PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF COMMERCIAL TRANSPORT

HON. F. X. RICHTER, *Minister* A. J. BOWERING, B.A.SC., P.ENG., *Deputy Minister*

REPORT OF THE
Department of Commercial Transport

containing reports on

COMMERCIAL VEHICLES, ENGINEERING, RAILWAYS, AERIAL TRAMWAYS, PIPE-LINES, AND INDUSTRIAL TRANSPORTATION

YEAR ENDED DECEMBER 31

1970

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1971

VICTORIA, BRITISH COLUMBIA, February 11, 1971.

To Colonel the Honourable JOHN R. NICHOLSON, P.C., O.B.E., Q.C., LL.D.,
Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits the Annual Report of the Department of Commercial Transport for the year ended December 31, 1970.

F. X. RICHTER
Minister of Commercial Transport

VICTORIA, BRITISH COLUMBIA, February 18, 1971.

The Honourable F. X. Richter,
Minister of Commercial Transport.

SIR: I have the honour to submit the Annual Report of the Department of Commercial Transport for the year ended December 31, 1970.

A. J. BOWERING, B.A.SC., P.ENG.
Deputy Minister of Commercial Transport

The Honourable Francis Xavier Richter, Minister of Commercial Transport.

Alfred John Bowering, B.A.Sc., P.Eng., Deputy Minister of Commercial Transport.

Report of the Department of Commercial Transport

A. J. Bowering, B.A.Sc., P.Eng., Deputy Minister

During the past year, several sectors of transportation have been affected by industrial unrest and other areas have been affected by changing methods of transport. These changes have presented a challenge to our staff in both the Engineering Branch and the Weigh Scale Branch. We are going through a period of growth and diversification that was not foreseen several years ago.

There has been an 11-per-cent increase in commercial vehicle registrations in British Columbia over the previous year, which is above the 10-year average of 6.6 per cent.

In co-operation with the Department of Highways, several changes were made in regulations governing the operation of commercial vehicles on Provincial highways. These changes reflect trends in the transport industry and necessary controls where traffic is increasing.

In order to control the movement of very large loads and to limit the movement of mobile homes and sectional buildings to a maximum width of 12 feet, the Department has been dealing to a greater extent with manufacturers. Meetings have been arranged with companies which build mobile homes and sectional buildings, steel fabricators, and those companies manufacturing large and bulky structures, so that these may be built in acceptable sizes for movement by rail or highway. This contact has established a communication which will reduce the need for movement of very large components of buildings and structures. This 12-foot-wide limit for the movement of mobile homes and sectional buildings has been in effect in British Columbia and in two other provinces for over a year, and recently all provinces with the exception of Alberta agreed to establish this same limit for highway operation.

The Department has for the past three years presented a report with respect to size and weight allowances for commercial-vehicle operation in Canadian provinces to the Canadian Conference of Motor Transport Authorities. This group, which includes administrators from all provincial governments, meets once a year to discuss regulations affecting motor-vehicle operation. As a result of this report being presented, regulations have become more uniform between provinces, making it easier for interprovincial operation of commercial vehicles. During the past year a second report was prepared for the conference on licence reciprocity agreements in Canadian provinces. These agreements are fairly consistent between provinces but vary considerably between individual provinces and American states.

Commercial-vehicle licence reciprocity agreements which are in force between this Province and 16 American states continue to provide a satisfactory means of licensing for international operators. There have been some changes in regulations in individual states; however, these have not affected the British Columbia operation. Problems are being experienced in some of the states with the operation of leased vehicles. This is not a problem in British Columbia as we require these to be licensed by the carrier under the agreement, or operators must purchase trip permits.

The number of bunk scales used on logging-trucks has increased considerably during the past year, mainly in the Prince George, Quesnel, Kamloops, and Midway areas. These scales enable the operators to determine more accurately the weight of their loads.

We have again provided assistance to the Department of Finance by issuing temporary motive-fuel permits when new vehicles are brought into the Province or new vehicles are purchased within the Province. This makes it possible for operators to use their equipment while applying for permanent authority under that Act. Issuance of these temporary motive-fuel permits was simplified to some extent during the year by the establishment of a prepaid, nonrefundable fee for short-trip operation.

The additional responsibility which was assumed by the Department in January of enforcing sections of the *Motor Carrier Act* at weigh scales has proceeded in a satisfactory manner, with both industry and the Public Utilities Commission acknowledging favourable results.

Use of heavy machinery by industry in mining operations has presented problems both in moving these machines to the sites and operation of them in the movement of large bodies of ore. The Engineering Branch has been involved with the staff of the Department of Mines and Petroleum Resources in checking heavy equipment used in strip-mining operations and on industrial roads. Some problems relating to braking systems were encountered, but these are being adjusted by the companies involved following meetings with our Engineering Branch staff.

This Branch was busy early in the year with matters relating to the construction of the railway to Roberts Bank. At this time, unit trains are operaing on a regular basis from Natal to Roberts Bank superport, and it is expected that within a few months' time the frequency of these trips will double. Signals installed at main highway crossings are working well and traffic is moving across the railway with a minimum of delay when trains are in the area.

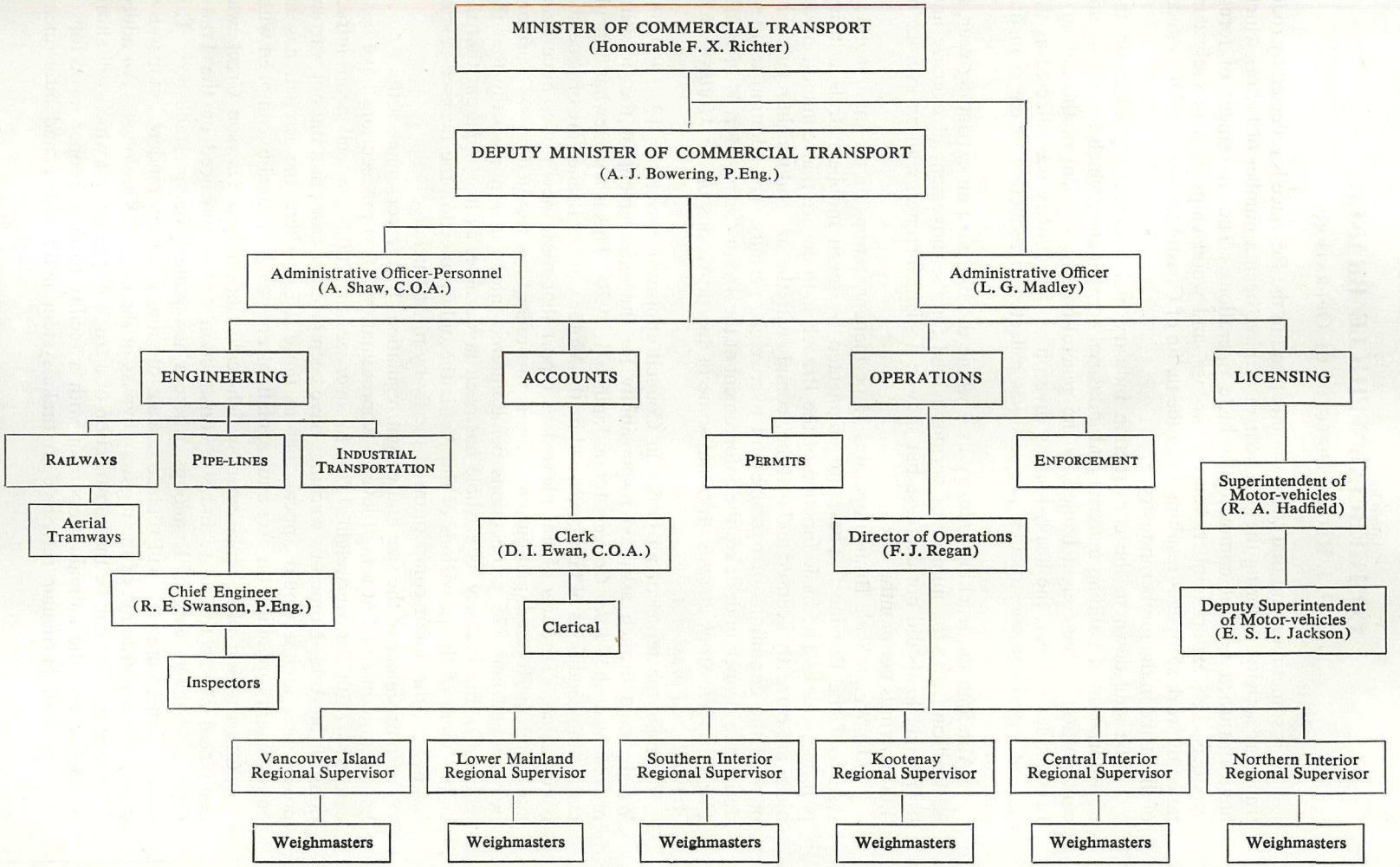
No major pipe-lines were built during 1970, but 143 miles of gathering lines were installed. Where necessary, test procedures were prepared and tests conducted to ensure safe working-pressures.

Aerial-tramway construction by industry has continued with the addition of four new chair-lifts and a number of other facilities for ski-ing being added. Further plans have been approved for the proposed reversible tramway over the Fraser River at Hells Gate. The company has started construction of the terminal on the west side of the Fraser River and plans to complete the installation early in 1971. Providing parking for cars and trailers is a problem at this location and special arrangements are being made to accommodate these vehicles as owners use the tramway.

Operators of ski-ing facilities have formed a new organization known as "Canada West Ski Areas Association." They formerly were members of an international organization, but have recently formed this new association as they find their interests somewhat different to those in the United States. This group is active in working on safety standards with the Department and improving operations at locations in the Province by guiding their own members.

Again I wish to acknowledge the excellent co-operation we have received from other departments of Government and particularly from the Department of Highways and the Motor-vehicle Branch of the Attorney-General's Department.

ORGANIZATION CHART



COMMERCIAL VEHICLE BRANCH

F. J. REGAN, DIRECTOR OF OPERATIONS

It is sometimes said that the economic trend in the Province is reflected by road transport activity. During the past year there have been a number of factors which have disturbed normal commercial-vehicle operations. The movement of forest products, i.e., export lumber, veneer, sawlogs, and wood chips, was severely curtailed by work stoppages resulting from the tie-up of Coastal tugboats and the effects of the strike in the lumber industry.

The shut-down in the construction industry had a depressing effect on the transportation of building material and industrial components, which form a significant portion of the freight hauled by the general-cartage segment of the industry. In a similar manner, the heavy-hauling division of the industry was affected as the lack of new large construction projects was reflected in reduction of cargo in this category.

Although the trucking industry as a whole did not have an expanding year, it is significant that the number of permits issued for the movement of oversize and overweight loads did not decrease but showed a slight increase, with an average of 4,000 permits per month.

The Weigh Scale Branch operates 36 permanent stations on the main highway system of the Province. These are augmented by seven mobile patrols utilizing portable scales. The basic function of the Branch is to ensure that commercial vehicles are correctly licensed and that they comply with the size and weight regulations or with the conditions of oversize and overweight permits. In addition to these duties, the Branch undertakes the enforcement of the *Motor Carrier Act, Motive-fuel Use Tax Act, Stock Brands Act,* and some of the provisions of the *Motor-vehicle Act* and the *Forest Act.*

Under the terms of an Order in Council approved November 12, 1969, the Weigh Scale Branch assumed responsibility for the enforcement of the licensing provisions of the *Motor Carrier Act* on January 1, 1970. This is a somewhat difficult task as the conditions of licences issued by the Motor Carrier Branch are of necessity complicated. However, I am pleased to report that these new duties have been adequately performed, and our checking in this regard has resulted in 498 warnings being issued and 775 prosecutions being entered into. It is noteworthy that the reaction of the industry as a whole has been favourable, as it is apparent that the enforcement of the provisions of the Act is the only protection the licensed carrier has against the unfair competition of the fly-by-night trucker.

Enforcement of the size and weight regulations by the personnel of the Branch has been maintained at a high level. Approximately 3,500 prosecutions have been entered—2,300 for overweight, 1,000 for oversize, and 200 for miscellaneous infractions of the Act. Numerous warnings have been given in cases that did not warrant prosecution and it would appear that in those areas where the Branch has an enforcement capability, the Act and regulations are being reasonably complied with.

Construction of a replacement weigh-scale station near Dawson Creek was completed during the year, and site construction was commenced on the Trans-Canada Highway west of Kamloops, where a new scale is being established. This scale, when completed, will replace a scale-site that has been rendered inoperative due to the construction of the highway bypass of the City of Kamloops. An added feature of this site will be the construction of a truck-inspection pit which will afford the police and the individual operator with a facility to do a proper inspecton of vehicles with particular reference to brake-system maintenance and adjustment.

There have been a number of truck runaways on the steep hill entering Kamloops in past years and in almost every case investigation has shown that the prime cause of the accident has been improper maintenance or adjustment of trailer brakes.

One of the problems mentioned in the 1969 Annual Report, that of communication between truck-driver and weigh-scale operator, has to a degree been overcome. Fifteen sets of the new-type signals have been built for us by the Department of Highways and will be installed early next year. It is anticipated that all installations will be complete by the end of 1971.

Scale maintenance for the year has been normal; Toledo Scale Company of Canada is performing the preventive-maintenance service in a satisfactory manner. No new scale decks or installations have been completed; however, some investigations have been made of a load-cell application for truck scales, and present indications are that this principle offers many advantages. It is hoped that during the coming year further studies and evaluations will be made of this unit and, if our present opinions are confirmed, a change over to this type of installation will be programmed.

Our field staff are divided into six regions, with a Regional Supervisor in charge of each area. It is his duty to ensure that the policy of the Department with respect to the administration of the Act and regulations is carried out. The following is a summary of activities by region:

Region 1. Vancouver Island—General trucking activity on Vancouver Island during the year was affected by sporadic movement in both the logging and construction branches of the industry.

The only major construction project was the British Columbia Hydro and Power Authority dam development at Jordan River. In order to minimize road movement of oversize and overweight loads to this site, the contractor installed a barge grid near the power development.

Development of the Utah Mine near Port Hardy will not affect the public roads in the area. All hauling and shipping will be on private roads. The only mine using public roads on the Island is Western Mines at Buttle Lake, where production is hauled to tidewater at Campbell River.

Region 2. Lower Mainland—Commercial truck activity has remained steady and the only retarding influence was the series of strikes and lockouts. The movement of mobile homes and modular buildings showed an increase, as did the movement of prefabricated houses and precast beams. When the over-all length of the load exceeds 100 feet, which is often the case, a steering trailer is used and the movement is carried out between 2 a.m. and 5 a.m., without creating problems for the motoring public.

International traffic has increased and almost without exception the industry has found a back haul for the vehicle used to import produce and machinery. Inbound freight destined for Alaska has been very steady during the year under review.

Region 3. Southern Interior—Headquarters of this region is at Kamloops, and the region extends north to 100 Mile House, south to Boston Bar, east to Revelstoke, and west to Lillooet.

Projects affecting trucking in this area were the large expansion of the Kamloops Pulp Mill; the opening of the Lafarge Cement Company Plant at Campbell Creek; the development of the Lornex, Brenda, and Similkameen mines; and the construction of a new distillery near Kelowna.

Logging remained steady when labour and weather conditions allowed. There has been some reorganization of the industry with the construction of new mills at Okanagan Falls, Princeton, and Armstrong. This new construction will affect the highway haul of raw material and lumber products.

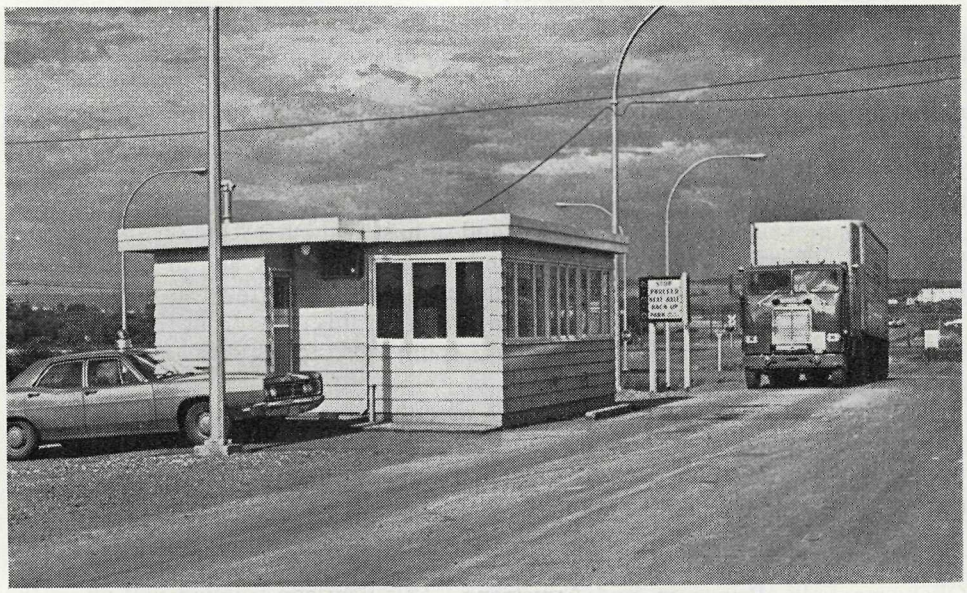
Region 4. Kootenays—This region reported an over-all increase in traffic during 1970. The most notable increase was at the border scales of Golden and Fernie and was due to the movement of equipment, machinery, and material for a number of industrial developments, the most notable of which was the coal development in the Fernie-Natal areas. In addition, the trucking industry benefited by the expansion of the pipe-lines in the area and the development of mineral resources in the Columbia Valley and Bull River area. Oil-drilling equipment was moved into the Flathead Valley during the year. The cost of moving the pipe by issuance of oversize and overweight permits was approximately $6,000. While this amount may be small in the light of the over-all expense, it is indicative of the amount of revenue produced by industrial activity of this type.

Region 5. Central Interior—The headquarters of this region is located at Prince George, and the Supervisor's area extends from the British Columbia-Alberta Boundary to the Pacific Ocean, north to Pine Pass on the John Hart Highway, and south on Highway 97 to the 100 Mile House area.

This region has the largest number of highway logging-trucks in the Province. In an effort to achieve a greater pay load, a large number of vehicles has been equipped with compressed-air-operated bunk scales. These scales have been found to be accurate to within 200 pounds and have enabled the operators who have them to achieve a maximum pay load. Last year for the first time, highway log hauling was carried out during the spring breakup. This was due to the use of bunk scales, as the driver was able to comply with the road weight restrictions imposed during this period.

The general industrial activity in the central Interior of the Province has sustained the trucking industry in that region and it is to be expected that road transport in this area will continue to develop to serve the new townsites and industries.

Region 6. Northern Interior—This region comprises all of the Province north of Pine Pass. The headquarters is at Dawson Creek, where a replacement weigh-scale building was constructed at Mile 3 on the Alaska Highway. It was opened for



New weigh-scale at Dawson Creek, showing improved signal system for directing trucks.

traffic on May 1, 1970. The new building, with full basement, heat into the scale pit, air-conditioning, and traffic directional signals is a great improvement over the old building and signal system.

Truck traffic remained steady throughout the area, with the greatest activity in the Fort Nelson area. Logging has increased in both the south Peace River area and in the north Peace River district. It is only recently that any number of restricted route permits were issued in this region, and now there are 75 vehicles regularly hauling gross loads of 89,000 pounds.

On April 23, 1970, the regulations under the *Department of Commercial Transport Act* were changed to allow for a maximum width of 8 feet 6 inches for commercial vehicles. This change was necessary to permit the line-haul section of the industry to take full advantage of the modern method of packaging, which is in modules of 2 feet. With the advent of the new regulation, a full 8 feet of interior cargo space was made available. This slight increase in over-all width was also of great assistance in the transportation of stud logs; stripped, piled lumber; and veneer.

Division 10 of the regulations under the *Department of Commercial Transport Act* was amended on June 24, 1970, making it mandatory that pilot cars be equipped with roof-mounted flashing amber lights when escorting oversized loads. This change also set out the positions to be taken by pilot cars when operating on the highway.

The prorate reciprocity licence agreement between British Columbia and 16 western American states, as well as our Canadian licence reciprocity agreements with several Canadian provinces, have been working well, with no major areas of conflict.

In conclusion, I am pleased to report that the Weigh Scale Branch has received full support and assistance from other Government departments, local police forces, and from the Royal Canadian Mounted Police.

PERMIT-ISSUING OFFICES

Weigh-scales

Cache Creek
Chetwynd
Dawson Creek
Deas Island North
Deas Island South
Duncan
Fernie
Fort St. John
Golden
Hunter Creek
Kaleden
Kamloops
Kamloops North
Kinnaird
Midway
Pacific
Parksville
Pattullo Bridge
Port Mann East
Port Mann West
Prince George North
Prince George South
Quesnel
Rossland
Ruskin
Rutland
Saanich
Sicamous
Terrace
Tête Jaune Cache
Tupper Creek
Vanderhoof
Vernon
Victoria (term permits)
Williams Lake
Yahk

Portable Patrols

Kamloops
Kootenay
Lower Mainland
Nelson
Okanagan
Peace River
Prince George
Victoria

Department of Finance Government Agents

Alberni
Ashcroft
Atlin
Burns Lake
Clinton
Courtenay
Cranbrook
Creston
Duncan
Fernie
Fort Nelson
Fort St. John
Golden
Grand Forks
Ganges
Invermere
Kamloops
Kaslo
Kelowna
Kitimat
Lillooet
Merritt
Nanaimo
Nelson
New Westminster
Oliver
Penticton
Pouce Coupe
Powell River
Prince George
Prince Rupert
Princeton
Quesnel
Revelstoke
Rossland
Salmon Arm
Smithers
Terrace
Vancouver
Vanderhoof
Vernon
Williams Lake

Motor-vehicle Branch Offices

Abbotsford
Bella Coola
Campbell River
Castlegar
Chilliwack
Cloverdale
Dawson Creek
Gibsons
Kamloops
Masset
Mission
Nakusp
New Denver
New Westminster
North Vancouver
Pemberton
Port Hardy
Queen Charlotte City
Sechelt
Slocan
Squamish
Stewart
Trail
Valemount
Vancouver (Main)
Vancouver (East)
Vancouver (Point Grey)
Victoria

Miscellaneous

Director of Operations, Department of Commercial Transport, Victoria.
Engineering Branch, Department of Commercial Transport, Vancouver.

Comparison of Gross Revenue Collections from Commercial Licence and Permit Fees for Five-year Period 1965/66 to 1969/70, Inclusive

Source	1965/66	1966/67	1967/68	1968/69	1969/70
Commercial licences	$10,674,538	$11,281,095	$11,732,631	$13,010,278	$14,639,288
Nonresident permits	429,067	459,048	444,302	565,877	715,407
Trailer fees	91,177	97,934	100,278	114,782	122,556
Temporary operation permits	98,007	99,604	102,337	113,642	134,918
Oversize and overweight permits	629,453	706,213	785,690	840,305	889,623
Totals	$11,922,242	$12,643,894	$13,165,238	$14,644,884	$16,501,792

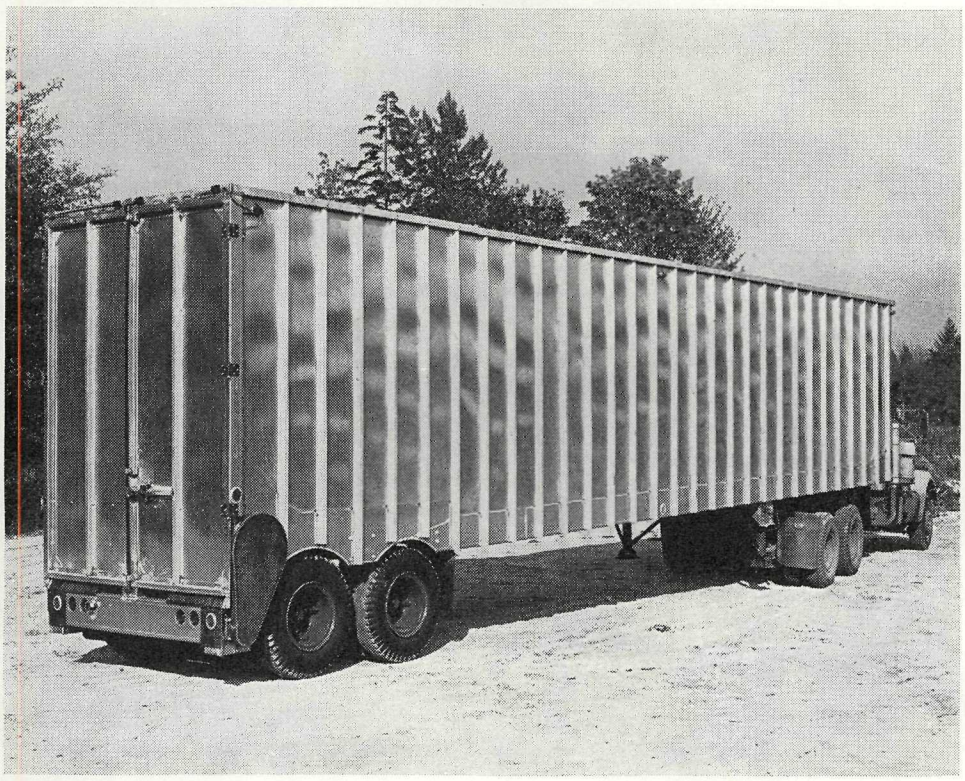
Summary of Commercial-vehicle Licences and Permits Issued for Five-year Period 1965/66 to 1969/70, Inclusive

Source	1965/66	1966/67	1967/68	1968/69	1969/70
Commercial motor-vehicle licences	155,670	165,703	175,358	194,332	215,670
Nonresident commercial permits	16,720	17,085	16,142	18,839	23,684
Commercial-trailer licences	16,978	19,057	20,929	21,188	22,176
Temporary operation permits	36,732	38,179	39,137	42,814	49,974
Oversize and overweight permits	32 919	36,101	44,777	46,768	51,218

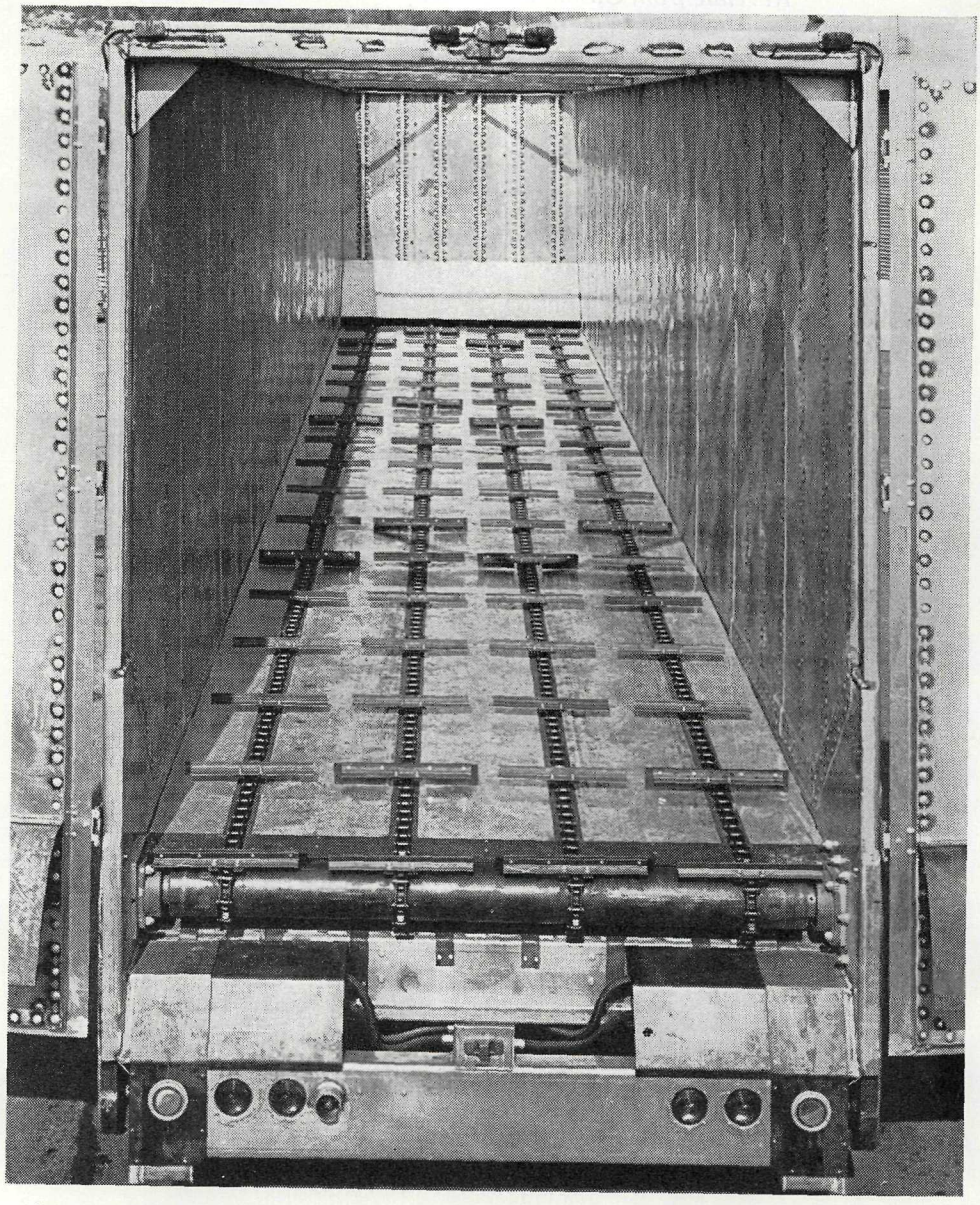
Revenue from Gasoline and Motive-fuel Use Taxes for Passenger and Commercial Vehicles

Fiscal Year	Amount	Fiscal Year	Amount
1956/57	$22,593,000	1963/64	$46,420,000
1957/58	24,500,000	1964/65	50,865,000
1958/59	26,100,000	1965/66	56,441,000
1959/60	28,582,000	1966/67	61,388,000
1960/61	30,093,000	1967/68	65,548,000
1961/62	39,262,000	1968/69	69,414,000
1962/63	43,129,000	1969/70	76,115,000

NOTE—The above information on revenue from gasoline and motive-fuel taxes has been combined, as separate returns for commercial vehicles are not available.



Aluminum live-floor chip transport, self-unloading, 45 feet long by 8 feet 6 inches wide. Capacity, 15.3 units, approximately; empty weight, 16,580 lb.



Aluminum live-floor chip transport. Interior view showing details of endless unloading chains and glides. Chains are driven by means of two hydraulic motors at rear of trailer.

Commercial Vehicles Licensed

Fiscal Year	Number of Vehicles
1960/61	113,514
1961/62	117,709
1962/63	125,088
1963/64	132,267
1964/65	142,886
1965/66	155,670
1966/67	165,703
1967/68	175,358
1968/69	194,332
1969/70	215,670

Commercial-vehicle Licence and Permit Revenue

Fiscal Year	
1960/61	$8,371,679
1961/62	8,854,387
1962/63	9,127,958
1963/64	9,902,543
1964/65	10,809,218
1965/66	11,922,242
1966/67	12,643,893
1967/68	13,165,238
1968/69	14,644,883
1969/70	16,501,792

Two-way transport for hauling mine concentrates in centre-side dump-box and petroleum products delivery to mine on return trip.

ENGINEERING BRANCH

(Railways, Aerial Tramways, Pipe-lines, and Industrial Transportation)

R. E. SWANSON, P.ENG., CHIEF ENGINEER

The year 1970 has been a year of challenge. The Pacific Great Eastern Railway has been extending north with two extensions, one north from Fort St. John for 250 miles to Fort Nelson, and the other north from Fort St. James to Dease Lake, a distance of 350 miles. Freight movement on railways continued to increase steadily. On the Pacific Great Eastern Railway the increase was due to development in the forest industry, as new pulp-mills were put into operation in the northern area. In the Kootenays, and on the British Columbia Harbours Board Railway to Roberts Bank, the increase in haulage was due to coal, 2,250,000 short tons of coal being delivered to Roberts Bank by the new railway during the last nine months of 1970.

Wharf and inplant railways increased during the year. Neptune Terminals Ltd., in North Vancouver, due to the Canadian National Railway coal haul, purchased a diesel-electric locomotive and now runs its own switching operation. Locomotives have been purchased for the new pulp-mill complexes at Mackenzie. Heavy switching and log hauling is taking place at Fort St. James. The pulp-mills at Prince George now generate heavy traffic both in chips and pulp, as well as in supplies.

The oil and gas industry has contributed to the increase in freight both by shipping sulphur and propane products by rail.

Our engineers have been very active. Inspections were made in Kitimat, Prince Rupert, Prince George, Fort St. John, Dawson Creek, Terrace, Quesnel, Nelson, Cranbrook, Kamloops, Victoria, Alberni areas, and other points served by rail.

Propane and oil storage adjacent to railways has been given special attention. Accidents due to these commodities were as a minimum during the year. A number of new installations were checked out, approved, and inspected.

New locomotives were approved for the Pacific Great Eastern Railway and the British Columbia Hydro and Power Authority Railway, and considerable other rolling-stock was inspected by our engineers.

Logging railways were quite active. At Crown Zellerbach Canada Ltd., Ladysmith Division, new railway cars were built and inspections carried out. At Englewood, the 75-mile railway of Canadian Forest Products Ltd. was inspected, along with bridges and rolling-stock. Separate reports made by Inspecting Engineers for each major railway are included later in this section.

Pipe-line construction has been quite active, with the installation of a number of compressor stations. In some cases, these stations incorporated water injection systems for oil recovery in the field. A great amount of technical work has been done on Canadian Standards Association Codes on oil and gas pipe-lines, as the Chief Engineer of the Department was appointed by the Canadian Standards Association to be chairman of a number of CSA codes. In 1970, a meeting was held in Calgary on standards for materials for pipe-lines, and a code is being formulated by pipe-line engineers from all parts of Canada. This is necessary in order to keep the pipe and steel manufacturers in line with the technology required in the design of pipe-lines. Further details are included later in this report by the Inspecting Engineers, whose duty it is to test and inspect pipe-lines in the field.

A separate section of this report deals with industrial transportation by truck; however, I wish to point out here that this section of the Engineering Branch works in liaison with the Department of Mines and Petroleum Resources, the Workmen's

Compensation Board, the Motor-vehicle Branch, and the Royal Canadian Mounted Police, as well as the city police forces. Training courses are conducted by our engineers, in which the foregoing authorities participate.

The aerial-tramway industry has been very active over the past year, and large aerial tramways were under construction before the close of the year. The Hells Gate Aerial Tramway is being constructed to allow the public access to the fish hatcheries at Hells Gate Canyon on the Fraser River. Difficulties were encountered in having the design comply with the requirements of the Canadian Standards Association, as the Swiss manufacturers work to European standards. The problems were solved and the design has been approved in principle, so that construction commenced in October 1970.

Engineering plans have been studied during the year on the Boston Bar Aerial Car Ferry, as the design of this tramway is now required to be brought up to the requirements of the Canadian standards. This work has been progressing in stages so that, by the end of 1971, it is expected to be completed and, in addition, a rescue car will be provided in case of emergency.

With regard to Canadian standards and their application to rope-tows, ski-lifts, and large aerial tramways, the Canadian Standards Passenger Aerial Tramway Code Z-98 has been chaired since its inception by the Chief Engineer of the Department. The subcommittees on design and editing are also located in Vancouver, and meetings are held from time to time in the office of the Chief Engineer. The membership of these subcommittees, with the exception of the chairman of the Main Committee, are all engineers from industry and not in any way connected with Government. Consequently, the subcommittees concerned are in a position to render interpretations of the Code for governmental bodies across Canada, including the Federal Park authorities in Ottawa.

All drawings and specifications of new ski facilities and tramways in British Columbia are approved by our Engineering Branch, and during the year subsequent to this approval, our engineers have followed through with inspections prior to the facilities being certified.

Separate reports by the engineers responsible for these inspections are included later in this report.

RAILWAYS

Pacific Great Eastern Railway Company

Chief Engineer's Report

In accordance with established procedures, inspections were carried out over the entire year on the Pacific Great Eastern Railway. In the early part of the year during snow and winter breakup, inspections were made of new construction north of Fort St. John, particularly where public interest could be affected with regard to the crossing of public thoroughfares by the new railway extensions. Other inspections were made of permanent way, including river crossings, drainage, and all matters affecting operation.

During the weeks of October 4 and November 22, the official annual inspection was carried out over the entire line. The trip was made by track motor, starting from Fort St. John and inspecting new construction north between Fort St. John and Fort Nelson. Following this, an inspection was made between Fort St. John and Chetwynd, from Chetwynd to Dawson Creek, from Kennedy to Mackenzie, and between Summit Lake, Fort St. James, and Camp Kenyon. The inspection then continued south over the main line to North Vancouver, so that over 1,000 track

miles were covered on the trip. Appropriate officials of the Pacific Great Eastern Railway accompanied me during the inspection, which encompassed matters affecting track, right-of-way, operation, dispatching, communications, stations, sidings, the servicing of industries served by the railway, maintenance facilities, motive power, and rolling-stock.

During the year, 165,000 creosoted ties were installed as replacements in existing track over the entire line. Between Mileages 51 and 61, 10 miles of 100-pound rail was replaced with 115-pound rail. This is the start of a programme on the part of the railway to upgrade subdivisions where heavy grades and considerable curvature exist. The economics of such a programme are obvious when one considers the car loadings and the tonnage now handled by this railway.

The rail re-lay programme completed for 1970 was as follows:

	Track Miles
100-pound rail replaced by 115-pound	10
85-pound rail replaced by 100-pound	191
85-pound rail made available for construction	201
39,000 tons of rail welded into 78-foot lengths	218

I am pleased to report that heavy rail is now continuous from North Vancouver to Prince George, a distance of 460 miles, and that 85-pound rail is continuous from Prince George to Fort St. John. The new construction is utilizing the 85-pound rail made available by this well-timed programme of rail re-lay upgrading.

Sixty-seven miles of crushed rock ballast were installed during the year between Mileages 393 and 460.3. An excellent job has been done on this ballasting. The old ballast has been ploughed out and replaced by properly classified crushed rock. Shoulders have been well formed, with proper ditching and drainage throughout the completed area of upgrading. Other ballast was laid in various locations throughout the line in keeping with standard maintenance procedure.

All bridges throughout the line were inspected. It is noted 16 bridges were upgraded or reconstructed. In some cases bents were renewed, bridges redecked with fireproof material, steel girders replaced wooden spans, and bents and footings replaced with concrete. Generally, existing bridges are in quite good condition, with normal maintenance carried out by company forces; however, the advent of larger locomotives which weigh 192 tons on six axles demands that the standard of the bridges be upgraded to accommodate the heavier power. This requirement is emphasized now that heavy rail permits increased speed with increased impact. It is now an established practice that five such units are coupled together at the head end of the train, with two or more units placed farther back and operated by remote control radio from the head end of the train.

Nine trestles were replaced by culverts and fill. This was done mostly in mountainous terrain to avoid the potential danger of fire due to brake-shoe burn. Some years ago, a locomotive was lost on Pavilion Mountain when a bridge was destroyed from this cause. I am pleased to report all the bridges on Pavilion Mountain have now been replaced by fills and, in most cases, the curvature has been decreased where such trestles have been replaced by permanent fill. In addition to this work, concrete cribbing has been installed as replacements to hold alignment. This applies particularly to the Anderson Lake and Seaton Lake areas of the line. On the Peace River Subdivision, three timber trestles were replaced with concrete-box construction. This design was originated by company engineers subsequent to soil studies in the Peace River area.

A system of replacing wooden bridges with prestressed-concrete box girders, using a specially designed gantry crane for installation, was developed by Harry

Minshall, P.Eng., Chief Engineer, Pacific Great Eastern Railway (retired 1970). By the use of Mr. Minshall's system, seven major bridges were replaced during 1970 without disrupting traffic to any serious extent. Mr. Minshall utilized prestressed concrete techniques in his design of these bridges. The box-girder deck accommodates normal ballast and ties over the structure; thus, the shock load is absorbed without vibration and, of course, the fire hazard from brake-shoe burn is entirely eliminated. All the designs, including the gantry for installation, were approved by the Engineering Branch of the Department of Commercial Transport prior to construction, and the bridges, when completed, were inspected.

The Cottonwood, Ahbau, Prince George, Peace River, Deep Creek, Clinton, and Lillooet bridges have been given special attention during 1970, as these are the major key bridges on the line. Decks have been renewed where required. Foundations and abutments were found to be in order. The soil conditions adjacent to the north abutment of the Cottonwood Bridge were given special attention, as the ground in this area at times presents problems.

In the West Vancouver area, an agreement was established between the railway company and the municipality to lay a major sewer on the railway right-of-way. The construction is being done by the Greater Vancouver Sewerage and Drainage District. Certain problems required special attention in the design, as the railway bridges in the area are now required to support the 18-inch sewer pipe. Transition problems from bridge to grade embankment and the placement of manholes and undercrossings required to be worked out and finalized. In this respect, our Engineering Branch worked directly with the Greater Vancouver Sewerage and Drainage District so that a plan was approved in principle prior to construction commencing. During construction, field inspections were made by our engineers and in several instances the sewer pipe had to be moved or relocated and, in some instances, manholes were moved to maintan standard clearances as agreed to in the basic design. This project was not completed by the end of 1970, but completion with final inspection and approval is expected early in 1971.

In summarizing the main line between Fort St. John and North Vancouver, it can be stated much has been accomplished during 1970 and the latter years of the 1960's in bringing the entire track structure up to main-line standards. Traffic has steadily increased, which has justified bigger power and longer trains, which, in turn, demanded track and substructures to accommodate the bigger power and the heavier trains and equipment. Management must, therefore, be given credit for its farsightedness in planning ahead of time to provide the heavier rail, creosoted ties, crushed-rock ballast, curve alignment, and upgraded bridges. These things cannot be accomplished overnight and, therefore, good judgment is in evidence on the part of those who have made the growth of this railway possible.

All the branch lines or operating branch subdivisions were inspected by track motor. These lines, being feeder lines, are not up to the standards of the main line with respect to weight of rail, ballast, and heavy construction, but are of a standard commensurate with branch-line traffic. In particular, it is to be noted the 61-mile Dawson Creek subdivision is laid with 60- and 70-pound rail and, while the volume of traffic on this line does not justify main-line standards, the rail is generally crooked and surface kinked as it is re-lay rail changed out from the main line. The ballast has a larger-than-average content of small boulders, which make surfacing very difficult. At the first opportunity that economics justify the expenditure, 85-pound re-lay rail should be laid. Bridges, crossings, and alignment on this branch are in order.

The interchange trackage at Dawson Creek between the Alberta Northern Railway and the Pacific Great Eastern Railway was inspected. It was noted that the

lock was missing on the derail, and officials were notified accordingly. The grain elevators at this location have been quite active and a creosoting plant is now operating on the Pacific Great Eastern Railway lines in this area.

Inspection of the "Mackenzie Lead" (not considered to be a subdivision) revealed that traffic on this 20-mile branch has greatly increased. This branch serves a very large lumber-manufacturing complex, and two pulp-mills were under construction at the time of the inspection. In addition, the branch line serves the Town of Mackenzie. There is no doubt this 20-mile branch should be laid with 100-pound rail when such rail is available as re-lay from the main line. All replacement ties on this branch should be creosoted ties in anticipation of the heavier rail within the next two years. Actually, considering the volume of traffic and the light rail, this branch is in quite good condition. The main highway crossing has been relocated and a recommendation has been made to have this crossing signalized in 1971, but not later than 1972. Other road crossings have been brought up to standard on this branch line during 1970.

The bridges were inspected and found to be in a proper state of maintenance. The yards and close clearances were also inspected in the sawmill and pulp-mill areas, and approvals are being given with respect to these matters.

A main road or highway exists in the Mackenzie area which crosses the railway, and I am informed this road is owned by the Pacific Great Eastern Railway. Notwithstanding its status with regard to ownership, the railway crossings must be treated as public crossings and all appropriate signs must be displayed. Company officials were also instructed that crossings on this road must not be blocked by trains for periods exceeding five minutes.

The storage of inflammable liquids (oil tanks, etc.) adjacent to the railway were inspected and approved during the year. These installations are owned and operated by the oil companies but are served by the railway.

The Takla Lake subdivision or branch line was inspected by track motor. This line traverses in a westerly direction between Kennedy on the main line to Fort St. James, a distance of 72.5 miles. The line is being extended and construction will extend the steel an additional 72.5 miles in a northwesterly direction. It is planned that construction will continue ultimately to Dease Lake. At present the line serves a sawmill and plywood complex at Fort St. James, besides serving oil-storage facilities (which were also inspected and approved), as well as serving the town and the area of Fort St. James and Pinchi Lake.

This line is laid with 85-pound rail and is in a much improved condition over the past year. The track and structures are adequate for the type and volume of traffic, and it will serve its purpose until the extension imposes heavier traffic and speed is increased as urgency demands.

The Prince George Industrial Park was inspected and found to be in order. Various trader sidings were examined and clearances checked. A large number of machinery houses have established themselves in this complex, and a number of manufacturers and treaters of wood products are served by the railway in this area. Generally, it can be reported that the track and rail facilities are in proper order and the area is being properly served by the railway.

The yards, trackages, and interchanges of the Prince George Pulp and Paper Limited, the Intercontinental Pulp Company Ltd., the Northwood Pulp Limited, and the Union Oil Company of Canada Limited were inspected. Generally, the trackage and facilities are satisfactory and in order and, where switched by the Pacific Great Eastern Railway, no problems of any consequence exist; however, at the Northwood Pulp Limited plant, where the pulp company does its own inplant switching, a number of problems have been encountered with respect to the pulp company's own switching personnel. These matters were found to be of a domestic nature, and

one of our engineers was dispatched to this plant to investigate, after which the domestic problems were satisfactorily settled.

An inspection was made of the branch line that services the McMahon Plant of Pacific Petroleums Ltd. at Taylor. This line is switched by the Pacific Great Eastern Railway. The inspection revealed the tank-loading facilities were satisfactory, having been upgraded over the past two years. The track, clearances, signals, and operation were found to be in order.

The yard at Williams Lake was checked out and facilities for refuelling were investigated. Considerable improvements have been made by the Pacific Great Eastern Railway in this area. An automatic signal was ordered in 1969 for the Chilcotin Road crossing adjacent to the new South Yard. At the time of the inspection, the signal was not installed.

During the annual inspection trip, particular attention was paid to the matter of weed control and chemical spraying. In the Squamish area, municipal authorities have gone on record as being adverse to the use of chemicals for this purpose. I disagree entirely and would state that, for the control of deciduous trees, no adverse ecological effect is in evidence after 30 years' experience in this field. A fairly good job has been done by the contractors of this work, but the evergreens persist. In this regard, it is probable slashing will give the best and most acceptable result. It can be reported, however, that the matter of weed control is being adequately handled by the railway.

The station facilities were inspected between North Vancouver and Prince George. Housekeeping was in order and washroom facilities are being properly maintained. Platforms required to have the yellow line repainted at Lillooet and Quesnel. This was drawn to the attention of the officials.

Communications were inspected from time to time over the year, and operating checks were made during the annual inspection trip. A new dispatch centre has been installed in North Vancouver, where all communications are dispatched and received via microwave. During the year the new railway extensions in the north have demanded an expansion of the microwave system and an addition of a telephone system interconnected with the British Columbia Telephone Company system.

In the northern area, repeater stations were required to be constructed. In most instances, no commercial power is available and power is generated by small diesel plants. These are unattended and are operated by remote control by the use of radio. In one instance, a station caught fire and was destroyed and required to be replaced. Most of the northern microwave installations have not been inspected, but all of them have been discussed with the Chief Communications Officer of the Pacific Great Eastern Railway.

The Communications Department of the Pacific Great Eastern Railway is also responsible for all signalization at railway crossings. The policy has been well established that each year an assessment is made of all level crossings and an average of four crossings per year have been installed on this railway. During 1970, five new signals were placed in operation. Some of these were a carry-over from 1969, while some of the 1970 signalizations have been carried over to 1971. During the 1970 inspection trip, four crossings were scheduled for signalization in 1971. Three of these are in the Pemberton area and one is in the Mackenzie area. It is probable that West Vancouver will apply for the signalization of one or two crossings in 1971 and, if so, the application will be assessed and, if in order, approved for installation.

Shop facilities were inspected and it can be reported the new car shop at Squamish was put into operation during the year. This new complex adds considerably to the enlarged locomotive shops completed last year. This new facility will enable the railway to effectively cope with the AAR rules in the repair and rebuild-

ing of railway cars to international standards for the interchange of rolling-stock between railways. The shops incorporate a paint shop, a blacksmith shop, spring shop, wheel shop, electric shop, locomotive rebuilding shop, and a shop to rebuild track-building equipment such as tampers, speeders, and bulldozers.

The shops at Prince George and North Vancouver were inspected and found to be in order and adequate for present requirements.

During the year the Pacific Great Eastern Railway ordered and took delivery of five new 3,000-horsepower diesel-electric locomotives. These engines weigh 192 tons each in working order and are in addition to the four units of the same type delivered in 1969. These locomotives are standard in all respects; in fact, they all worked their way in service on the Canadian Pacific Railway across Canada from Montreal to Vancouver. This effected a tremendous saving in freight, and the engines were ready to be put in service the day they arrived on Pacific Great Eastern Railway lines. In addition, a wrecking crane (big hook) was delivered in 1970, so that one is now located in Prince George and one is located in Squamish.

During the year, the Engineering Department of the Pacific Great Eastern Railway moved from Vancouver to North Vancouver into a new building constructed adjacent to the Operating, Communications, and Dispatching Departments.

On the northern extension from Fort St. John to Fort Nelson, a distance of 250 miles, progress can be reported as follows:

	Miles
Grading completed	212.5
Rail and ties laid	115.6
Ballasting completed	71.6

Inspections were made during the year on various phases of this construction. In one case, reports of improper drainage by a farmer were investigated and corrections made. In another case, reports of problems at level crossings were investigated and corrective measures were ordered to be put into effect. During the annual inspection trip, the construction was inspected and level crossings were checked. It can be reported that two major grade crossings in the Fort St. John area have been signalized and the signals were in operation at the time of the inspection. Mackenzie Avenue, when signalized, incorporated a flashing forewarning sign to vehicular traffic on the north approach. At Airport Road in Fort St. John, the automatic signal is our standard approved design and incorporates a warning bell.

Stop signs to vehicular road traffic were ordered at most level crossings during the construction stage, but in most cases these are eliminated when the line is opened for traffic and the crossings are given final approval. It can be reported the construction of the Fort St. John to Fort Nelson Extension is progressing, so that it is expected to be opened for traffic during 1971.

The Takla Lake Extension from Fort St. James to Takla Lake, a distance of 72.5 miles, was inspected, and I would report as follows:

	Miles
Grading 100 per cent completed	30
Grading 50 per cent completed	42.5
Rail and ties laid	6

On the Dease Lake Extension, from records obtained from the Pacific Great Eastern Railway, I would report as follows:

	Miles
Total survey of Takla Extension	350
Clearing completed 100 per cent	18

During the year all accidents were investigated by our engineers. A fatal accident occurred on construction when a bridge worker was knocked from a gilley

board. Preventive measures were instituted to avoid a recurrence. The Safety Officer of the railway worked closely with our engineers on all matters pertaining to safety, as safety on railways is the responsibility of the Department of Commercial Transport, rather than of the Workmen's Compensation Board, and our responsibility extends to all switching areas in the Province of British Columbia.

Conclusion—It can be reported that the Pacific Great Eastern Railway is being properly maintained and properly operated commensurate with serving the public in a safe and proper manner. It can also be reported that the extensions of this railway are being located and constructed in a proper and efficient manner. — *Robert E. Swanson, P.Eng., Chief Engineer.*

Roberts Bank Superport Railway

R. E. Swanson, Chief Engineer

The Roberts Bank Superport Railway of the British Columbia Harbours Board was opened for traffic on April 6, 1970. This opening for traffic was subsequent to a final inspection of the line on March 24, pursuant to section 179 (4) of the *Railway Act*. The inspection trip was made by two track motors with officials of the British Columbia Harbours Board, the Pacific Great Eastern Railway, the British Columbia Hydro and Power Authority, and the Canadian Transport Commission accompanying me. In view of the jurisdictional bodies being Federal and Provincial, and in consideration of representation from the British Columbia Hydro and Power Authority and from the Pacific Great Eastern Railway, this trip was carried out as a joint inspection.

The rail route to Roberts Bank, in order to interconnect with the Canadian Pacific Railway and the Canadian National Railway, begins at Fort Langley by branching from the Canadian National Railway main line and traversing 2.2 miles in a southerly direction, joining with the Fraser Valley Branch of the British Columbia Hydro and Power Authority Railway at Mileage 21.73. The route then traverses over British Columbia Hydro lines in a southerly direction to Mileage 14.35, a distance of 6.38 miles. At this mileage, the tracks join the British Columbia Harbours Board Railway at a point designated as "View." The route then continues on the British Columbia Harbours Board Railway in a westerly direction for a distance of 6.95 miles, where the rails join with those of the Burlington Northern Railway. The route then continues west on the Burlington Northern Railway a distance of 0.72 mile, where it again joins with the British Columbia Harbours Board Railway at Mileage 7.67. From this point it continues in a general westerly direction to Mileage 21.6, where is connects with the in-plant railway of the Kaiser Coal Limited. The in-plant railway of Kaiser Coal Limited includes a loop which permits a unit train to move ahead through the dumping process, and when this is completed to continue around the area on its return trip in an easterly direction.

It is evident from the foregoing description that, in order to make an assessment of the total trackage involved and the operating conditions to be encountered, it was advisable that the inspection party start at Fort Langley and travel west over the entire route, picking up or dropping off those officials who were only concerned with their own integrated section of line.

On March 23, the day before the official inspection, a nonrevenue Canadian Pacific Railway coal train was taken over the line from Colebrook to Roberts Bank, a distance of 15 miles. This train was manned by British Columbia Hydro crews and it carried slack coal to bed in the unloading equipment of Kaiser Coal Limited at the Roberts Bank superport. The train was operated at restricted speeds to observe crossings and track structures prior to the official inspection. The opera-

tion of the train through the dumper was observed, and notes were taken of problems which arose in the handling of this new train operation.

My reports of March 25, 1970 and April 1, 1970, submitted pursuant to section 179 (4) of the *Railway Act,* confirmed the railway was properly constructed and that it was laid with 115-pound rail with 3,000 creosoted ties to the mile on crushed-rock ballast and installed to main-line standards. The reports required that certain speed restrictions were to be placed in effect at highway crossings where automatic protection had been ordered, but installations were not complete at the time of the inspection. In addition, the reports recommended an over-all speed limit of 30 miles per hour for the first 30 days of operation, with slower speeds at specific points where deemed necessary. The reports recommended that the line be opened for traffic in accordance with the requirements of the *Railway Act.* Individual and specific Orders in Council were approved on April 6, 1970 by the Government of the Province of British Columbia, declaring both the British Columbia Harbours Board Railway and the applicable portion of the route over British Columbia Hydro lines open for the carriage of traffic.

Subsequent to the filing of agreements as to the joint use of track by the railways affected, and the application of the Uniform Code of Operating Rules with respect to the operation of such trains over the Federally controlled railways affected, the Canadian Transport Commission, upon application, issued general orders approving the operation of trains and the use of the Uniform Code. The Commission also issued general orders approving the rail interconnections between the Canadian National Railways and the British Columbia Hydro Railway, and between the Burlington Northern Railway and the British Columbia Harbours Board Railway. These orders require to be ratified on the part of the Government of British Columbia.

Immediately the foregoing procedures had been complied with, the railway was placed in operation. The average traffic has been one unit train per day of 87 cars, each car loaded with 100 tons. The Canadian Pacific Railway reports 2,245,834 short tons were hauled over this line during the first nine months of operation.

The railway operating unions expressed the requirement that a "number one" brake test be conducted at Roberts Bank before an empty train was returned. The rules do not stipulate that such a test is mandatory; however, the Canadian Pacific Railway felt it would be good policy to comply with the wish of the operating unions, and the Canadian Transport Commission recommended the air-brake tests to be carried out. Between May 15 and July 10, our engineers and engineers from the Canadian Transport Commission conducted and witnessed air-brake tests on each train arriving at Roberts Bank. Of 3,650 cars inspected, only 14 showed minor defects over the test period of nearly two months. It is, therefore, felt the requirement of a "number one" air-brake test at the unloading point is a redundancy.

During original construction, a total of 12 level highway crossings were signalized over the entire route from Livingstone Road to Roberts Bank, a distance of 27.98 miles. Seven signalized crossings were on the British Columbia Harbours Board 21.6-mile section, with five on the 6.38-mile section of the British Columbia Hydro Railway. After construction, the various municipalities requested that additional crossings be signalized. Following joint inspections by our Engineering Branch and the municipalities concerned, recommendations were submitted to the Minister that 12 additional level crossings be signalized, eight on the British Columbia Harbours Board 21.6-mile section and four on the 6.38-mile British Columbia Hydro section of the route, making a total of 24 signalized crossings ordered to be installed over the total route of 27.98 miles.

Orders in Council were subsequently approved in which the Minister of Commercial Transport ordered that the 12 additional signals be installed and maintained as recommended.

During the official inspection trip, prior to the official opening of the line, it was noted the "first generation" of 12 signals were installed and working over the total route of 27.98 miles and that none of the "second generation" had, up to that date, been installed.

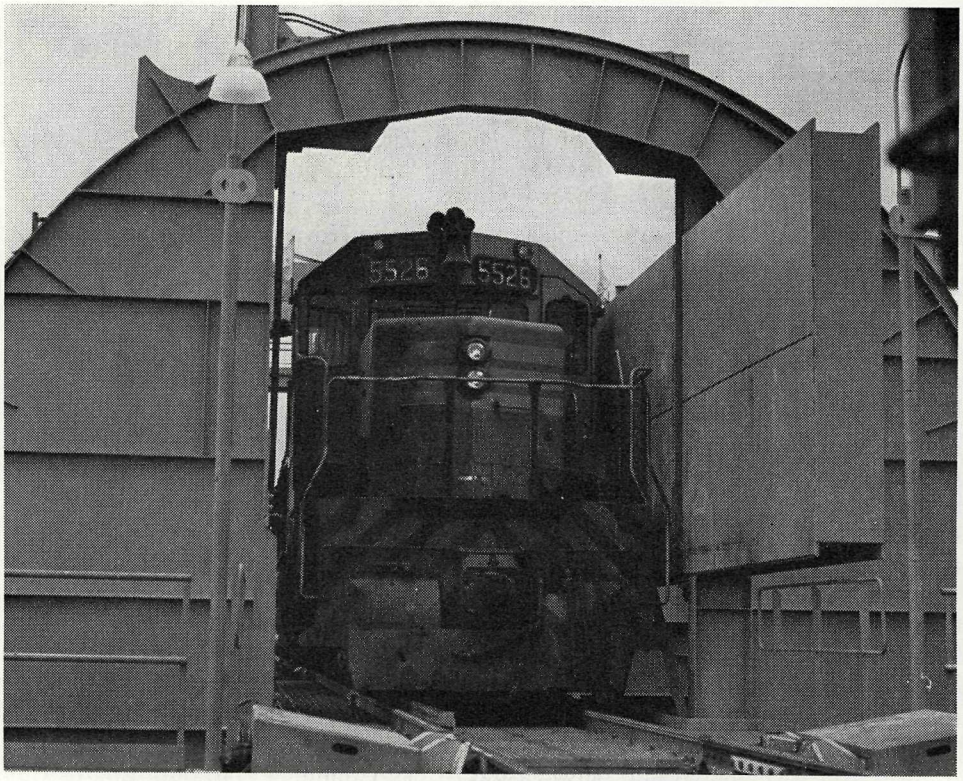
A follow-up inspection was made of the line in November, when it was noted the original "first generation" of signals were in order, but all of the "second generation" of signals had yet to be installed. In checking with the operating authorities, it was reported all of the signals were on order but delivery had not been made. A further check was made at the end of 1970 and the signal material had not yet arrived. In checking further, our Engineering Branch was assured the signals would be installed immediately they were delivered.

During the November inspection of the line, the matter of Central Traffic Control was investigated. The necessary equipment was installed and all signals and switches were in place. A further inspection late in December revealed the equipment was working. A recommendation was made and an Order in Council passed approving the integration and interconnection of the Central Traffic Control system with the Burlington Northern Railway. At this writing, negotiations are under way to integrate the Central Traffic Control on the 6.38-mile section of the British Columbia Hydro Railway so that the entire system can be interconnected with the Canadian Pacific, Canadian National, British Columbia Hydro, British Columbia Harbours Board, Burlington Northern, and the Pacific Great Eastern Railways.

Prior to the line being opened for traffic, an agreement in accordance with the *Railway Act* was entered into between the British Columbia Harbours Board Railway and the Pacific Great Eastern Railway. This agreement makes provision and stipulates that, inasmuch as this railway is owned in the right of the British Columbia Harbours Board, the Pacific Great Eastern Railway will operate the line on behalf of the British Columbia Harbours Board.

During the planning and approval of this railway, five grade separations were agreed upon, as follows: Pacific Highway, King George VI Highway, Highway 499, Highway 17, and Arthur Drive. During construction a rail overpass was completed at Highway 499 and, with a relocation of Hornby Drive, both Highway 499 and Hornby Drive were overpassed by the railway. At Highway 17 a highway overpass was constructed and in operation by December 1970. This eliminated the temporary signalized level crossing adjacent to the overpass and, at this writing, the level crossing has been eliminated and the signal is being relocated. The grade separations at Pacific Highway and King George VI Highway are not yet constructed. This is due to a highway relocation in one case and the establishment of foundations in the other. The overpass at Arthur Drive is dependent upon the ultimate location of rail sidings and other conditions in the Municipality of Delta and is, therefore, being held in abeyance pending final planning.

Conclusion—It can be reported that the Roberts Bank Superport Railway of the British Columbia Harbours Board is being operated in a safe and efficient manner, that the track and structures are in a safe condition, and that the general good of the Province of British Columbia is being properly served. — *Robert E. Swanson, P.Eng., Chief Engineer.*



The first train to arrive at Roberts Bank passing through the rotary dumper.

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY
FRASER VALLEY BRANCH LINE

Inspecting Engineer's Report

On Thursday, December 10, 1970, an inspection was made of the railway facilities of the British Columbia Hydro and Power Authority in the New Westminster and Fraser Valley areas.

In company with Mr. G. T. Powers, Assistant Railway Engineer, and Mr. W. Alcock, Roadmaster, a trip was made by rail car between New Westminster and Chilliwack, a distance of 63.80 miles of main-line track. At this time, sidings, passing tracks, yards, buildings, and bridges were inspected.

An efficient track-maintenance programme was carried out during the past year with 11,000 yards of ballast, 10,000 creosoted ties, 3,000 rail anchors, and 2,000 tie-plates laid. Twenty miles of ditching was done along the right-of-way and sight-line brush-cutting to improve visibility at crossings was also carried out. There is a two-year programme of sterilization and brush control in effect on this railway line, of which 20 miles of dormant spraying was done.

Automatic signalization has been completed and placed in operation at the following level road crossings:

	Mile
Scott Road at Kennedy	4.57
Scott Road at Victoria	3.51
New McLellan Road 1 (Highway 10)	12.04
New McLellan Road 2	16.25
Fraser Way	16.95
Carvolth Crescent	17.13
Langley Bypass (Highway 10)	18.13
Crush Crescent	19.40*

* Flashing light to vehicular traffic only.

Automatic signalization has been approved for the following level road crossings, but installations are not yet completed:

	Mile
Halls Prairie Road	14.64
Latimer Road	15.61
Glover Road	20.45
Livingstone Road	21.73
Vedder Road	61.07

Stop signs to vehicular traffic were installed at the following level road crossings:

	Mile
Worrell Road	19.15
Crush Crescent	19.42
Smith Road	19.65
Topham Road	19.90
Roberts Road	28.37
Le Feuver Road	28.77
Rand Road	29.02
Bradner Road	29.79
Ross Road	30.85
Mount Lehman Road	31.92
Burgess Road	32.32
Harris Road	33.82
Glenmore Road	34.37
Gladwin Road	35.50
Township Line Road	35.97
Downes Road	37.05
Valley Road	37.94
Industrial Road	38.32
Morey Road	39.09

There were 1,100 feet of passing track and a 2,000-foot extension lead to Timberland Lumber Mills installed in 1970.

New leads were installed to Reliance Foundry Co. Ltd., Irly Bird Lumber Co., Fulkener Wood Specialties Ltd., and Associated Foundry Ltd.

A new unloading ramp was built at Tenth Avenue and Jemmit Street in the New Westminster yard area to accommodate the unloading of trilevel railway cars which transport new automobiles from the eastern factories to the West Coast.

The bridges at Serpentine River, Salmon River, Matsqui Slough, Marshall Creek, Sumas River, Thompson Road, Saar Creek, Bullman Road, Arnold Slough, Marion Road, Knox Slough, Vedder River, and Chilliwack River were inspected and found to be in good condition. The Bullman Road Bridge was rebuilt early in

the year due to fire damage attributed to arson. The Vedder River steel bridge was inspected. This bridge was strengthened and repainted in 1965. The approaches were properly aligned and no scouring appeared to be taking place in the substructure.

The locomotive and car shop were inspected and found to be clean and properly maintained during the year. The shop staff handled four main-engine overhauls, eight locomotive-truck overhauls, and painted three locomotives, as well as maintaining a total of 17 diesel-electric locomotives, two electric locomotives, and a diesel line car.

Orders have been placed for the delivery of two cabooses in 1971, and one six-axle 2,000-hp. diesel-electric locomotive.

Regular inspections have been made of all the motive power and rolling-stock during the year, and annual certificates have been issued in accordance with the rules and regulations.—*D. B. Burgess, Inspecting Engineer.*

Recreational Railways

Chief Engineer's Report

Fort Steele Historic Foundation—Fort Steele was founded in 1896 as an outpost of law and order. During those boisterous years before the turn of the century, Sam Steele, of the Northwest Mounted Police, was dispatched to the area, where a town was founded and named after him. As the years went by and civilization replaced the gold diggings, and railways superseded the old stern-wheel river packets, the town of Fort Steele went the way of Barkerville, and the miners moved on.

The restoration of Barkerville preserves a page in our history in the same way the restoration of Fort Steele creates a museum displaying the development of our East Kootenays, so that the restorations of these ghost towns is a commendable achievement by those responsible for the work.

In restoring Fort Steele, 2 miles of railway were laid, using the original rails laid in the construction of the early railways in the Crowsnest area, and the locomotive *Dunrobin,* vintage 1895, was restored, with two railway coaches to operate over the 2-mile line as a tourist attraction.

During the summer months of 1970, *Dunrobin* carried 26,425 revenue passengers. The train is operated each year by the McTavish family on a concession basis, so that the railway project is self-supporting.

It was felt more of British Columbia should be preserved in the Fort Steele Museum and, as a result, a Corliss steam-generating engine was contributed by a Coast lumber firm. Last year, a Pacific Coast Shay locomotive, complete with flat-cars, tank-cars, and shop boiler, was donated by an anonymous donor to Fort Steele.

The big, steam Shay locomotives were the work-horses of the British Columbia woods, so that this restored locomotive will create a tremendous sensation, especially to those small boys filled with wonder, as well as to the old-timers who logged and railroaded during the glory days of steam in the British Columbia woods.

The Fort Steele Railway is in good condition. The equipment has been tested and certified, and this recreational railway is serving the public by providing enjoyment and fulfilling the educational requirements that only a science museum can provide.

Cowichan Valley Forest Museum — The Cowichan Valley Forest Museum, located on the Trans-Canada Highway 2 miles north of Duncan, extended its 3-foot-gauge railway in 1970 to provide a longer ride and to make the simulation of the early days of logging more realistic.

Three steam locomotives and two gasoline locomotives operate on this recreational railway during the summer months. Along the route, old retired locomotives stand silently by on sidings beneath the trees, as though they were still in service hauling British Columbia's huge forest giants to the salt chuck. Old spool donkeys poke their smokestacks up through the trees, and old oxen yokes, handsaws, and all the paraphernalia of the pioneer logger are on display in Jerry Wellburn's Forest Museum on Vancouver Island.

The locomotives and equipment were tested and certified during the year, and it can be reported the track is in good, safe condition. This museum railway fulfils a need in today's society, the public is being served and, at the same time, enjoyment and education are being provided.

CANADIAN FOREST PRODUCTS LTD.

Inspecting Engineer's Report

During the week of November 16 to 25, an inspection was made of the railway bridges and equipment of Canadian Forest Products Railway at Englewood.

In company with Mr. A. Horne and Mr. G. Collins, Roadmaster and Bridge Foreman respectively, the inspection was made by track motor from Woss Camp to Sutton Reload at the south end of the railway and from Woss Camp north to Beaver Cove at Tidewater. The inspection covered the main line, sidings, shop tracks, yards, and reload sidings. There are approximately 114 miles of standard-gauge track, including sidings and spur lines.

The following conditions were noted:

Sutton Reload: In good condition. Switches properly lined and derails in place. Some packing required at switches and guard-rails.

Alston Creek Bridge: In good condition. There is some debris at bridge pilings, this to be cleaned out to prevent any further buildup.

Bridge 59.2: In good condition. Creek bed cleaned out by bulldozer to clear channel of rock buildup.

Sutton Creek Bridge: Redecked in 1968 and in good condition. Rail anchors are required at south approach to prevent rail movement. The creek bed was cleaned out this year.

Vernon Camp Yard: In good condition. Some packing required at switches and guard-rails. Loose material to be kept 6 feet clear of gauge side of rail.

Fire Creek Bridge: In good condition. It was reported low at north end in 1969. This was due to crushing which was rectified by shimming-up in December 1969. New Jordan rails are to be installed in 1971.

Maquilla Creek Bridge: Rebuilt in 1967 and is in good condition. The rail curve at Mile 50.5, south approach to bridge, to have super elevation corrected.

Davie Creek Bridge: In good condition. Requires tie-plates at south end of bridge approach. The mud sill at north end to be reconstructed. There are two split ties and a few broken tie-plates to be replaced.

Groves Creek Bridge: In good condition.

Groves Creek Bridge Annex: In good condition. Caps of yellow cedar. Two staging planks and eight ties rock-damaged at south end to be replaced. Large rock to be removed to prevent damage to pilings of No. 2 Bent.

Bugle Creek Bridge: Will be replaced by culvert and fill in early 1971.

Kla-anch Creek Bridge: Combination rail and vehicular traffic. Nimpkish end shows signs of crushing. Stringers, ties, and decking to be renewed in

spring of 1971. Bracing caps and stringers on hinged-arch span were drilled and found to be in a good, sound condition.

Davie Creek Bridge HO Line: Tower bent appears to be leaning a few inches out of line. These bents have been shored up to prevent any further movement. It is reported that the bridge is to be rebuilt in 1971. The south approach to the bridge requires a number of ties replaced and rail anchors installed to prevent rail movement.

Gold Creek Bridge: In good condition. Queen-post span to be raised at north end and new ties laid in 1971.

Twin Bridge 10: In good condition. Some tie movement at rail joints to be corrected by installing rail anchors. There are a number of undersized ties at the north end that require to be shimmed or replaced.

Twin Bridge 11: In good condition. It was rebuilt in 1969.

Steel Creek Bridge: New bridge completed and open for traffic in December 1969.

Mile 21.5 Bridge: In good condition. Stringers drill-tested for soundness.

Kinman Creek Bridge: In good condition.

Storey Creek Bridge: In good condition.

Noomas Creek Bridge: In good condition.

Halfway Island Bridge: In good condition. One broken mud-sill plank at south end is to be replaced.

Tsultan Creek Bridge: In good condition. Bracing was respiked this year. The concrete footings at Tower Bents inspected and a little evidence of undermining was noted; however, this does not affect the bridge structure as the pilings are driven down to hard rock and concrete poured to prevent scouring.

East Fork Bridge: New span stringers redecked, bracing respiked. Rail on upstream side elevated. Queen-post span braces tightened, all caps are creosoted and in good condition.

Elk River Bridge: Stringers and decking renewed 1969/70, mud sills rebuilt. There are a number of angle-plate bolts that require tightening, underbrush is to be cleared out this year.

Kokish River Bridge: Steel-span bridge was repainted last year. Decking and rails are in good condition.

Span Mile 0.04: This is a three-bent bridge. Bents were new in 1969. Span stringers and decking are in good condition.

Beaver Cove Dump and Trestle: This trestle has all treated piles. The decking and ties are in good condition. The bracing is to be replaced as required due to log damage caused by log dumping. There is one pile split, which requires to be banded. The water-line at the far end of the trestle requires repairs. Damage was caused by the sudden freeze-up. The dump machinery and equipment were inspected and a hydro test was applied to the air reservoir. The fire extinguishers are to be tested and dated.

Generally, the track is in good condition and being well maintained. Three miles of light rail were replaced by 85-pound steel. Five miles of ballast has been installed and 13,000 ties replaced. A total of 15,000 tie-plates and 15,000 rail anchors were installed over the line to prevent rail movement. Approximately 5 miles of ditching was carried out during the past year to accommodate water run-off. Brush cutting was done as required along the right-of-way.

In checking the observance of rules, it was noted that sectionmen were observed to be working under proper flag protection, as prescribed by Rule 103.

Self-propelled crew rail-cars 121, 122, 123, 125, 129, 130, and diesel-electric locomotives 251 and 252 were inspected and hydro tests applied to air reservoirs. Diesel-electric locomotives 301, 302, and 303 were inspected. Power crane 7001 and diesel locomotive crane 3 were inspected. Certificates for the above motive power are being issued.

Seven cars were scrapped and 22 cars rebuilt. There were 342 wheels changed and 230 cars repaired. Air tests revealed 91 K1 triples and 40 AB triple valves required change outs. A number of skeleton logging-cars were inspected and found to be in good condition, with the testing of air-brake equipment being carried out at regular intervals by company forces.

All crossings were inspected and it was noted cross block signs, vehicle stop signs, and whistle posts were being maintained in accordance with the rules.

Summary—It can be reported this railway is in a good condition and is being well maintained. The bridge rebuilding programme is well in hand and will be completed during 1971. The continued upgrading of trackage and structures emphasizes the confidence this company places in the economics of the haulage of timber products by railway, particularly where the combined use of railway and trucks constitute an integrated haulage system.—*D. F. Burges, Inspecting Engineer.*

Crown Zellerbach Canada Logging Railway, Ladysmith to Nanaimo Lakes

Inspecting Engineer's Report

On November 19, 1970 the annual inspection was made of the logging railroad from Ladysmith to Nanaimo Lakes, a distance of 22 miles. The inspection was made by rail car and in company with Mr. Bob Harrison, Resident Forestry Engineer.

In general, the track was found to be in good condition and well maintained; however, a considerable amount of ballasting and tie replacement is required. During 1970, on a regular maintenance programme, approximately 7,000 ties had been replaced and an equal number is planned for renewal in 1971.

Halsam Creek Bridge: Rails are loose and require respiking. The south end up to bent No. 3 is scheduled for replacement in 1971.

Nanaimo River Bridge: The stringers on bent No. 3 at north end of the bridge had been previously shimmed and now again require shimming. It would appear that the pilings are settling into the ground and should, therefore, be regularly checked for any further settling. Also one split rail was noticed at six rail-lengths from the south end of the bridge. The stringers and decking on the south end wood span were replaced in 1970.

Boulder Creek Bridge: The west end approach requires new ties and ballasting.

Deadwood Bridge: The west end approach requires ballasting. It was also noted that one very short piece of rail had been laid at three rail-lengths from the west end of the bridge. This appears to be an unsafe practice, particularly since the angle plates and rails were also loose.

The defects noted were brought to the attention of Mr. Bruce King, and immediate steps were taken to have them corrected.—*John Dyck, Inspecting Engineer.*

MacMillan Bloedel Ltd. (Chemainus Division) Inplant Railway

Inspecting Engineer's Report

On Friday, October 23, 1970, after inspecting steam locomotive 1055, an inspection was made of the inplant trackage at the above site.

The track in general is clean and well maintained, except for a few ties which require replacing near the entrance to the loading-shed and also at the switch leading to the scow-loading ramp. The points of this switch also require attention due to wear and chipping.

The new spur to accommodate the unloading of oil tank-cars for the boiler-house was found to be in order. Oil barges are unloaded into a tank farm near the log dump, and single cars of oil are shunted to this spur. The transferral of oil is accomplished by use of a steam-driven duplex pump mounted on the tank-car.—*E. A. Smith, Inspecting Engineer.*

INDUSTRIAL TRANSPORTATION

The logging industry as a whole experienced a general slowdown through most of 1970. This, together with the early arrival of winter, resulted in a low-production year.

With many logging operations closed for much of 1970, the number of vehicle inspections and driver-training sessions was considerably reduced from the previous year.

One statistic which showed an increase, unfortunately, was that of industrial road accidents. Of the 24 vehicle accidents reported, six of these resulted in a total of seven fatalities. Investigation of these accidents indicated that the cause, with one exception, did not originate with equipment failure but rather from driver failure. It would appear that the attitude of some truck-drivers has become one of unconcern both for the equipment and for other drivers on the same road. The answer to this increasing problem may lie in the handing-out of stiffer suspensions to those offenders who ignore safe working practices.

The one accident involving equipment failure occurred on a crew bus. Fortunately, this upset resulted in only minor injuries to the passengers. The cause of this accident originated in a wheel-bearing failure, which in turn allowed the wheel and brake drum to move outward from the bus. This in turn caused a failure when the brakes were applied. A repetition of this type of accident is highly improbable as dual braking systems are now being installed in new equipment.

The logging industry did not introduce any new types of hauling equipment into the Province during 1970, but the Department did get involved with the braking systems on some of the monster ore-hauling units being used at various mine-sites. Working in close co-operation with the staff of the Department of Mines and Petroleum Resources, members of the Engineering Branch of this Department made a careful study of the operation of these units, and in particular the brake systems used. As a result of these inspections, factory braking specifications were modified to meet the requirements of the *Industrial Transportation Act,* thus providing a greater margin of safety for the operators of those vehicles.

Regarding air-brake lectures, two sessions of three days each were conducted for the Royal Canadian Mounted Police at their semiannual traffic conferences in Victoria in the months of March and November. This programme was again well received by the traffic members of the RCMP, as it is almost impossible for them to make comprehensive checks of air-equipped vehicles without first having taken this type of training. This continuing programme of training has resulted in a more

intensive check of vehicles operating on public highways, and companies are more cognizant of the need to maintain their vehicle braking systems in a satisfactory manner. This has resulted in fewer accidents on our highways than otherwise would have occurred.

The proposed change in the issuance of driver licences by the Motor-vehicle Branch of the Attorney-General's Department imposed an added work load toward the end of the year under review, as many highway truck-operators requested air-brake lectures and examinations in order to qualify for "air tickets." The reason for this action is that if they are licensed under the *Industrial Transportation Act* they are more likely to qualify for a licence under the *Motor-vehicle Act.* Other lectures and examinations were held at the various vocational schools throughout the Province for budding mechanics and heavy-duty equipment operators.

Night school courses covering the operation and maintenance of air brakes on heavy-duty vehicles were conducted in the lecture room of the Vancouver office of the Department in February and March. Due to the pressure of other work, inspectors were not available to hold more than a limited number of these courses, and as a result many mechanics and operators were not able to receive the benefit from these instructive lectures and demonstrations.

In co-operation with the Department of Highways personnel and local school district representatives, air-brake lectures were conducted in Kamloops, Merritt, and Williams Lake. The response to this programme was so great that in one instance the meeting had to be moved to a larger hall.

It can be seen from the foregoing that an inspector, when addressing a meeting, does not simply deliver a stock lecture. One night he may be talking to a group of mechanics, the next a group of logging-truck drivers, the following week it may be a class of students, or inspectors from the Motor-vehicle Branch or the Workmen's Compensation Board.

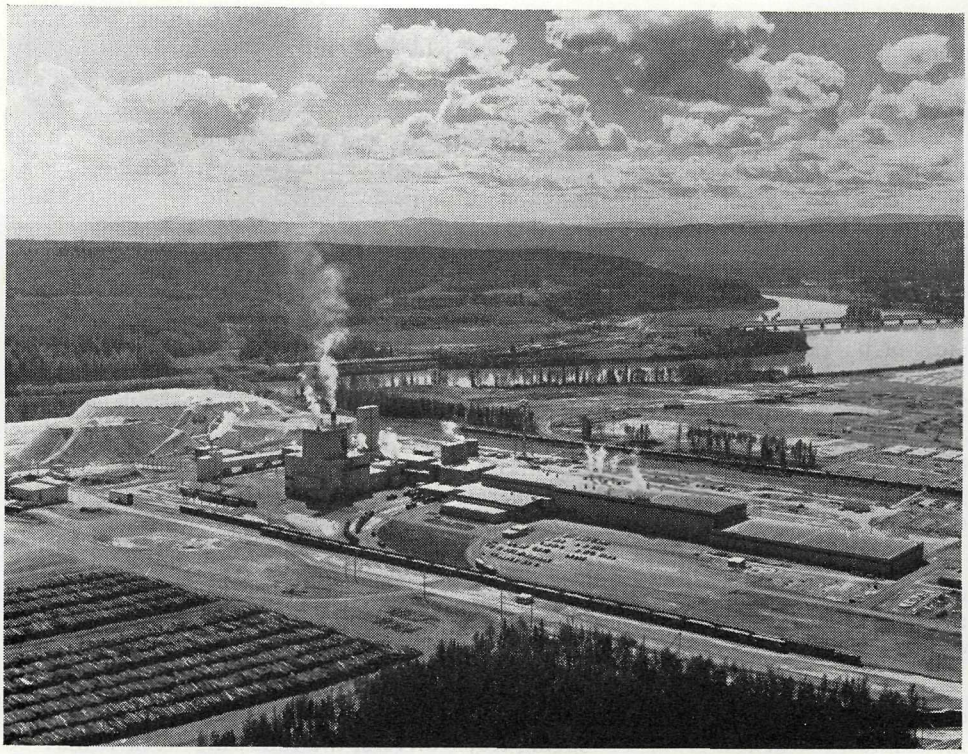
This diversified lecture and instruction programme, with demonstrations using actual equipment which is installed on heavy-duty trucks, has been a continuing one since 1955. Much good has resulted from this close contact with operators. Over this period of time more than 9,000 operators have been certified. — *John F. Kirkland, Inspecting Engineer.*

Air-brake Lectures and Examinations Conducted During 1970

Lectures held	41
Lecture attendance	1,243
Logging-truck operators certified	591
Vocational school (air-brake examinations)	288
RCMP (air-brake examinations)	58
Heavy-duty mechanics air-brake course	15

Additional Lectures and Examinations Held for Other Agencies

	Number	Attendance
Haney Correctional Institution	1	34
Lake Cowichan School District	1	49
Standard Oil Company, Burnaby	2	48
City of Port Alberni	1	10
British Columbia Institute of Technology	1	68
Kamloops School District	2	170
Merritt School District	2	142
Williams Lake School District	2	104



Pulp-mill, Quesnel, showing plant railway service-trackage.

Unique Log-haulage System at Ootsa Lake

A log-hauling operation, unique in the history of the forest industry, is now in operation in British Columbia where inland log species are being towed in 100-ton bundles down Ootsa Lake, hauled by truck and trailer over the 3,500-foot summit of Sandifer Pass through the Coast Mountain Range to Kemano Bay, dumped in tidewater, and towed 50 miles to the new Eurocan pulp-mill at Kitimat. This is the first time Interior wood fibre has been blended with Coast wood fibre for pulp manufacture.

The 34-mile industrial road, one of the very few penetrating the rugged coastal range, was laid out and engineered in 1967 and completed in 1969. After traversing the pass, it drops 3,500 feet in 20 miles, then 7 miles farther reaches salt water. Because of the heavy snowfall, it is possible to keep the road open only for about 130 days each year. For this reason, hauling has to be done in a short period, and a continuous road hauling-system was put into operation with the log-trucks operating in two 10-hour shifts every day for a total of 20 hours on the road, seven days a week, until snow comes.

The vehicles used in this transport operation are HDX 100-ton Hayes logging-truck trailer units. The hauling contractor placed an order for 26 of these units with trailers and, because there is no other access to Kemano Bay, trucks and trailers were delivered by barge and unloaded on shore. The first load of logs from the Interior to the Coast was unloaded in the salt water in June 1970, and the trucks were on the road continuously, making five to six trips daily from the West Tahtsa end of Ootsa Lake to Kemano, until the winter shutdown.

The $2,000,000 order placed for 26 Hayes HDX 100-ton trucks and trailer units was the largest single order ever received at one time, according to Hayes Manufacturing Co. Ltd., of Vancouver. The Hayes units on the Eurocan job have 15-foot log bunks and are equipped with 12V71 Detroit diesel engines, power-shift Allison transmission, and Clark 90,000-pound rear axles.

Experiments are being made with pup trailers in an attempt to boost log-load capacity to 200 tons. Present indications are that pup trailers will be added to all trailers in 1971.

One of the features in the economics of the operation is the fast load and unload system with an A-frame-hoist setup that allows an average of seven minutes for loading and seven minutes for unloading.

AERIAL TRAMWAYS

Considering what has taken place in the Canadian economy over the past year where any number of projects have been cancelled or put off indefinitely, one would imagine that similar circumstances would be the order of the day in the field of recreation and in that of ski-ing in particular. However, if anything, the opposite would be true as the number of new lifts installed exceeded that of 1969, which was considered to be a very active year for the construction of new facilities.

One interesting aspect of the 1970/71 season has been the introduction in numerous areas of portable handle-type rope-tows. These units have filled a need for a lightweight, dependable tow which can be easily moved as required to a different location on a ski slope. This particular type of installation is especially suited for the beginner, and as such has found favour with the ski schools at the various locations in the Province.

While the portable rope-tow fulfils the need of a portion of the ski society, there remains the task of transporting large numbers of skiers from the valleys to the mountain-tops, and in most instances this is best done by chair-lift. To this end, Silver Star Sports Ltd., at Vernon, completed construction of their second chair-lift, while Apex Alpine Recreations installed their first chair-lift on Apex Mountain, west of Penticton.

Elsewhere in the Okanagan, Tod Mountain Ski Resorts Ltd., which had the misfortune of having their 9,400-foot chair-lift burn down in 1968, were able this year to rebuild this facility and, together with the two T-bars, will once again provide good ski-ing for residents of the Kamloops district.

The Parks Branch of the Department of Recreation and Conservation added a locally built, double chair-lift to the existing lifts in Gibson Valley in Manning Park.

At Whistler Mountain, Garibaldi Lifts Ltd. doubled the length of the "Green Chair." Originally this chair-lift was just over 3,600 feet in length, but the area served by this lift proved to be so popular that it was necessary to extend it down the mountain so that more skiers could be accommodated.

A chair-lift of American design was erected across the British Columbia-Alberta Boundary. This chair originated in Banff, with the return station located in British Columbia. While the design for this tramway was approved by the Engineering Branch of the Department of Commercial Transport, the actual inspection and testing was left to the Alberta authorities since the area is more readily accessible from the Alberta side.

The first chair-lift in British Columbia not specifically designed for skiers was put in service in Vancouver's Exhibition Park in August. The path of the "Sky Glider," as this installation is called, runs from the south end of the "Giant Dipper" to the Showmart Building, a distance of some 1,800 feet. This is an extremely high-

capacity chair-lift, and is capable of transporting 2,600 people per hour. This addition to Exhibition Park was extremely well received by the public, and operational checks indicated that the passengers were being attended to extremely well.

One double reversible aerial tramway now under construction at Hells Gate in the Fraser Canyon by next summer will provide an unusual ride above the turbulent waters of the Fraser River. Restaurant facilities are also to be included, thus offering summer tourists an interesting side-trip.

T-bars were finalized at Stewart in northern British Columbia, Green Mountain on Vancouver Island, and at Mount Baldy, 35 miles east of Osoyoos.

With so many major lifts being built during the year, it increases to a great extent the amount of man-hours necessary to do a proper job of work from the engineering standpoint. It is not simply a case, as many imagine, of merely visiting the area after the tramway has been completed, taking a casual look, and pronouncing everything to be satisfactory. Before construction commences, the plans as submitted by the manufacturer are double-checked and then during construction several follow-up inspections are made before the final acceptance tests are concluded.

Once in operation, every aerial tramway in the Province is subject to an annual inspection which may take from two hours to two days. An example of what is involved in the annual inspection of a major tramway is illustrated in the following report of the "Skyride" at Grouse Mountain.

ANNUAL INSPECTION REPORT

"Skyride," Grouse Mountain Resorts Limited

The annual inspection of this installation was begun on November 2, 1970, and completed on November 9, 1970, and the results are as follows:

Valley Station

1. Fire extinguishers — OK. Checked September 21, 1970.
2. Travel-limit switches on all counterweights checked—OK.
3. Bumper-limit switches—OK.
4. No. 1 trackrope counterweight—OK.
5. No. 2 trackrope counterweight—OK.
6. Hauling rope counterweight—OK.
7. Main drive sheave—Liner to be replaced.
8. Hauling rope counterweight sheave —Liner on No. 1 side to be replaced.
9. Standby power unit—OK.
10. Housekeeping—OK.

Car No. 1

1. Track-rope brakes—OK.
   Pull test:
   Upper brake, 5,390 lb.
   Lower brake, 6,160 lb.
2. Cabin brake control—OK.
3. Emergency stop button—Tested OK, but new car batteries required.
4. Communications—OK.
5. Escape rope—OK.
6. Fire extinguisher — OK. Checked September 21, 1970.
7. Tools—OK.
8. First aid kit—OK.
9. Carriage and hanger—OK.
10. Carriage sheaves—OK.
11. Cabin body and appurtenances—OK.

Main carriage hanger-pin ultrasonically tested and hauling-rope sockets inspected on November 2, 1970.

Car No. 2

1. Track-rope brakes—OK.
   Pull test:
   Upper brake, 6,160 lb.
   Lower brake, 5,750 lb.
2. Cabin brake control—OK.
3. Emergency stop button—Tested OK, but new car batteries required.
4. Communications—OK.
5. Escape rope—OK.
6. Fire extinguisher — OK. Checked September 21, 1970.
7. Tools—OK.
8. First aid kit—Case to be repaired or replaced.
9. Carriage and hanger—OK.
10. Carriage sheaves—OK.
11. Cabin body and appurtenances—OK.

Main carriage hanger-pin ultrasonically tested, lower hauling-rope socket inspected, and upper hauling-rope shortened and resocketed on November 3, 1970.

Tower No. 1

1. Cabin guides—OK.
2. Saddles and inserts—OK.
3. Framework—OK.
4. Guard-rails and handrails—OK.
5. Foundations—OK.

Tower No. 2

1. Cabin guides—OK.
2. Saddles and inserts—OK.
3. Framework—OK.
4. Guard-rails and handrails—OK.
5. Foundations—Some grouting broken away from the steelwork on both upper footings. The steel is rusting and this condition should be remedied.

Mountain Station

1. Track-rope bollard—OK.
2. Track-cable storage—One cable laying partly in the water under the bollard.
3. Fire extinguishers—The extinguisher in the furnace room is to be checked.
4. Hauling-rope return sheaves—OK.
5. Guide sheaves—OK.
6. Housekeeping—Rags and paint left in the area of the return sheaves. Cans of paint stored in the furnace room.

Performance Tests

Car No. 2 was loaded with six drums of water weighing approximately 2,500 pounds, in order that the braking performance could be checked against that of the previous annual inspection.

The tramway was then operated at various speeds to obtain the following performance data:

Speed (M/S)	Brakes	Distance in feet	Time in Seconds
2	No. 1 thruster	23	4.0
	No. 2 thruster[1]	45	7.2
	Main brake	11	2.0
4	Both thrusters	49	5.1
	Main brake	27	3.1
6	Both thrusters	85	7.2
	Main brake	50	4.0
8	Both thrusters	140	8.5
	Main brake	86	4.9
10	Both thrusters	205	10.0
	Main brake	160	7.9
	All brakes	117	5.8

[1] No. 2 thruster has an approximate 5-second time-delay.

The deadman switch checked at 6 m/s and proved OK. The 110-per-cent overspeed switch and motor overload switch were both OK, along with the programmer chain switch. Landing control zone speeds were checked and were OK.

Standby

A complete power failure was simulated and several runs were made using the diesel standby engine. All standby equipment performed satisfactorily.

Ropes

Visually all ropes appear to be in good condition; however, magnetic-induction tests will be made within the next 10 days.

In general, the tramway is being well maintained, and when the self-propelled rescue car, which has proven to be unsatisfactory, is replaced with the new gravity system now under construction, this facility will be in a position to provide the public with a standard of safety comparable to that found anywhere in the world.

J. W. KIRKLAND
Inspecting Engineer

In the concluding paragraph of the foregoing report, mention is made of the inadequacy of the rescue car as supplied by the manufacturer of the tramway. During the initial inspection of the installation, the rescue car was demonstrated by the manufacturer's representative and so was considered adequate.

At a later date, however, it was drawn to the attention of the Department that the operation of this rescue car could prove to be extremely hazardous. A manufacturer's agent was dispatched from Austria to make certain modifications to the rescue car, and while in the process of testing this unit was injured when it ran away.

The use of this self-propelled rescue car has since been abandoned, and Grouse Mountain Resorts Limited are installing a gravity system. This involves using a winch at the top of the mountain which will raise and lower the rescue car in a much more efficient manner. This system has been approved by the Department and will be fully tested before being put into service.

While one cannot foretell the future with any great degree of accuracy, if the development of ski areas over the past few years is any criterion, then it can be expected that greater expansion is to be expected in 1971.—*J. W. Kirkland, Inspecting Engineer.*

Aerial Tramways

Name of Company	Location	Reversible	Gondola	Chairlift	T-bar	J-bar	Ropetow	Industrial Freight
1. Grouse Mountain Resorts Ltd.	North Vancouver	1	....	4	2	....	3	....
2. Hollyburn Ski Lodge	West Vancouver	....	....	....	....	....	1	....
3. Mount Seymour Caterers Ltd.	Mount Seymour Park	....	....	2	....	....	5	....
4. Garibaldi Lifts Ltd.	Garibaldi	....	1	3	2	....	2	....
5. Diamond Head Chalets	Garibaldi Park	....	....	....	....	....	1	....
6. Mount Becher Ski Development Society	Courtenay	....	....	....	2	....	2	....
7. Snobirds Lifts Society	Green Mountain	....	....	....	1	....	2	....
8. Aluminum Company of Canada Ltd.	Kemano	....	....	....	....	....	....	1
9. Dawson Creek Ski Club	Dawson Creek	....	....	....	1	....	....	....
10. Tabor Mountain Ski Area Development Ltd.	Prince George	....	....	....	1	....	2	....
11. Wells Ski Club	Wells	....	....	....	....	....	1	....
12. British Columbia Telephone Co.	Hope	....	....	....	....	....	....	1
13. Canadian National Telecommunications	Hope	....	....	....	....	....	....	1
14. Tod Mountain Ski Resort Ltd.	Kamloops	....	....	1	1	....	....	....
15. Le Jeune Lodge	Lac Le Jeune	....	....	....	1	....	1	....
16. Revelstoke Winter Sports Ltd.	Mount Revelstoke National Park	....	....	....	....	....	1	....
17. Mount MacKenzie Ski Development Ltd.	Revelstoke	....	....	....	1	1	2	....
18. Silver Star Sports Ltd.	Vernon	....	....	2	3	1	1	....
19. Big White Ski Development Co.	Kelowna	....	....	....	3	....	....	....
20. Panorama Ski-Hill Co. Ltd.	Invermere	....	....	....	1	....	1	....
21. Department of Recreation and Conservation	Manning Park	....	....	2	1	....	2	....
22. Amber Ski Club	Princeton	....	....	....	....	....	2	....
23. Apex Alpine Recreations Ltd.	Penticton	....	....	....	1	1	1	....
25. Phoenix Alpine Ski Club Society	Grand Forks	....	....	....	1	....	1	....
26. Kimberley Ski Club	Kimberley	....	....	1	2	....	....	....
27. Snow Valley Ski Development Ltd.	Fernie	....	....	....	2	....	2	....
28. Silver King Ski Club	Nelson	....	....	....	1	....	1	....
29. Salmo Ski Club	Salmo	....	....	....	1	....	....	....
30. Red Mountain Ski Club Society	Rossland	....	....	2	....	1	1	....
31. Sturzenegger's Hill Rope Tow	Smithers	....	....	....	....	....	1	....
32. Shuswap Ski Club	Salmon Arm	....	....	....	....	....	2	....
33. Kamloops Ski Club	Kamloops	....	....	....	....	....	2	....
34. Nakusp Ski Club	Nakusp	....	....	....	....	....	2	....
35. Smithers Ski Club	Smithers	....	....	....	....	....	2	....
36. Rainbow Lake Ski Club	Prince Rupert	....	....	....	....	....	2	....

Aerial Tramways—Continued

Name of Company	Location	Reversible	Gondola	Chair-lift	T-bar	J-bar	Rope-tow	Industrial Freight
37. Bornite Ski Club	Terrace	....	....	....	....	....	2	....
38. Corporation of the District of Kitimat	Kitimat	....	....	....	....	....	1	....
39. Northlander Motor Lodges Ltd.	Rogers Pass	....	....	....	....	....	1	....
40. Blue River Ski Club	Blue River	....	....	....	....	....	1	....
41. Omineca Ski Club	Burns Lake	....	....	....	....	....	3	....
42. Little Squaw Valley Resorts Ltd.	Williams Lake	....	....	....	1	....	1	....
43. Dragon Mountain Development	Quesnel	....	....	....	....	....	1	....
44. Silver Tip Development Ltd.	Hope	....	....	....	1	....	2	....
45. Nicola Valley Ski Club	Merritt	....	....	....	....	....	1	....
46. 100 Steps Ski Hill	Prince George	....	....	....	1	....	....	....
47. Fort St. John Ski Club	Fort St. John	....	....	....	....	1	....	....
48. 100 Mile House Ski Club	100 Mile House	....	....	....	....	....	2	....
51. Chetwynd Ski Tow	Chetwynd	....	....	....	....	....	1	....
52. Sicamous Ski Club	Sicamous	....	....	....	....	....	2	....
53. Beaver Valley Ski Club	Fruitvale	....	....	....	1	....	1	....
54. Last Mountain Ski Resort Ltd.	Westbank	....	....	1	1	....	....	....
55. Grandview Ski Acres Ltd.	Kamloops	....	....	....	1	....	3	....
56. McBride Bell Ski Resort	McBride	....	....	....	....	....	1	....
57. Clearwater Ski Club	Clearwater	....	....	....	....	....	1	....
58. Golden Skiers	Golden	....	....	....	....	....	1	....
59. Burke Mountain Ski Resort	Port Coquitlam	....	....	....	....	....	3	....
60. Mount Diadem Ski Club	Powell River	....	....	....	....	....	2	....
61. British Columbia Telephone Co.	Terrace	....	....	....	....	....	....	1
63. Portage Mountain Ski Club	Hudson Hope	....	....	....	....	....	1	....
65. Fort Fraser Ski Club	Endako	....	....	....	....	....	1	....
66. Purden Lake Ski Development Ltd.	Prince George	....	....	1	1	....	....	....
67. British Columbia Telephone Co.	Salmo	....	....	....	....	....	....	1
68. Squamish Stawamus River Intake	Squamish	....	....	....	....	....	....	1
69. Azu Lift Co. Ltd.	Prince George	....	....	....	1	....	....	....
70. Corporation of the District of Stewart	Stewart	....	....	....	1	....	2	....
72. Fairmont Hot Springs Resort Ltd.	Fairmont Hot Springs	....	....	....	1	....	....	....
74. Mount Baldy Recreations Ltd.	Rock Creek	....	....	....	2	....	1	....
75. Canyon Aerial Tramways Ltd.[1]	Fraser Canyon	1	....	....	....	....	....	....
76. McDame Mountain Ski Club	Cassiar	....	....	....	....	....	1	....
77. Municipality of Mackenzie	Mackenzie	....	....	....	....	....	2	....
78. Mica Creek Community Club	Mica Creek	....	....	....	....	....	2	....
79. Department of Highways Aerial Tramway	Boston Bar	1	....	....	....	....	....	....
80. Hemlock Valley Recreations Ltd.	Harrison Lake	....	....	1	....	....	1	....
81. Winterside Recreations Ltd.	Vernon	....	....	....	1	....	1	....
82. Snowpatch Developments Ltd.	Princeton	....	....	....	....	....	2	....
83. Granduc Ski Club	Tide Lake	....	....	....	....	....	1	....
84. Blewett Ski Club	Nelson	....	....	....	....	....	1	....
85. Mission Mountain Winter Sports Assn.	Shalalth	....	....	....	....	....	1	....
86. Alpine Meadows Ski School	Alta Lake	....	....	....	....	....	1	....
87. Pemberton Lions Club	Pemberton	....	....	....	....	....	1	....
88. Sky-Glider Recreations Ltd.	Vancouver	....	....	1	....	....	....	....
89. Kemano Ski Club	Kemano	....	....	....	....	....	2	....
92. Overlander Recreations	Armstrong	....	....	....	....	....	1	....
Totals		3	1	21	41	5	98	6

[1] Under construction.

Construction of foundations for lower terminal, Canyon Aerial Tramways Limited, at Hells Gate, Fraser River.

High-location construction of an aerial tramway tower by helicopter.

PIPE-LINES

Gas exploration programmes during 1970 have resulted in significant increases of known reserves in the Fort Nelson and other areas of the Peace River. In addition, there has been extensive infield drilling and consolidation of known reserves in the majority of northern gas fields.

Oil production has been increased significantly through the upgrading of facilities, extension of exploration programmes, infield drilling, and extensive employment of water-injection and gas-flooding systems. Water-flooding has proven very effective in many areas, existing systems are being extended and new installations are now under construction.

Gas transmission-lines have been built into the Milligan Creek and other gas and oil fields, providing additional gas flows and allowing unrestricted oil production from gas and oil wells in these areas.

The marked increase in compressor stations, pumping stations, and gas- and water-injection systems has resulted in a significant increase in inspection requirements. The use of chlorine injection, caustic solutions, and new techniques in water-flooding systems is providing improved production in oil fields.

Major installations now include more than 80 compressor, pumping, and injection complexes which are inspected annually. In addition, some 700 pressure vessels complete with relief valves, controls, heaters, and other auxiliary equipment are checked for full compliance with pressure vessel, fire protection, and other code requirements.

The general picture of operating standards throughout the Province is very encouraging, with excellent co-operation shown in the maintenance of required safety standards. There is, however, always the need to remind the occasional offender concerning good housekeeping, checking of safety systems at regular intervals, and provision of suitable facilities to cope with poison gas, fire, and other hazards. Several companies are now installing electrically operated automatic gas-detection systems linked with station shut-down systems at compressor and pumping stations where electrical energy is available. Fire-detection systems are also being continually improved and extended to previously unprotected areas. Unfortunately, such improvements were preceded by several expensive explosions and fires. No doubt this equipment will be provided as standard safety protection in many future installations.

Equipment throughout the oil and gas fields of British Columbia is relatively new, but we must expect a gradual increase from year to year in maintenance requirements. Several line breaks have been reported, and in such cases a thorough investigation is made to ascertain the cause of failure. Severe corrosion can, particularly in sour gas and oil fields, be a contributing factor in such failures. The most up-to-date corrosion-control procedures are now being employed by the industry, and with increased years of pipe-line service, a closer look is being given to areas with only minor corrosion problems.

Ultrasonic testing programmes covering all pressure vessels were established by the major pipe-line companies prior to 1965. Up-to-date summaries of testing programmes were submitted and reviewed in detail during 1970, with excellent control indicated in all reports submitted to date. The use of this testing equipment has been demonstrated to Inspecting Engineers in the Fort St. John area by the corrosion-control engineers, and readings checked by follow-up inspections where flaws had been indicated. Several of the major oil and gas companies provided a training programme for their own technicians, who are in some cases working on a year-round basis, to cover all pressure vessels, pipe-lines, and auxiliary components.

Concerning power units in oil and gas stations, many of the original reciprocating engines are still carrying full-capacity loads. The trend for several years has been to much larger single units and the installation of numerous gas turbines with proven advantages in these modern gas and oil transmission systems. More recently, high-voltage electric motors have been installed in major oil-pumping systems and these have several advantages similar to gas turbines, particularly where remote control systems are employed.

Power installations have increased in recent years far in excess of flow increases, and in the larger systems the number of units and horespower capacities have more than doubled over the past five years. Westcoast Transmission Company's total horsepower has been increased during this period by 123 per cent to a total now exceeding 280,000 horsepower. Major oil-pumping systems show a similar trend, with Western Pacific Products and Crude Oil Pipelines Ltd. showing 270 per cent increased horsepower over the past five years.

Distribution systems throughout the Province have been expanded rapidly during recent years. During the past year, British Columbia Hydro and Power Authority Gas Division has carried out construction of extensions to their distribution-lines in the Richmond, Steveson, and Delta areas, including modification of the transmission gas pipe-line over Pattullo Bridge. Inland Natural Gas Co. Ltd. has extended its distribution system to provide natural gas to facilities at Mackenzie, Hudson Hope, Highland Valley, Winfield, Okanagan Falls, Rutland, and Kamloops during the year. Columbia Natural Gas Limited completed a 5-mile extension to supply natural gas to the Kaiser Coal Plant at Sparwood. Pacific Northern Gas built extensions to supply natural gas to facilities at Kitimat, Prince Rupert, and Stuart Lake. Pacific Petroleums Ltd. completed a total of 45 miles of gathering systems in the several gas fields in the northern area of the Province. These additions, together with the construction of gathering systems by several other companies in northern British Columbia, comprised a total of 144 miles of new construction during 1970.

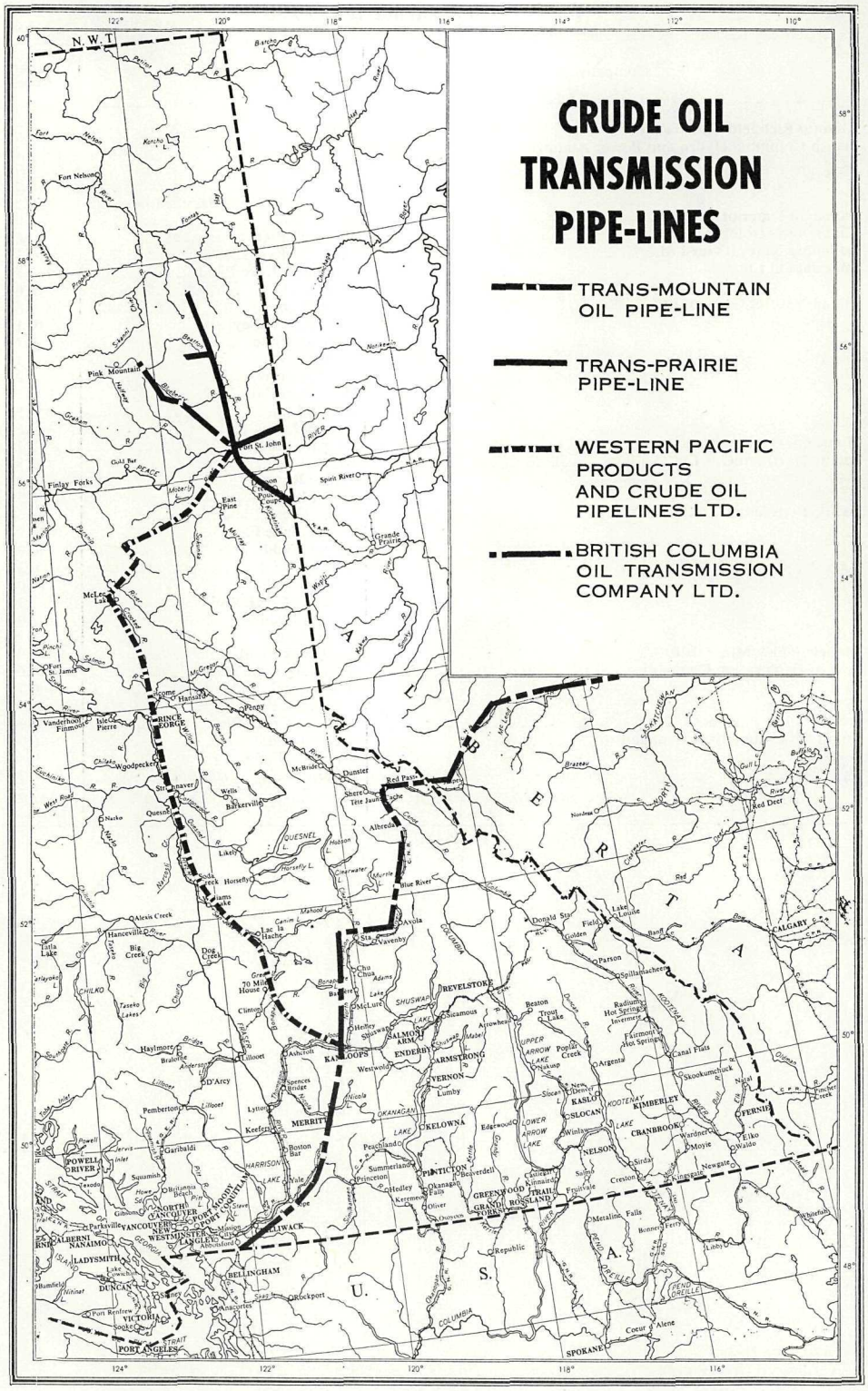
During the year, several pipe-line companies were granted certificates for the construction of pipe-lines in British Columbia. They include Monsanto Oil & Minerals Ltd., Bear Flat area; Tenneco Oil & Minerals Ltd., Weasel and Nig Creek areas; Canadian Superior Oil Ltd., Inga area; and Atlantic Richfield, Julienne area.

It can be reported that there is continued excellent co-operation between the pipe-line companies and the Department in the installation and safe operation of all phases of pipe-line construction.—*A. W. Turnbull, Assistant Chief Inspecting Engineer.*

Pipe-lines Constructed in 1970

Company	Location	Length (Miles)
Atlantic Richfield Canada Ltd.	Julienne Field	8.00
British Columbia Hydro and Power Authority	Richmond	1.20
	Steveson	2.70
	Delta	2.10
	Pattullo Bridge reclassification	0.20
Canadian Superior Oil Ltd.	Inga Field	5.00
Champlin Petroleum Co.	Flatrock Field	3.60
Columbia Natural Gas Ltd.	Sparwood	5.39
Imperial Oil Ltd.	Boundary Lake Field	2.70
	Rigel Field	15.60
Inland Natural Gas Co. Ltd.	Hart Highway	1.60
	Highland Valley	10.10
	Hudson Hope	0.28
	Kamloops	2.10
	Mackenzie	0.20
	Okanagan Falls	0.30
	Rutland	1.50
	Winfield	0.50
Monsanto Oils Ltd.	Bear Flat Field	1.10
Pacific Northern Gas Ltd.	Kitimat	2.80
	Prince Rupert	1.40
	Stuart Lake	0.50
Pacific Petroleums Ltd.	Buick Creek Field	0.50
	Clarke Lake Field	3.20
	Jedney Field	10.04
	Kotcho Field	0.30
	Peejay Field	16.00
	Stoddart Creek Field	7.30
	Syphon Field	2.90
	Yoyo Field	4.70
Tenneco Oil & Minerals Ltd.	Nig Creek Field	7.90
Texaco Exploration Company	Boundary Lake Field	10.60
	Buick Creek Field	0.70
	Nig Creek Field	1.50
Trans-Prairie Pipelines Ltd.	Milligan Creek Field	1.90[1]
Union Oil Company of Canada Ltd.	Peejay Field	6.00
	Wildmint Field	0.80
	Willow Field	0.74
Total mileage		143.95

[1] Oil.


CRUDE OIL
TRANSMISSION
PIPE-LINES
TRANS-MOUNTAIN
OIL PIPE-LINE
TRANS-PRAIRIE
PIPE-LINE
WESTERN PACIFIC
PRODUCTS
AND CRUDE OIL
PIPELINES LTD.
BRITISH COLUMBIA
OIL TRANSMISSION
COMPANY LTD.
N.W.T.
ALBERTA
U.S.A.
PRINCE GEORGE
QUESNEL
PRINCE RUPERT
PRINCE GEORGE
DAWSON CREEK
FORT NELSON
PEACE
FINLAY FORKS
MCLEOD LAKE
FORT ST. JAMES
VANDERHOOF
FRASER LAKE
FORT FRASER
PINE PASS
PINK MOUNTAIN
FORT ST. JOHN
SPIRIT RIVER
GRANDE PRAIRIE
EAST PINE
MONTNEY
WILLISTON LAKE
MACKENZIE
FINMOOR
PINE PASS
MCBRIDE
DUNSTER
TETE JAUNE CACHE
RED PASS JUNCTION
MCLENNAN
MCGREGOR
WOODPECKER
STONY CREEK
WELLS
BARKERVILLE
QUESNEL
LIKELY
HORSEFLY L.
HOBSON
ALBREDA
BLUE RIVER
NORTH THOMPSON
RED DEER
NORDEGG
BRAZEAU
MCLEOD
SASKATCHEWAN
GOLDEN
FIELD
LAKE LOUISE
BANFF
CALGARY
CANMORE
SPILLIMACHEEN
PARSON
DONALD STA.
AVOLA
VAVENBY
CHU CHUA
ADAMS
BARRIERE
MCLURE
SHUSWAP
REVELSTOKE
SICAMOUS
ARROWHEAD
BEATON
TROUT LAKE
RADIUM HOT SPRINGS
INVERMERE
FAIRMONT HOT SPRINGS
CANAL FLATS
SKOOKUMCHUCK
NATAL
PINCHER CREEK
FERNIE
KIMBERLEY
KOOTENAY
KASLO
SLOCAN
CRANBROOK
WARDNER
ELKO
WALDO
MOYIE
NELSON
SIRDAR
NEWGATE
CRESTON
YAHK
WYNNDEL
FRUITVALE
METALINE FALLS
BONNERS FERRY
LIBBY
WHITEFISH
KALISPELL
ARGENTA
POPLAR CREEK
NEW DENVER
SILVERTON
ROSEBERY
SLOCAN
WINLAW
EDGEWOOD
LOWER ARROW LAKE
UPPER ARROW LAKE
NAKUSP
CASTLEGAR
KINNAIRD
TRAIL
ROSSLAND
GRAND FORKS
GREENWOOD
PHOENIX
MIDWAY
OLIVER
OKANAGAN FALLS
OKANAGAN
KEREMEOS
PENTICTON
SUMMERLAND
PRINCETON
PEACHLAND
KELOWNA
LAKE
VERNON
LUMBY
ARMSTRONG
ENDERBY
SALMON ARM
SHUSWAP
KAMLOOPS
WESTWOLD
ASHCROFT
SPENCES BRIDGE
LYTTON
LILLOOET
D'ARCY
PEMBERTON
MERRITT
KEEFERS
BOSTON BAR
HARRISON
LAKE
HOPE
YALE
CHILLIWACK
MISSION
ABBOTSFORD
LANGLEY
NEW WESTMINSTER
VANCOUVER
NORTH VANCOUVER
PORT COQUITLAM
PORT MOODY
BURNABY
HOWE SOUND
SQUAMISH
GARIBALDI
POWELL RIVER
TEXADA
GIBSONS
PARKSVILLE
ALBERNI
NANAIMO
LADYSMITH
CHEMAINUS
DUNCAN
VICTORIA
SOOKE
PORT RENFREW
PORT ANGELES
STRAIT
BELLINGHAM
ANACORTES
OCKPORT
REPUBLIC
COEUR D'ALENE
SPOKANE
COLUMBIA
KOOTENAY
PEND OREILLE
CHILCO
CHILKO
TATLA LAKE
HANCEVILLE
ALEXIS CREEK
BIG CREEK
DOG CREEK
70 MILE HOUSE
LAC LA HACHE
CANIM
MAHOOD
GREEN
CLINTON
HAYLMORE
BRALORNE
LILLOOET
TOBA INLET
POWELL
JERVIS
SECHELT
PENDER
GEORGIA
STRAIT
JUAN DE FUCA
STRAIT
SAANICH
SAANICHTON
HAZELTON
SMITHERS
TELKWA
HOUSTON
BURNS LAKE
FRANCOIS L.
FORT FRASER
FORT GEORGE
PRINCE GEORGE
MCBRIDE
DUNSTER
TETE JAUNE CACHE
RED PASS JUNCTION
MCLENNAN
MCGREGOR
WOODPECKER
STONY CREEK
WELLS
BARKERVILLE
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HORSEFLY L.
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ALBREDA
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NORTH THOMPSON
RED DEER
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GOLDEN
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CALGARY
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SHUSWAP
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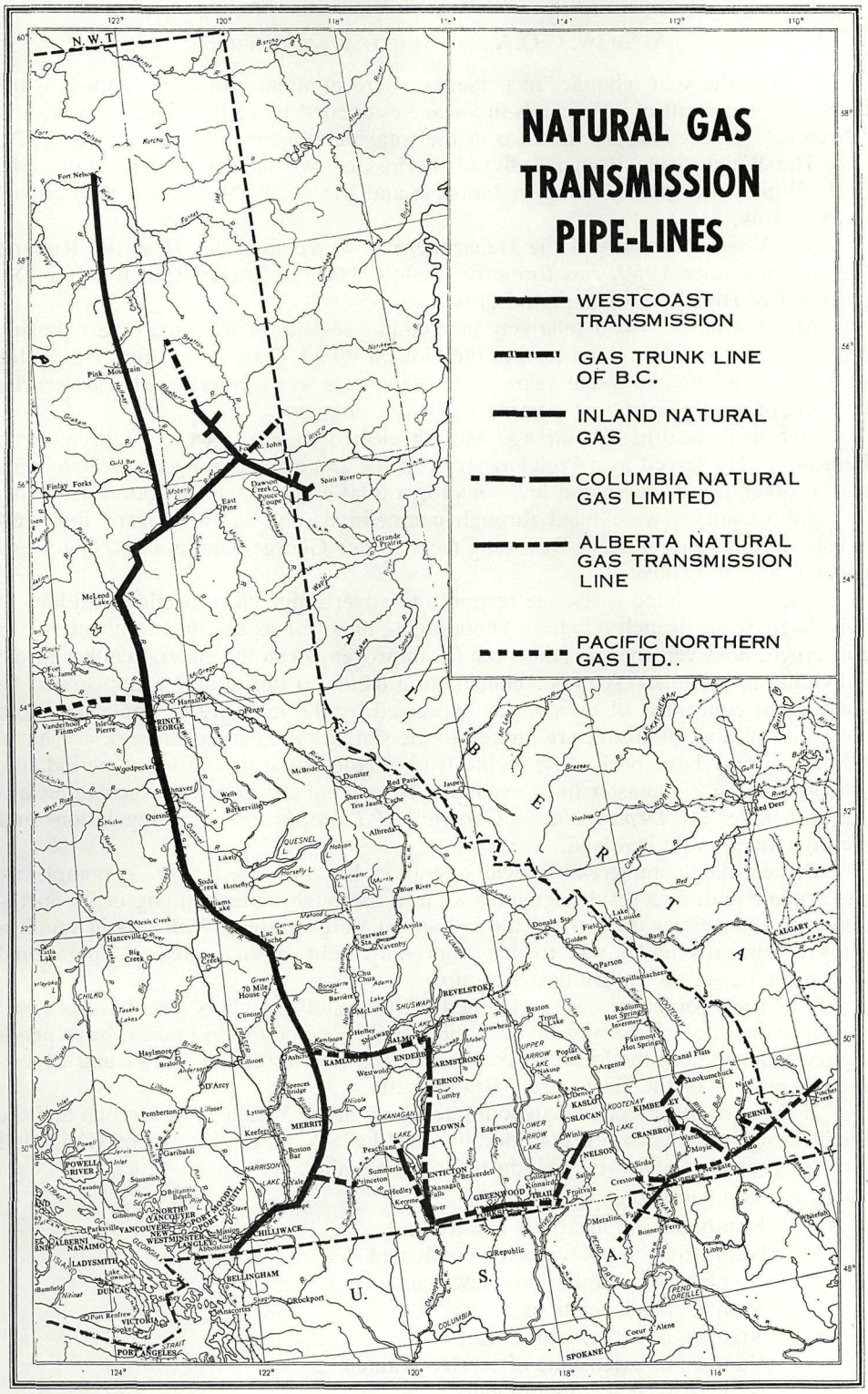
TELKWA
HOUSTON
BURNS LAKE
FRANCOIS L.
FORT FRASER
FORT GEORGE
PRINCE GEORGE


NATURAL GAS TRANSMISSION PIPE-LINES
WESTCOAST TRANSMISSION
GAS TRUNK LINE OF B.C.
INLAND NATURAL GAS
COLUMBIA NATURAL GAS LIMITED
ALBERTA NATURAL GAS TRANSMISSION LINE
PACIFIC NORTHERN GAS LTD..
N.W.T.
ALBERTA
U.S.A.
Fort Nelson
Fort St. John
Dawson Creek
Pouce Coupe
Spirit River
Grande Prairie
Finlay Forks
Pink Mountain
McLeod Lake
Hansard
Vanderhoof
Fort St. James
PRINCE GEORGE
Dunster
Red Pass
Jasper
Tete Jaune Cache
Albreda
QUESNEL
Williams Lake
Soda Creek
Alexis Creek
Hanceville
Lac la Hache
Dog Creek
70 Mile House
Clinton
Kamloops
Ashcroft
Lytton
Lillooet
Pemberton
Haylmore
D'Arcy
Squamish
Garibaldi
Boston Bar
MERRITT
Keefers
Spences Bridge
Chua
Adams Lake
Barriere
McLure
Vavenby
Clearwater
Blue River
Avola
REVELSTOKE
Sicamous
SALMON ARM
ENDERBY
ARMSTRONG
VERNON
Lumby
OKANAGAN LAKE
KELOWNA
Peachland
Summerland
Princeton
PENTICTON
Okanagan Falls
Hedley
Keremeos
Beaverdell
GREENWOOD
TRAIL
Rossland
Castlegar
Kinnaird
Fruitvale
Salmo
Crescent
Sirdar
NELSON
Winlaw
Edgewood
Slocan
SLOCAN
KASLO
KOOTENAY LAKE
CRANBROOK
Wardner
Moyie
KIMBERLEY
FERNIE
Elko
Natal
Stookumchuck
Canal Flats
Fairmont Hot Springs
Radium Hot Springs
Invermere
Beaton
Trout Lake
Argenta
Popoff
Creek
Nakusp
Arrowhead
Revelstoke
Golden
Donald Sta.
Field
Lake Louise
Banff
CALGARY
Parson
Spillimacheen
Gulf L.
Red Deer
Nordegg
Brazeau
Jasper
Tete Jaune Cache
Albreda
Dunster
McBride
Prince George
Vanderhoof
Finmoore
Isle Pierre
Woodpecker
Quesnel
Nazko
Soda Creek
Williams Lake
Alexis Creek
Hanceville
Lac la Hache
Dog Creek
Big Creek
Latla Lake
CHILKO
Taseko Lakes
Haylmore
Bralorne
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Ashcroft
Kamloops
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Keefers
Boston Bar
Garibaldi
Squamish
POWELL RIVER
Britannia Beach
Gibsons
NORTH VANCOUVER
VANCOUVER
WEST VANCOUVER
Parksville
Mission
NEW WESTMINSTER
LANGLEY
Abbotsford
CHILLIWACK
Agassiz
Harrison Lake
Harrison Hot Springs
Hope
ALBERNI
NANAIMO
LADYSMITH
Lake Cowichan
DUNCAN
Bamfield
Port Renfrew
VICTORIA
Sooke
PORT ANGELES
STRAIT OF GEORGIA
BELLINGHAM
Anacortes
Crockport
Republic
Coeur d'Alene
SPOKANE
COLUMBIA
KOOTENAY
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Libby
Waterford
Cranbrook
Fernie
Elko
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Lake Cowichan
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PORT ANGELES
STRAIT OF GEORGIA
BELLINGHAM
Anacortes
Crockport
Republic
Coeur d'Alene
SPOKANE
COLUMBIA
KOOTENAY
PEND OREILLE
Metaline Falls
Bonner Ferry
Libby
Waterford
124°
122°
120°
118°
116°
60°
58°
56°
54°
52°
50°
48°

PERSONNEL

A. SHAW, C.O.A., ADMINISTRATIVE OFFICER

During the year, changes in personnel were minimal and were limited to the normal replacement of individuals in vacancies created by resignation, transfer, and retirement. There was no increase in the total permanent establishment in 1970.

The Weigh Scale Branch suffered the loss of two members of its staff—Mr. R. E. White, who passed away in January; and Mr. A. P. Newhouse, who passed away in July.

Mr. White, who served the Department as a Weighmaster II at the Rutland Weigh Scale since 1959, was formerly employed by the Traffic Branch of the Department of Highways for a period of two years.

Mr. Newhouse was a relatively new employee, and at the time of his passing was employed as a Weighmaster I at the Golden Weigh Scale, a position he held for approximately one and a half years. Mr. Newhouse was formerly with the Security Division of the Pacific Great Eastern Railway Company.

Due to ill health, Mr. George McIvor elected to take an early retirement in February. He served as a Weighmaster I at the Department's Pacific Weigh Scale and at other Lower Mainland locations for a total employment period of 13 years.

All vacancies were filled through competition, and in this regard interview panels were held in Golden, Dawson Creek, Prince George, Chilliwack, New Westminster, and Vancouver.

Except in isolated cases, the response to advertisements respecting positions in the Weigh Scale Branch has been encouraging in so far as the degree of interest is concerned; however, there is still room for improvement in the general calibre of the individual applicants. A major contributing factor to this situation appears to be the general concensus of opinion, as expressed by the majority of applicants, that the duties of a weighmaster are limited to the simple physical weighing of a vehicle. While this may have been close to the truth in the initial development period, the functions of a weighmaster have expanded because of increased responsibilities authorized under the *Department of Commercial Transport Act* and regulations and are now much more involved.

Present-day commercial-vehicle operation has increased both in complexity and volume and, as a result, demands a more thorough understanding of its operational procedures on the part of the individual weighmaster. With this in mind, a study is currently under way to determine the extent of the increased operational responsibilities of the weightmaster group.

Extensions of service were obtained for four staff members who have reached the retirement age. Two were in the Weigh Scale Branch on an interim basis pending reorganization at the localities concerned, and two were long-service and experienced members of the Engineering Branch staff.

If the current rate of growth continues, both in the Weigh Scale Branch and the Engineering Branch, serious consideration will have to be given to increases in staff if the present level of service to industry is to be maintained.

Number of competitions held	7
Number of applications received	144
Number of interview panels conducted	9
Number of personal interviews conducted	69
Number of resignations	2
Number of retirements	3
Number of extensions of service granted	4
Number of new appointments	7
Number of transfers	2