

PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF COMMERCIAL TRANSPORT

HON. W. K. KIERNAN, *Minister*

A. J. BOWERING, *Deputy Minister*

REPORT OF THE
Department of
Commercial Transport

containing the reports on

RAILWAYS, AERIAL TRAMWAYS, PIPE-LINES,
INDUSTRIAL TRANSPORTATION,
and COMMERCIAL VEHICLES

YEAR ENDED DECEMBER 31

1963



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in right of the Province of British Columbia.

1964

PROVINCE OF BRITISH COLUMBIA
DEPARTMENT OF COMMERCIAL TRANSPORT
Hon. W. K. R. ...

REPORT OF THE
Department of
Commercial Transport

RAILWAYS, AERIAL TRANSPORT, PIPE LINES,
INDUSTRIAL TRANSPORTATION
AND COMMERCIAL TRUCKS

YEAR END ...

1938



Printed and Published by the Government of British Columbia
at the Department of Commercial Transport

VICTORIA, B.C., January 21, 1964.

To Major-General the Honourable GEORGE RANDOLPH PEARKES,
V.C., P.C., C.B., D.S.O., M.C.,
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, 1963.

W. K. KIERNAN,
Minister of Commercial Transport.

VICTORIA, B.C., January 21, 1964.

*The Honourable W. K. Kiernan,
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, 1963.

A. J. BOWERING, B.A.Sc., P.Eng.,
Deputy Minister of Commercial Transport.

Report of the Department of Commercial Transport, 1963

A. J. BOWERING, DEPUTY MINISTER

INTRODUCTION

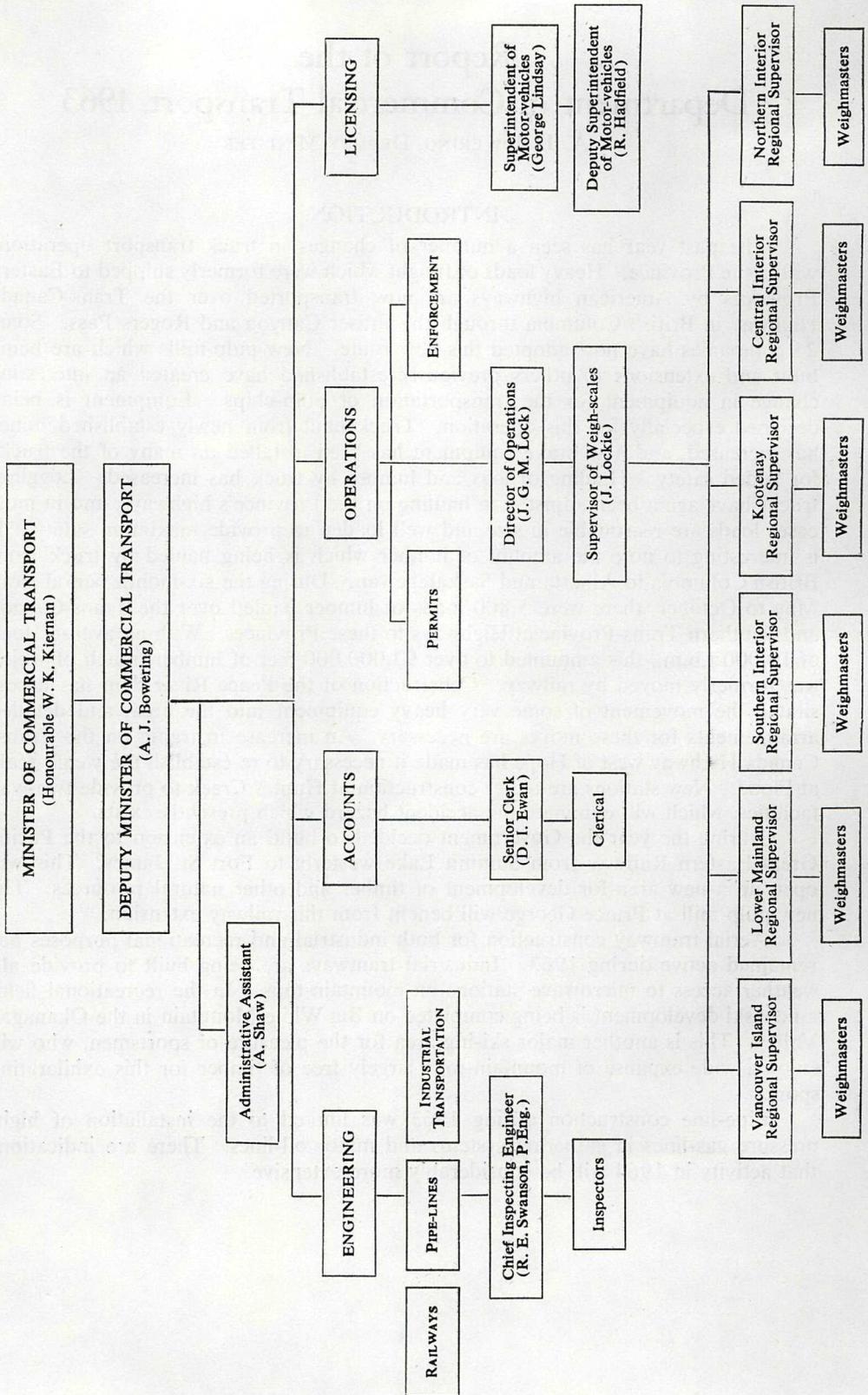
The past year has seen a number of changes in truck transport operations within the Province. Heavy loads of freight which were formerly shipped to Eastern Provinces by American highways are now transported over the Trans-Canada Highway in British Columbia through the Fraser Canyon and Rogers Pass. Some 25 companies have now adopted this new route. New pulp-mills which are being built and extensions to others previously established have created an interesting change in equipment for the transportation of pulp-chips. Equipment is being designed especially for this operation. Truck haul from newly established mines has increased, and new brake equipment has been installed on many of the trucks for added safety. Hauling of logs and lumber by truck has increased. Logging-trucks have again been adjusted to hauling on the Province's highways, and in most cases loads are reasonable in size and well loaded to provide maximum safety. It is interesting to note the amount of lumber which is being hauled by truck from British Columbia to Alberta and Saskatchewan. During the six-month period from May to October, there were 5,800 loads of lumber hauled over the Trans-Canada and Southern Trans-Provincial Highways to these Provinces. With an average load of 16,000 f.b.m., this amounted to over 93,000,000 feet of lumber, much of which was formerly moved by railway. Construction of the Peace River dam has necessitated the movement of some very heavy equipment into the area, and detailed arrangements for these moves are necessary. An increase in traffic on the Trans-Canada Highway west of Hope has made it necessary to re-establish the weigh-scale at Flood. New stations are under construction at Hunter Creek to provide two-way facilities, which will eliminate the accident hazard which presently exists.

During the year the Government decided to build an extension to the Pacific Great Eastern Railway from Summit Lake westerly to Fort St. James. This will open up a new area for development of timber and other natural resources. The new pulp-mill at Prince George will benefit from this railway extension.

Aerial tramway construction for both industrial and recreational purposes has remained active during 1963. Industrial tramways are being built to provide all-weather access to microwave stations on mountain-tops. In the recreational field, a new ski development is being completed on Big White Mountain in the Okanagan Valley. This is another major ski-ing area for the pleasure of sportsmen, who will enjoy a wide expanse of mountain-tops largely free of timber for this exhilarating sport.

Pipe-line construction during 1963 was limited to the installation of high-pressure gas-lines in gathering systems and minor oil-lines. There are indications that activity in 1964 will be considerably more extensive.

ORGANIZATION CHART



COMMERCIAL VEHICLE BRANCH AND ACCOUNTS BRANCH

GEORGE LINDSAY, SUPERINTENDENT OF MOTOR-VEHICLES

J. G. M. LOCK, DIRECTOR OF OPERATIONS

D. I. EWAN, SENIOR CLERK

The movement of commercial vehicles within and through the Province has changed to some extent during the year 1963. This change has been occasioned by the completion of the Trans-Canada Highway through Rogers Pass in 1962, industrial development in the northern part of the Province, increased weight of vehicles using the Fraser Canyon section of the Trans-Canada Highway, and increased activity in the mining and pulp-mill industries.

The number of trucks operating through Rogers Pass on the Trans-Canada Highway between Revelstoke and Golden in August, September, October, and November has increased about 25 per cent over the same period in 1962. Part of this increase is due to firms changing their operation from the southern route, which they formerly used. There has been a considerable increase in the amount of lumber moved by truck from British Columbia to Alberta and Saskatchewan both through the Rogers Pass and the Crowsnest Pass. During the six-month period from May to October, inclusive, 93,000,000 f.b.m. of lumber was moved by truck from British Columbia to Alberta. It is interesting to note that many of the trucks hauling this lumber are based in Alberta.



Typical heavy equipment currently in use at the Peace River dam-site construction project: 560-horsepower single-axle tractor-scraper; over-all length, 49 feet; width, 14 feet; height, 13 feet; capacity, 44 cubic yards.

Construction of the Peace River dam has increased the movement of heavy machinery into that area, requiring a great deal of supervision for the part of the move along Provincial highways. To date, oil-drilling in the Peace River area has

been less than in 1962; however, other activity has made up the difference. The year 1964 will likely continue to be a good one in this area of the Province with renewed activity in pipe-line construction and resultant movement of heavy equipment as well as loads of large pipe.

Elsewhere in the Province new large pulp-mills are being built. These require the movement of heavy equipment for construction, and later, when logs and chips are hauled, additional trucks are required for this purpose.

Mining activity and the movement of ore by trucks have increased during 1963. As an example, Bethlehem Copper ore production is all hauled by large trucks from the mine, located east of Ashcroft, to loading facilities in North Vancouver. These trucks are equipped with electric retarder brakes, for which a special weight allowance was granted during the year. This allows heavier loads to be transported safely with less wear on equipment.

In the international trucking field, there has been some change in fleet operations, which has occurred since the proration agreement for licensing has been extended. The Province of British Columbia, which has entered into an agreement with 14 States for licence proration, is now gaining some additional benefit of revenue from this source. About 30 British Columbia-based companies which formerly used the American route to Eastern Canada are now operating through the Rogers Pass and no longer use the southern route. An additional 21 British Columbia-based companies, however, have increased their operation into these States by means of the flexibility obtained through the agreement. This agreement has meant much in reduced licence fees to these firms, and the result has been an increase in their trucking operations. During 1963, 37 American-based companies have discontinued using the prorate agreement or sold their interests; however, an additional 72 new American companies have licensed their vehicles in this manner. This has meant a general increase in commercial-vehicle movement across the American Border, with a resultant increase in fuel taxes and other revenue. Another definite gain to the Provincial economy has been the increase in shipment of peat, shingles, fish, and fertilizer to Western States. Firms hauling produce north haul these products back to make it a two-way operation. Firms selling the British Columbia products have a much wider range of equipment available to move their produce and obtain more competitive rates as a result.

The number of non-resident commercial vehicles entering the Province for various reasons, other than under Prorate Agreement, has increased over the previous year by about 12 per cent.

During 1963 various changes have been noted in equipment used on commercial vehicles. Retarder brakes of various designs are being used more extensively. These new developments add to safety on our highways and greater over-all efficiency to operators. Some change is noted in tire equipment for heavy vehicles, particularly logging-trucks. The use of large tires is more in evidence, and some operators are replacing dual tires with single larger tires. If these prove to be suitable, then there will be an over-all saving in weight.

The big single tire has displayed a number of advantages over dual tires. Its rolling resistance is less, it gives good flotation over soft ground, and tire-matching is no problem. There are, however, several disadvantages which must be overcome before the single tire becomes generally accepted.

Trailers for long-haul operations are being built with single-leaf springs. Not only does the spring weigh 60 pounds less, but vehicle stability on the road is increased. Interleaf spring friction is eliminated, thus providing a better ride. Greater care must be taken with maintenance of the single-leaf spring, however, as damage to the spring surface will result in a more rapid deterioration rate.

OPERATIONS

As in previous years, the increased activity in the logging industry resulted in an increase in the number of restricted-route permits issued. Benefits to logging operators by the introduction of the "block load" principle was largely responsible for this increase. The additional weight allowance, coupled with the elimination of the cost of oversize permits, provided a substantial saving for most of the operators. Another change in the regulations governing restricted-route permits brought an extra axle weight allowance for hog-fuel and pulp-chips.

Additions to the Provincial highways listed in Schedule 1 and Schedule 8 of regulations under the *Motor-vehicle Act*, as well as the reclassification of highways and construction of new bridges, have allowed the movement of heavier loads over a greater area in the Province, thus increasing the truckers' scope of operation. This, in turn, has resulted in a considerable saving in the costs of permits for the operation of both oversize and overweight vehicles. It has also resulted in a greater volume of goods moved by truck, with a consequent increase in revenue derived from fuel taxes.

This greater movement of goods by truck has prompted a change of policy by railroads, and we now find the Canadian Pacific Railway Company entering into more active participation in the trucking business.

Increased truck transport and construction of new highways have made it necessary for additional new weigh-scales to be established on new routes.

During the year a reduction in fees was granted for vehicles operated by improvement districts under the *Water Act* in the Province.

In the interest of safety, Lear retarders were added to the growing list of safety devices for which a weight allowance is granted to truck operators.

The Department continues to enjoy active co-operation with other departments of Government and is pleased to utilize its facilities to this extent in the best interests of the Government as a whole.

REGION 1 (VANCOUVER ISLAND)

During the year it was reported that hauling of lumber by truck on Vancouver Island has increased from the Cowichan Lake area with the manufacturing of green veneer. There has also been an increase of 17 chip-hauling units in this area. Truck logging in the Parksville and Sooke areas has increased. As a result of pulp-mill construction at Crofton, Harmac, and Port Alberni, there was an increase in the movement of heavy construction equipment.

REGION 2 (LOWER MAINLAND)

A close liaison was maintained with the trucking industry in the Lower Mainland area during 1963, assisting operators and keeping them up to date on the regulations pertaining to truck operation.

To eliminate a traffic hazard at the Flood weigh-station, it was decided to relocate that weigh-scale.

Two new scales are presently being established at Hunter Creek, several miles west of Flood on the Trans-Canada Highway, for this purpose. Traffic will be checked in each direction separately, thus reducing materially the traffic problem.

Continuing the Department's policy of providing better service to the industry, a further weigh-scale is being built on Highway No. 7 immediately west of the new Port Mann Bridge. Although this weigh-scale will only accommodate west-bound traffic at present, it is anticipated that it will provide some measure of relief at the presently overtaxed Pattullo Bridge scales.

Construction of these facilities is currently under way, and it is expected that completion will be early in 1964.

Logging operations in the Hope area continue to enjoy a high level of activity.

REGION 3 (SOUTHERN INTERIOR)

It is reported that trucking activities in the Southern Interior of the Province have increased during the past year as a result of a heavier influx of through traffic using the new Rogers Pass route to and from Alberta.

Department officials in this region continue to enjoy close co-operation with lumber and logging associations to the mutual benefit of both the industry and the Government.

REGION 4 (KOOTENAY)

During the first three months of 1962, the truck traffic through the scales in this region was normal due to winter conditions. With the lifting of road restrictions in April, the truck traffic increased considerably. At that time a convoy of 40 trucks transporting bees en route from California to the Prairie Provinces was checked through the Fernie scales. The Department of Highways reconstructed parts of Highway No. 95 between Cranbrook and Golden, with the result that this highway is now classified as a Schedule 1 highway. This will be of benefit to the trucking industry operating in and through the Kootenay area. During a seven-month period, May to November, there were 2,802 trucks checked through the Fernie weigh-scale, transporting 42,932,045 board-feet of lumber out of the Province, and 3,524 trucks checked through the Golden weigh-scale, transporting 59,666,166 board-feet of lumber out of the Province, making a total of 102,598,211 board-feet through these two stations. Due to the opening of the Rogers Pass, the interprovincial truck traffic through the Golden weigh-scale has increased tremendously, with the result that it was found necessary to increase the staff at this scale from three to five men to keep pace with the demand.

In the month of May the National parks opened the Banff-Windermere Highway to truck operation transporting lumber from the East Kootenay to Alberta and Saskatchewan.

During the late summer and fall a series of 46 non-resident permits was issued to a group of Hutterites who make an annual visit from Alberta and Saskatchewan for the purpose of purchasing British Columbia fruit.

In October the new highway between Salmo and Creston was opened, with the result that long-haul trucks no longer require to use the ferry on Kootenay Lake. This will be a great advantage to the industry in respect to the movement of oversize loads and reduce traffic congestion on the Kootenay Bay-Creston section of Highway No. 3.

REGION 5 (CENTRAL INTERIOR)

Industry in the vicinity of Prince George in particular and the whole of the Central Interior in general has enjoyed an active year. Industrial expansion currently under way has been the principal contributing factor to this increase in trucking activity. It is with a great deal of enthusiasm that the trucking industry views the future, which appears to hold promise of further industrial expansion in the area.

Highway relocation into Prince George from the south and east will require the construction of a new weigh-scale in 1964. Excellent co-operation is enjoyed by the Department with the Department of Highways in planning adequate facilities sufficient to provide a service equal to the demands of industry in the area.

Improved road conditions and the establishment of a trucking terminal have been the principal reasons for Prince George becoming one of the major trucking centres of the Province. The terminal provides a bonded customs sufferance warehouse, adequate storage, and yard facilities.

There is a growing tendency among the truck operators to utilize the terminal as a clearing-house for bonded cargoes, thus avoiding the busy clearance warehouses in the Vancouver and border areas, at the same time gaining the advantage of a saving in costly miles and hours of operation.

REGION 6 (NORTHERN INTERIOR)

It is reported that although the movement of heavy equipment in the northern section of the Province is at all times reasonably heavy, a definite increase was evident over the past year.

This is no doubt due in most part to the heavy-construction schedule set in connection with the Peace River power project, and partly due to a continued programme of oil and gas research and development.

The variety of equipment passing over the weigh-scale in this region is quite extensive, and certainly at times taxes the ingenuity of Department staff in the area.

With the operation of the weigh-scale at Fort Nelson, it is anticipated that a steady control of the movement of heavy oilfield equipment on the Alaska Highway will be possible. It is anticipated that this station will be particularly active during 1964, when heavy loads of equipment and pipe for the construction of a major gas pipe-line are moved in the area.

PRORATE

The Province of British Columbia is entering into its third year as a member of the Western Compact, operating under the Uniform Vehicle Registration Proration and Reciprocity Agreement.

It is under this Agreement that truckers obtain their licences on a prorate basis, which permits them to operate in 14 of the Western United States as well as in the Province of British Columbia at reduced licence fees.

The percentage of miles travelled on British Columbia roads during the first year was limited, due in part to the fact that the distributing points for the Lower Mainland and Vancouver Island and the larger centres of population are located close to the American Border.

This mileage percentage was also affected by the newness of the operation and the limited amount of business which they had previously established.

Still another factor affecting this mileage percentage was that firms operating out of Vancouver to the Eastern United States were using Blaine as a port of entry and exit because of the lack of a more suitable east-west route.

Reconstruction of the Southern Trans-Provincial Highway from Salmo to Creston will have some effect on these operations.

American firms are now gaining more knowledge of the Province of British Columbia, and, as a result, truck operations are increasing between this Province and American States.

Truckers operating from the Point Roberts area through British Columbia to Blaine were responsible for most of the increase in the number of reciprocity plates issued during the second year. In all, 31 reciprocity plates were purchased in 1963. These are permitted for trucks under 12,000 pounds gross originating in one of the States which is included in the Prorate Agreement.

ACCOUNTS

During the past year the number of oversize and overweight permits audited by this office showed a slight increase, averaging nearly 2,200 per month. There has been an increase in the number of new accounts opened during the year. However, these were largely offset by cancellations resulting from the introduction of block loads in the logging-truck industry.

The movement of heavy equipment engaged in construction of the Peace River power development has resulted in a general increase of permits and revenue from the northern part of the Province, while the block load for logging-trucks and reclassification of several highways in the southern part have caused a general decline in the need for operating permits.

Several surveys dealing with carrying capacity of logging-trucks, the impact of the Prorate Agreement on commercial-vehicle revenue, sizes and weight of farm vehicles, and Canadian interprovincial traffic were carried out.

The following tables show the results of the activities of the Weigh-scale Branch during the past year.

TABLE NO. 1.—REVENUE FROM GASOLINE AND MOTIVE-FUEL USE TAXES FOR PASSENGER CARS AND COMMERCIAL VEHICLES

| Fiscal Year | Amount | Fiscal Year | Amount |
|-------------|--------------|-------------|--------------|
| 1953/54 | \$15,963,000 | 1958/59 | \$26,100,000 |
| 1954/55 | 17,455,000 | 1959/60 | 28,582,000 |
| 1955/56 | 19,820,000 | 1960/61 | 30,093,000 |
| 1956/57 | 22,593,000 | 1961/62 | 39,262,000 |
| 1957/58 | 24,500,000 | 1962/63 | 43,129,000 |

TABLE NO. 2.—SUMMARY OF COMMERCIAL VEHICLE LICENCES AND PERMITS ISSUED, JANUARY 1, 1963, TO DECEMBER 31, 1963

| Month | Number of Commercial Vehicles Registered and Licensed ¹ | Number of Commercial Trailers Registered and Licensed ¹ | Number of Non-resident Permits Issued | Number of Temporary Operation Permits Issued | Number of Oversize and Overweight Permits Issued | Number of Vehicles Checked at Weigh-stations |
|-----------|--|--|---------------------------------------|--|--|--|
| January | 21,480 | 1,898 | 922 | 1,269 | 2,273 | 94,256 |
| February | 61,891 | 4,410 | 894 | 1,251 | 1,957 | 97,804 |
| March | 14,742 | 2,925 | 2,012 | 2,750 | 2,087 | 130,747 |
| April | 5,628 | 620 | 1,020 | 2,646 | 1,885 | 91,302 |
| May | 5,097 | 757 | 1,223 | 2,843 | 2,151 | 124,705 |
| June | 3,866 | 379 | 1,425 | 2,426 | 2,489 | 110,085 |
| July | 3,007 | 305 | 1,418 | 2,129 | 2,385 | 102,640 |
| August | 2,668 | 224 | 1,222 | 2,146 | 2,156 | 120,583 |
| September | 2,158 | 181 | 1,451 | 1,817 | 2,032 | 108,450 |
| October | 2,272 | 205 | 1,159 | 2,041 | 2,407 | 117,675 |
| November | 1,794 | 127 | 948 | 1,810 | 2,040 | 133,312 |
| December | 1,403 | 84 | 1,148 | 1,658 | 1,633 | 89,571 |
| Totals | 126,006 | 12,115 | 14,842 | 24,786 | 25,495 | 1,321,130 |

¹ Includes vehicles licensed under Prorate Agreement with American States.

TABLE NO. 3.—SUMMARY OF PRORATE OPERATION, 1963

| | Companies Prorated | Tractor Units | Trailer Units | Reciprocity Plates |
|------------------|--------------------|---------------|---------------|--------------------|
| British Columbia | 70 | 309 | 289 | — |
| United States | 228 | 1,825 | 3,677 | 31 |
| Totals | 298 | 2,134 | 3,966 | 31 |

TABLE NO. 4.—COMPARISON OF GROSS REVENUE COLLECTIONS FROM COMMERCIAL LICENCE AND PERMIT FEES FOR FIVE-YEAR PERIOD 1958/59 TO 1962/63, INCLUSIVE.

| Source | 1958/59 | 1959/60 | 1960/61 | 1961/62 | 1962/63 |
|-----------------------------------|----------------|-------------------------|-----------------------------|----------------|----------------|
| Commercial motor-vehicle licences | \$4,470,162.49 | \$6,804,101.57 | \$7,541,536.02 ¹ | \$7,938,605.82 | \$8,253,251.46 |
| Non-resident commercial permits | 133,716.34 | 189,374.06 ² | 401,976.11 | 478,156.17 | 381,673.01 |
| Trailer fees | 201,547.95 | 128,123.38 | 60,325.00 ³ | 57,452.34 | 61,408.52 |
| Temporary operation permits | | 5,001.20 | 45,765.00 | 58,442.51 | 62,909.21 |
| Oversize and overweight permits | 21,176.00 | 276,741.12 ⁴ | 317,568.53 | 321,730.55 | 368,715.57 |
| Totals | \$4,826,602.78 | \$7,403,341.33 | \$8,367,170.66 | \$8,854,387.39 | \$9,127,957.77 |

¹ Commenced issuing licences on gross vehicle weight January 1, 1960.

² Department of Commercial Transport commenced issuing permits June 15, 1959.

³ Licence fees collected on gross-vehicle-weight basis charged to tractor unit and nominal \$10 fee collected on trailer. This reduced trailer fees and transferred them to commercial vehicle licences.

⁴ Department of Commercial Transport commenced issuing permits July 15, 1959.

TABLE NO. 5.—SUMMARY OF VIOLATION NOTICES ISSUED, JANUARY 1, 1963, TO DECEMBER 31, 1963

Licence and Permit Violations

| | |
|----------------------------------|-----------|
| Gross vehicle weight | 1,878 |
| Motor-vehicle registration | 503 |
| Licence-plates | 628 |
| Trailer plates | 116 |
| Quarterly licence | 14 |
| Non-resident permit | 12 |
| Temporary operation permit | 5 |
| Motive-fuel emblem | 15 |
| Overweight permit | 2 |
| Oversize permit | 56 |
| Restricted-route permit | 126 |
| Highway crossing permit | 8 |
| Proration | 6 |
| Other | 21 |
| Total violations | 3,390 |
| Total number of vehicles checked | 1,321,130 |

Motor-carrier Violations

| | |
|---|--------|
| Motor-carrier plates not displayed | 317 |
| Motor-carrier licence not carried | 329 |
| Conditions of licence not carried | 284 |
| Operating otherwise than permitted by licence | 318 |
| Total violations | 1,248 |
| Total number of vehicles checked | 11,949 |

Weight Violations

| | |
|------------|-----|
| Overweight | 739 |
|------------|-----|

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

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

Improved transportation facilities to Northern British Columbia in recent years has sparked a great boom in development of British Columbia's natural resources. Drilling and exploration went forward, and with it pipe-lines, another means of transport, to bring the raw materials to world markets. Industrial roads, railways, and pipe-lines, as well as good highways, are therefore opening the last great frontier to civilization, and now that the Peace River is being harnessed to provide abundant power in almost limitless quantities which can also be transported to market, prosperity is assured, and those with the foresight and fortitude to initiate such a vast programme of expansion have recognized and accepted the law that "the natural resources of a country are related to its economy in direct proportion to the transportation available to the industries concerned."

British Columbia, then, can look forward to an expanding economy as the north country grows and opens up and as transportation continues to blaze the trail into the great untapped reservoirs of British Columbia's northland.

Nineteen sixty-three was a good year for industry, and all phases of the work of the Engineering Branch continued, as in the past, to serve industry and to render engineering service and make inspections where these were necessary. It is the principle of this Branch to operate with a minimum staff, and all engineers and inspectors are trained to handle various facets of the work, rather than have specialists who cover only one specialized section of a field. If the system of specialists had been adopted, it would have necessitated having a larger number of engineers, draughtsmen, and pipe-line, railway, boiler, and electrical inspectors. The present staff consists of three field inspectors and two engineers in the Engineering Branch, with two stenographers for office work.

During the year the staff has not been increased, but the scope of the work has expanded to a large extent. For example, the Canadian Standards Association has been requested by the pipe-line industry to formulate an all-Canadian pipe-line code to govern the construction and maintenance of gas and oil pipe-lines in Canada. The various Provinces concerned, the National Energy Board, the pipe and valve manufacturers, and all the major pipe-line companies are participating in this activity, and a vice-president of Westcoast Transmission Company is Chairman of the Gas Code Committee, while the Chief Inspecting Engineer of our Engineering Branch is a Vice-Chairman. The president of a large pipe-line company in Saskatchewan is the Chairman of the Oil Code Committee, while a member of the National Energy Board is a Vice-Chairman. The Chairmen of both Committees and their Vice-Chairman constitute the Central or Steering Committee, with a member from the Canadian Gas Association as secretary and the general manager of Canadian Standards Association acting as Chairman of the Central or Steering Committee. It will be observed British Columbia is given an equal standing with the National Energy Board in the constitution of this Committee, and there are over 70 members actively participating in this work.

Meetings have been held in Toronto, Calgary, and Vancouver, and progress is being made; however, there is a tremendous amount of research being done in the field of special steel for pipe-lines and the causes of pipe-line fracture and crack propagation. In order to participate and contribute, it is necessary that considerable research be done with respect to keeping abreast of the problems encountered in the

pipe-line industry, and also protecting the interests of the Province when so many representatives are working on a national basis.

A second Canadian Standards Association committee has been set up to study and produce a national code to govern the construction of aerial tramways. In this regard, the Chief Inspecting Engineer of this Department is the Chairman, and all the Provinces of Canada having tramways are represented, as well as the Canadian tramway-manufacturers and the Canadian ski and mountain resort industry.

The first meeting of the Canadian Standards Association Aerial Tramway Code Committee was held in Toronto in October, 1963, and the second meeting is scheduled to be held in Banff or Calgary in April, 1964.

It can be reported progress is being made, and it is hoped a national code may be brought about based on the present British Columbia code, upon which most of the English-speaking countries, including the United States, have patterned their aerial-tramway codes.

In addition to the foregoing committee activity over the past year, 1963 was a busy year with respect to the construction of new aerial tramways to serve various winter playgrounds in British Columbia.

The pipe-line industry has not built as many miles of new pipe-line as in the past two years, but it has been quite busy on short field gathering-lines and on the installation of compressor-stations in the gasfields, so that wells with a lower pressure than the Westcoast main-line gathering system may be boosted up to feed into that system. In most cases, sour gas has to be accommodated, which necessitates considerable ancillary equipment. Three such compressor-stations were constructed during 1963 in the Jedney field, and stations in the Buick and Kobes fields have been extended to cope with the increased demand. A new compressor-station was added on the Westcoast main line near Chetwynd during 1963, and the new pumping-station of Western Pacific Products' oil-line at McLeod Lake was placed in full operation during the year. The latter compressor and pumping stations were installed in lieu of looping, as this is normally the first move in pipe-line economics to increase the throughput of a long pipe-line. These stations were inspected and plans and engineering design approved by the Department.

In the railway industry a number of plant-yard installations were made, as well as barge slips and other rail handling facilities. The design of all such projects was done by engineering firms, with final approval by Department engineers.

The Pacific Great Eastern Railway is extending its system 100 miles or more into the Stuart Lake area, and while this was initiated in 1963, the impact of the work will not be felt until 1964.

Inspection of industrial roads—that is to say, roads which are not publicly owned—has continued during 1963. A number of these road systems have special regulations to govern traffic, especially where the public is allowed access, and a degree of responsibility is required by both the public using such roads and the company owning and operating them. In some cases such roads are logging company roads where the public requests access for hunting and fishing. Company regulations made pursuant to the Act and approved by Order in Council are a great help in such cases, as the regulations give the company specific powers and allow it to control traffic conducive to the public interest, as well as to the interest and well-being of its employees.

In other cases, industrial roads are operated by oil companies as in the Peace River area, where farmers, residents, and exploration companies use the roads as though they were public roads. In such cases, company rules approved by Order

in Council would help both the public and the company, especially during the break-up season, when traffic on certain roads should be restricted.

Some industrial roads serve mining interests or large industrial interests such as Kitimat. In the case of Kitimat, special rules have been approved, and the company operates a security system with regular police-type cars to control traffic under the rules of the *Industrial Transportation Act*. This arrangement has worked out very well.

Inspectors and engineers have been engaged regularly during 1963 checking vehicles, air brakes, roads, and bridges on industrial roads in the Province. This has entailed the issuance of driving permits requiring doctor's certificates, examinations, and special training programmes.

While the *Industrial Transportation Act* does not apply to any public highway, street, or other public communication, it is recognized that vehicles use both public and private road systems jointly; consequently, this Branch has extended its training programme to include the R.C.M.P. road patrol, and over 100 R.C.M.P. officers have been instructed on the proper procedure of checking air brakes during the year. This has been a useful contribution in the interest of public safety.

The manufacturers of equipment have increased the use of the services of our Engineering Branch during 1963 as the trend in logging and hauling equipment has changed radically over the past two years. The spar tree in logging has been replaced with the steel spar, a portable piece of equipment weighing up to 150 tons and having a retractable section over 150 feet high. This unit is a complete machine, and in some cases is self-propelled from one location to another. This new equipment has posed a problem in brakes, safety, and the certification of drivers, but on all three counts the companies have co-operated with this Branch so that adequate brakes and certified drivers have been made available to the industry.

It is considered desirable to have rules which the companies can follow, and that such rules be reasonable and practicable. Our engineers assure that the company is responsible to enforce such rules with respect to its own employees and for general safety at all times. General inspection on this basis is considered adequate and relieves Department inspectors of additional detailed work.

RAILWAY INSPECTION

All railways operating under the *Railway Act* in British Columbia were inspected during the year. This included logging-railways, mining-railways, industrial-plant railways, narrow-gauge railways, and main-line railways, such as the Pacific Great Eastern Railway and the British Columbia Hydro and Power Authority Railway.

There are only two main-line logging-railways left operating in British Columbia. One is at the Englewood Division of Canadian Forest Products Limited, which is 67 miles in length, and the other is between Ladysmith and Nanaimo Lakes, which is approximately 20 miles in length. The latter railway is operated jointly by Comox Logging and Railway Company and MacMillan, Bloedel and Powell River Limited. A diesel locomotive is operated on behalf of the Comox Logging and Railway Company, and MacMillan, Bloedel and Powell River Limited operates two steam locomotives on the same road. This operation is quite satisfactory. Separate Inspecting Engineers' reports covering certain railways are included in this Report.

A number of additions and improvements have been made to the industrial-plant railways throughout the Province. Some have been extended, and additional trackage and facilities have been installed. In other cases, barge slips have been installed to accommodate rail traffic, and such a barge slip is in the course of

construction at Woodfibre. The Island Tug & Barge Company, in addition to its Victoria rail facilities, has installed quite elaborate facilities to connect the Pacific Great Eastern Railway with other lines in the United States by the use of a barge slip in North Vancouver.

The mining-railway of Consolidated Mining and Smelting Company of Canada Limited, which serves the Sullivan mine at Kimberley, was inspected in company with the Chief Inspector of Mines and the electrical staff of the Mines Branch. This inspection was conducted at the company's request in order to establish a system whereby the engineer or operator would be enabled to leave the cab of the locomotive and to control the locomotive and train during dumping operations. It was felt by both the Mines Branch inspectors and by our inspectors that automation would make the operation safer than the old method, where workmen were required to be in the near vicinity of cars while being dumped at the dumper. The new proposed system was approved and will be inspected before it is placed in full operation. Track and equipment were inspected and found to be quite well maintained.

The narrow-gauge operation of the Consolidated Mining and Smelting Company of Canada Limited at Trail was inspected, and new rules to apply specifically to this operation were approved by the Department. This tramming operation is in good condition, and improvements with respect to safety recommended by the Inspecting Engineers were carried out by the company.

At Michel, in the Crowsnest Pass, the air locomotives were inspected, and annual hydrostatic tests were applied to the air-receivers. One of the locomotives required extensive repairs, and it was taken out of service so that repairs could be carried out in the company's shop. In this case the Mines Branch inspectors are making the follow-through inspection to see that this locomotive is put in proper condition by the company before it is returned to service. In the case of all mine locomotives which go underground, copies of reports are sent to the Chief Inspector of Mines so that follow-up inspections can be made by that branch of the Mines Department.

Calculations were made with respect to haulage in the new proposed 11-mile tunnel of Granduc Mines' operation north of Prince Rupert, and recommendations were made as to the size of locomotives required and the amount of haulage which could be done with horsepower available. This report was prepared at the request of company consultants.

The operation of the industrial railway between the Pacific Great Eastern Railway and the McMahon Refinery at Taylor was handed back to the Pacific Great Eastern Railway Company during the latter part of 1963, as it was found the industrial company was having serious difficulty in operating the railway efficiently. In this regard an agreement exists between the Pacific Great Eastern Railway Company and the refinery with respect to railway maintenance and other matters involving railway operation. These agreements have been approved by the Department.

The railway at Kitimat, which serves the terminal between the Canadian National Railways and the smelter at Kitimat, was inspected during the year, and the diesel-electric locomotive was examined and certified. The inspectors were consulted with respect to switching problems in this area, and, as a result, various problems were straightened out. This railway is in quite good condition and handles heavy traffic between the smelter plant and the Canadian National Railways.

Twigg Island railway, serving the steel-mill at Twigg Island in the Vancouver area, was inspected and locomotives examined. This railway operates between the British Columbia Hydro and Power Authority Railway and the smelter. A steel railway-bridge span connects Twigg Island with the mainland, which was inspected

and found to be in proper order. Locomotive cranes operating at this plant were also inspected, as they are considered to be part of the railway equipment.

The railways and equipment in the shipyards in Vancouver and Victoria were inspected during the year. In one case a locomotive crane had been converted into a locomotive and was not satisfactory. The Inspecting Engineer issued instructions as to proper safety appliances and as to proper methods of handling cars. In another case, cranes were tested as to capacity and certified. It can therefore be reported that railway equipment and cranes in shipyards are being properly maintained.

CANADIAN FOREST PRODUCTS LIMITED

Inspecting Engineer's Report

On October 29, 1963, an inspection was made of the track and bridges on the logging-railway operated by the above company between Beaver Cove and Vernon Lake. This included the reloads at Camp A siding, Woss, Croman, Maquilla, and Sutton.

Generally the track is in good condition, with ballast and tie conditions good between Beaver Cove and K 26 siding. It is intended that ballasting and ditching will be undertaken from K 26 siding to the end of the line at Vernon Lake.

Some packing is missing from switches, guard-rails, and frogs in the yard at Beaver Cove, Nimpkish, and Woss.

The condition of the bridges is as follows:—

Kokish: Good.

Elk River: Shim batter pile south end.

East Fork: Good.

Tsulton River: Ties cut badly.

Halway Island: Good.

Noomas: Shim mudsill south end.

Storey Creek: Bad order guard-rail and ties.

Kinman Creek: Good.

Woodengle: No. 1 bent, north end, requires attention.

Delusion Creek No. 7: Fairly good. To be replaced by fill by end of 1963.

Steele Creek: Good.

Bridge 10: No. 2 pile moving, north end.

Bridge 11: Good.

Gold Creek: Shims loose at rail pile, north end, down-stream side.

Groves Creek: Good.

Davie Creek: Fair. A 5-miles-per-hour speed-limit is in effect. This bridge will be dispensed with in favour of a new bridge at another location early in 1964.

Maquilla Creek: Good.

Fire Creek: Tie ends poor.

It is estimated that between eight and nine thousand new ties have been installed during 1963, and 12 miles of track were reballasted during that period. This is evident from the improved condition of the track since the last inspection.

Six rail-cars and one diesel locomotive were inspected, reservoirs tested, and certificates issued to cover the inspection.

Robert Clark was certified as a power-car operator and Alex Lisogar was certified as an air-equipped vehicle operator.—*W. F. Thomas, Inspecting Engineer.*

COMOX LOGGING AND RAILWAY COMPANY

Inspecting Engineer's Report

On October 2, 1963, in company with Mr. Murtsell, the annual inspection of the railway track of the above company was made by track-motor from Nanaimo Lakes to Ladysmith.

In general this railway is in excellent condition, with a good maintenance programme being carried out. Five miles of ballast have been completed this season, 10,000 tie-plates have been installed, and 7,000 ties have been renewed. All tie renewals are of yellow cedar and, as a result, are more or less of a permanent nature. Four switch-point protectors have been installed in different locations as an experiment, and when checked appeared to be very satisfactory. Derails are in order at the necessary locations. All railway crossings were inspected and found to be in good condition. Tie-plates are required on some portions of the Deadwood Bridge, and Boulder Creek Bridge requires some attention to the south end abutment piling.

Rail-car 104, Gas Switcher 107, and Unloader No. 3 at the log dump were inspected and air-receivers hydro-tested.

Diesel-electric Locomotive 7128 has been equipped with a Burrell-type flange-oiler. This oiler also supplies lubrication to both truck centre castings, and this item in conjunction with the flange lubrication should reduce wheel-flange wear a very substantial amount.—*J. H. Carmichael, Inspecting Engineer.*

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

Inspecting Engineer's Report

On November 22, 1963, the general annual inspection was made of the above main-line railway from Mile 0, New Westminster, to Mile 63.92, Chilliwack. The inspection was made by track-motor in company with Mr. W. Alcock, roadmaster.

The main line, passing-tracks, and spur tracks are all in a very good state of maintenance. Ballast, tie renewal, ditching, and general maintenance of the railway are being efficiently carried out.

Rail-lubricators installed in the appropriate locations are being kept in good working order, and, as a result, it is estimated the locomotive flange wear has decreased approximately 50 per cent. The 85-pound rail laid in 1959 shows little signs of wear as a result, in most part due to the proper operation of the rail-lubricators.

There are 13 diesel-electric and 2 electric locomotives used as motive power in freight service on this line. The shop maintenance staff in the New Westminster shop keeps the locomotives in good safe working condition and available when required.

Highway, farm, and private crossings over the railway were inspected and in general are in good order.

All locomotives and track vehicles are equipped with radio communication, which makes for a high standard of safety in the movement of traffic over the road.—*J. H. Carmichael, Inspecting Engineer.*

PACIFIC GREAT EASTERN RAILWAY

Inspecting Engineer's Report

During the year numerous inspections were made of the facilities of the Pacific Great Eastern Railway to check on maintenance of way and capital improvements being carried out by the company's forces.

A new 100-pound rail-renewal programme has been put into effect, and already 10.3 miles of new 100-pound rail have been laid on the Squamish subdivision. The 85-pound rail taken up will be used on new extensions and sidings. In addition, new 85-pound rail has been laid on curves to replace worn rail.

A most ambitious programme of capital work has been completed during 1963, and a list of the work completed follows for the record. It should be mentioned the ditching done in 1963 following the ditching programme set up by Pacific Great Eastern two years ago has certainly been worth while as drainage is now up to the best railway standards and the right-of-way can now be referred to in proper terms as the "permanent way." The new appearance presents the railway in its proper perspective as a major railway integrated with the economy of this Province.

Face-lifting done to stations and buildings is quite noticeable, and the removal of old obsolete telephone-lines has done away with that outdated look so common on most railways.

The problem of level railway crossings, which had become quite serious in past years, is being resolved. A number of level highway crossings have been eliminated by overpasses, and in some cases level highway crossings have been signalized by the installation of automatic flasher lights. Signalization is done on a joint basis by the Pacific Great Eastern and the Department of Highways, with this Department approving all engineering and setting forth the terms in the general order.

Over the past 40 years the mileages as posted have been changed from time to time, and, as a result, railway crossings approved as such during the original construction have lost their identity, and in a number of cases private crossings have grown into public crossings by public use. Our last inspection has established these requirements on the Lillooet and the Prince George subdivisions, and the company is now preparing the necessary paper work required for our completion of this matter. A number of grade-crossing improvements on other subdivisions were under construction at the end of 1963 but will not be completed until 1964. In other cases, studies of grade-crossing improvements are being carried over to 1964.

A fatal accident due to a derailment on the Squamish subdivision was attributed in some circles to the handling of 100-car trains. This matter was investigated by our engineers, and it was found the derailment was caused by a laterally fractured rail-end, and that the handling of long trains was in no way a contributing factor to the accident.

Motive Power and Rolling-stock

Motive power and rolling-stock were inspected at regular intervals and maintenance was found to be good, so that all locomotives and other power could be certified to be in order. This railway, being completely dieselized, presents as modern and as up-to-date roster of motive power as any railway in North America.

Capital Work—Permanent Way

Following are the 1963 capital and general improvements completed and inspected during 1963:—

Tie Renewals.—A total of 130,770 treated and 7,701 untreated track ties were renewed to November 30, 1963. In addition to these, 5,735 ties were installed in new company and trader sidings and 5,151 ties in derailments, making a grand total of 149,357 ties installed during the first 11 months of the year.

Ballast Programme.—A total of 70 miles of main track was given a 6-inch ballast lift during the year. The major continuous lifts were as follows: 10.4 miles from Mile 49.2 to Mile 59.6, 2.8 miles from Mile 63.5 to Mile 66.3, 5.1 miles from Mile 68.3 to Mile 73.4, 12.0 miles from Mile 232.2 to Mile 244.2, 7.2 miles from Mile 273.2 to Mile 280.5, 3.9 miles from Mile 414.1 to Mile 418.0, 8.0 miles from Mile 482.0 to Mile 490.0, 6.6 miles from Mile 585.4 to Mile 592.0, 14.0 miles at various locations not listed above.

In addition to the 6-inch ballast lifts above noted, a lighter spread of crushed gravel was applied from Mile 42.5 to Cheakamus as a surfacing spread in conjunction with surfacing carried out with an electromatic tamper.

New Rail Re-lay Programme.—Ten and three-tenths track miles of 85-pound rail were replaced by new 100-pound rail between Mile 49.6 and Mile 60.4, Squamish subdivision. In addition, approximately 4 miles of curve-worn 85-pound rail was replaced with new 85-pound rail where required.

Bridges.—The reconstruction of two major bridge structures was completed during the year—one at Mile 206.0 near Clinton and one at Mile 383.8 over the Quesnel River.

The timber trestle at Mile 206.0 was replaced by a steel viaduct-trestle structure on concrete piers and abutments on a revised alignment approximately 50 feet east of the existing timber structure. Fabrication and erection of the steel structure was carried out by the Dominion Bridge Company of Vancouver, B.C., with traffic being routed over the new structure in April, 1963. The old timber structure at Mile 206.0 was taken down and the site cleaned up.

The timber Howe-truss spans and timber trestle bridge over the Quesnel River were replaced by three 200-foot-long steel through-truss spans on concrete piers and abutments on a revised alignment approximately 42 feet west of the existing bridge. Fabrication and erection of the steel superstructure was carried out by the Western Bridge Company of Vancouver, B.C., with traffic being routed over the new structure in November, 1963. Removal and salvage of the old bridge structure was commenced and will be completed in 1964.

Other bridge work of a capital nature was completed as follows: Replace pile and timber trestle at Mile 42.3 and timber on concrete structure; renewed timber decks on steel bridges with creosote-treated timbers at Mile 81.4 and Mile 89.6; field painting of Mamquam River truss span completed.

The programme of applying fire-protective coatings to bridge decks in the form of pea gravel imbedded in an asphaltic coating was completed as follows: Remaining bridges on Pavilion Hill, including the Fraser River Bridge at Lillooet and the new Clinton Trestle, were coated; bridges on the Birken Hill between Pemberton and D'Arcy were coated.

Fencing.—A total of 31.3 miles of fencing was constructed during the year. The majority of the fencing was carried out on the Lillooet subdivision, continuing through those areas where the greatest incidence of accidents to cattle on the right-of-way has occurred.

New Buildings and Structures

North Vancouver.—New truck scales and semi-trailer parking area with wash facilities installed.

Alterations to freight-shed offices completed as follows: New truck-dispatcher's office, assistant terminal supervisor's office, and trainmen's facilities and lunchroom.

A new barge slip was constructed for Island Tug & Barge Company. Traffic formerly using the Pacific Great Eastern Railway Company's barge slip at Squamish is now being handled over the Island Tug & Barge Company slip in North Vancouver.

Squamish.—New paint-shop completed; engine load-test shelter completed.

Williams Lake.—Enginemen's bunk-house and yard completed.

Quesnel.—Modernization of station buildings completed. This has cleaned up the Quesnel area and presents an acceptable appearance to the public.

Prince George.—Installation of new electrical-powered cement unloader completed; alterations and improvements to station building completed; lumber-loading platform extended.

Chetwynd.—Maintenance-of-way section facilities relocated to east side of main track in area between station and shop buildings. Water, sewage, and light facilities installed.

Fort St. John.—Yard drainage improvements carried out, including the construction of a drainage and storage scoop-out with a control weir.

New Trackage

Company Tracks.—Barge-slip tracks, North Vancouver; North Vancouver yard tracks, Nos. 5B, 6B, and 7B; new paint-shop tracks, Squamish north yard; Motor V-10 track, Squamish north yard; extension to scale track, North Vancouver yard; company siding at Mile 644.2.

Trader Trackage Sidings.—Evans, Coleman & Evans track, North Vancouver; Vancouver Wharves track, North Vancouver; Western Plywood Company siding to new log dump at Squamish; temporary track at Mile 82.1 for Department of Highways; Imperial Metal & Power Corporation track at Mile 200.0; Metropolitan Trading Company track at Mile 213.3; temporary track at Mile 206.0 for Dominion Bridge Company; temporary track at Mile 253.8 for Department of Highways; Canim Lake Sawmills track, Exeter, Mile 260.4; Northern Studs track at Wright, Mile 283.2; temporary track at Quesnel for B.C. Hydro; Nielson Sawmill trackage at Mile 513.0; Junction Mills trackage at Dokie; Fort St. John Lumber Company trackage at Chetwynd; temporary trackage at Dawson Creek for B.C. Hydro.

Grade Stabilization.—A programme of grade stabilization and drainage improvement work was carried out as follows: An extensive gravel-and-rock toe berm was constructed along the Fraser River at Mile 449 to stabilize the grade where several sink holes had resulted in very heavy maintenance; the construction of this stabilizing berm has been most effective. Stabilizing berms were constructed at several locations in the Salmon Valley area as well as at Mile 669.4 and at Mile 716.6; these berms were most effective in stabilizing sloughing fill embankments at these locations.

Conclusion

It can be reported the Pacific Great Eastern Railway is safe and efficient, and the public is being properly served.—*Robert E. Swanson, P.Eng., Chief Inspecting Engineer.*

AERIAL TRAMWAYS

Aerial tramways used for uphill transportation in winter playgrounds are on the increase in British Columbia. Each year a number of J-bars, T-bars, rope tows, or chair-lifts have been constructed throughout British Columbia. In 1963 three new lifts were completed.

Tod Mountain.—The Tod Mountain aerial tramway, constructed two years ago, is known to be the longest single aerial tramway in the world. This tramway operates in the vicinity of Kamloops and serves a wonderful winter sport-ground on Tod Mountain, where there is an abundance of alpine meadow, which is considered ideal for ski purposes. This tramway has been performing well during 1963 and was inspected and certified.

Seymour Park.—The new tramway in Seymour Park, the construction of which is an improvement on the Tod Mountain aerial tramway, has been performing exceptionally well during 1963, and no difficulty whatsoever has been experienced. This tramway is ultramodern and utilizes a diesel-electric drive, and every known means of safety device has been installed.

Grouse Mountain.—The three tramways on Grouse Mountain, including the T-bar lift operated by Grouse Mountain Resorts Limited, are all functioning well and doing a good job of serving the public. There was some public concern during 1962 with regard to the tariffs and rates charged on the two aerial lifts as the two companies operating the lifts in competition were at variance with each other with respect to common fares. Hearings were held in our Vancouver office, and we are pleased to report the matter has been straightened out and there have been no complaints from the public during 1963. The new chalet operated in conjunction with the aerial tramways is working out very well, so that the Grouse Mountain operation is a major contribution to winter sports in the Vancouver area.

Hollyburn Mountain.—The aerial tramway on Hollyburn Mountain was inspected and certified in 1963 and is working satisfactorily.

Garibaldi Park.—The rope tows at Diamond Head in the Garibaldi Park area were inspected, and additional ski tows are under construction.

Grand Forks.—The engineering work of Phoenix Alpine Ski Club ski tow was inspected and found to be in satisfactory condition, and this lift is scheduled for construction in 1964.

Kemano.—The industrial tramway at Aluminum Company of Canada was inspected and certified as satisfactory. This tramway is used to maintain the power, water-tunnel, and penstocks.

Hope.—The industrial tramway of British Columbia Telephone Company on Dog Mountain was inspected and approved. The new haulage cable installed in 1962 was found to be satisfactory. This tramway provides access to the microwave station of British Columbia Telephone Company on Dog Mountain.

Kamloops.—The Royal Canadian Navy Department of National Defence tramway at Kamloops was inspected and certified. This project serves a munitions dump and is operated by Federal control, but they insist it be certified under British Columbia rules. This is done, and the Department charges a fee.

Rossland.—The Red Mountain aerial tramway at Rossland is now in good shape. Its condition has been upgraded over the past five years under a programme of advisement by the engineers of this Department. Rope tows operate in conjunction with this lift, and these were also upgraded due to annual inspections.

Manning Park.—The T-bar lift and the rope tows in this area were inspected and certified during the year, and operation is in order.

Penticton.—The Poma lift of Apex-Alpine Recreations Limited was examined and certified, and various improvements carried out in the interests of safety.

Fernie.—The Hall T-bar lift of the Snow Valley Ski Development Company was inspected and put in order, after which a certificate was issued. This development serves the area of Fernie, and it is quite popular.

Nelson.—The T-bar lift of Silver King Ski Club was inspected and approved, and it can be reported in good operating condition.



Ski trails, Big White Mountain, Kelowna, B.C.

NEW TRAMWAYS CONSTRUCTED IN 1963

The three new tramways constructed in 1963 are as follows:—

Big White Ski Development Company.—Big White Mountain is located 39½ miles from downtown Kelowna, and is the site of one of the Province's finest ski-ing areas.

The development of ski-ing facilities on Big White represents the culmination of an ambition involving many years of study and consultation by ardent skiers and active officials of the Kelowna Ski Club.

Big White Mountain is the highest mountain in the Okanagan area and has three major peaks, the highest of which reaches 7,703 feet, commanding a superb view of the ski area and the surrounding countryside.

The facilities on Big White, although somewhat limited at this early stage of development, include a chalet at the 6,500-foot level equipped to serve light refreshments and limited accommodation. Due to its close proximity to Kelowna, the limited accommodation does not present a problem.



Ski trails, Big White Mountain, Kelowna, B.C.

The ski area itself is in a huge bowl 1 mile in width and is located on the south side of the mountain. This location is advantageous in that it is protected from the elements as prevailing weather during the winter season usually originates from the north and north-west.

The ski lift is a Doppelmayr high-speed T-bar with a normal capacity of 500 skiers per hour. It has a vertical drop of 1,311 feet in a longitudinal distance of 5,325 feet. The ski runs are ideal, with steep slopes at the higher elevations, leveling out proportionately at the base of the runs, to provide safe ski-ing areas for all classes of skiers.

Additional features are the rope-tow hill adjacent to the chalet-site for the use of inexperienced skiers and good transportation facilities from the nearby City of Kelowna.

The statistics of this lift are as follows: Driving power supplied by a Caterpillar diesel engine with a horsepower rating of 156.8 at 1,260 r.p.m.; breaking strength of traction rope, 107,400 pounds; rope diameter, 1½-inch Seal, Left Langs Lay; maximum speed of rope, 689 feet per minute; there are 67 T-bars, which give a capacity of 500 persons per hour (provision has been made to increase the capacity to 800 per hour by the addition of 40 T-bars); distance between terminals, 5,325 feet; rise, 1,311 feet; number of towers, 12. Lift was approved for operation in December, 1963.

Mount Jarvis Aerial Tramway.—Mount Jarvis is located east of Hope, where Canadian National Telecommunications is installing a microwave telephone system. An aerial tramway is the only means of access in all weather, and consequently a very large and elaborate tramway is being installed.

The microwave telephone system operates under Federal jurisdiction, but the Federal authorities agree that the tramway should operate under Provincial jurisdiction. Our inspectors and engineers therefore have approved the design and made inspections, for which a fee is charged.

A temporary aerial tramway has been installed to take care of construction. It has been inspected and certified. This tramway is unique in that one of the spans is 7,000 feet in length and the passenger car is several hundred feet above the ground while on this span. Radio communication is maintained from the car to the hoistman. The hoistman has been certified at the company's request.

The permanent tramway was designed in Norway and is now under construction. Our engineers have checked and approved the design and have made a number of inspections at the site.

Following are the statistics of this tramway: Aerial tram is of the single-car, double jig-back type using two parallel track ropes and an endless traction rope; breaking strength of the track ropes is 303,200 pounds; strength of the traction rope is 123,350 pounds; the driving power is supplied by a 150-horsepower diesel engine; maximum speed is 600 feet per minute with a maximum load of 6,200 pounds; elevation of lower terminal, 800 feet; elevation of upper terminal, 5,578 feet; total rise, 4,778 feet; length, 8,500 feet; number of towers, 5.

Kimberley Ski Club.—A new T-bar ski lift was installed by the Kimberley Ski Club in 1963. This is in addition to the existing T-bar Lift No. 1, which has been operating over the last year or two.

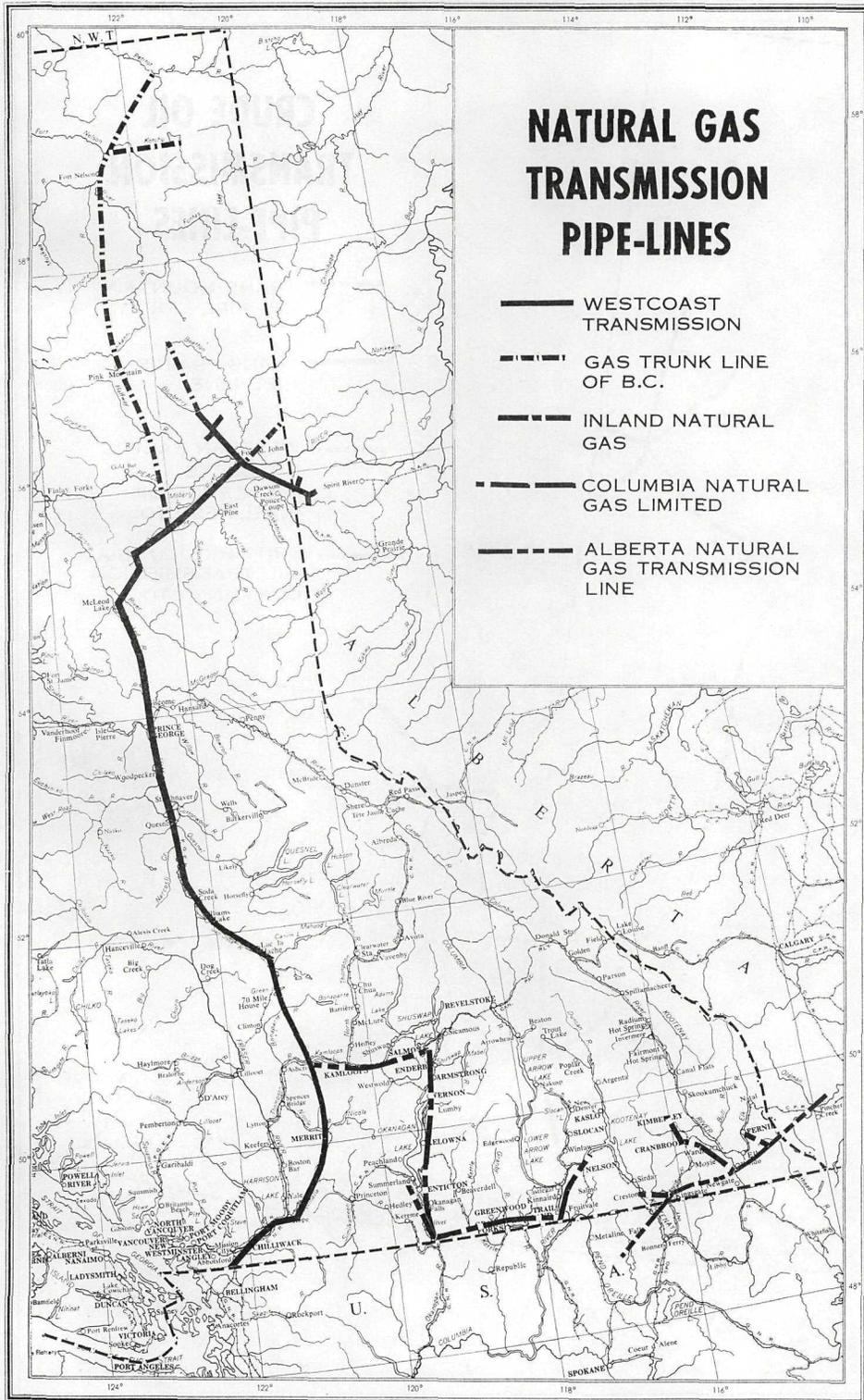
The new Lift No. 2 is an improvement in design and incorporates many safety features. Our engineers checked the design and advised the company as to improvements. This is a smart design and adds to the facilities in the Kimberley area, so that winter playground and recreational facilities offered to the public are now excellent in this area.

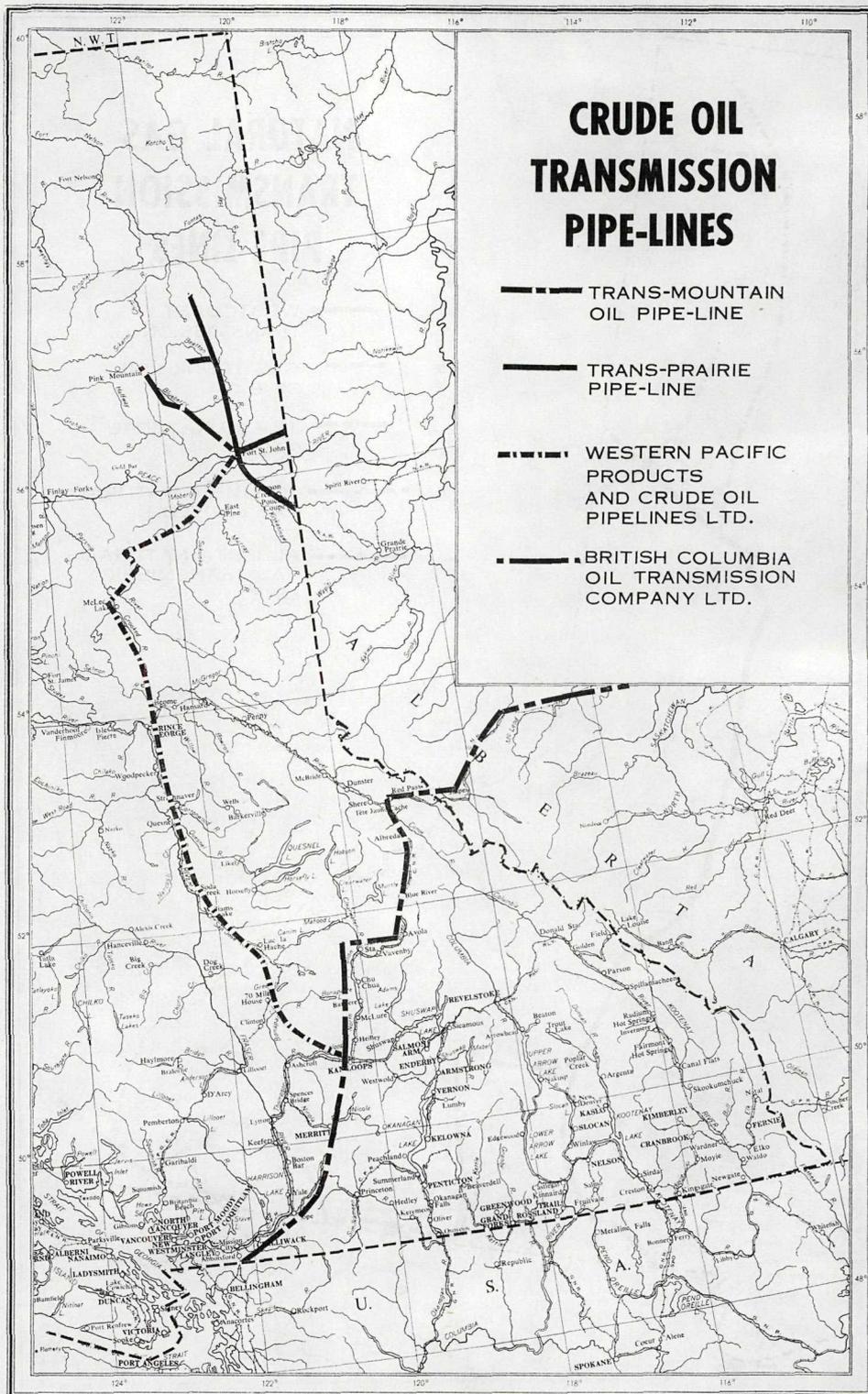
The following statistics apply to the new No. 2 lift: Size of rope, ¾-inch, 6 x 9 Langs Lay fibre core; strength, 23 tons; rise, 315 feet; length, 1,200 feet; estimated capacity, 500 persons per hour; speed, 600 feet per minute; horsepower, 50, electric motor.

PIPE-LINES

Approval of pipe-line design is one of the major functions of the Engineering Branch, and while not over 100 miles of pipe-line were built in 1963, there were 52 pipe-line projects approved, tested, and certified in addition to the approval of five compressor-stations and various auxiliary pressure components.

The pipe-line design engineers deal directly with the Engineering Branch on matters of engineering so that our engineers may follow through in the design stage.

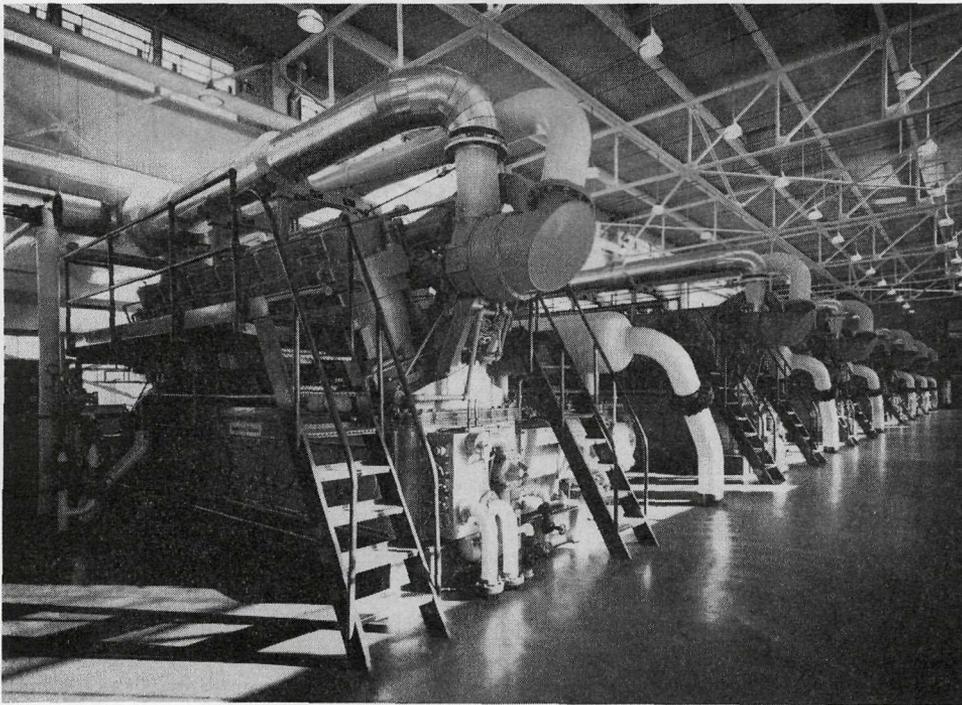




This procedure tends to get new pipe-lines on stream, with a resultant boost to the over-all economy of the industry.

Inspections carried out in the field included the witnessing of high-pressure tests (over 1,000 p.s.i.) held for 24-hour periods, after which the pipe-line was allowed to go on stream, provided its legal status had been approved in accordance with the Act.

The engineers from this Branch have inspected all the compressor-stations on the Westcoast Transmission system, and while the main-line pipe itself falls within Federal jurisdiction, the pressure vessels used in the stations are considered to be a Provincial matter as such vessels are interchangeable between the various Provinces. This procedure has been worked out with the Chief Boiler Inspector so that there is no overlapping of jurisdiction in this regard either on a Provincial or Federal basis. Each compressor-station is certified after inspection, for which this Department obtains a fee.

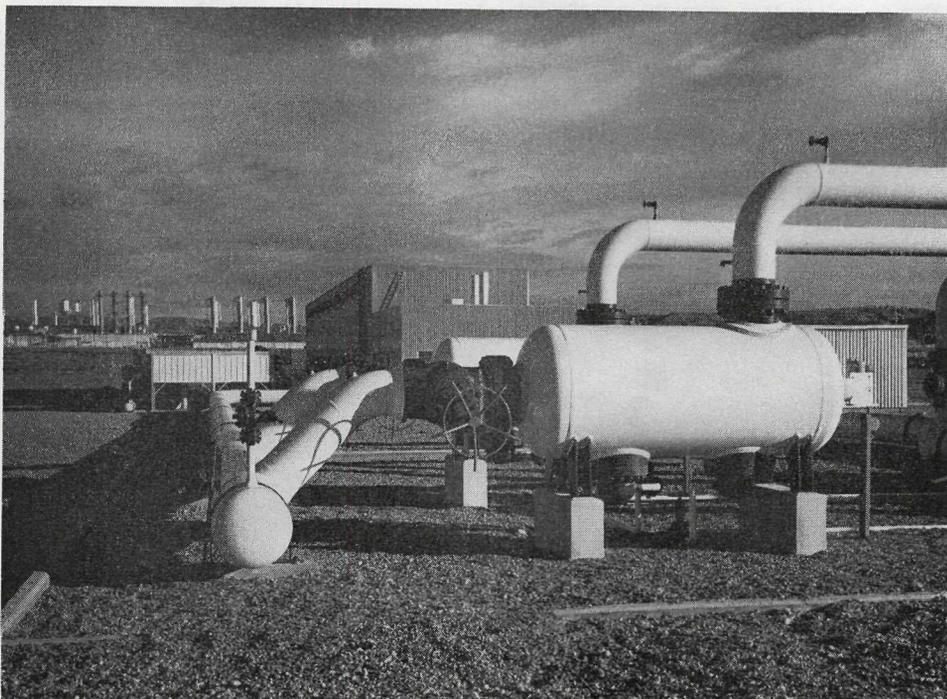


Interior view of 14,000-horsepower gas compressor-station at Taylor.

Pumping-stations on the major oil-lines are in the same category as the compressor-stations. In some cases the pumping-stations are on lines which operate under Federal jurisdiction, but the pressure vessels and safety with regard to workmen are under Provincial jurisdiction, and consequently are inspected by our engineers, for which the approved fee is charged by the Department.

Tank-farms are under the *Fire Marshal Act*, but as our engineers are also appointed as Assistant Fire Marshals and carry badges as such, they check the requirements under the Fire Marshal Regulations when they are inspecting the requirements under the *Pipe-lines Act*. This working arrangement between other departments of government lends itself to cutting down on duplication of services.

It can be reported the pipe-line industry is showing a great measure of responsibility on its own initiative, so that the industry, through its professional engineers, can be relied upon to handle most of the detail work of design and testing. Our engineers are required only to check on their work and keep them within the framework of the regulations. This also applies to the British Columbia Hydro and Power Authority Gas Division, which operates large high-pressure gas utilities in the Lower Mainland area under the authority of the *Pipe-lines Act*, with smaller operations likewise approved in Prince George and Chetwynd.



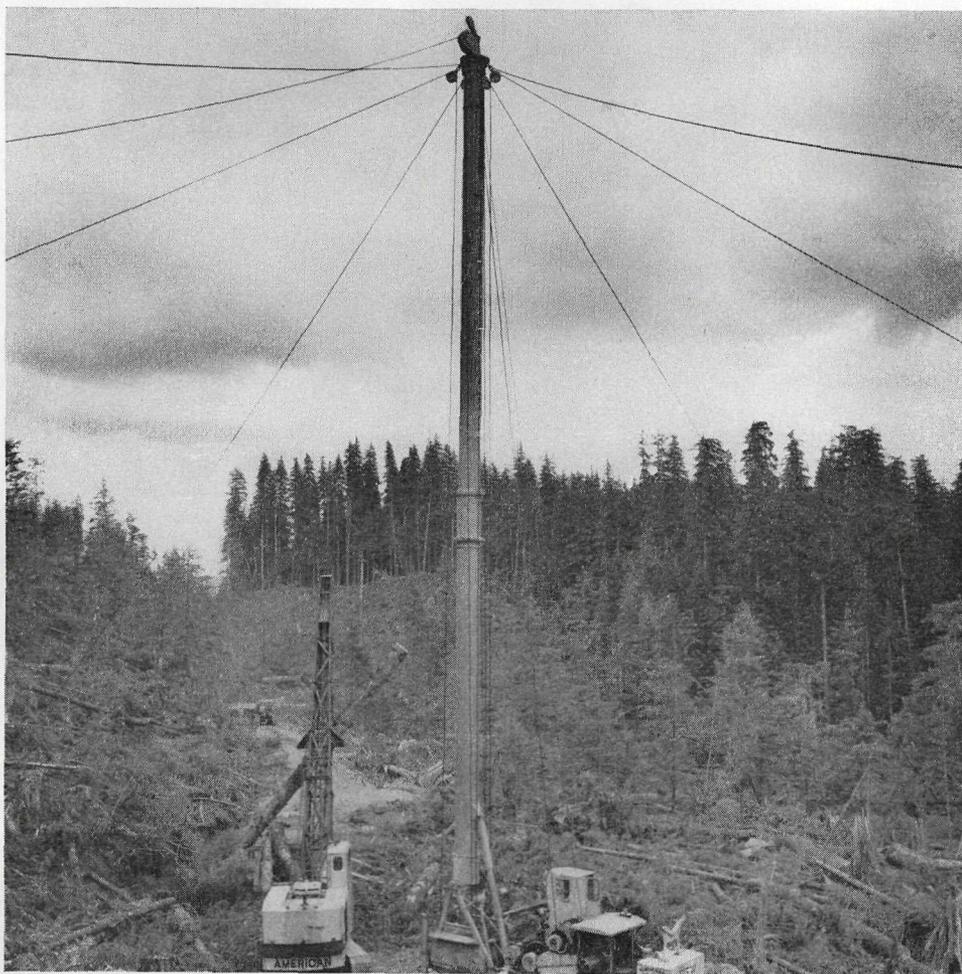
Compressor-station at Taylor, with high-pressure piping and pressure vessels in foreground.

A list of pipe-line companies and pipe-lines built and tested is included in the appendix of this report, from which it can be seen the various functions of the work completed in 1963 with respect to the *Pipe-lines Act*. In the preamble of the Branch report, mention is made of a new pipe-line code which is being formulated under the auspices of the Canadian Standards Association and in which we are actively engaged together with the National Energy Board and the major pipe-line companies of Canada.

This Branch is devoting considerable attention to the formulation of this new code, and it is felt when a new code is agreed upon, it must be substantially the same as the American Standards Association B.31.8 Code, which is used throughout Canada and the United States. As our major pipe-lines in Canada intercommunicate with the United States, our economies are interrelated. Anything detrimental to Canada in the new code would consequently have an adverse effect on the economy of the pipe-line industry in Canada and British Columbia as a whole; therefore, this phase of our operation must be kept under careful observation.

INDUSTRIAL ROADS

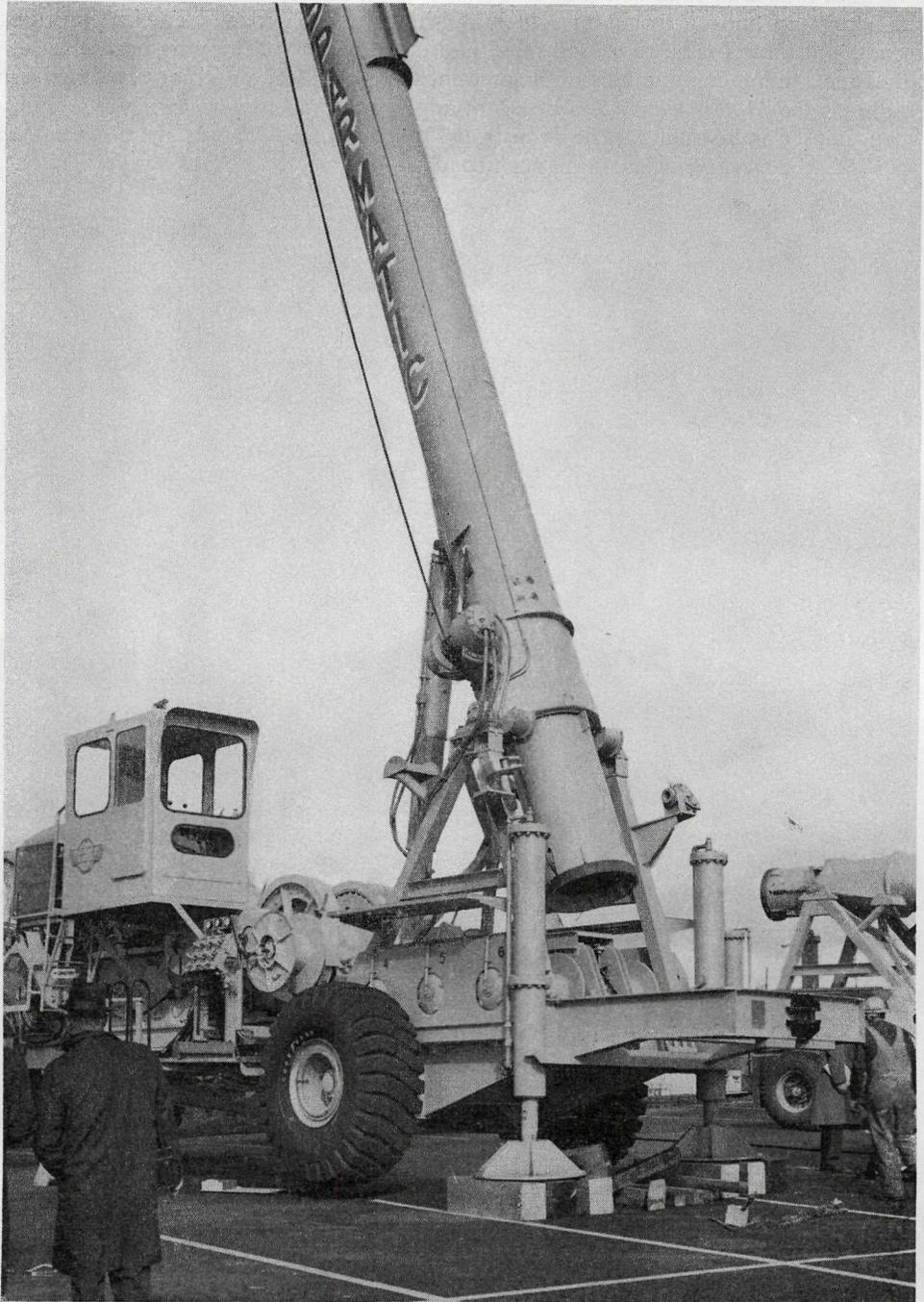
An industrial road is any road other than a public road over which materials or people are moved by motor-vehicle. Originally such roads were logging-truck roads, but these roads were used more and more by people wanting access to logging and mining communities until some measure of safety was required to govern traffic as the *Motor-vehicle Act* does not apply where such wide and heavy equipment is used industrially. The *Industrial Transportation Act* was therefore set up in 1955 to govern vehicles on all such roads.



A portable steel spar and shovel log-loader on an industrial road.

Hunters, fishermen, and sportsmen such as hikers and skiers now use industrial roads on week-ends and in off hours to gain access into wild land for their own recreational pleasure, and by and large the logging companies have responded to the public request for such access by providing gates and a pass system allowing them in under controlled conditions.

During 1963 Crown Zellerbach Canada Limited issued permits allowing 22,704 sportsmen into its operations on Vancouver Island, and of these, 7,075 were skiers going into the Green Mountain ski area at Nanaimo Lakes. These



Inspecting a new steel spar before leaving the builder's shops.

figures are for one company only, and some idea can be formed of what is being done on a Province-wide basis. Several companies have provided special regulations approved by the Minister under the Act so they can properly control access and the traffic generated by multiple use of these roads, of which there are many hundreds of miles in operation.

Nineteen sixty-three was a good year for the industry, and it operated to full capacity in logging, lumbering, mining, and oil production. Industrial roads were fully utilized, and much new equipment was procured and put into operation. This equipment was inspected by our engineers, and air brakes and safety appliances were tested.

Since the logging industry abandoned railways in favour of industrial roads, there has been a complete revolution in the methods used and the machinery employed. The old familiar rigged spar-tree has been replaced by portable steel spars, and the loading-works using donkey engines have been replaced by shovel loaders. The new type of equipment is mobile and travels from place to place on the industrial roads. Some of this equipment weighs up to 100 tons and operates on grades up to 25 per cent; therefore, special air brakes and safety equipment had to be developed, and this was done by the engineers in this Branch.

In the old system when steam was used, "donkey punchers" held tickets to operate the yarding and loading equipment, but now, with the new and specialized equipment, the operators are required to hold air tickets to assure they are qualified to move such heavy equipment where workmen's lives are involved and a misjudgment could result in a disaster.

During 1963 the engineers from this Branch held field instructional lectures and trained operators in the use of air brakes and safety appliances on this new-style equipment.

In addition to the mobile logging equipment, logging-trucks were inspected, and in a number of cases taken out of service until repairs were made to the safety equipment. In addition, lectures were given in the shops where the repairs were being carried out. In this regard the Department's portable visual training equipment was brought into play so that workmen could be instructed on working parts. Over 300 truck-drivers were examined and certified during the year.

In operations such as Kitimat and Cassiar, where whole townships operate under the *Industrial Transportation Act* by virtue of special regulations approved by the Minister, company examiners and security officers have been approved under the regulations to control traffic. Offences in these cases are handled by the Courts in the same manner as on public roads, but charges are laid under the special regulations pursuant to the *Industrial Transportation Act*.

It can be reported the industrial roads in the Province are being operated in an orderly manner, and in a great number of cases the public is being well served by the joint use of such roads.

APPENDIX

EQUIPMENT INSPECTIONS DURING 1963 UNDER THE RAILWAY ACT

Following is a list of individual inspections carried out by Department engineers:—

| | |
|---|-------|
| Hydrostatic tests applied to boilers | 54 |
| Internal-combustion locomotives and cranes inspected and certified | 36 |
| Air locomotives inspected and certified | 10 |
| Electric locomotives inspected and certified | 6 |
| Self-powered rail-cars inspected and certified | 24 |
| Diesel-electric locomotives inspected | 90 |
| Air reservoirs tested and inspected | 285 |
| Railway cars inspected on industrial railways | 350 |
| Railway cars inspected on common-carrier railways | 300 |
| Miles of railway track inspected | 1,800 |
| Aerial tramways inspected and certified | 18 |
| Railway conductors examined and certified | 5 |
| Power-car operators examined and certified | 7 |
| Locomotive-crane engineers examined and certified | 4 |
| Steam-locomotive engineers examined and certified | 1 |
| Motormen examined and certified (Consolidated Mining and Smelting Company of Canada Limited) | 4 |
| Accidents on logging and industrial railways | ----- |
| Accidents investigated, British Columbia Hydro and Power Au- thority Railway Division | 1 |
| Compensable employee accidents, Pacific Great Eastern Railway | 77 |
| Accidents involving automobiles at crossings, etc., Pacific Great Eastern Railway | 18 |
| Passengers injured, Pacific Great Eastern Railway | 3 |
| Fatal accidents to employees, Pacific Great Eastern Railway | 1 |
| Non-fatal accidents to employees, Pacific Great Eastern Railway | 77 |
| Fatal accidents to non-employees, Pacific Great Eastern Railway | 2 |

LIST OF RAILWAYS AND SUMMARY OF MILEAGE

Industrial Railways

| No. and Owners/Name of Railway | Head Office | Operating | Mileage | | | Gauge |
|---|-----------------|--------------------|---------|------------------|--------|-------------------|
| | | | Main | Sidings, etc. | Total | |
| 1. Aluminum Company of Canada Ltd. | Montreal..... | Kitimat..... | 2.90 | 3.19 | 6.09 | Standard. |
| 2. Arrowhead Wood Preservers Ltd. | Revelstoke..... | Revelstoke..... | 0.92 | ..... | 0.92 | „ |
| 3. B.C. Forest Products Ltd. | Vancouver..... | Crofton..... | 1.50 | 2.50 | 4.00 | „ |
| 4. Canada Creosoting Co. Ltd. | Montreal..... | New Westminster | 3.00 | 3.00 | 6.00 | 30" and standard. |
| 5. Canadian Forest Products Ltd. | Vancouver..... | Nimpkish Valley | 91.00 | 19.10 | 110.10 | Standard. |
| 6. Canadian Forest Products Ltd. | Vancouver..... | Port Mellon..... | 0.50 | 0.50 | 1.00 | „ |
| 7. Canadian Industries Ltd. | Montreal..... | James Island..... | 6.25 | 1.25 | 7.50 | 30" and standard. |
| 8. Columbia Cellulose Co. Ltd. | Montreal..... | Watson Island..... | ..... | 7.01 | 7.01 | Standard. |
| 9. Comox Logging & Railway Co. | Vancouver..... | Ladysmith..... | 21.80 | 4.02 | 25.82 | „ |
| 10. Consolidated Mining & Smelting Co. of Canada Ltd. | Trail..... | Trail..... | 19.00 | ..... | 19.00 | 18". |
| 11. Consolidated Mining & Smelting Co. of Canada Ltd. | Trail..... | Kimberley..... | 9.00 | 33.01 | 42.01 | 18", 36". |
| 12. Crow's Nest Pass Coal Co. Ltd. | Fernie..... | Michel..... | 1.53 | ..... | 1.53 | 30". |
| 13. Elk Falls Company Ltd. | Vancouver..... | Duncan Bay..... | ..... | 3.00 | 3.00 | Standard. |
| 14. Hillcrest Lumber Co. Ltd. | Mesachie Lake | Mesachie Lake..... | 6.00 | 1.50 | 7.50 | „ |
| 15. Hooker Chemicals Ltd. | North Vancouver | North Vancouver | 0.10 | 1.90 | 2.00 | „ |
| 16. MacMillan, Bloedel and Powell River Ltd. | Vancouver..... | Chemainus..... | 1.58 | 3.81 | 5.39 | „ |
| 17. MacMillan, Bloedel and Powell River Ltd. | Vancouver..... | Dunsmuir District | 1.00 | 3.10 | 4.10 | „ |
| 18. MacMillan, Bloedel and Powell River Ltd. | Vancouver..... | Harmac Pulp Div. | 2.20 | ..... | 2.20 | „ |
| 19. MacMillan, Bloedel and Powell River Ltd. | Vancouver..... | Port Alberni..... | ..... | 1.00 | 1.00 | „ |
| 20. MacMillan, Bloedel and Powell River Ltd. | Vancouver..... | Powell River..... | 1.50 | ..... | 1.50 | Narrow. |
| 21. Osborne Bay Wharf Co. Ltd. | Mesachie Lake | Crofton..... | 0.33 | ..... | 0.33 | Standard. |
| 22. Pacific Coast Terminals Co. Ltd. | New Westminster | New Westminster | 5.20 | ..... | 5.20 | „ |
| 23. Pacific, Jefferson Lake, Westcoast (Pacific Petroleum Ltd.) | Calgary, Alia. | Taylor..... | 3.05 | 0.71 | 3.76 | „ |
| 24. Rayonier Canada (B.C.) Ltd. | Vancouver..... | Woodfibre..... | ..... | (1) | ..... | „ |
| 25. Vancouver Steel Co. Ltd. | Vancouver..... | Twigg Island..... | 1.25 | ..... | 1.25 | „ |
| 26. Vancouver Wharves Ltd. | Vancouver..... | North Vancouver | 2.00 | ..... | 2.00 | „ |
| 27. Western Forest Industries Ltd. | Honeymoon Bay | Honeymoon Bay | 7.00 | 0.60 | 7.60 | „ |
| 28. Western Plywood (Cariboo) Ltd. | Quesnel..... | Quesnel..... | 0.95 | ..... | 0.95 | „ |

Common-carrier Railways

| | | | | | | |
|--|----------------|---|--------|--------|--------|-----------|
| 29. British Columbia Hydro and Power Authority | Vancouver..... | New Westminster-Huntingdon-Chilliwack | 76.58 | 25.29 | 101.87 | Standard. |
| 30. Pacific Great Eastern Railway Co. | Vancouver..... | Vancouver to Fort St. John and Dawson Creek | 788.60 | 146.10 | 934.70 | „ |

1 Ferry slip.

PIPE-LINES APPROVED, INSPECTED, AND TESTED, 1963

| Name of Company | Oil or Gas | Project No. | Pipe-line Location |
|--|------------|-------------|---|
| Amerada Petroleum Corporation | Gas | 1199 | Laprise Creek. |
| | " | 1189 | Laprise Creek. |
| British Columbia Hydro and Power Authority | " | 1166 | Fraser Gate, Vancouver. |
| | " | 1172 | Regulator Vault No. 82. |
| | " | 1187 | Lougheed and Sperling, Vancouver. |
| | " | 1190 | Regulator, Burrard Thermal Plant. |
| | " | 1194 | Third Avenue to Second Narrows Bridge, Vancouver. |
| | " | 1195 | Regulator Station No. 143, Vancouver. |
| | " | 1196 | Regulator Vault, North Vancouver. |
| | " | 1236 | Fort Nelson. |
| | " | 1237 | Huntingdon. |
| | " | 1238 | Chetwynd. |
| | " | 1239 | Prince George. |
| British Columbia Oil Transmission Co. Ltd. | Oil | 1183 | Aitken Creek. |
| | " | 1207 | Blueberry. |
| | " | 1176 | Blueberry-Taylor. |
| | " | 1177 | Blueberry-Aitken Creek. |
| Canadian Kewanee Ltd. | Gas | 1223 | Beg. |
| Consolidated Mic Mac Oils Ltd. | " | 1198 | Buick Creek. |
| Dome Petroleum Ltd. | " | 1193 | Laprise Creek. |
| Fort Nelson Gas Co. Ltd. | " | 1225 | Fort Nelson. |
| Imperial Oil Ltd. | " | 1210 | Rigel Creek. |
| | " | 1240 | Rigel Creek. |
| | " | 1242 | Boundary Lake. |
| Imperial Oil Enterprises Ltd. | Oil | 1221 | Trans-Mountain-Ioco. |
| Inland Natural Gas Co. Ltd. | Gas | 1213 | Prince George. |
| | " | 1214 | Prince George. |
| | " | 1208 | Kamloops-Royalite. |
| | " | 1191 | Prince George. |
| | " | 1192 | Kamloops. |
| | " | 1186 | Okanagan Falls. |
| | " | 1219 | Ferguson Lake. |
| Northland Utilities (B.C.) Ltd. | " | 1231 | Pouce Coupe. |
| Pacific Petroleum Ltd. | " | 1215 | North Jedney. |
| | " | 1216 | Sinclair Beg. |
| | " | 1212 | West Jedney. |
| | " | 1209 | Parkland. |
| | " | 1203 | Jedney. |
| | " | 1204 | Laprise. |
| | " | 1205 | Buick Creek. |
| | " | 1200 | North Jedney. |
| | " | 1201 | Jedney. |
| | " | 1202 | Red Creek. |
| | " | 1197 | Stoddart Creek. |
| | " | 1173 | Jedney. |
| | " | 1224 | Peejay. |
| | " | 1222 | Highway gathering. |
| | " | 1217 | West Jedney. |
| | " | 1227 | Blueberry. |
| | " | 1228 | Blueberry. |
| | " | 1229 | Nig Creek. |
| | " | 1232 | North Jedney. |
| | " | 1233 | North Jedney. |
| | " | 1234 | Blueberry. |
| | " | 1235 | Blueberry. |
| Sun Oil Co. | " | 1211 | Buick Creek. |
| | " | 1206 | Blueberry. |
| | " | 1184 | Rigel Creek. |
| | " | 1185 | Blueberry. |
| | " | 1188 | Blueberry. |
| | " | 1182 | Blueberry. |
| | " | 1175 | Blueberry. |
| Texaco Exploration Co. Ltd. | " | 1178 | Buick Creek. |
| | " | 1174 | Rigel Creek. |
| | " | 1167 | Buick Creek. |
| | " | 1168 | Nig Creek. |
| | " | 1169 | Buick Creek. |
| | " | 1220 | Rigel Creek. |
| Trans-Prairie Pipe-lines Ltd. | Oil | 1180 | Boundary Lake. |
| | " | 1181 | Milligan Creek. |
| Western Decalta Petroleum Ltd. | Gas | 1230 | Blueberry. |
| Whitehall Canadian Oils Ltd. | " | 1226 | East Buick Creek. |

ANNUAL INSPECTIONS UNDER THE PIPE-LINES ACT, 1963

| | |
|--|------|
| Number of pipe-line inspections..... | 155 |
| Miles of new pipe-line inspected and tested..... | 89.8 |
| Compressor-station inspections..... | 22 |
| Pumping-stations inspected..... | 8 |
| Accidents investigated on pipe-lines..... | |
| Gas distribution and metering stations inspected..... | 12 |
| Number of tank-farms inspected..... | 5 |
| Number of new pipe-line projects approved..... | 88 |
| Number of pipe-line crossings of railways inspected..... | 7 |
| Number of pipe-line crossings of highways inspected..... | 4 |
| Number of pipe-line crossings of other pipe-lines approved..... | 12 |
| Power-line crossings over pipe-line right-of-way approved..... | 10 |
| Approval of sets of plans and specifications for pipe-line projects..... | 88 |
| Approval of company pipe-line testing procedures..... | 5 |
| Investigation of pipe-line problems involving subdivisions..... | 3 |
| Certificates issued under the <i>Pipe-lines Act</i> authorizing the construction of new pipe-lines..... | 88 |
| Certificates of inspection issued under the <i>Pipe-lines Act</i> authorizing the operation of new pipe-line projects..... | 88 |

ANNUAL INSPECTIONS UNDER THE INDUSTRIAL TRANSPORTATION ACT

| | |
|---|-----|
| Logging-trucks inspected..... | 388 |
| Gravel-trucks inspected..... | 34 |
| Crummies (workmen's buses)..... | 227 |
| Miscellaneous vehicles inspected..... | 215 |
| Highway vehicles inspected with Royal Canadian Mounted Police..... | 197 |
| Number of new logging-trucks put into service..... | 113 |
| Air-brake lectures..... | 33 |
| Logging-truck operators certified..... | 361 |
| Lectures and instructions to Royal Canadian Mounted Police..... | 5 |
| Lecture classes held for highway transport drivers..... | 4 |
| Lecture classes held for mechanics for Department of Education..... | 32 |
| Mechanics examined and certified for Department of Education..... | 35 |
| Accidents investigated on highways for Royal Canadian Mounted Police..... | 6 |
| Accidents investigated on logging-truck roads..... | 2 |
| Fatal accidents on logging-truck roads..... | 1 |

AIR-BRAKE LECTURES AND EXAMINATIONS HELD IN THE FIELD

| | Number Attending | Number Examined |
|--|---------------------|--------------------|
| Cowichan Lake..... | 30 | 15 |
| Duncan..... | 40 | 25 |
| Franklin River..... | 10 | 10 |
| Hazelton..... | 30 | --- |
| Juskatla, Q.C.I..... | 15 | 6 |
| Lumby..... | 36 | 26 |
| Nimpkish..... | 18 | 18 |
| Port Hardy..... | 15 | 10 |
| Revelstoke..... | 8 | 8 |
| Terrace..... | 40 | 40 |
| Williams Lake..... | 72 | 58 |
| British Columbia Vocational School—Nanaimo..... | 86 | 86 |
| British Columbia Vocational School—Prince George..... | 15 | 15 |
| Haney Correctional Institution..... | 45 | 27 |
| Vocational Curriculum Development Division, Burnaby..... | 38 | 38 |

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