PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF COMMERCIAL TRANSPORT

HON. R. W. BONNER, Q.C., *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, INDUSTRIAL TRANSPORTATION AND ACCIDENT PREVENTION

YEAR ENDED DECEMBER 31

1966

Printed by A. SUTTON, Printer to the Queen's Most Excellent Majesty
in right of the Province of British Columbia.
1967

VICTORIA, B.C., January 24, 1967.

To Major-General the Honourable GEORGE RANDOLPH PEARKES,
V.C., P.C., C.B., D.S.O., M.C., C.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, 1966.

R. W. BONNER, Q.C.,
Minister of Commercial Transport.

VICTORIA, B.C., January 16, 1967.

The Honourable R. W. Bonner, Q.C.,
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, 1966.

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

Report of the Department of Commercial Transport, 1966

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

INTRODUCTION

The year 1966 was one of notable activity, progress, and achievement in the Department, in keeping with and contributing to the dynamic growth of the Provincial industrial economy.

Three major pulp-mills commenced operations during the year, and construction continues at a fast pace on several others to place British Columbia among the leaders of the world as a supplier of pulp and paper products.

The advent of these new pulp-mills created a need for an economic means of transporting large volumes of chips from sawmills to the pulp-mills. As always, the versatility of the trucking industry showed its ability to cope with this situation on a short-haul basis; however, railway transportation proved to be more economical for long-distance hauling.

As a result, a new secondary industry has developed in Vancouver, where several hundred railway cars were built for the Pacific Great Eastern Railway and the Canadian National Railway. Many of these cars were specifically designed to haul bulk pulp chips and logs. Others were built to carry piggy-back loads, and special tankers were designed and built for transporting malt and chlorine.

We are well aware, of course, of the progress made to date in the development of hydro-electric power through the construction of the mammoth dam on the Peace River in Northern British Columbia and the Duncan, Arrow, and Mica storage projects in the Southern Interior of the Province. These major industrial projects speak for themselves; however, of prime consideration is the upsurge in secondary business activity generated as a direct result of these projects. Of particular interest to the Department was the over-all increase in transportation of large and extremely heavy loads, which required particular attention by Departmental staff.

The Pacific Great Eastern Railway continues to serve the northern reaches of the Province by providing transportation service into the newly developed areas of Mackenzie and Alexander, while the older-established community of Fort St. James is to be better served by the new extension now under construction.

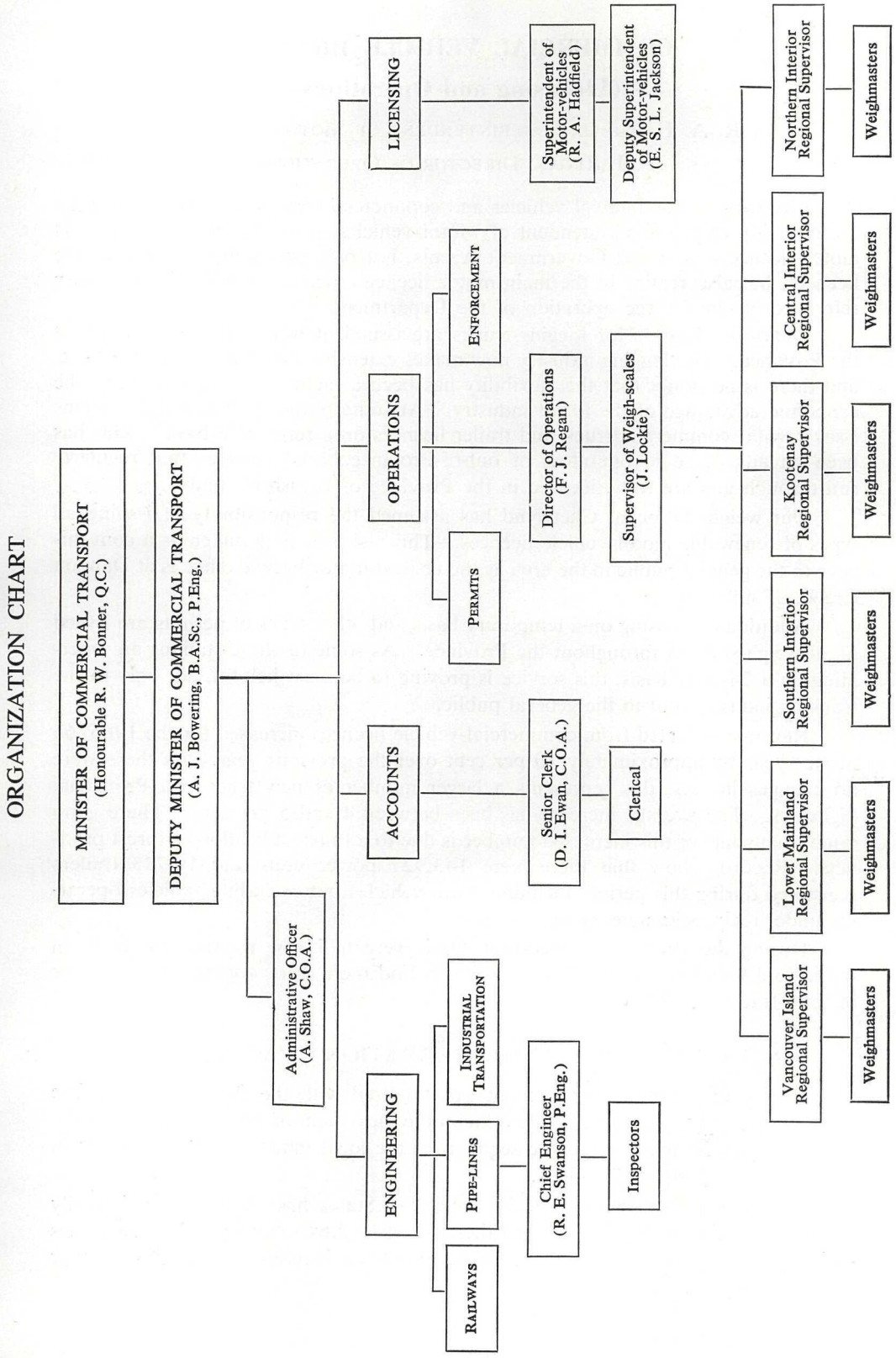
Recreational areas which cannot be economically served by conventional means have gained prominence over the past several years, and during 1966, through co-operation between the Department and the aerial-tramway industry, great strides have been made in the standardization of ski-ing facilities and their operation.

Two outstanding examples in this regard are the development of the vast recreational area of Mount Whistler in Garibaldi Park and the " Sky Ride " on Grouse Mountain, on the northern shores of the City of Vancouver. Many other areas of the Province now offer outstanding facilities, enabling not only the ski-ing fraternity but the public at large to enjoy British Columbia's vast winter playground.

The pipe-line industry has enjoyed a steady growth during the year in the recognized oil and natural-gas fields of the Province, where 68 miles of gathering pipe-lines were installed. In addition, 39 miles of crude-oil transmission-line were

built and 56 miles of gas distribution-lines were constructed. Increased export of natural gas will mean additional facilities will be required in 1967, and increased crude-oil exploration and production may mean further pipe-lines will be necessary. New lower tariff rates on the Western Pacific Products & Crude Oil Pipelines Ltd. line will provide an additional incentive to the crude-oil industry.

All branches of the Department have been extremely active during the past year, and we look forward with keen interest to the assured continued expansion in industrial and commercial aspects of the Provincial economy.


ORGANIZATION CHART
MINISTER OF COMMERCIAL TRANSPORT
(Honourable R. W. Bonner, Q.C.)
DEPUTY MINISTER OF COMMERCIAL TRANSPORT
(A. J. Bowering, B.A.Sc., P.Eng.)
Administrative Officer
(A. Shaw, C.O.A.)
ENGINEERING
RAILWAYS
PIPE-LINES
INDUSTRIAL TRANSPORTATION
Chief Engineer
(R. E. Swanson, P.Eng.)
Inspectors
ACCOUNTS
Senior Clerk
(D. I. Ewan, C.O.A.)
Clerical
OPERATIONS
PERMITS
ENFORCEMENT
Director of Operations
(F. J. Regan)
Supervisor of Weigh-scales
(J. Lockie)
LICENSING
Superintendent of Motor-vehicles
(R. A. Hadfield)
Deputy Superintendent of Motor-vehicles
(E. S. L. Jackson)
Vancouver Island Regional Supervisor
Lower Mainland Regional Supervisor
Southern Interior Regional Supervisor
Kootenay Regional Supervisor
Central Interior Regional Supervisor
Northern Interior Regional Supervisor
Weighmasters
Weighmasters
Weighmasters
Weighmasters
Weighmasters
Weighmasters

COMMERCIAL VEHICLE BRANCH

(Licensing and Operations)

R. A. HADFIELD, SUPERINTENDENT OF MOTOR-VEHICLES

F. J. REGAN, DIRECTOR OF OPERATIONS

Licensing of commercial vehicles and commercial trailers is carried out under the direction of the Superintendent of Motor-vehicles, who, through a network of motor licence offices and Government Agents, not only issues the majority of the licences, but also retains in the main motor licence office at Victoria the necessary reference system for the operation of the Department.

Quarterly licences for logging-trucks are issued at weigh-stations throughout the Province. The logging industry now makes extensive use of this type of licence, and there is no doubt that this flexibility has been a factor that has worked to the economic advantage of the forest industry. At some border points, weigh-stations issue regular commercial truck and trailer licences on a renewable basis. This has been an advantage to operators of out-of-Province based vehicles that regularly run through and are fully licensed in the Province of British Columbia.

Our weigh-station at Chetwynd has assumed the responsibility of issuing all types of renewable motor-vehicle licences. This task was undertaken as a convenience to the general public in the area as the nearest motor licence office is at Dawson Creek, 65 miles away.

Additional licensing on a temporary basis and other types of permits are issued at all weigh-stations throughout the Province. As some of these stations are operating on a 24-hour basis, this service is proving to be most helpful, not only to the trucking industry, but to the general public.

Revenue collected from commercial-vehicle licences increased for the 1965/66 licence-year by approximately 10 per cent over the previous year. As there were no changes in fees, this represents a larger number of new trucks on Provincial highways. The average increase has been between 4 and 5 per cent. There is no doubt that some of this increased number is due to a fuller utilization of forest products. Records show that there were 143,927 power units and 10,723 trailers registered during this period, including farm vehicles but excluding vehicles operating under reciprocity agreements.

During the 1965/66 licence-year there were 675 new registrations of farm trucks and 9,495 renewals. For the same period there were 406 new registrations of farm tractors and 2,489 renewals.

INTERPROVINCIAL AND INTERNATIONAL AGREEMENTS

During the year an arrangement was finalized with the Province of Quebec providing reciprocity for trucks operating in the movement of used household goods. This arrangement has assisted the segment of the local industry that is engaged in the movement of personal effects.

The prorate agreement with 16 American States has operated satisfactorily during the period under review, and there are now 2,649 extra-provincial vehicles registered under this agreement. This represents an increase of 30 per cent over the previous year.

OPERATIONS

One of the prime factors contributing to the sustained economic activity of the Province of British Columbia has been the existence of a commercial trucking industry that has been able to adapt and meet the heavy demands placed on it in recent years.

It has been the function of the Department of Commercial Transport to assist and encourage this development by close liaison with other Government departments and industry itself, encouraging trends that will enable, with due regard to the public safety and the proper protection of the bridge and highway system, the trucking industry to remain competitive and healthy.

In 1966 the *Department of Commercial Transport Act* was brought before the House and revised, and several amendments were made to the regulations during the year. All were made with the view to removing ambiguity and giving statutory authority to practices that were necessary in order to keep industry competitive and operating in a safe and reasonable manner.

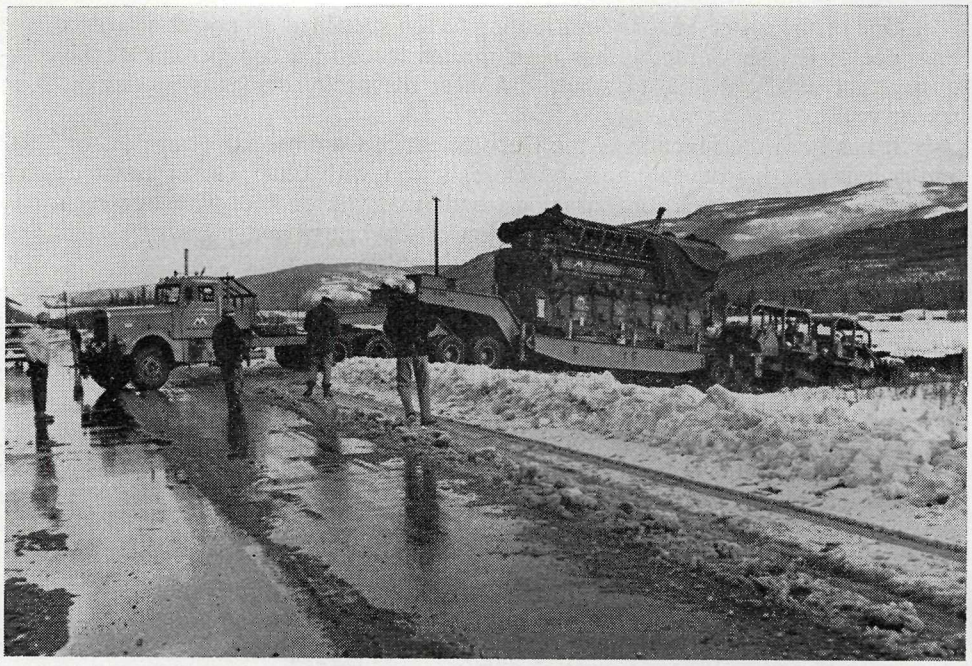
During the year a general information pamphlet was published and distributed. It was well received by industry, especially in regard to the usual safety requirements necessary when transporting oversize loads, which is and always will be a most difficult area of responsibility.

On September 20, 1966, the Act and regulations were consolidated for convenience and published by the Queen's Printer. This is the first publication since 1961, and it is the intention of the Department to publish consolidations as they become necessary. Due to the changes in industry and highway development within the Province, it is foreseen that it will be more necessary to amend the regulations made pursuant to the Act in the future than in the past.

One of the main responsibilities of the Weigh-scale Branch is the granting of permits for the movement of oversize and overweight loads by commercial vehicles on Provincial highways. The granting of these permits requires the approval of the Department of Highways, and, in many cases, due to the safety factors involved, the approval and assistance in traffic control of local police forces when the movement is on arterial highways within municipalities, and the assistance and approval of the Royal Canadian Mounted Police when operations are being carried out on other Provincial roads.

The area west of Hope presents a particularly difficult problem in the movement of this extraordinary traffic. Not only does this area contain the majority of motor-vehicles that are registered in the Province, but it also has the two freeway systems as well as the majority of important bridge crossings. As the usefulness of these systems and bridges is dependent upon their ability to carry a maximum traffic load, it follows that extraordinary traffic that tends to form bottlenecks must be routed to alternate highways, or so restricted to time of travel so that as not to interfere with the traffic that the facilities were primarily designed for. Extraordinarily large loads tend to disrupt the normal traffic flow; however, extraordinarily heavy loads have some effect, for as the weight of the load increases there is a corresponding decrease in speed of movement. In the past year well in excess of 600 such loads have been routed under conditions that have met with the maximum demand for safety and minimum of public inconvenience.

In order to move this type of traffic, it is necessary to provide escort cars and pilot cars to warn the general public and to effect traffic control while the loads are executing turning movements in restricted areas. This necessity has led to the development of a sizeable secondary industry which specializes in providing this type of service; however, in order to achieve some uniformity of practice, it has become



A 6,000-h.p. engine being moved from railway siding by truck to Westcoast Transmission Company compressor-station near Chetwynd. Engine dimensions: Length, 40 feet; height, 14 feet; weight, 160 tons. Special trailer (width, 12 feet; length, 59 feet) equipped with thirty-four 1200 x 20 wheels.

Typical long load being moved on the Provincial highway. Note the pilot cars front and back.

necessary to recommend to the Minister the standards for pilot cars and escort cars be set out by regulation.

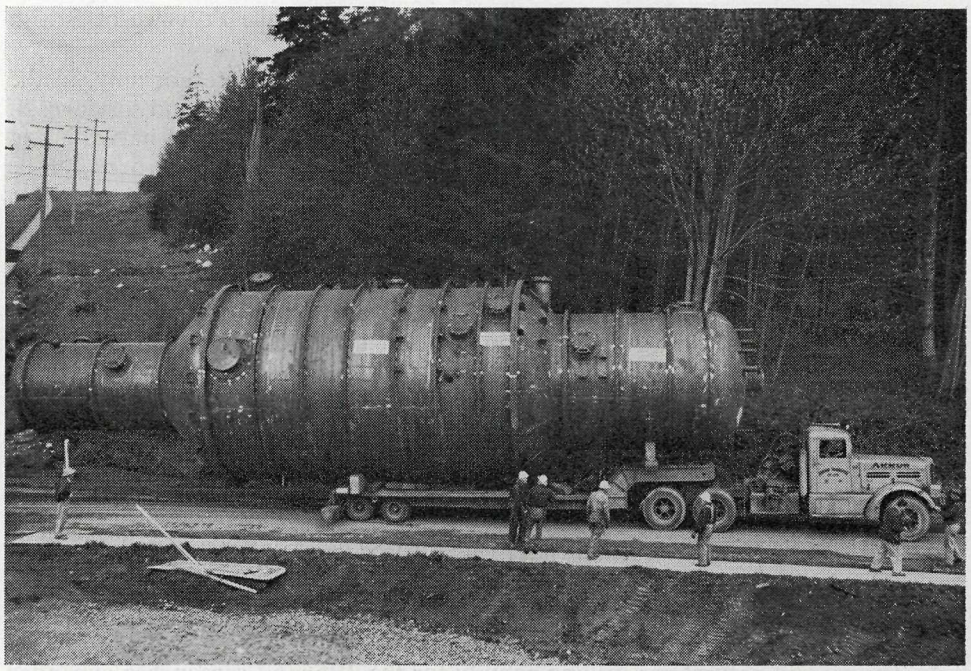
The industrial factors that have affected the trucking industry in the past year are the same ones that have given the industry its main impetus over the past 10 years; that is, the unprecedented industrial development in the Province of British Columbia.

The power projects presently being built in the Province are not only, in the main, dependent upon the trucking industry for the actual building and servicing of the sites, but have created a forest industry that is concerned with the harvesting of the flood-area timber, and as this industry is also dependent upon trucks for its development and continuation, the result has been an expansion both in the forest hauling and in the freight hauling. It is anticipated that this level of activity will continue not only throughout the life of the power projects, but the resultant industrial development in the forest-products field will be of a permanent nature.

The pulp and paper industry is to a large extent serviced by trucks, and its expansion programme shows no indication of letting up. Not only does the trucking industry benefit from the actual construction of these plants, but their establishment has led to a regular time-tabled chip haul to supply the raw products. Experimentation in the field of portable chippers at logging sites is under way, and if this technique proves to be of economic benefit in this Province, it will lead to an increased use of large chip-haul combinations which now travel some Provincial highways at a gross weight of up to 99,000 pounds.

This increase in chip trucks is not expected to decrease the truck-logging haul, as the requirements of the industry for raw products is so great that any technique that will increase the availability of the product to the manufacturer will not affect the present established practices.

The oil and natural-gas drilling activity for the 1966/67 season has expanded in the north-east section of the Province. When one considers that from 6 to 15 trucks are necessary to service and haul one drilling rig, it is apparent that this increase in exploration can do nothing other than add to the existing truck traffic.



Two of the many oversize loads moved over the Provincial highways during the year.

In the northern part of the Province, the utilization of the by-products of the petroleum industry has resulted in the increased movement by truck of plant material and heavy machinery in the Peace River area. Some of the machinery hauls and special equipment hauls necessary to fabricate the new plants have been in excess of 300,000 pounds and have been carried out with all of the necessary safeguards, both for the general public and for the highways and bridges concerned.

The increased use of assembly docks, particularly in the shipment of export lumber, has led to a corresponding build-up in the number of trucks necessary to haul export lumber to these stockpile areas.

Steady improvements both of the highways and bridges in the Province have resulted in an increased use of these facilities both in the line-haul segment of the trucking industry and in the transportation of oversize and overweight loads. As the highways of the Province are the prime controlling factor in the development of the land transportation system, the progress in construction and reclassification has been closely watched both by industry and by this Department with a view to the establishment, as soon as possible, of interprovincial routes of uniform standards that will permit their utilization by vehicles carrying maximum loads on all main arterial roads.

The truck-logging industry has, in the past year, continued experimenting with the use of bunk scales. Their gradual acceptance in the Province will lead to a maximum pay load with a minimum of inconvenience to the industry. The introduction of scaling by weight in the forest industry has gathered considerable momentum, and there are now in excess of 70 such scales operated by industry. Apart from the advantage to be gained in this method of scaling, it is anticipated that with a more accurate knowledge of the actual weight involved, operators will

New ferry connections to Alaska increase road use.

be in a position to conform more closely to the standards as set out in the Act and regulations.

One additional weigh-scale station has been added at Midway. This unit is a one-man operation, and it is presently a control point and permanent issuing office on the Southern Trans-Canada Highway. Stations at Cache Creek and Vanderhoof were reopened in order to keep pace with the increased demands for permits and to provide control points on the respective highways.

Replacement stations at Fort St. John and Rossland were constructed to provide more adequate facilities at those points. Arrangements have been made with the Department of Highways for a weigh-scale station at Castlegar. This station is expected to be in operation on a part-time basis in 1967.

Considerable maintenance work was carried out at the weigh-scale sites both to the buildings themselves and to the approach roads. At the present time there are three operating stations that require improvements to their facilities. One factor that has caused delay in this regard is the uncertainty of the permanency of the stations and the consequent reluctance to spend funds at points which may be abandoned because of changes in industry or highways.

Our portable operations have been increased by one additional unit stationed in the East Kootenay District of the Province. This unit provides for better control and liaison between other Provincial departments and industry and supplements the weigh-scale operations at Golden, Fernie, and Yahk. There are at the present time 30 permanent weigh-scales and seven portable operations at work in the Province plus four stations that are operated on a part-time basis.

The issuance of quarterly licences to logging-trucks, as well as restricted-route permits, have increased the duties performed by members of this Department at the weigh-scale sites. Not only are trucks weighed and measured, but permits of all types are issued, surveys are undertaken both for this Department and for other departments, annual licence renewals both for trucks and trailers are issued at our border points, and inspections are carried out on behalf of the Department of Agriculture under the *Stock Brands Act* and on behalf of the Superintendent of Motor Carriers under the *Motor Carrier Act*. A great deal of assistance is rendered the Consumer Taxation Branch of the Finance Department in the checking of vehicles at border points under the provisions of the *Social Services Tax Act* and in liaison with members of that Department. In a similar manner, a great deal of enforcement under the *Motive-fuel Use Tax Act* is carried out by members at the weigh-stations and by the portable units. It is fair to say that the stations provide a convenient point of contact for the trucking industry in all matters relating to road use. Five of these stations are operated on a 24-hour basis, while others operate on a 16-hour or 8-hour basis. As road traffic increases and the number of vehicles increases, along with the demands of industry for more adequate service, it will become necessary to proportionately increase the weigh-scale staff.

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.
Midway.
Pacific.
Parksville.
Pattullo Bridge.
Port Mann East.
Port Mann West.
Prince George North.
Prince George South.
Quesnel.
Rossland.
Ruskin.
Rutland.
Saanich.
Sicamous.
Tupper Creek.
Vanderhoof.
Vernon.
Victoria (term permits).
Williams Lake.
Yahk.

Portable Patrols

Cranbrook.
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.
Gulf Islands (Ganges).
Invermere.
Kamloops.
Kaslo.
Kelowna.
Kitimat.
Lillooet.
Merritt.
Nanaimo.
Nelson.
New Denver.
New Westminster.
Oliver.
Penticton.
Pouce Coupe.
Powell River.
Prince George.
Prince Rupert.
Princeton.
Quesnel.
Revelstoke.
Rossland.
Salmon Arm.
Sechelt.
Smithers.
Terrace.
Vancouver.
Vanderhoof.
Vernon.
Victoria.
Williams Lake.

Motor-vehicle Branch Office

Abbotsford.
Chilliwack.
Cloverdale.
Dawson Creek.
Kamloops.
Mission.
New Westminster.
North Vancouver.
Squamish.
Trail.
Vancouver (Main).
Vancouver (East).
Vancouver (Point Grey).
Victoria.

Miscellaneous

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

ENGINEERING BRANCH

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

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

RAILWAYS

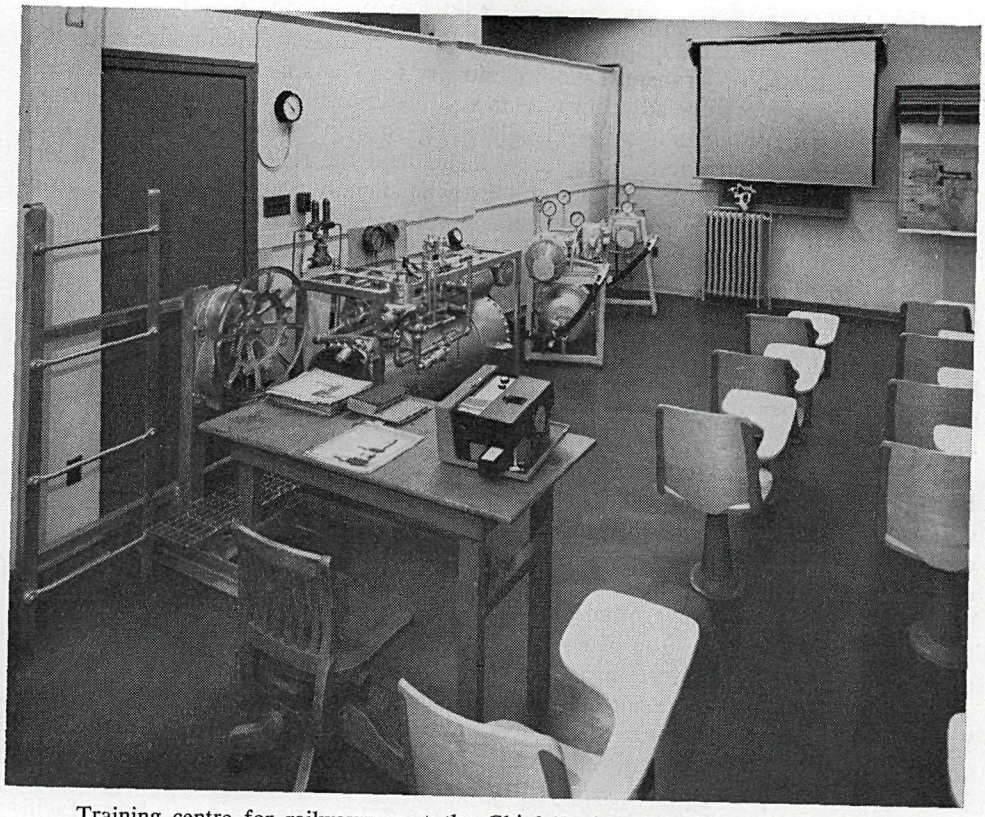
The Engineering Branch, responsible for the administration of railways, pipe-lines, and industrial transportation, has been exceptionally busy during the year 1966. Facilities of the Branch have been taxed to the fullest, and during the early part of the year it was necessary to engage two additional Inspecting Engineers to cope with the work. The work being diversified, a great deal of training was necessary to acquaint these new men with the various facets of the Branch, including pipe-line inspection, railway inspection, locomotive inspection, aerial-tramway inspection, as well as the training and teaching of personnel throughout industry with respect to truck-driving, locomotive engineers' and railway conductors' duties, and, in addition, the instruction of tramway operators for the ski areas throughout the Province.

A few years ago it was assumed railways were on their way out; however, the use of railways has increased, not only on the main lines, but in the port areas. The movement of potash and sulphur from the Prairie Provinces to the seaboard at the West Coast has prompted the installation of large dock facilities in the Lower Mainland area of British Columbia, where these bulk commodities are loaded on ships destined for various parts of the world. Some of the wharf-sites utilize up to 12 miles of railway, while others use shorter railways, conveyer systems, and specialized mechanized loaders. The railway personnel employed require special training, and it is the duty of this Branch to instruct and train them, as well as to inspect and offer constructive criticism where required.

The advent of a number of new pulp-mills throughout the Province has increased the industrial-railway installations, so that several of the pulp-mills now use locomotives and switch their own plants with their own train crews. This has necessitated an accelerated programme of training on the part of our engineers, as they have been required in a number of cases to train the railway crews on the job, especially where such dangerous commodities as chlorine and ammonia are being handled by railway tank cars.

The movement of propane has, due to the industrial expansion, been accelerated over the past year, and a number of technical problems have been encountered. At Squamish, liquid petroleum gas was loaded from railway tank cars to specially designed ocean-going vessels for export to Japan. The movement and storage of the propane tank cars presented a problem as municipalities were skeptical as to public safety where large volumes of this commodity were being stored and handled. In some cases it was necessary to discuss the problem with the Council of the municipality concerned.

With regard to the handling of propane by railways, some tank cars were shipped from Alberta where they were loaded in sub-zero weather, and when these arrived at the Coast the tanks were filled beyond the normal capacity, causing a hydrostatic condition. As a result, some of the tanks leaked, and it was necessary to flare the tanks in order to minimize the public danger. As this is a complicated procedure, meetings were held at the Fire Marshal's office, and as a result a special



Training centre for railwaymen at the Chief Engineer's office, 636 Burrard Street, Vancouver, where a complete locomotive air-brake system of two railway cars is set up and operated by compressed air to instruct railway locomotive engineers and trainmen. At the left foreground is a hand brake as used on box cars, and at the right is a lecture chart with a slide projector in the centre for teaching the various functions of air-brake systems.

technical committee was set up to act in any emergency where a tank car is considered dangerous. In addition, four depots were set up throughout British Columbia where special equipment is stored for the handling of this equipment during emergency conditions when propane tank cars present a danger. The areas selected by the committee are Vancouver, Prince George, Kamloops, and Nelson.

In co-operation with the Superintendent of Motor-vehicles and the Provincial Fire Marshal, a second technical committee was set up to study any dangerous condition which might arise with respect to the transportation of dangerous commodities such as propane or chlorine where they are transported by tank trucks on highways. This committee was functioning by the end of 1966 and will continue its work during 1967.

The advent of new pulp-mills throughout the Province necessitated the design of special cars to handle pulp logs and pulp chips. Special designs were approved by our engineers, and in most cases the cars were built in Vancouver, where they were inspected during construction. In addition, a number of high-pressure railway tank cars are being built in Vancouver, and these require to be inspected during construction by our engineers as they are pressure vessels and fall within the A.A.R. Code used by the railways throughout North America.

In addition to propane, the storage of oil and flammable liquids adjacent to railways has presented many problems during the year as it was assumed in the past that the Board of Transport Commissioners for Canada handled all such installations where they were adjacent to transcontinental railways. However, during 1966 the Board pointed out to the Engineering Branch of this Department that where such installations were not actually located on the right-of-way of an interprovincial railway, the installation was a Provincial matter and came within Provincial jurisdiction. As a result, our engineers obtained a list from the Board of Transport Commissioners and made inspections of approximately 25 such installations at various locations in the Province. In a number of cases certain work was required to up-grade the installations to assure public safety.

The increase in pulp-mills also increased the number of logging-trucks used, particularly in the northern and Interior parts of the Province. This in turn increased the number of men required to be trained and the number of trucks requiring inspection.

It should also be pointed out the inspection work of the Pacific Great Eastern Railway required to be stepped up during the year as the railway company has increased its facilities by the addition of large railway yards and industrial estates in order to cope with the increased traffic generated by the addition of new pulp-mills on or adjacent to the railway.

In the mountain playground areas, ski-ing has increased to the point where there were by the end of 1966 over 40 areas in the Province where aerial tramways, ski tows, and rope tows were in operation. A number of new facilities were built during the year, and as a result our engineers and inspectors were kept busy in the field and in the office approving designs and inspecting facilities as constructed. In this regard a new Canadian Standards Association Code is being put into effect in an effort to improve public safety in this field of transportation. A number of new innovations were insisted upon for the 1966/67 ski-ing season to bring facilities up to the new code requirements.

While the foregoing is intended to give a general idea of the work encompassed for the year, the following presents a broader spectrum of the work accomplished.

Pacific Great Eastern Railway Company

Chief Engineer's Report

During the first two weeks in September, the annual fall inspection of the Pacific Great Eastern Railway was made in company with the assistant manager, the chief engineer, and other officials of the company. The trip was made by track motors in two companies, from North Vancouver to Fort St. John and Dawson Creek, from Summit Lake to the end of the Fort St. James extension, and from Kennedy to the end of the Kennedy spur line to Alexander and Mackenzie.

In the second week of August, in accordance with section 179 of the *Railway Act,* the newly constructed Kennedy spur line of the Pacific Great Eastern Railway was inspected and pronounced safe to haul revenue tariff, and consequently it was officially opened for traffic by Order in Council on August 15th. This branch line serves the two new towns of Alexander and Mackenzie, where two new pulp-mill complexes are to be built, the sawmill portion of part of the complex being in operation at the time of the inspection. The line is 21.7 miles in length, and it is laid with 60- and 72-pound rail. Details of this line and the inspection are covered in another section of this report.

The follow-up inspection revealed that the work required on the August report had been completed and the line was being operated in a satisfactory manner.

During the September inspection the Fort St. James branch line was checked and gone over as to progress and safety. It can be reported that of the total 78 miles projected for this branch, 78 miles of grade were completed with 30 miles of steel laid, of which 12 miles have been ballasted and surfaced. The line is being laid with 85-pound re-lay rail, using No. 1 untreated ties with tie-plates. The bridges on the first 30 miles are completed and were found to be installed in accordance with the plans submitted.

The first 25 miles of this line are constructed through very difficult terrain in that drainage is difficult and the ground is, geologically speaking, not consolidated as glaciation has left it in a plastic state. Consequently cuts and fills required flatter slopes than are usually the practice in older geological formations. It can be reported than an excellent job of construction has been completed through the difficult area, and the track was in good alignment at the time of the inspection.

The Dawson Creek branch (Dawson Creek Subdivision) was inspected and found to be in satisfactory condition. This line is laid mainly with 60- and 70-pound re-lay steel. Ballasting has been carried out extensively over the entire subdivision so that the track is in quite good alignment.

Fencing was checked, and in only one instance were cattle found on the right-of-way. Generally the fencing on the subdivision is well maintained.

The signals at the Alaska Highway crossing were tested and found to be in order, as were all level crossings on the subdivision.

At Dawson Creek it is to be noted that new grain elevators have been constructed on Pacific Great Eastern Railway tracks and are now in operation. As a result, more grain from the Peace River area is expected to move over the more direct route of the Pacific Great Eastern Railway for export from the Port of Vancouver.

Main Line

In making the main-line inspection from North Vancouver to Fort St. John, the inspection party stopped at all strategic points along the 728-mile route. Following are the main points checked:—

Mile 38.85: Inspected new signalized crossing near Squamish.
Mile 157: Inspected Lillooet yard.
Mile 160: Inspected Fraser River Bridge at Lillooet.
Mile 203.2: Inspected oil-tank installations at Clinton.
Mile 283.2: Inspected safety in yards and chip-loading.
Mile 313: Inspected Williams Lake south yard.
Mile 373.5: Inspected Dog Prairie signalization of Cariboo Highway.
Mile 381.5: Inspected sidings at Western Plywood, Quesnel, and mud bank adjacent thereto.
Mile 452.7: Inspected and checked Cale Creek Bridge for fill and culvert.
Mile 461.9: Inspected new Prince George industrial estate, trackage, shops, yards, crossings, etc.
Mile 467: Inspected Prince George pulp-mill tracks.
Mile 467: Inspected Continental pulp-mill tracks.
Mile 470: Inspected Northwood pulp-mill interchange.
Mile 485.9: Inspected Salmon Valley crossing of Hart Highway.
Mile 497.7: Inspected Hart Highway at Odell.
Mile 499.85: Inspected and checked Hart Highway at this point for signalization in 1967.
Mile 511.25: Inspected and checked gravel-pit tracks and assessed Hart Highway for signalization.

Mile 548: Inspected Parsnip River Bridge; checked new through span completed in 1966.

Mile 579.31: Inspected and checked Hart Highway for signalization in 1967.

Mile 660: Inspected yards at Chetwynd.

Mile 727: Inspected yards at Fort St. John.

Generally, the trackage and facilities over the entire railway are in a much improved condition over former years. This railway has 2,671,200 railway ties in total. Of these, 1,022,000 are now treated or creosoted with tie-plates, so that 38 per cent of the total has been replaced with the permanent type of tie having a life expectancy of 30 years as against eight years for untreated ties.

One hundred and fifty-four miles of main line have been relaid with 100-pound rail. This rail is laid on the Squamish Subdivision along Anderson and Seton Lakes and on the Pavilion Hill to Kelly Lake. With the crushed-rock ballast and the treated ties, this portion of the track is now up to main-line standards and, as a result, operation has been greatly improved.

Forty-five miles of new ballast were put down during 1966. This was done in various locations where deemed necessary.

One of the features of the 1966 final inspection was the use of a high-speed camera to photograph every level grade crossing of the railway. Two hundred and sixteen pictures were taken, which, when sorted and classified, will be of great assistance to our engineers and to the Pacific Great Eastern Railway in improving the level crossings on this railway.

In 1966 five level crossings were ordered to be signalized on the main line, and at the time of the inspection three of these projects were nearing completion and were inspected. It is probable that four signalizations will be completed by the end of the year.

The inspection and subsequent study revealed that five main-line level crossings should be signalized in 1967—Mile 497.7 at Hart Highway, Mile 499.85 at Hart Highway, Mile 511.25 at Hart Highway, Mile 579.31 at Hart Highway, and Mile 658.5 at Hart Highway at Chetwynd—with the following level crossings signalized in 1968: Dawson Creek Subdivision, Mile 11.1 at Hart Highway; Kennedy spur line, Mile 6.1 at Hart Highway; and main line, Mile 466 at Cariboo Highway at Prince George.

All overhead wire crossings were inspected en route. The new 500-kilovolt power-line from the Peace River dam to Kelly Lake crosses the main line in several places. These crossings were found to be in accordance with the approved plans for this very high voltage transmission, and the necessary precautions have been taken. However, some of the lower-voltage crossings appeared not up to the required standard, and British Columbia Hydro and Power Authority has been instructed to run a computer programme on this phase of the transmission-lines. This was done in 1964 on a number of crossings and, as a result, larger crossarms and hardware were required to up-grade the crossings at that time. The chief communications officer of the Pacific Great Eastern Railway participated in this inspection and will follow up with the British Columbia Hydro and Power Authority to the completion of the project.

The new Pacific Great Eastern Railway industrial park at Prince George was inspected, and the inspection included shop facilities, tracks, office facilities, bunkhouses, scales, loading-ramps, and other undertakings and facilities. This yard, or park, is a large industrial complex involving hundreds of acres and several miles of railway trackage with the Pacific Great Eastern Railway main line traversing the centre of the complex. The project is well under way, and due to its size

and the expansion of the area as a whole, no estimate can be made as to when the project will be actually completed.

At Squamish the new shops are being expanded to include drop-pits and added facilities to accommodate the addition of more motive power and equipment. The additions were well in hand at the time of the inspection, and they will be completed and in operation by the end of the year.

At Prince George a complete new shop has been built to service locomotives and Budd cars. This new shop complex incorporates pit inspection tracks, jacking

One of the new 1,800-horsepower diesels added to the Pacific Great Eastern fleet in the fall of 1966.

facilities, compressed air, car repair facilities, steam heating, washrooms, and special equipment to service diesel locomotives by up-to-date methods. This shop was approved by Department engineers in the drawing-board stage and given a final inspection in September, 1966.

During the year three new 1,800-horsepower diesel locomotives were delivered from the Montreal Locomotive Works, which brings the Pacific Great Eastern Railway roster of locomotives up to 57. These locomotives are standard with the transcontinental railways. It is interesting to note they were run over the Canadian Pacific Railway from Montreal to Vancouver and hauled freight thereon to offset delivery charges. Pacific Great Eastern Railway locomotives are at times rented to the Canadian Pacific Railway as the power is now up to main-line standards accepted by the Board of Transport Commissioners on Federal-controlled lines.

The microwave stations were inspected at Williams Lake and at other points on the system. The dispatch system and the communicating system of the railway are up to standard, and they are operating to the satisfaction of the Department.

Summary

It can be reported that the Pacific Great Eastern Railway is being properly maintained and its facilities expanded commensurate with the growth of British Columbia, so that it is in safe operating condition and the public interest is being properly served.—*Robert E. Swanson, P.Eng., Chief Engineer.*

Crown Zellerbach Canada Ltd. Logging Railway, Ladysmith to Nanaimo Lakes

Chief Engineer's Report

On October 17th the annual inspection was made of the Crown Zellerbach Railway between Ladysmith and Nanaimo Lakes, a distance of 22 miles. The inspection was made by track motor with Mr. Gordon Naylor, superintendent of Crown Zellerbach Canada Ltd., in attendance during the inspection.

This railway was reconstructed and extended in 1943 by Comox Logging and Railway Company. The original line was built in 1904 from Ladysmith to Extension by the Dunsmuir coal interests. It was abandoned in 1931, but the steel bridge over Nanaimo River was not dismantled. This bridge was the key to the 1943 reconstruction, and considerable work was required at that time to rehabilitate the steel bridge, after which the line was extended to the Nanaimo Lakes and opened for traffic.

Mention is made as to the history of the line and to this bridge in particular, for during 1966 the south approach was completely renewed with heavy-timber construction, with the north approach slated for rebuilding in 1967, and new bridge ties at a later date.

A satisfactory job of the south approach reconstruction has been completed. All footings and masonry were checked, and it is noted part of the 1904 masonry has been reinforced with concrete and all footings and piers are sound and in proper condition.

The Deadwood Creek Bridge was inspected, and it is noted new log stringers were installed in 1962, and they are in good shape. Footings are in order and the bridge is in alignment.

The Boulder Creek Bridge had the pilings renewed in 1959 when other work was completed. The stringers were found to be in order at this inspection and the footings clear and unobstructed.

The Haslam Creek Bridge had given trouble by log jams. This has been corrected by bulldozing out the river channel and removing a small island in the river-bed. New stringers and some new bents have been recently installed and the ties are in good condition.

The loading-works and log dump were inspected and found clean and in proper repair.

The line is laid with 80-pound rail, using yellow cedar ties. Alignment is good and ballast conditions are excellent, so that the line itself can be compared with the standards for branch lines used by the transcontinental railways.

Dispatching is done by radio-telephone in accordance with the rules and regulations, and a land line is used as a stand-by. Motive power consists of a 1,000-horsepower General Electric diesel-electric locomotive and two steam locomotives operated over the same line by MacMillan Bloedel Limited as the line is jointly owned. All motive power was inspected and found to be in good order and properly maintained.

All railway crossings were inspected and no repairs were necessary. It can therefore be reported this railway is in good condition and it is being properly maintained.—*Robert E. Swanson, P.Eng., Chief Engineer.*

British Columbia Hydro and Power Authority

Inspecting Engineer's Report

On November 10th an inspection was made of the railway facilities owned and operated by the above Authority in the New Westminster and Fraser Valley district.

In company with Mr. Fred Fiedel and Mr. W. Alcock, superintendent of maintenance and roadmaster respectively, a trip was made by rail car between New Westminster and Chilliwack, during which time buildings, bridges, yards, sidings, and main-line trackage were inspected.

An efficient trackage-maintenance programme was carried out during the past year, with 4,000 yards of crushed-rock ballast and 3,000 creosoted ties laid. Weed control is contracted through an established chemical company every two years and heavy brush control annually, with the result that weed and brush growth is kept to a minimum. Mileage-posts, derail signs, and other markers which were of wooden construction are being replaced by aluminum posts with distinctive letters and figures.

Rail and wheel wear has been greatly reduced by the installation of the track lubricators, 11 of which are in operation over the district.

Track forces working at various points were observed carrying out their duties under the protection of standard flagging procedures.

All bridges and trestles were inspected and found to be in good condition. The new equipment-maintenance shop in New Westminster is still in the process of being built. It was hoped to have this completed in 1966, but contractor employee strikes have delayed completion until the spring of 1967. When completed the shop will have 8,000 square feet of working area and 5,400 square feet of stores, office, and general utility area. A new yard office, dispatching office, and crew quarters will be situated nearby for convenience.

The railway freight yard which was opened in 1965 has been extended with the addition of 30 per cent more trackage.

Industrial development adjacent to British Columbia Hydro and Power Authority trackage has resulted in the installation of seven new spurs in 1966 in addition to 1 mile of new trackage serving the Langley industrial subdivision.

At present the railway crosses the main street in Langley. So this can be avoided, a 2½-mile diversion is being built and should be in service early in 1967.

Regular rolling-stock inspections were carried out during 1966, and observations indicate that the forces responsible for the maintenance of this equipment are doing so in an excellent manner.

Accidents to persons resulting from the movement of trains were very light in 1966 and without fatalities.

In general the operation was found to be in good condition, with the exception of the following items, which will be given immediate attention:—

Toppin Road: Stop sign requires repositioning.
Livingstone Road: Stop sign missing.
Jackman Road: South side stop sign missing.
Farm crossing west of Cloverdale: Requires replanking.—*W. F. Thomas, Inspecting Engineer.*

Canadian Forest Products Limited

Inspecting Engineer's Report

On November 1st an inspection was made of the railway facilities and equipment owned and operated by the above company at its Englewood logging division.

In the company of Railway Superintendent G. Lutz, Roadmaster M. Solecki, and Bridge Foreman G. Collins, a trip was made by speeder between Woss Camp and Beaver Cove and between Woss Camp and Vernon Camp, at which time the trackage and bridges were inspected.

Since the last annual inspection, approximately 7,000 new ties and tie-plates have been renewed. Eight miles of crushed-rock ballast were laid on " H " line and 4 miles of curve steel were laid on the Beaver Cove line.

In general the railway installation is in good condition. It would appear from the improved condition since the last inspection that a good maintenance programme is being carried out.

The following conditions were noted:—

Beaver Cove Yard and Dump: Some new piles were driven and cross-pile bracing was installed. New caps, stringers, and decking will be required in a year or two. Renew crossing planks at office.
Kokish Bridge: Steel span requires scraping and painting.
Elk River Bridge: Shoring has been done to contain piling. Brush-clearing completed.
East Fork Bridge: Ties poor due to previous derailment. Not serious.
Siding No. 2: Paint derail sign.
Tsultan Bridge: Watch cement foundation at Beaver Cove end for water sloughing. Ties rotting due to wheel cutting.
Halfway Island Bridge: Woss end span sticks are crushing lightly. Poor mud-sill bearing at upstream stringer, Woss end.
Noomas Creek Bridge: Check rail pile stringers and ties for renewal.
Mile 14.1: Clean up small rockslide.
Storey Creek Bridge: Stringers deteriorating and should be changed.
Kinman Creek Bridge: Intermediate cap is split and crushing. Clean out brush.
Siding No. 3: Straighten switch stand.
Steele Creek Bridge: Defective stringer has been renewed.
Twin Creek Bridges: Bracing and collars poor, require attention.

Mile-post 29 and Mile-post 25: Present rail should be replaced with heavier rail in standard lengths. Derailments could occur due to rail breakage.

Gold Creek Bridge: Shims loose on No. 1 bent, Woss end. New span installed in 1966.

Nimpkish Shop Tracks: The dumping of material, rails, etc., too close to switches and tracks must be stopped. Rules No. 64 and 66, Part I (*c*) must be adhered to in the interest of safety.

Rice Creek Bridge: Repair walkway and handrail. Clear out brush and check rail stringers for rotting.

Groves Creek and Davie Creek Bridges: Good condition.

Maquilla Creek and Fire Creek Bridges: Good condition.

Track between Woss and Vernon Camps: Heavy run-off on south side requires close check of culverts; otherwise track is in good condition.

Rail Cars 121, 122, 125, 129, 130 and Locomotive 252 were inspected, reservoirs tested, and certificates issued. Steam Locomotive 113 was hydrostatically tested in 1964 and has not been used since that time. It is intended to move this locomotive from Nimpkish to Woss, where it will be placed on a spur track under the care of an ardent steam-locomotive fan, Alex Matoski.

A number of skeleton logging-cars were inspected and Form 2 submitted with defects noted.

The wooden-sill cars are gradually being replaced by steel cars. An efficient maintenance programme being carried out by the car-shop forces has resulted in the over-all good condition of the rolling-stock and the reduction in the number of derailments.—*W. F. Thomas, Inspecting Engineer.*

Industrial Railways

In addition to the two common-carrier railways—namely, the Pacific Great Eastern Railway and the British Columbia Hydro and Power Authority Railway—there has been an increase in the number of in-plant industrial railways which come under the jurisdiction of the Department.

In-plant railways serve a variety of industries and include pulp and paper mills, chemical plants, oil and gas refineries, deep-sea docking, and wharves.

Log-hauling railways in the forest industry are listed in separate reports.

Construction of new pulp-mills in the Province and the extension of existing mills has increased the railway trackage considerably. New paper-mills are under construction at the site of the Columbia Cellulose Company Limited mill at Prince Rupert, British Columbia Forest Products Limited mill at Crofton, MacMillan Bloedel Limited mill at Powell River, and Elk Falls Company Limited mill at Duncan Bay. Department engineers have approved the extension of the railway trackage in the foregoing plants, and inspections have been made of the existing facilities.

Department engineers made inspections in the Kamloops Pulp & Paper Company Limited plant at Kamloops. A trackmobile is employed for the switching of chemical cars, chip cars, and other rolling-stock. Employees engaged in switching were examined and certified according to the regulations.

Switching operations at the Celgar Limited pulp-mill at Castlegar is largely performed by the Canadian Pacific Railway, except when chemical and other cars require to be spotted for unloading. A rubber-tired vehicle equipped with a large scoop on the front end was used for spotting cars. The company was advised of the hazards involved in using a machine of this type for the switching of railway

cars. It was ordered that a trackmobile or a similar power-car be available for switching within the plant area. Track inspections revealed certain close clearances which the company took steps to eliminate.

Switching operations at the Elk Falls Company Limited pulp-mill is performed entirely by the company's own motive power. A Shay steam locomotive is used for handling barge slip movements, while a 25-ton diesel locomotive is used for light switching. As in all plants where railway tank cars containing chemicals or other dangerous liquids are being handled as part of a railway, emphasis is placed on safe switching procedures and on precautionary measures being taken to see that cars are not moved while unloading is in progress.

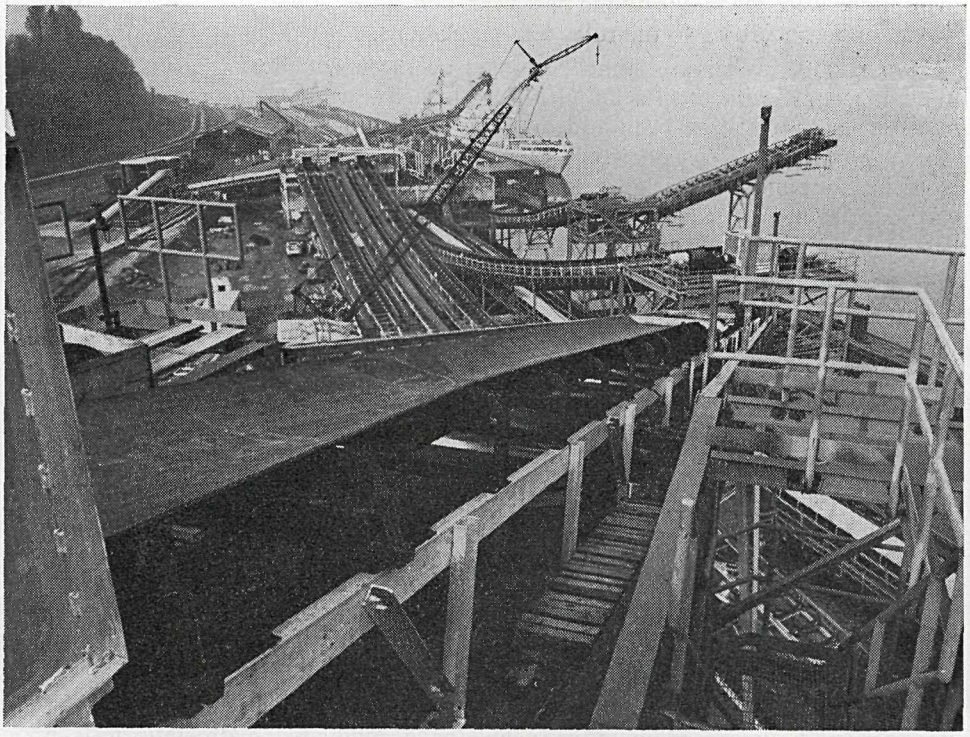
MacMillan Bloedel Limited mills at Port Alberni are served by the Esquimalt & Nanaimo division of the Canadian Pacific Railway, and the in-plant switching is done by a company-owned 45-ton diesel-electric locomotive. The locomotive was inspected, as well as the trackage and other railway facilities. The foregoing company's plant at Harmac is not serviced by a common-carrier railway. A 65-ton diesel-electric locomotive is used to switch a connecting barge service and to spot company-owned flat cars loading pulp at a deep-sea dock. Regular inspections have been made at this operation with respect to trackage, clearances, and railway personnel.

The British Columbia Forest Products Limited operation at Crofton is being enlarged by the addition of a paper-mill, which will be in operation by early summer of 1967. A 65-ton diesel-electric locomotive working one day shift is used for in-plant switching of railway cars at the deep-sea docks, chemical-unloading spurs, and warehouses. When the paper-mill is in operation, it will be necessary to work the locomotive an afternoon shift as well as a day shift. This will necessitate the training of additional train and locomotive crews under the supervision of the Department engineers. Recent inspections disclosed a well-conducted operation at Crofton.

The pulp and paper industry in the Prince George area is growing with the addition of Intercontinental Pulp Company Limited mill adjacent to the Prince George Pulp & Paper Limited operation. At present wood-chip cars, chemical cars, pulp cars, and other cars on railway spurs within the plant are switched by a company-owned trackmobile, the operators of which are certified by the Department. The plant is served by the Pacific Great Eastern Railway, and it is necessary that its switching units enter the company property. So that there would be no conflict of operations between Pacific Great Eastern Railway crews and company crews, meetings were held between the Department, Pacific Great Eastern Railway Company, and Prince George Pulp & Paper Limited officials for the purpose of setting up safe practical procedures to be followed when switching is in progress.

Northwood Pulp Limited in Prince George is also served by the Pacific Great Eastern Railway. In-plant switching is performed by company personnel using a 400-horsepower diesel-electric locomotive. Inspections made of the operation in 1966 disclosed that contractors working within the plant area were using unauthorized vehicles to move railway cars, with resultant damage to same. The Department ordered the discontinuance of this type of movement in the interest of safety. Company railway personnel were examined as to their proficiency and duly certified in their respective categories.

The industrial railway at Taylor is certified under joint ownership by Phillips Petroleum Limited, Pacific Petroleums Limited, Westcoast Transmission Company Limited, and Jefferson Lake Petrochemicals Limited. A recent inspection at the Jefferson Lake plant disclosed that restricted clearances existed in the trackage area. It was ordered by the Department engineer that steps be taken to bring the



Pacific Coast Terminals Limited, Port Moody. At this operation, bulk commodities are handled from railway cars to ships by the use of bulk conveyers. The railway in the left background is the main line of the Canadian Pacific Railway.

clearances within the regulations. It is operated by the above companies with siding, cross-over, and interchange agreements with the Pacific Great Eastern Railway. Switching of cars to and within the plant area is performed by the Pacific Great Eastern Railway.

Pacific Coast Terminals Limited operates two bulk terminals, one at New Westminster and one at Port Moody. Both are certified by Orders in Council as industrial railways under the *Railway Act*. Facilities at New Westminster have been extended by the erection of a heated shed which will be used to thaw frozen concentrates in railway cars so they may be unloaded. Switching operations are performed with the use of a rubber-tired vehicle which engages the rolling-stock coupler. A properly trained crew, certified by the Department, performs the switching in a safe and efficient manner.

The Port Moody operation of Pacific Coast Terminals Company Limited is served by the Canadian Pacific Railway. Heavy tonnage is handled and three dumpers are used for the dumping of materials. Any commodity can be handled by the dumpers, but one is used specifically for coal from Michel. Five million tons of coal may be handled annually through this terminal.

Conveyers are used for stockpiling and storage with front-end loaders used for loading out. The hoppers are designed to be roofed in if storage is required for commodities other than coal. The entire area is black-topped and maintained for a safe movement of all vehicles. The Department has approved safety rules and regulations with regard to in-plant switching operations, and switching personnel have been certified and registered with the Department. Several safety and track

inspections were made during the past year, and it was found that the establishment was in order according to the rules and regulations.

Vancouver Wharves Limited, situated on the north shore of Burrard Inlet, is interchangeable with the Pacific Great Eastern Railway. During the past year 4 miles of new track have been added to the railway operation and in addition new motive power has been added. Two steam Shay locomotives, two diesel locomotives, and one diesel-electric locomotive comprise the fleet required to switch railway cars being unloaded for storage before being transferred to deep-sea ships destined to all ports of the world. Several inspections have been made throughout the year and recommendations made in the interest of safety.

Fraser Surrey Dock is operated by Johnston Terminals Limited for the purpose of loading and unloading a 5,000-ton train ship with railway cars shuttling between Alaska and Surrey. Inspections conducted in 1966 have revealed no cause for complaint.

Weldwood Transportation Limited of Weldwood of Canada Limited and the river sawmills division of MacMillan Bloedel Limited have interchanges with the British Columbia Hydro and Power Authority railway in the Vancouver area. Both companies have barging facilities with the Canadian National Railway on the north arm of the Fraser River. In-plant switching is performed with trackmobiles operated by company employees properly trained and certified by the Department.

Steel-fabricating plants, scrap-iron yards, steel-mills, and wood-processing plants in the Lower Mainland continue to use in-plant railways and locomotive cranes for the handling of materials. Two diesel cranes of 100 tons capacity have been imported in 1966. Department engineers have supervised the overhaul of steam crane boilers used in industry and have conducted hydrostatic tests upon completion.

The growth of the pulp and paper industry in the Province has required an increase in the manufacture of chemicals which are allied to the industry. F.M.C. Chemicals established a plant at Squamish, with railway trackage within the plant area and interchange with the Pacific Great Eastern Railway. Barging facilities are also available to the company for the transport of chemical tank cars by water. General layout and construction details were checked by Department engineers and, after construction, inspections were made to see that the regulations were complied with. The company has leased a trackmobile for railway car-switching duties on plant trackage. Operators of the trackmobile have been instructed in safe procedures and certified according to the regulations.

Hooker Chemicals Limited, situated in the North Vancouver area, has been in operation since 1957 and has interchange with the Canadian National Railway. Switch crews at this operation are competent in their duties, and the equipment is being well maintained. Procedures with respect to tank-car testing have been observed, and the company submits test forms to the Department for perusal.

The major shipyards in the Province make use of the connection to common-carrier railways in that materials are brought in by rail. It is advantageous that standard railway trackage is laid within the yards. Locomotive cranes are used for hoisting purposes and also for switching of standard railway equipment. Burrard Dry Dock Company Limited, of North Vancouver, and Victoria Machinery Depot Company Limited, of Victoria, operate diesel locomotive cranes in their yards. These were inspected, appliances tested, and operators examined as to their proficiency. The 50-ton-capacity electric crane in Yarrows Limited shipyard in Victoria was inspected and tested by Department engineers.

Island Tug & Barge Limited, has railway yards and barge facilities in Vancouver and Victoria with connections with the Milwaukee railway system of the United States.

The explosives division of Canadian Industries Limited is located on James Island, a short boat ride from Saanichton wharf. A barge slip and connecting trackage is located at the east spit. Materials are brought in through this location and the finished product is dispatched out this direction. A 25-ton diesel locomotive is used to load and unload cars from the barge slip and for switching cars around the magazines. This operation was inspected, the locomotive tested, and the locomotive operator certified with the Department.

MacMillan Bloedel Limited's Chemainus sawmill division is supplied with logs by truck and by rail. Logs are loaded on railway skeleton cars at the company's Nanaimo River camp and then hauled by a steam locomotive to a marshalling yard at Ladysmith, which is interchanged with the Esquimalt and Nanaimo Railway Company division of the Canadian Pacific Railway. Canadian Pacific Railway crews pick up the loads at Ladysmith and take them to the MacMillan Bloedel rail yard at Chemainus. A Porter steam locomotive built in 1924 is used as a switch engine to switch loaded logging-cars to the dump. This locomotive was recently overhauled and the boiler given an internal inspection under the supervision of Department inspectors. The mill yard rail operation at Chemainus and the rail yard at Nanaimo River were inspected and found to be in order.

The industrial railway at Kitimat operates within the Aluminum Company of Canada Limited's smelter area. It is situated on tidewater with connection to a deep-sea dock. The company operates its own motive power for loaded and empty railway cars delivered to and from the Canadian National Railway interchange. Department inspections were made during the year, and conditions found were very good. Track maintenance included the renewal of ties and ballast on the east line. The locomotive was tested and a certificate issued to cover the inspection.

The Cominco Ltd. surface-haul railway operation at Kimberley was inspected. Three electric locomotives were inspected in service and company records checked with respect to running repairs and maintenance. The track, clearances, buildings, derail indicators, and signals were found to be in order. It can be reported that the remote-control system for the dumping and switching of one train at the concentrator dumper is 90 per cent complete, but work is progressing to bring the dumping and switching of ore trains at the concentrator dumper completely operative with push-button control by 1967. The operation in general is being conducted in a safe and efficient manner, with no accidents reported.

The Stanley Park railway operated by the Vancouver City Board of Parks and Public Recreation increased its popularity since it was reopened in 1964, and it was found necessary to add another train. A new gasoline-powered locomotive with steam-engine design, together with passenger cars, was built in 1966 and put into service. The Department approved and supervised the construction of the new equipment, and tests were made before it was placed in service.

The Cowichan Valley Forest Museum at Duncan was officially opened in June, 1966, after a building programme which saw 15 or more acres of land transformed into a museum designed to preserve the relics of bygone days of logging. An appropriate display building constructed entirely of logs, as well as parking facilities, was constructed and ready for the opening day. Civic and government officials, as well as prominent people in the forest industry, were present at the ceremonies. The steam locomotives and other motive power hauling passenger cars

were inspected by the Department engineers prior to being put into service, test runs were made, and the equipment approved for service. The railway track, bridges, crossings, and installations were inspected and found to be in good condition.

Equipment Inspections During 1966 Under the Railway Act

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

Hydrostatic tests applied to boilers	36
Electric locomotives inspected and certified	6
Self-powered rail cars inspected and certified	15
Diesel-electric locomotives and cranes inspected	79
Air reservoirs tested and inspected	250
Railway cars inspected on industrial railways	200
Railway cars inspected on common-carrier railways	400
Miles of track inspected	3,200
Aerial tramways inspected and certified	80
Railway conductors examined and certified	10
Power-car operators examined and certified	2
Locomotive-crane engineers examined and certified	6
Steam-locomotive engineers examined and certified	4
Motormen examined and certified (Cominco Ltd.)	11
Accidents on logging and industrial railways	----

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	Standard.
3. British Columbia Forest Products Ltd.	Vancouver	Crofton	1.50	2.50	4.00	Standard.
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	Standard.
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. Cominco Ltd.	Trail	Trail	19.00	.....	19.00	18″.
10. Cominco Ltd.	Trail	Kimberley	9.00	33.01	42.01	18″, 36″.
11. Crown Zellerbach Canada Ltd.	Vancouver	Ladysmith	21.80	4.02	25.82	Standard.
12. Crow's Nest Pass Coal Co. Ltd.	Fernie	Michel	1.53	.....	1.53	30″.
13. Elk Falls Co. Ltd.	Vancouver	Duncan Bay	.....	3.00	3.00	Standard.
14. F.M.C. Chemicals Ltd.	Squamish	Squamish	.....	.30	.30	Standard.
15. Hillcrest Lumber Co. Ltd.	Mesachie Lake	Mesachie Lake	6.00	1.50	7.50	Standard.
16. Hooker Chemicals Ltd.	North Vancouver	North Vancouver	0.10	1.90	2.00	Standard.
17. Intercontinental Pulp Co. Ltd.	Prince George	Prince George	.....	3.50	3.50	Standard.
18. Island Tug & Barge Ltd.	Victoria	Vancouver	.....	0.20	0.20	Standard.
19. Island Tug & Barge Ltd.	Victoria	Victoria	.....	0.30	0.30	Standard.
20. Kamloops Pulp & Paper Ltd.	Kamloops	Kamloops	.....	2.70	2.70	Standard.
21. MacMillan Bloedel Ltd.	Vancouver	Chemainus	1.58	3.81	5.39	Standard.

LIST OF RAILWAYS AND SUMMARY OF MILEAGE—*Continued*

Industrial Railways—Continued

No. and Owners/Name of Railway	Head Office	Operating	Mileage			Gauge
			Main	Sidings, Etc.	Total	
22. MacMillan Bloedel Ltd.	Vancouver	Dunsmuir District	1.00	3.10	4.10	Standard.
23. MacMillan Bloedel Ltd.	Vancouver	Harmac Pulp Div.	2.20	.....	2.20	Standard.
24. MacMillan Bloedel Ltd.	Vancouver	Port Alberni	.....	1.00	1.00	Standard.
25. MacMillan Bloedel Ltd.	Vancouver	Powell River	1.50	.....	1.50	Standard.
26. MacMillan Bloedel Ltd.	Vancouver	Vancouver	.....	1.30	1.30	Standard.
27. Northwood Pulp & Paper Co. Ltd.	Vancouver	Prince George	.....	3.16	3.16	Standard.
28. Osborne Bay Wharf Co. Ltd.	Mesachie Lake	Crofton	0.33	.....	0.33	Standard.
29. Pacific Coast Bulk Terminals Ltd.	New Westminster	Port Coquitlam	.....	4.70	4.70	Standard.
30. Pacific Coast Terminals Co. Ltd.	New Westminster	New Westminster	5.20	.....	5.20	Standard.
31. Pacific, Jefferson Lake, Westcoast (Pacific Petroleums Ltd.)	Calgary, Alta.	Taylor	3.05	0.71	3.76	Standard.
32. Prince George Pulp & Paper Ltd.	Vancouver	Prince George	.....	3.51	3.51	Standard.
33. Rayonier Canada (B.C.) Ltd.	Vancouver	Woodfibre	.....	(1)	.....	Standard.
34. Vancouver Steel Co. Ltd.	Vancouver	Twigg Island	1.25	.....	1.25	Standard.
35. Vancouver Wharves Ltd.	Vancouver	North Vancouver	6.00	.....	6.00	Standard.
36. Western Forest Industries Ltd.	Honeymoon Bay	Honeymoon Bay	7.00	0.60	7.60	Standard.
37. Western Plywood (Cariboo) Ltd.	Quesnel	Quesnel	0.95	.....	0.95	Standard.

1 Ferry slip.

Common-carrier Railways

38. British Columbia Hydro and Power Authority	Vancouver	New Westminster–Huntingdon–Chilliwack	76.58	35.29	111.87	Standard.
39. Pacific Great Eastern Railway Co.	Vancouver	Vancouver to Fort St. John and Dawson Creek	788.60	172.22	960.82	Standard.
40. Pacific Great Eastern Railway Co.	Vancouver	Mackenzie spur	21.70	5.20	26.90	Standard.

Recreational Railways

41. *Cowichan Valley Forest Museum*	*Duncan*	*Duncan*	0.875	0.125	1.00	36″.
42. Stanley Park Miniature Railway	Vancouver	Vancouver	0.42	.....	0.42	18″.
43. Sam Sunter, Mattick's Farm	Saanich	Saanich	0.20	.....	0.20	10″.

CENTENNIAL TRAIN PROJECT

The British Columbia Centennial Committee acquired a 70-year-old Scottish steam locomotive and coach which was owned by the third Duke of Sutherland and run on a private line in the north of Scotland. The locomotive was built in 1895 and weighed approximately 35 tons. It was idle from 1949 until it was put into service as a Centennial project by the Centennial Committee.

The Department was given the task of putting the locomotive in working order. Due to the age of the boiler, Department engineers considered a complete overhaul would be necessary. It was also decided that the running-gear should be refurbished. Boiler-makers with locomotive experience were brought out of retirement to rebuild the boiler and to make air-brake repairs. A Vancouver company experienced in locomotive machine work put the " Dunrobin " in first-class running condition.

When the boiler repairs were completed, tests were conducted by the Department engineers in the presence of officials of the Canadian Pacific Railway, the Canadian National Railway, and the Board of Transport Commissioners, and it was agreed that the locomotive was fit to run on any railway line in Canada.

A retired Canadian Pacific Railway locomotive painter was engaged to repaint the locomotive and coach to original colours.

Through the co-operation of the Canadian Pacific Railway and the British Columbia Hydro and Power Authority, schedules were drawn up so that the " Dunrobin " and coach could be displayed throughout the Lower Mainland, Fraser Valley, and Vancouver Island. Consequently the little train was run under its own power from Vancouver to Chilliwack, from Vancouver to Mission, and thence to Vancouver Island via the Canadian Pacific " Princess of Vancouver," where it was displayed at all railway stations between Victoria, Courtenay, and Port Alberni. Upon completion of the Vancouver Island trip, the " Dunrobin " and coach were returned to the Mainland and tied up for the winter in the British Columbia Hydro and Power Authority shed in New Westminster.

History of the " Dunrobin "

With the nationalization of the British railways, the agreement between the Duke of Sutherland and the London, Midland and Scottish Railway, whereby the Duke had running powers for his rolling-stock over that company's lines, ceased. Thus came to an end a rich nobleman's hobby of owning and running his own train. The Duke was the only owner of a private railway carriage in the British Isles, but in America several millionaires owned private railway cars.

The railway through Sutherland from Golspie to Helmsdale (17¼ miles) was projected by the third Duke and built at his own expense after a local undertaking, the Sutherland Railway, had succeeded only in completing its line from Bonar Bridge to Golspie, 6 miles short of Brora, the intended terminus. The line was authorized on June 20, 1870, but construction already had begun and the railway was completed on June 19, 1871. A private section was provided 2 miles north of Golspie to serve Dunrobin Castle, the seat of the Duke. The railway from Golspie to Helmsdale was worked by the Highland Railway, but it was not until July 28, 1884, that the Duke sold his undertaking to that company, of which he was already a director. He was also a director of the London and North Western Railway.

To enable his railway to be opened before the connection with the Sutherland Railway at Golspie was completed, the Duke had purchased a locomotive and some coaches. After the Highland Railway took over the working of the line, the engine was used to haul the Duke's private saloon between Inverness and Dunrobin, but south of Inverness the saloon was attached to the main-line trains. These arrangements were continued after the railways north of Inverness were amalgamated with the Highland Railway and persisted after the grouping in 1923.

The locomotive was a small 2–4–0 tank engine built by Kitson and Company, Leeds, and named " Dunrobin." It had outside cylinders 10 inches in diameter with 18-inch stroke and coupled wheels 4 feet in diameter. The weight in working order was 21 tons.

After the death of the third Duke in 1892, his son decided to have a more powerful engine, and David Jones, locomotive superintendent of the Highland Railway, designed a 0–4–4 side-tank engine with 13-inch by 18-inch inside cylinders and a boiler carrying a working pressure of 120 pounds per square inch. The diameter of the coupled wheels was 4 feet 6 inches and of the trailing wheels 2 feet

6 inches. This engine was built at the Atlas Works, Glasgow, in 1895. Like its predecessor, it was named " Dunrobin " and was painted dark green with black bands and yellow lining. A seat with leather cushions extending the full width of the cab was provided over the coal bunker for passengers riding on the footplate. The front weather-board was autographed by several illustrious travellers who inspected the engine while they were guests of the Duke.

The original " Dunrobin " was acquired by the Highland Railway and rebuilt at the Atlas Works with a larger boiler and new cylinders. It was numbered 118, named " Gordon Castle," and put to work on the branch from Orbliston Junction to Fochabers. Some years later it was renamed " Invergordon " and used for shunting at Invergordon Harbour. During the First World War it was loaned to the Great North of Scotland Railway, and was scrapped in 1923. The second " Dunrobin " performed shunting duties at Invergordon and at Rosyth during the recent war.

In 1899 a large saloon was built for the Duke at Wolverton Carriage Works, London & North Western Railway. It was designed by Mr. C. A. Park, carriage and wagon superintendent, L.N.W.R., who used it as the prototype for the Royal train built in 1903 for King Edward VII and Queen Alexandra, an example of railway-coach building, decoration, and furnishing unequalled during the past 50 years. This train was used subsequently by King George V and Queen Mary, and by King George VI and Queen Elizabeth until 1941. King Edward VIII never used it as he preferred the late Lord Stamp's " President's Car," which also has been used by Queen Elizabeth and Princess Margaret.

In February, 1949, the Duke of Sutherland advertised his saloon for sale for conversion into a bungalow, but a Lincolnshire firm of coach-builders recognized the vehicle from its description and purchased it. The new owner, the Lincolnshire Trailer Company, Scunthorpe, preserved the saloon as an example of the finest British coachwork in existence. It also acquired the Duke's locomotive and smaller saloon. Arrangements were made with Capt. J. E. P. Howey, chairman of the Romney, Hythe and Dymchurch Railway, for the engine and the saloons to be exhibited at New Romney.

The large saloon is 57 feet long over headstocks and 61 feet over the buffers. the width is 8 feet 6 inches, and height from rail level to the top of the roof 12 feet 7½ inches, and to the side cornices 10 feet 9½ inches. The saloon is carried on four-wheel bogies with a wheelbase of 8 feet, and spaced at 39-foot centres. It is fitted with the vacuum and Westinghouse brakes.

The saloon is divided into a large lounge 13 feet 10 inches long and extending over the full width of the vehicle, a smoking-room 7 feet long, three single-berth sleeping compartments, a pantry, and a luggage and attendant's compartment. Two of the sleeping-berths have separate toilets, and a third toilet adjoins the smoking-room. The lounge is furnished with two movable settees, a round table, and four dining chairs; the smoking-room has four fixed armchair seats convertible into two beds and two folding tables. The vestibules at each end of the saloon have end observation windows but no gangways to connect with other vehicles on the train. Complete privacy for the occupants is thus assured.

Stone's system of electric lighting is installed, and there are electric bells to the attendant's compartments and electric fans for ventilation in hot weather. The fittings of the pantry include an oil cooker, a sink, and a dresser. Steam heating apparatus and a self-contained high-pressure hot-water system are provided for warming the vehicle.

The interior decorations of the saloons and berths are of Spanish mahogany, white enamelled and picked out in gold leaf, with solid-silver lighting fittings. The

ceilings are in figured lincrusta, finished in white and gold leaf. The couches and easy chairs are upholstered in green figured tapestry with loose chintz covers, and the pelmets and curtains are of green silk and chintz to match. Turkish carpets are laid in the lounge and the smoking-room, but elsewhere Wilton pile carpets, underlaid with thick grey felt, are laid. The external finishings of the saloon are dark Sutherland green on the lower panels and white picked out with gold leaf on the upper panels. The roof and the tires are painted white.

The smaller saloon runs on four wheels and is 25 feet long and 8 feet 6 inches wide. It is divided into a saloon 14 feet 3 inches long with side and end windows, and a brake van 10 feet long. The saloon is furnished with six armchairs and a table, and there are three fixed seats in the brake van. The interior decorations are of mahogany and maple, and the external finish resembles that of the larger saloon. When the Duke was travelling by special train north of Inverness, the large saloon was steadied by having the smaller vehicle attached behind it.

AERIAL TRAMWAYS

It has been obvious to resident and visitor alike that industry in the Province of British Columbia has, in recent times, been surging ahead. However, what the general public has failed to recognize has been the phenomenal growth of outdoor activity and especially that of ski-ing.

The impact of this expansion has been felt within the Department to a marked degree. Five years ago the time required for annual inspections of existing aerial tramways and ski-ing facilities was a minor part of the over-all function of the Inspecting Engineers' work. Since then, however, due to the increased tempo in development of the ski-ing areas, the work and time involved in the checking of plans, profiles, and preliminary and final inspections of all types of lifts have increased tenfold, and as a consequence have become a major part of the Department's schedule.

Ski-ing facilities now exist in almost every corner of the Province. Excellent ski lifts of all types can now be found on Vancouver Island, where recent developments at Mount Becher near Courtenay and at Green Mountain west of Ladysmith are operational. Installations on Grouse Mountain and Mount Seymour have increased in number and will provide more skiers with greater reaches for ski-ing.

Another chair-lift constructed on Whistler Mountain at Garibaldi will further implement the fine complex now existing on the mountain. This mountain is unique in that alpine conditions are now available at the conclusion of a 2½ hour's drive from the heart of Vancouver.

Should one wish to find varying snow conditions and new runs to conquer, a week-end trip to the Interior of the Province will reveal a skier's bonanza. Journeying by automobile over the Hope–Princeton Highway, skiers can avail themselves of several ski tows in Manning Park, two of which were designed and constructed by the Department of Recreation and Conservation Parks Branch. Eastward at Princeton there are two rope tows which operate just outside the city, just a long step south of the Southern Trans-Canada Highway.

The Okanagan is also well served by excellent well-controlled areas at Apex Mountain at Penticton, Big White east of Kelowna, and Silver Star at Vernon. Some of the finest ski-ing conditions exist in this locale.

Farther east, once more, small operations exist at Bridesville and Phoenix. While these sites have only recently been in existence, plans are already afoot to begin expansion.

The upper bullwheel at Mount Seymour. Note the arrangement to prevent the bullwheel from jumping out of the frame in the event of a broken shaft or bearing.

The lower terminal at Mount Seymour. The motive power at the operation is diesel-electric.

A typical T-bar operation with pylon towers.

Red Mountain at Rossland, a long-time ski Mecca, introduced an 8,400-foot double chair-lift to augment its established lifts. This area is noted for the development of Miss Nancy Greene, who has gone on to achieve international acclaim on the world's ski slopes.

Nelson and Salmo, also in this general locality, provide tows of the T-bar type for residents of their respective communities.

In the East Kootenay at Kimberley, the highest city in Canada, two T-bars are at present handling many skiers from the surrounding district, and a double chair-lift planned for 1967 will increase the capacity at North Star Mountain.

The Snow Valley T-bar at Fernie, since its beginning three years ago, has developed many skiers who would otherwise have had to journey elsewhere to enjoy the sport.

The North Okanagan is serviced by Lac le Jeune and Tod Mountain, the latter having the longest double-seat chair-lift in Canada, a length of some 9,400 feet.

At Revelstoke a T-bar is beginning its second season. This has proved to be a welcome addition to the poma-lift which has been in use in Mount Revelstoke National Park for several years.

In the Cariboo country, interest in ski-ing has promoted lifts at Wells, Quesnel, and Williams Lake, the latter being in the process of erecting a new T-bar.

Prince George and Dawson Creek experienced successful seasons last year with the opening of T-bar lifts in each city.

Lakelse Hot Springs, adjacent to Kitimat, until last year notable only for its waters, introduced ski-ing as an added attraction in the form of a Hall T-bar, which received permission to operate just in time for the winter season.

The foregoing, of course, does not represent a complete coverage of all ski lifts in the Province, but merely serves to illustrate to what extent the facilities have grown.

The largest single project completed in 1966 was that of the Grouse Mountain Resorts jig-back aerial tramway stretching from Cleveland Dam in the North Vancouver watershed to the new chalet on Grouse Mountain. The construction on this tramway was commenced in 1965, and after being subjected to seven days of tests and inspections by engineers of the Department, it was approved for operation and was put into service in late February of this year. Because of its size and complexity, this tramway has been inspected periodically since its inception to ensure that the public may travel in complete safety.

Problems have arisen with the two large locked coil cables on which the 50-passenger cabins are carried. Again to be positive about the safety of this tramway, a wire-rope expert was flown over from Germany to assure the Department that the condition of the track cables could not give rise to an accident.

A subsequent meeting called by the Chief Engineer of the Department with the owners of the tramway and the German cable expert resulted in a written statement by the latter that he had found the track cables to be of such strength and condition as to preclude their contributing to an accident.

While in some quarters the insistence on this type of inspection may seem extreme, it is too late in the event of an accident on a tramway of this design to do what obviously should have been done in the first place.

The other major installation in 1966 was at Whistler Mountain, where a double-seat chair-lift of local design and manufacture was erected in November. This chair-lift will serve to open up new ski-ing slopes to the north of the original chair-lift, thus contributing to the added enjoyment of the skier.

At Mount Becher on Forbidden Plateau near Courtenay, an extension of 1,800 feet has been added to the original T-bar and a new 1,500-foot T-bar was erected uphill from the first lift. This will provide for an earlier ski-ing season.

A further project was undertaken at Williams Lake, where an old chair-lift of European design was purchased in Alberta. When the plans for this lift were presented to the Department for approval of installation, it was found that the design would not be able to comply with the new aerial-tramway code. Since the cost of making the necessary alterations in construction would be prohibitive, on the advice of Department engineers this chair-lift was converted to a satisfactory surface lift.

Annual inspections were conducted in 41 ski areas in the Province, which resulted in a coverage of 77 ski lifts during 1966. At the present rate of growth, this number will be greatly surpassed within the very near future.

In addition to the ski lifts, three industrial tramways are subject to annual inspection by the Department. These are located at Kemano, Dog Mountain, and Mount Jarvis. They are used mainly to transport men and equipment to mountain areas for maintenance of equipment on microwave stations and, in the case of Kemano, to service the water tunnel and penstocks which supply the power-station. All three of these tramways were inspected in 1966 and found to be well maintained and operated.

In the matter of accidents, unfortunately one area did experience an accident in which a number of passengers were injured. Upon investigation it was found that a large portion of the blame lay at the door of the man operating the chair-lift. It has since been proposed by the Department that tramway operators be compelled to pass an examination on the operation and maintenance of tramways and thus be properly certified. The chair-lift on which this accident occurred has since been

modified so that an accident of this particular nature could not happen again. Other accidents reported were fortunately few in number and, for the most part, minor in nature.

A meeting was held in Vancouver in October with the ski area operators of British Columbia, at which time some of the new regulations pertaining to aerial tramways were discussed, followed by a visit to the Grouse Mountain complex. It is the intention of the Department to conduct more of these sessions in the future to establish a closer relationship between government and industry, which should be of benefit to all concerned.

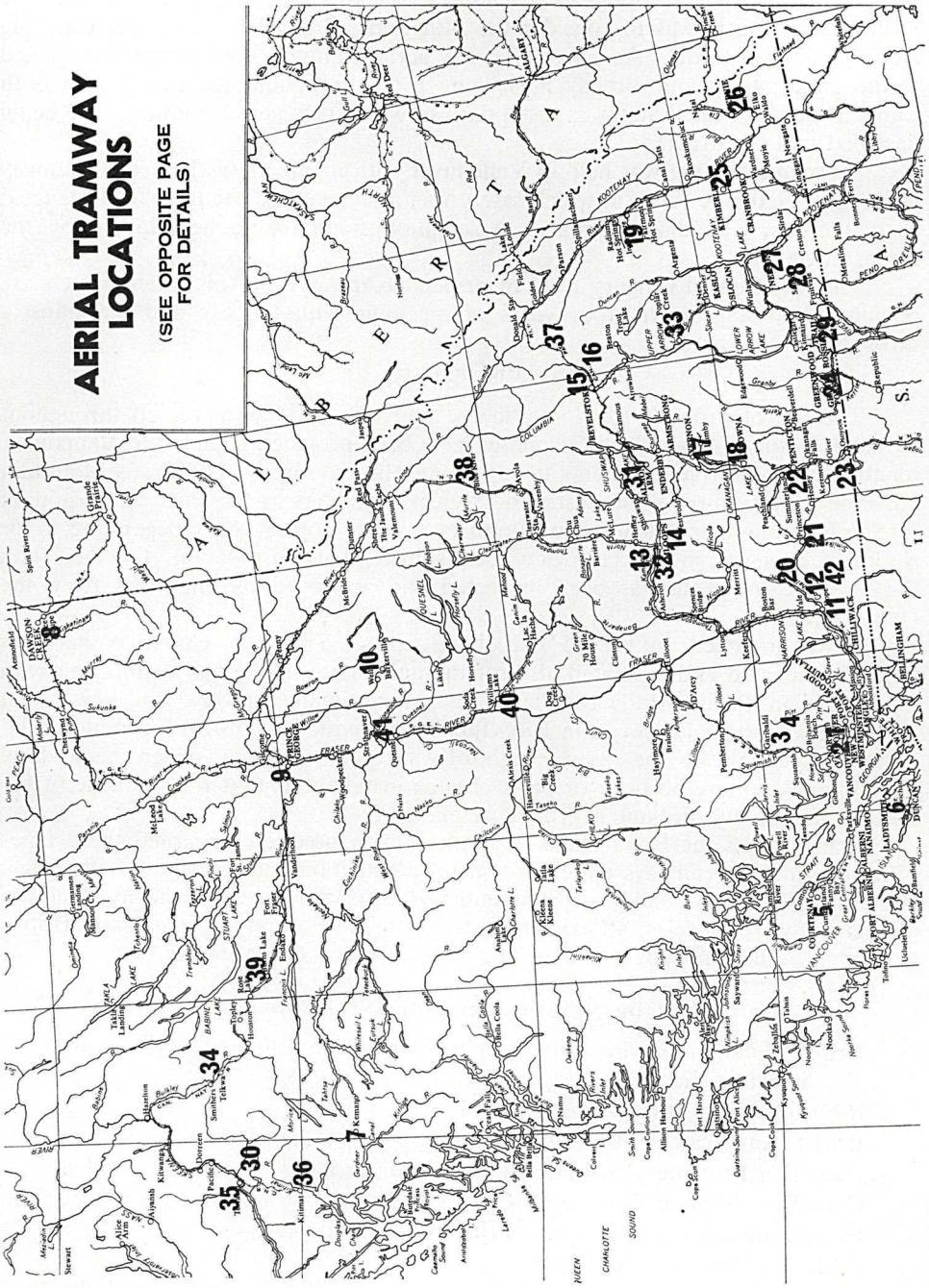
The fifth draft of the Canadian safety code for aerial tramways has been completed and will now be presented to the voting members of the committee which was formed in 1963 at the request of the Canadian Standards Association. This draft is expected to be approved early in 1967, and will then govern the construction and operation of passenger-carrying aerial tramways across Canada. In preparation, the ski lifts in British Columbia have all been up-graded so that only minor alterations will be required to comply with the new Canadian Standards Association Code Z98 when it is introduced.

AERIAL TRAMWAYS REGISTERED WITH THE DEPARTMENT OF COMMERCIAL TRANSPORT TO DECEMBER 31, 1966

Location No. and Name	Location	Gondola	Chair-lift	T-bar	J-bar	Rope Tow	Industrial Freight
1. Grouse Mountain	North Vancouver	1	2	1	----	2	----
2. Mount Seymour	North Vancouver	----	2	----	----	3	----
3. Garibaldi	Garibaldi Park	1	2	2	----	----	----
4. Diamond Head	Garibaldi Park	----	----	----	----	2	----
5. Mount Becher	Courtenay	----	----	2	----	1	----
6. Green Mountain	Near Ladysmith	----	----	1	----	1	----
7. Kemano (Alcan)	Kemano	----	----	----	----	----	1
8. Bear Mountain	Dawson Creek	----	----	1	----	----	----
9. Tabor Mountain	Prince George	----	----	1	----	----	----
10. Wells	Wells	----	----	----	----	1	----
11. Dog Mountain (B.C. Telephone)	South-west of Hope	----	----	----	----	----	1
12. Mount Jarvis (C.N.R.)	East of Hope	----	----	----	----	----	1
13. Tod Mountain	North of Kamloops	----	1	1	----	----	----
14. Lac Le Jeune	South of Kamloops	----	----	2	----	----	----
15. Revelstoke Park	Revelstoke	----	----	----	1	----	----
16. Mount MacKenzie	Revelstoke	----	----	1	----	1	----
17. Silver Star	Vernon	----	----	2	1	----	----
18. Big White	East of Kelowna	----	----	2	----	----	----
19. Invermere	West of Invermere	----	----	----	1	----	----
20. Pinewoods	Manning Park	----	----	1	----	2	----
21. Amber	Princeton	----	----	----	----	2	----
22. Apex Alpine	West of Penticton	----	----	1	1	1	----
23. Borderline	East of Osoyoos	----	----	1	----	1	----
24. Phoenix Alpine	West of Grand Forks	----	----	----	----	1	----
25. North Star	Kimberley	----	----	2	----	----	----
26. Fernie (Snow Valley)	Fernie	----	----	1	----	1	----
27. Silver King	Nelson	----	----	1	----	1	----
28. Salmo	Salmo	----	----	1	----	----	----
29. Red Mountain	Rossland	----	2	----	1	1	----
30. Skogland Hot Springs	South of Terrace	----	----	1	----	----	----
31. Shuswap	Salmon Arm	----	----	----	----	1	----
32. Kamloops	Kamloops	----	----	----	----	1	----
33. Nakusp	East of Nakusp	----	----	----	----	2	----
34. Smithers	Smithers	----	----	----	----	1	----
35. Bornite	Terrace	----	----	----	----	1	----
36. Kalque Mountain	Kitimat	----	----	----	----	1	----
37. Glacier	Glacier	----	----	----	----	1	----
38. Blue River	Blue River	----	----	----	----	1	----
39. Burns Lake	Burns Lake	----	----	----	----	1	----
40. Little Squaw	North of Williams Lake	----	----	1	----	2	----
41. Quesnel	Quesnel	----	----	----	----	1	----
42. Silver Tip	Sumallo Area	----	----	----	----	1	----
Totals		2	9	26	5	35	3

To supplement the above, Provincial regulations have been passed by Order in Council to cover any eventuality not covered in the aforementioned code.

In view of the number of tramways constructed and areas improved over the past year and the support given by the public to these enterprises, it is safe to assume that this field has only one direction to go—forward!



CANADIAN STANDARDS

The Department is a sustaining member of the Canadian Standards Association, and the Chief Engineer of the Engineering Branch is an active member of several Canadian Standards Association committees, including oil pipe-lines, gas pipe-lines, and passenger-carrying aerial tramways.

During the year, meetings were held in Calgary, Vancouver, and Victoria. The meeting in Victoria was to consider the fifth draft of the Z98 Passenger Carrying Aerial Tramway Code. As a result, a new aerial-tramway code is now completed to the ballot stage, and already it is being used throughout the industry in both Canada and the United States as a standard to which new aerial tramways are being designed and constructed.

A second meeting was held in Vancouver with members of the aerial-tramway industry in October, 1966, at which safety was discussed and the industry instructed as to the new Canadian Standards Association standards to be adopted by the Department.

The meetings in Calgary were in respect to the gas and oil codes, which are reaching final stages after four years of meetings with the gas and oil industry throughout Canada.

PROPANE

The use of propane for domestic use and industry has increased throughout British Columbia. In addition, facilities have been provided adjacent to Vancouver for the export of large shipments to Japan and the Far East. The Trans Mountain Oil Pipe Line Company has installed extensive facilities at the Port of Coquitlam for the handling of propane from jumbo tank cars, storing and refrigerating it for shipment overseas in specially equipped ships. This installation, together with the trackage involved, has been inspected and approved by engineers from the Department.

It was assumed until 1965 that the Board of Transport Commissioners for Canada inspected and regulated all propane-unloading facilities in connection with the Canadian Pacific Railway, the Canadian National Railway, and the Great Northern Railway. However, in 1965 this Board made it known its current regulations applied only on the railway right-of-way of any railway under the Federal jurisdiction, and any portions or parts of such installations that were outside of the Board's jurisdiction became a Provincial matter.

Inasmuch as the Department had rules which precisely governed these types of installations on railways under Provincial jurisdiction, such as the Pacific Great Eastern Railway and the British Columbia Hydro and Power Authority Railway, inspections were made on all existing installations located on all railways in British Columbia. The following is a list of the installations as of December, 1966:—

Location of Propane Bulk Storage and Handling Facilities

British Columbia Hydro and Power Authority: Pattullo Gate, New Westminster, Victoria.

Bibby Propane Ltd: Vernon.

British American Oil Co. Ltd.: Fort St. John, Quesnel, Sumas.

Canadian Propane Consolidated Ltd.: Burns Lake, Castlegar, Golden.

Canadian Propane Equipment Co.: Cedarside.

Cigas Products Ltd.: Langley, Prince George, Topley, Vernon.

F.M.C. Chemicals: Squamish.

Home Oil Distributors Ltd.: Clinton, Quesnel, Shalalth, Williams Lake.

Imperial Oil Ltd.: Chetwynd, Ioco, Lillooet, Pemberton, Quesnel, Williams Lake.
Inland Natural Gas Co. Ltd.: Nelson, Trail.
Kamloops Pulp & Paper Co. Ltd.: Avola.
Mountain Gas Ltd.: Cranbrook, Galloway.
Pacific Coast Hydrocarbons: Squamish.
Pacific Petroleums Ltd.: Taylor.
Rockgas Propane Ltd.: Nelson, Penticton, Revelstoke, Smithers, Terrace, Williams Lake.
Seventy-seven Oil Co.: Cranbrook.
Shell Canada Ltd.: Exeter, Quesnel, Squamish, Williams Lake.
Texaco Canada Ltd.: New Westminster, Quesnel, Williams Lake.
Trans Mountain Oil Pipe Line Co.: Westridge, Burnaby.
Western Propane Ltd.: Topley.

In making inspections under Part XII of the regulations, it was found that liaison was required between the Boiler and Pressure Vessel Inspection Branch, the Fire Marshal's Office, the Motor-vehicle Branch, and the propane industry itself. A committee was consequently set up chaired by the Chief Engineer of the Department with a second committee encompassing the five major railways.

Propane has presented a number of problems, especially where the product is transferred from a container such as a tank car to a tank installed on a motor-vehicle. A further public hazard is presented in transferring propane or butane from a tank truck to a stationary storage tank. Hoses under refrigerated conditions are subject to failure, and training became necessary so that people handling this product on the railways, in the trucks, and transferring it to ship-side loading would be properly trained.

The production manager of the British Columbia Hydro and Power Authority's gas division was loaned to the Department to serve on committees and to train personnel. Lectures were conducted at the Bayshore Inn in Vancouver, the Engineering Branch office of the Department in Vancouver, the Fire Marshal's Office in Vancouver and in Prince George.

Meetings have been held in the Fire Marshal's Office from time to time with the industry, the railways, and representatives from the Board of Transport Commissioners of Canada. In addition, legal representatives from the Propane Association of Canada have met with Department officials in an effort to bring this involved matter to a safe and equitable solution.

PIPE-LINES

The petroleum industry continued to be quite active during 1966 in the construction of gas- and oil-gathering systems, mostly in the field of pipe-line connections into the major transmission-lines. There were more than 60 pipe-line projects approved, tested, and certified for operation during the year. The approval of plans, specifications, and installations for these projects is one of the major functions of the Engineering Branch of this Department.

In the Lower Mainland area the British Columbia Hydro and Power Authority gas transmission-lines were inspected and extensions to the system, including the up-grading of operating pressures, were tested and approved. A number of extensions to the distribution system of the Inland Natural Gas Company Limited were carried out during the year and were inspected and tested.

Nine additional water- and gas-injection recovery systems were installed in the Peejay, Boundary Lake, Milligan, and Wildmint fields and approved for operation.

Water-flood- and gas-injection recovery has proven to be very effective, and the principle of proceeding with gas and oil recovery before the field pressure has dropped to any extent has proven the advantage of this procedure.

The annual inspection of compressor and pumping stations was carried out during the year by Department inspectors. Each station was certified, after the inspection, that the requirements of the *Pipe-lines Act* and Fire Marshal's regulations had been complied with. This included the stations of Westcoast Transmission Company Limited, which is under Federal jurisdiction, but the pressure vessels and safety with regard to workmen are under Provincial jurisdiction.

An application by Pacific Diatomite Limited, Edmonton, Alta., for leave to construct a slurry pipe-line in the district of Quesnel was received by the Department. The engineering data and aspects were studied by engineers of this branch and the project was found to be sound, and an Order in Council was recommended and passed approving the construction of this pipe-line. This is British Columbia's first pipe-line for hauling solid materials. It was felt that this could pioneer the construction of other pipe-lines to be used for hauling solid materials long distances in British Columbia. The 4-inch pipe-line will be approximately 8 miles in length and will be used to transport fossilized earth, which is used in the manufacture of fertilizer. The material is ground into small particles at the mine-site and then pumped in water to the railway siding at Barlow Station on the Pacific Great Eastern Railway. Up to 120 tons of material a day can be hauled through this line.

All tank-farms were inspected to make certain that they conformed with the Fire Marshal's regulations. All tank-farms, in addition to being approved by the Department, are also approved by the Fire Marshal. Inspectors of this Department, however, have made all field inspections.

During the year three pipe-line companies were granted certificates for the construction of pipe-lines in British Columbia. They include the Fort Nelson Transmission Company Limited, Pacific Diatomite Limited, and Jefferson Lake Petrochemicals of Canada Limited. The Trans-Prairie Pipelines Limited looped the 12-inch oil-line from the Peejay area during the year, made necessary by the increased oil production from this field. Inland Natural Gas Company Limited has completed 23 miles of distribution-line to serve the townsite of Mackenzie and related pulp-mills in the Pine Pass area, the source of supply being taken from the Westcoast Transmission metering-station.

Cryogenic Enterprises Limited is constructing a methane liquefication plant in the Richmond area. A pipe-line distribution system is being planned for Squamish and several communities on Vancouver Island. The product is to be carried to the distribution points in a specially designed 11,880-gallon liquid-methane trailer at minus 259° F., where it will be re-evaporated and supplied to the distribution systems. The specifications of this trailer were checked by this Department and forwarded to Victoria for approval.

In July of this year a hearing before the Public Utilities Commission at Terrace was attended by officials of this Department. The purpose of the hearing was to consider an application by Pacific Northern Gas Limited to construct a natural-gas transmission system from a point between Summit Lake in Northern British Columbia and Prince Rupert. This would entail the construction of approximately 431 miles of pipe-line at a cost of $24,000,000 and be completed by November, 1967. A certificate of public convenience and necessity was issued to the company on December 8th by the Public Utilities Commission, and an application has been received under the *Pipe-lines Act* by this Department.

Westcoast Transmission Company is at present constructing five additional compressor-stations on the transmission-line from Taylor. The increase in production and consumption of natural gas has resulted in the necessity of increasing the capacity of the present line by adding to the number of compressor-stations at present in operation. Specifications of these stations were checked by this Branch, and on-site preliminary inspections have been made.

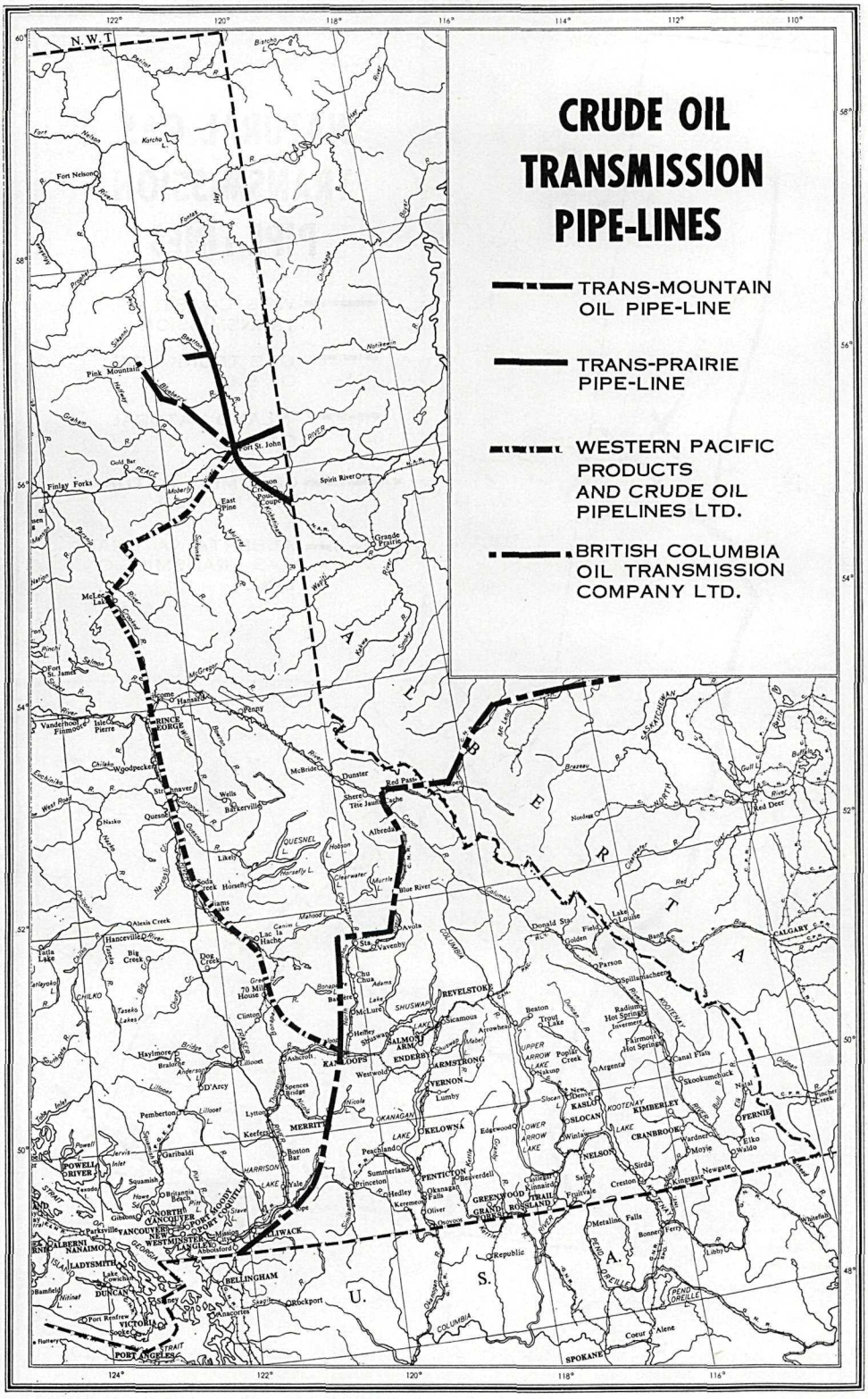
The status of pipe-lines constructed, tested, and approved is contained in the appendix of this report.

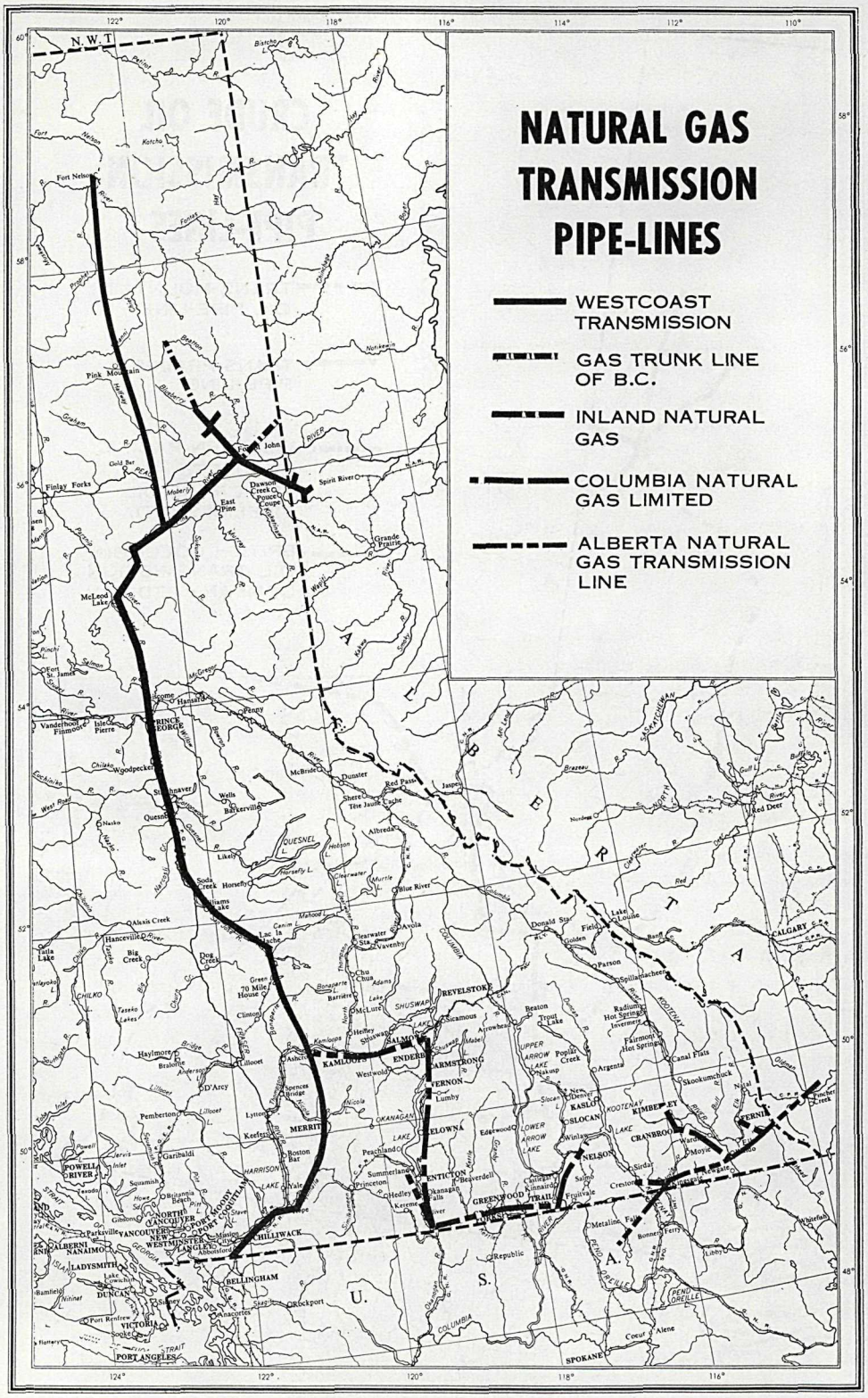
Annual Inspections Under the Pipe-lines Act, 1966

Miles of new pipe-line inspected and tested	162
Compressor-stations inspected	34
Pumping-stations inspected	18
Gas distribution and metering stations inspected	13
Number of tank-farms inspected	5
Approval of plans and specifications for pipe-line projects	60
Number of new extensions to pipe-line projects approved	59
Certificates of inspection issued under the *Pipe-lines Act* authorizing the operation of new extensions to pipe-line projects	58
Number of pipe-line crossings of railways inspected	3
Number of pipe-line crossings of highways inspected	2
Number of pipe-line crossings of other pipe-lines approved	31
Power-line crossings over pipe-line right-of-way approved	13

Pipe-lines Approved, Inspected, and Tested, 1966

Name of Company	Oil or Gas	Project No.	Pipe-line Location	Mileage
British Columbia Hydro and Power Authority	Gas	1345	Coquitlam	1.80
	,,	1356	North Vancouver	1.00
	,,	1364	Surrey	6.95
	,,	1365	Tsawwassen	7.59
	,,	1366	Cloverdale	1.00
	,,	1367	Surrey	1.00
	,,	1370	North Vancouver	4.40
	,,	1371	North Vancouver	1.00
	,,	1381	Twigg Island	3.37
	,,	1391	Richmond	0.27
Dome Petroleums Ltd.	,,	1352	Nig Creek	1.40
Fort Nelson Transmission Co.	,,	1355	Fort Nelson	8.18
	,,	1395	Fort Nelson	0.28
Imperial Oil Ltd.	,,	1401	Rigel	1.50
Inland Natural Gas Co. Ltd.	,,	1248	Pine Pass–Mackenzie townsite	23.00
	,,	1350	Prince George	0.02
	,,	1358	Hudson Hope	0.07
	,,	1369	Castlegar	0.94
	,,	1373	Castlegar	0.73
	,,	1374	Castlegar	0.81
	,,	1382	Kamloops	0.20
	,,	1384	Prince George	0.07
	,,	1390	Prince George	2.10
Jefferson Lake Petrochemicals	,,	1383	Stoddard	6.67
Pacific Diatomite Ltd.	Slurry	1378	Quesnel (approved only)	8.50
Pacific Petroleums Ltd.	Gas	1346	Buick Creek	1.20
	,,	1347	Fort St. John	5.17
	,,	1354	Clarke Lake	3.50
	,,	1392	Laprise	9.10
	,,	1399	Clarke Lake	1.50
Plains Western Ltd.	,,	1372	Fort St. John	1.06
	,,	1385	Fort St. John	0.70
Texaco Exploration	,,	1348	Nig Creek	0.60
	,,	1394	Boundary Lake	9.10
Trans-Prairie Pipelines Ltd.	Oil	1357	Taylor North	15.50
	,,	1359	Milligan Creek	1.80
	,,	1361	Taylor North	23.50
	,,	1363	Nancy	3.20
Union Oil Co.	,,	1396	Weasel	0.76
	,,	1397	Bullrush	1.04
	,,	1398	Milligan	1.40
Total				161.98


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.
Fort Nelson
Pink Mountain
Fort St. John
Finlay Forks
Spirit River
Grande Prairie
McLeod Lake
Prince George
Vanderhoof
Fraser Lake
Burns Lake
Smithers
Hazelton
Terrace
Prince Rupert
Queen Charlotte Islands
Dawson Creek
Chetwynd
Mackenzie
Bella Coola
Williams Lake
Quesnel
Wells
Barkerville
Hanceville
Alexis Creek
Lac la Hache
Clinton
70 Mile House
Ashcroft
Lillooet
Pemberton
Squamish
Garibaldi
Britannia Beach
Powell River
Gibsons
Sechelt
Parksville
Nanaimo
Ladysmith
Duncan
Port Renfrew
Victoria
Sooke
Port Angeles
Port Moody
Port Coquitlam
Langley
Vancouver
North Vancouver
New Westminster
Abbotsford
Mission
Chilliwack
Bellingham
Anacortes
Rockport
Sedro Woolley
Lytton
Merritt
Boston Bar
Spences Bridge
Kamloops
Salmon Arm
Enderby
Armstrong
Vernon
Revelstoke
Sicamous
Kelowna
Penticton
Summerland
Princeton
Hedley
Keremeos
Oliver
Osoyoos
Greenwood
Grand Forks
Trail
Rossland
Nelson
Kaslo
Slocan
New Denver
Kimberley
Cranbrooke
Fernie
Elko
Wardner
Moyie
Creston
Kingsgate
Newgate
Salmo
Fruitvale
Metaline Falls
Bonners Ferry
Libby
Republic
Coeur d'Alene
Spokane
Pend Oreille
Revelstoke
Golden
Donald Sta.
Field
Lake Louise
Banff
Calgary
Red Deer
Drumheller
Edmonton
Jasper
Grande Prairie
Fort St. John
Dawson Creek
Fort Nelson
Pine River
Dunster
Red Pass
Tête Jaune Cache
Albreda
Blue River
Avola
Vavenby
Sta.
McLure
Chu Chua
Barriere
Kamloops
Westwold
Lumby
Edgewood
Beaverdell
Beaton
Trout Lake
Radium Hot Springs
Invermere
Fairmont Hot Springs
Canal Flats
Skookumchuck
Argenta
Nakusp
Winlaw
Salmo
Creston
Kingsgate
Newgate
Moyie
Wardner
Elko
Wallo
Fernie
Pincher Creek
Cranbrook
Kimberley
Kaslo
Slocan
Nelson
Trail
Rossland
Grand Forks
Greenwood
Oliver
Osoyoos
Penticton
Summerland
Kelowna
Vernon
Salmon Arm
Enderby
Armstrong
Revelstoke
Sicamous
Kamloops
Merritt
Lytton
Boston Bar
Spences Bridge
Lillooet
Pemberton
Squamish
Garibaldi
Britannia Beach
Powell River
Gibsons
Sechelt
Parksville
Nanaimo
Ladysmith
Duncan
Port Renfrew
Victoria
Sooke
Port Angeles
Port Moody
Port Coquitlam
Langley
Vancouver
North Vancouver
New Westminster
Abbotsford
Mission
Chilliwack
Bellingham
Anacortes
Rockport
Sedro Woolley
Lac la Hache
Clinton
70 Mile House
Ashcroft


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
N.W.T.
Fort Nelson
Fort St. John
Dawson Creek
Pouce Coupe
Spirit River
Finlay Forks
McLeod Lake
Prince George
Vanderhoof
Fraser Lake
Burns Lake
Smithers
Terrace
Prince Rupert
Queen Charlotte
Port Simpson
Kitimat
Stewart
Hazelton
Kitwanga
Kitsumkalum
Kitsumkalum
Kitsumkalum

INDUSTRIAL ROADS

Despite a decline in log production in the latter part of 1966, logging-trucks have again increased in numbers and size. Units fitted with 15-foot bunks, 8-foot stakes, and powered by engines of 500 horsepower are no longer a sight to inspire awe in the casual observed. While the vehicle size and proportionate load would appear to present more problems safety-wise, such is not the case. These trucks, which are being supplied to the logging industry by local manufacturers, represent the ultimate in safety as it is known today. The braking systems contain all the latest safety refinements, as well as those which have been successfully used over the past years. The measure of safety afforded by this arrangement has been recognized by the Motor-vehicle Branch and is now mandatory on the large air-equipped school buses in the Province. The adoption of this braking system will provide our school-children with far greater protection than is enjoyed anywhere else in the world.

While the installation of safety equipment is one thing, the training of drivers in the operation of this same equipment gives rise to more problems. To this end, inspectors of the Department travel often to remote areas of the Province to conduct vehicle inspections, lectures, and examinations to ensure that only competent personnel are employed as air-equipped vehicle operators, and that the vehicles themselves are maintained in a proper manner. Despite this training, accidents are still being experienced on our industrial roads, but it has been found that the incidence of accidents is decreasing while the number of vehicles employed is increasing. Comparing this with the increase in accidents involving highway transport trucks, one can only assume that insistence on safety equipment, proper inspection, and driver-training is paying dividends for the logging industry.

Industrial-road complexes, while originally constructed to obtain access to rich timber stands or mineral deposits, have become highways to the outside world for numbers of formerly isolated communities. A case in point is the link-up of industrial roads which connect Campbell River and the Port Hardy area as well as the west coast of Vancouver Island. People residing in these areas are now allowed to use these roads after normal working-hours.

The prospect of being able to get out for a week-end once in a while has encouraged more people to move into this section of Vancouver Island, thereby creating instant towns as well as establishing a reliable working force for the logging concerns in the area.

Columbia Cellulose Company Limited, operating in the Terrace district, is opening up a vast area on the Nass River. This river is some 70 miles north of Terrace and is reached by a first-class industrial road owned and operated by this company. Again, while providing a means of logging the forest, it also serves the Indian communities along the river and provides for easy access to considerable mining development north of the logging limits.

Winter operations have in the past been curtailed due to the freezing over of the river, thus causing seasonal unemployment. However, the company is in the process of extending its logging-road west along the river to reach the salt water. When this is completed, year-round logging operation will be possible. This, of course, is most desirable for both the employer and the employee as well as the business life of Terrace and surrounding communities.

The extension of the logging-road to an ice-free booming-ground has tripled the distance for log haulage. The cost of hauling a single load of logs for this many miles is considerable, so, taking a leaf from the book of the Vancouver Island logger, truck trains are being introduced to this haul. Truck tractors capable of pulling up to four trailer loads of logs are being purchased for this project. The use of these

trains has presented problems with the braking systems and trailer hook-ups, which, however, have been overcome by engineers of the Department working closely with the truck and trailer manufacturers.

Another industrial road which bears mention at this time is the one operated by Trautman-Garroway Limited at Peachland. The first 8 miles of this road were originally constructed as access to the Peachland water reservoir system, and they were maintained by the Department of Highways. As time went by, Trautman-Garroway Limited developed its logging operations in the area and, to facilitate movement of its heavy logging-trucks, widened and improved this stretch of road to the point that very few traces of the original road remained. However, since this was still gazetted as a public road, the Department of Highways was still responsible for snow removal and general road maintenance, which was proving to be quite costly and resulted in machinery being allocated to this road when it could have been used more advantageously elsewhere.

Upon receiving a request from the company that this be declared an industrial road, an Inspecting Engineer from the Department was dispatched to conduct a survey of the road. As a result of his inspection, an agreement was reached with the Department of Highways resulting in a change of status so that Trautman-Garroway Limited maintains this road under the *Industrial Transportation Act,* having full jurisdiction under regulations approved by this Department.

Since the Trautman-Garroway road is adjacent to the company's other logging-roads in the area, opportunity for the public to enjoy the excellent hunting and fishing to be found in the district is now possible, providing it respects the road regulations as posted by the company.

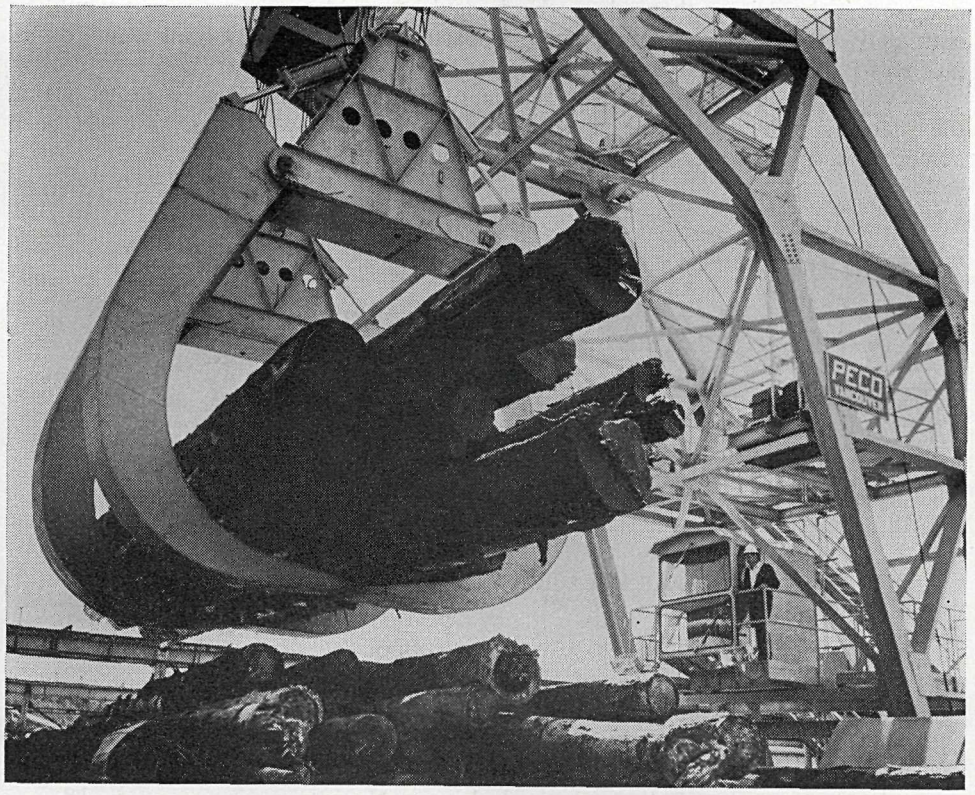
In general, hunters, fishermen, hikers, and tourists have welcomed the opening-up of new vistas as provided by those companies operating industrial roads. While there have been isolated acts of vandalism and theft in some localities, the public as a whole has been very co-operative, and it is to be hoped that the present good relationship will continue as new areas develop.

Accident reports have been gratifying in 1966, inasmuch as there were no driver fatalities. However, reports filed do indicate a number of near misses. Investigation of these accidents reveals in all cases that drivers had become inured to the danger of overspeeding or had overestimated their ability to control their vehicle. One of the greatest difficulties encountered by the Department engineers has been to attempt to overcome the complacent attitude found in some truck-drivers. Success in this endeavour is difficult to achieve and may be best overcome by more frequent trips to logging operations where this unfortunate attitude exists.

A total of six investigations by members of the Department into accidents involving highway tractor trailers was conducted in 1966. These investigations were made at the request of the Royal Canadian Mounted Police highway patrol and the New Westminster City Police when air-brake failure was suspected as the cause of an accident.

It is expected that requests of this type of investigation will lessen in the future as a semi-annual traffic course conducted for the police at Victoria now consists in part of three to four days' training on air brakes and truck inspection taught by staff of the Department. All persons benefit as a result of this instruction, as the police are now able to make more comprehensive safety checks of these large highway transports.

While on the subject of highway traffic, it is surprising to note the interest of transport-drivers in the courses conducted during the past year at the Burnaby Vocational School. The men attending these courses were experienced truck-drivers who wished to further their knowledge of diesel engines and air brakes. The Auto-



Unloading logs with a grapple at a Crown Zellerbach pulp-mill operation.

motive Transport Association of British Columbia, the driving force behind these classes, found the response to be far greater than it had anticipated, especially to the air-brake programme.

Students in training at the British Columbia Vocational Schools were, as in previous years, given air-brake training, and working models of the air systems were installed at the Prince George and Nelson schools under the guidance of the Department.

Technical information pertaining to stopping ability and distances was produced in Court for the benefit of the police, where this information was used to determine the outcome of the Court's judgment.

New air-brake valves and associated equipment have been presented for testing and approval, and, as in the past, only that equipment which could meet the standards as determined by the Department was given recognition for the Province of British Columbia.

With new types of vehicles entering the field of industrial transportation, it is important that the safety of these units be assured. To that end, the Department was forced in some instances to cause the manufacturers to alter the braking systems to provide a maximum of safety for the operator.

While the lumbering industry continues to grow year by year, resulting in rapid changes in transportation methods and a fantastic increase in the number of vehicles travelling on industrial roads, accidents have been held to a minimum. Without the co-operation of the logging companies, the truck-manufacturers, and in

many cases the drivers themselves, the foregoing would not be true as it would be extremely difficult for inspectors of the Department to keep a 24-hour watch on all facets of industrial transportation.

With continued support from within the lumbering industry, it appears that the year 1967 should produce even better results safety-wise than have yet been achieved, despite a record number of men and machines involved.

Annual Inspections under the Industrial Transportation Act

	1964	1965	1966
Logging-trucks inspected	573	295	245
Gravel trucks inspected	44	68	46
Crummies (workmen's buses)	244	158	161
Miscellaneous vehicles (including highway vehicles)	303	110	98
Air-brake lectures	23	21	25
Lecture attendance	534	450	730
Logging-truck operators certified	528	350	494
British Columbia Vocational Schools and other institutes (air-brake examinations)	108	158	140
Royal Canadian Mounted Police (air-brake examinations)	20	28	56

Air-brake Lectures Conducted during 1966

Date	Place	Attendance at Lectures
January 12	Prince George Vocational School	21
January 19	Department of Highways, Cloverdale	22
February 16	Nanaimo Vocational School	51
March 1	Diesel transport operators, Burnaby	30
March 3	Diesel transport operators, Burnaby	30
March 4	Crown Zellerbach truck-drivers, Nitinat	18
March 17	Royal Canadian Mounted Police, Victoria	24
March 18	Royal Canadian Mounted Police, Victoria	24
March 19	Royal Canadian Mounted Police, Victoria	24
March 20	Nanaimo Vocational School	9
May 5	Haney Correctional Institution	30
May 10	Diesel transport operators, Burnaby	60
May 11	Diesel transport operators, Burnaby	60
May 30	Crown Zellerbach, Beaver Cove	24
July 13	Crowsnest Industries truck-drivers, Fernie	20
July 20	Kootenay Forest Products, Nelson	25
September 16	Terrace logging-truck drivers	60
September 19	Nass River logging-truck drivers	30
September 20	Burnaby Vocational School	24
October 20	Royal Canadian Mounted Police, Victoria	32
October 21	Royal Canadian Mounted Police, Victoria	32
November 14	Crown Zellerbach, Nanaimo Lakes	26
November 28	Haney Correctional Institution	32
December 5	Royal Canadian Mounted Police, Vancouver	12
December 7	Royal Canadian Mounted Police, Vancouver	12
Total		730

ACCIDENT PREVENTION PROGRAMME

In line with Government policy, a programme of safety in the Department and in co-operation with industry has been carried out. Safety has been a prime consideration in the operation of all branches of the Department, and during the past year supervisory staff have been alert to dangerous practices and have recommended and required alternate more safe methods of operation by industry.

Equipment such as hard hats and reflectorized raincoats have been provided for members of the staff of the Weigh Scale Branch who are required to perform their duties on the open highway amidst heavy and fast-moving traffic. It is reported that this equipment not only provided better visibility to oncoming traffic, but afforded greater confidence to the operators working under these dangerous conditions.

In addition, the use of reflectorized traffic cones in areas where traffic direction is necessary both on the highway and within the operating confines of the permanent weigh-scales has contributed considerably to the standard of safety of these operations. At the permanent weigh-scales throughout the Province, additional illumination has been provided where it was considered necessary to eliminate hazardous conditions of operation.

New-type portable scales have been obtained, which reduce the actual weighing hazard and, due to their simplified operation, the time involved in turn contributes to the actual highway safety factor. It is anticipated that all portable units will be equipped with the new-type scale in the next two years.

A study has been made by the Engineering Branch into the feasibility of using the reflectorization principle on switch-stand targets of the Pacific Great Eastern Railway, including the use of this principle on all types of flags such as " Slow," " Stop," " Caution," etc., used for the protection of trains and crews.

It was found that the use of this principle on switch targets was very successful, and it was possible to do away with switch lamps as the reflectorized targets were far superior at night when energized by the locomotive headlights, especially in bad weather conditions. Preparations for testing out this principle on flags, yard-limit signs, and order boards are at present under way.

A number of safety devices have been devised and tested with regard to the safe operation of aerial tramways. These have been approved for operation, and when installed will be tested by the Department engineers. These include automatic braking, anti-roll-back, and bullwheel safety devices. Several chair-lifts were retested during the year to ensure that a satisfactory standard of safe operation was being maintained and further safety devices were not required.

As in previous years, new air-brake equipment being produced by manufacturers has been submitted to the Engineering Branch and tested before being approved for use on industrial roads in the Province. An installation of a braking system to provide greater safety in the operation of school buses where spring-activated emergency brakes are installed was designed and approved. This system was adopted and approved for operation on highways of the Province by the Motor-vehicle Branch.

The staff of the Department of Commercial Transport are ever cognizant of the need for safety in their daily operations, and we recognize their achievements in this programme. During the year a second silver safety award was presented to the Department for an accident-free period of operation extending over 19 months. We are pleased that this safety-conscious Department has been able to attain this record.

SAFETY IS YOUR BEST INVESTMENT
SAVINGS OF SAFETY PROG
SAVINGS
$
400 000
300 000
RETURN ON
INVESTMENT-%
604
285
96

ACCOUNTS BRANCH

D. I. EWEN, C.O.A., SENIOR CLERK

Accounting procedures were not changed to any extent during 1966, with the exception of a revision in payroll preparation, which was required to meet new policies of the Department of Finance.

Personnel records were maintained in the prescribed manner, although during the year an improved method of recording this information was implemented. This has been an asset to both the accounting office and to the personnel officer.

Relaxation by the Purchasing Commission in the level of purchases requiring purchase orders has resulted in greater flexibility in the field and has lessened administrative problems at headquarters.

Mileage charts, which are used to prepare permits for the movement of heavy loads and in computing pertinent fees, were revised in line with changes in highway routes and varying mileages.

An increase of 8 per cent in the issuance of oversize and overweight permits during the past year indicates the continued growth of the trucking industry within the Province. This trend is further evidenced by a rise of 8 per cent in the number of temporary operating permits issued. This, together with the additional number of commercial vehicles and trailers licensed, accounts for an over-all increase in gross revenue of 10 per cent.

Block load permits and restricted-route permits available to primary industries of the Province account for the greater portion of an 18-per-cent gain in oversize and overweight revenue, although the continuation of the major construction of the various power projects is still responsible for a minor increase in overweight revenue. Revenue derived from the operation of oversize vehicles has been supported by the use of trailers over 40 feet and the issuance of short-term permits to cover their operation.

The number of active company accounts has remained constant, with the addition of 20 new companies and the cancellation of 21 old ones. The number of oversize and overweight permits audited by this office has again increased and now averages approximately 3,000 per month, with the highest single month's operation in July when 3,847 permits were received, audited, and billed. The fact that this was accomplished with no interruption in the other duties points out the invaluable benefit derived from the change-over from manual accounting to data processing.

There has been a considerable increase of 27 per cent in the number of commercial vehicles registered under the Western Compact Prorate Agreement and, to a lesser degree, 18 per cent in prorate trailer registration. This gives an indication of the benefit derived by the operator as well as by the Province in the implementation of this agreement. The same appears to be true of the reciprocal agreement between the Province of British Columbia and several of the other Canadian Provinces in respect to the movement of used household goods. The increase in the east-west flow of commercial traffic is particularly noticeable when, in addition to movement of trucks under these various reciprocal agreements, the number of non-resident permits issued shows an increase of 10 per cent. By far the greater number of these permits are written at the Golden weigh-scale. However, the volume at this scale is expected to decrease to some extent when the Yellowhead Pass route is opened next year.

A programme of up-dating and modernizing office equipment in the various weigh-scale stations has been initiated, and it is anticipated that this will further

increase the efficiency of the field offices and, in particular, those serving as regional offices.

The following tables show results of the activities of the Weigh Scale Branch during the past year. Other tables relating to the Engineering Branch are included elsewhere in this report.

TABLE 1.—REVENUE FROM GASOLINE AND MOTIVE-FUEL USE TAXES FOR PASSENGER AND COMMERCIAL VEHICLES[1]

Fiscal Year	Amount	Fiscal Year	Amount
1954/55	$17,455,000	1960/61	$30,093,000
1955/56	19,820,000	1961/62	39,262,000
1956/57	22,593,000	1962/63	43,129,000
1957/58	24,500,000	1963/64	46,420,000
1958/59	26,100,000	1964/65	50,865,000
1959/60	28,582,000	1965/66	56,441,000

1 Includes vehicles licensed under prorate agreement with American States.

TABLE 2.—SUMMARY OF COMMERCIAL-VEHICLE LICENCES AND PERMITS ISSUED, JANUARY 1, 1966, TO DECEMBER 31, 1966

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	22,503	6,088	1,131	2,097	2,507	79,845
February	78,398	6,639	1,006	1,947	2,746	97,086
March	20,009	1,250	1,955	4,244	2,764	122,893
April	7,856	490	1,062	3,510	2,328	90,017
May	6,161	683	1,174	3,943	2,846	98,235
June	5,140	380	2,091	3,908	3,060	124,672
July	3,647	235	1,391	3,266	3,847	104,389
August	3,494	261	1,604	3,241	2,891	110,497
September	3,137	338	1,943	2,922	3,030	146,806
October	2,509	153	1,534	2,989	3,225	107,573
November	2,114	143	1,089	2,847	2,861	101,640
December	2,100	125	1,275	2,750	2,500	108,000
Totals	157,068	16,785	17,255	37,664	34,605	1,291,653

1 Includes vehicles licensed under prorate agreement with American States.

TABLE 3.—SUMMARY OF PRORATE OPERATION, 1966

	Companies Prorated	Tractor Units	Trailer Units
British Columbia	55	249	169
United States	215	2,649	5,077
Totals	270	2,898	5,246

TABLE 4.—COMPARISON OF GROSS REVENUE COLLECTIONS FROM COMMERCIAL LICENCE AND PERMIT FEES FOR FIVE-YEAR PERIOD 1961/62 TO 1965/66, INCLUSIVE.

Source	1961/62	1962/63	1963/64	1964/65	1965/66
Commercial motor-vehicle licences	$7,938,605.82	$8,253,251.46	$8,910,152.29	$9,706,485.52	$10,674,538.55
Non-resident commercial permits	478,156.17	381,673.01	404,410.49	410,645.40	429,067.05
Trailer fees	57,452.34	61,408.52	74,298.71	81,223.22	91,177.10
Temporary operation permits	58,442.51	62,909.21	66,001.38	80,692.20	98,006.54
Oversize and overweight permits	321,730.55	368,715.57	447,680.61	530,171.28	629,453.01
Totals	$8,854,387.39	$9,127,957.77	$9,902,543.48	$10,809,217.62	$11,922,242.05

TABLE 5.—SUMMARY OF VIOLATIONS ISSUED, JANUARY 1, 1966, TO DECEMBER 31, 1966

Licence and Permit Violations

Gross vehicle weight	1,442
Motor-vehicle registration	722
Licence-plates	608
Trailer plates	154
Quarterly licence	22
Non-resident permit	63
Temporary operation permit	12
Motive-fuel emblem	81
Overweight permit required	23
Oversize permit required	58
Restricted-route permit	32
Highway-crossing permit	13
Proration	3
Other	6
Total violations	3,239
Total number of vehicles checked	1,291,653

Motor-carrier Violations

Motor-carrier plates not displayed	436
Motor-carrier licence not carried	295
Conditions of licence not carried	286
Operating otherwise than permitted by licence	309
Total violations	1,326
Total number of vehicles checked	18,783

Oversize and Overweight Violations

Oversize and overweight violations issued	1,236
Oversize and overweight prosecutions, including those through Royal Canadian Mounted Police	1,078

PERSONNEL

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

During the year a considerable number of personnel changes were made as a result of retirements and increased establishment, as follows:—

	Field	Headquarters
Retirements	1	1
Resignations	8	2
New appointments—		
Permanent	10	6
Temporary	5	1
Transfers	3	1
Promotions	2	1
Number of competitions held	20	4

To fill the vacancies occasioned by the above-noted resignations and retirements, interviews were held in Vancouver, Pattullo Bridge, Hunter Creek, Cache Creek, Prince George, Dawson Creek, Fernie, Vanderhoof, Cranbrook, and Victoria.

Transfers were made to meet Departmental requirements and at the request of the individual staff members concerned.

The increased industrial activity throughout the Province reflects to some degree the slight decrease in interest displayed in the competitions for weighmaster positions. This is not a general condition, however, and only prevails in areas of intense industrial activity such as Prince George and Peace River centres.

The loss to the Department through retirement of Mr. J. G. M. (" Monty ") Lock, Director of Operations of the Weigh Scale Branch, and of Mr. T. U. (" Benny ") Lassalle, weighmaster at Fernie, is of noteworthy mention. Mr. Lock came to the Department of Commercial Transport at its inception from the Weigh Scale Branch of the Department of Highways, after spending some 25 years in the British Columbia Provincial Police and the Royal Canadian Mounted Police.

The Department was fortunate to obtain the services of Mr. F. J. Regan to replace Mr. Lock. Mr. Regan came to this Department with considerable background in enforcement, traffic control, and general administrative duties related to the commercial-vehicle industry in British Columbia.

Similarly, Mr. Lassalle upon his retirement climaxed a distinguished career in the service of the people of British Columbia, which commenced in April, 1927, as an equipment operator with the Department of Highways, where he served faithfully until he transferred to the Department of Commercial Transport in 1959. In 1966 Mr. Lassalle—" Benny " to his many friends in the Service—retired after 39 years and 2 months in the employ of the Province of British Columbia.

The increase in volume of commercial-vehicle movement within the Province necessitated a considerable increase in work load at many of the weigh-scales. In addition, it was necessary to provide permanent facilities in areas otherwise dependent upon the services of a portable-type operation. To keep pace with this influx of work load, increases in staff were requested and granted in the 1966 establishment.

The change-over from casual to permanent status of the weighmasters was completed early in the year, and a study is being undertaken at the present time with a view to recommending an up-grading of the position of weighmaster to reflect the increased duties now being assumed by the men in these positions.

The staff of the Engineering Branch was increased during the year by the addition of two new inspectors and one clerk. Despite the complexities of the work and the many and varied classes of engineering entailed in the sphere of Departmental operation, the new men appear to be adapting themselves quite adequately at this early stage of their training. To fill the position of Clerk 1 in the Engineering Branch, Miss S. J. E. Reuss joined the staff in August this year. Miss Reuss is a welcome addition to the small but capable clerical staff of this Branch.

The year 1966 has been one of growth and development, and the personnel of the Department of Commercial Transport have kept pace with the demands of service from all industries within its jurisdiction.

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