A Century
of Our Stories

100 Years of Building a Legacy Together

1919 — 2019

A Century
of Our Stories

100 CN

100 Years of Building a Legacy Together

1919 — 2019

2019 is a special year for CN as we mark the 100th anniversary of our founding. We have evolved from a collection of disparate government-owned railways into a leading publicly traded North American transportation and supply chain company. As a long-time member of the Board of CN and now Chair of Board, I am honoured to have witnessed an important part of this remarkable transformational journey—our privatization in 1995 and expansion of our network through the heartland of America all the way to New Orleans. CN has become an increasingly important part of the North American landscape and our iconic brand is synonymous with innovation and operational excellence.

I want to congratulate everyone at CN, past and present, for your remarkable contributions to building our great railroad. CN wouldn't exist without the women and men who built our company over the course of the last century. Efficiency, skill and determination have been your hallmarks as you have helped to deliver the goods for our customers and supply chain partners.

Many people have contributed to this great company over our 100 years. Some of their stories are told in this book. And so it is with great pride that I invite you to discover, explore and celebrate the people, places and events that have made CN the success it is today. We have a great deal to be proud of as we move forward into our next century.

— Robert Pace, D.COMM., C.M.
Chair of the Board
Canadian National Railway Company

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Welcome to *100 Years of Building a Legacy Together.* In this unique book, CN's rich history is brought to life through images and first-person accounts. This compilation is not organized like a traditional history book, but is instead a kaleidoscope of viewpoints. Inside, you will discover voices of our people—present and past—that illustrate aspects of CN's role in nation-building, connecting people and markets, and our deep history of innovation. If there is one theme that ties these 100 perspectives together, it is the unforgettable people who, together through time, have made CN the great company it is today. We are proud railroaders. This is our history and these are our stories.

Please join me in paying tribute to those who came before us and in sparking excitement for railroading in future generations of the CN family.

— Jean-Jacques Ruest
President and Chief Executive Officer
Canadian National Railway Company

Congratulations on the first 100 years from CN's current Board of Directors—and here's to 100 more!

Standing: Amb. Gordon D. Giffin, Shauneen Bruder, Hon. Denis Losier, Hon. Kevin G. Lynch, Donald J. Carty, James E. O'Connor, Julie Godin, Robert L. Phillips.

Sitting: Edith E. Holiday, Robert Pace (Board Chair), V. Maureen Kempston Darkes, Jean-Jacques Ruest (President & CEO), Laura Stein.

CURRENT

Robert Pace
Board Chair 2014 to date

Jean-Jacques Ruest
President & CEO 2018 to date

Shauneen Bruder
Donald J. Carty
Amb. Gordon D. Giffin
Julie Godin
Edith E. Holiday
V. Maureen Kempston Darkes
Hon. Denis Losier
Hon. Kevin G. Lynch
James E. O'Connor
Robert L. Phillips
Laura Stein

2009–2019

Robert Pace
Board Chair 2014 to date

David G. A. McLean
Board Chair 1994–2014

Jean-Jacques Ruest
President & CEO 2018 to date

Luc Jobin
President & CEO 2016–2018

Claude Mongeau
President & CEO 2010–2016

E. Hunter Harrison
President & CEO 2002–2009

Michael R. Armellino
A. Charles Baillie
Hugh J. Bolton
Shauneen Bruder
Donald J. Carty
J. V. Raymond Cyr
Amb. Gordon D. Giffin
Julie Godin
James K. Gray
Edith E. Holiday
V. Maureen Kempston Darkes
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Hon. Edward C. Lumley
Hon. Kevin G. Lynch
James E. O'Connor
Robert L. Phillips
Laura Stein

1999–2009

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Board Chair 1994–2014

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President & CEO 2002–2009

Paul M. Tellier
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A. Charles Baillie
Hugh J. Bolton
Purdy Crawford
J. V. Raymond Cyr
Amb. Gordon D. Giffin
James K. Gray
Edith E. Holiday
V. Maureen Kempston Darkes
Richard H. Kroft
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Robert H. Lee
Hon. Denis Losier
Hon. Edward C. Lumley
Alexander P. Lynch
Claude Mongeau
Edward P. Neufeld
Robert Pace
Cedric E. Ritchie

1989–1999

David G. A. McLean
Board Chair 1994–2014

Brian D. Smith
Board Chair 1989–1994

Brian O'Neill Gallery
Board Chair 1987–1989

Paul Tellier
President & CEO 1992–2002

John Harry Douglas Sturgess
President 1992

Ronald E. Lawless
President & CEO 1987–1992
President 1985–1987

Michael R. Armellino
Alfred James Bentley
Jacob Brouwer
George T. H. Cooper
Guy Coulombe
Purdy Crawford
J. V. Raymond Cyr
Eugene Demkiw

1989–1999 (CONT.)

Jean B. Forest
James K. Gray
H. Donald Guthrie
E. Hunter Harrison
Hon. Janis G. Johnson
V. Maureen Kempston Darkes
Richard H. Kroft
Gilbert H. Lamphere
Hon. Denis Losier
Hon. Edward C. Lumley
Alexander P. Lynch
Emerson A. Mascoll
Maurice Mayer
Stuart A. Murray
Edward Peter Neufeld
Robert Pace
Yvon R. Poitras
Cedric E. Ritchie
Bernard A. Roy
Francis J. Ryan
Cheryl J. Stagg
George W. Wickett

1979–1989

Brian R. D. Smith
Board Chair 1989–1994

Brian O'Neil Gallery
Board Chair 1987–1989

Dr. Jean Maurice LeClair
Board Chair & CEO 1985–1986
President 1982–1985

Elizabeth J. Hewes
Board Chair 1984–1985

Hon. John Henry Horner
Board Chair 1982–1984

Gen. Jacques A. Dextraze
Board Chair 1977–1982

Ronald E. Lawless
President & CEO 1987–1992
President 1985–1987

Robert A. Bandeen
President 1974–1982

Robert Bégin
Alfred James Bentley
Jacob Brouwer
George T. H. Cooper
Guy Coulombe
Eugene Demkiw
Pierre Des Marais II
Giuseppe Di Battista
Christine A. Fagan
Austin E. Hayes
James S. Hinds
Hon. Janis G. Johnson
Benoit Joncas
Charles Kroft
Lawrence Charles LaTouche Jolivet
Gary David Mandel

1979–1989 (CONT.)

Marie T. Marchand
Emerson A. Mascoll
David. G. A. McLean
Andre Monast
Ken Nurse
Herbert Charles Pinder
Yvon R. Poitras
Ewart Arthur Pratt
Harold A. Renouf
Fred D. Rosebrugh
Francis J. Ryan
John Tulloch Sears
Cheryl J. Stagg
George T. Urquhart
William John Vancise

1969–1979

Gen. Jacques A. Dextraze
Board Chair 1977–1982

Pierre Taschereau
Board Chair 1974–1977

Norman J. MacMillan
Board Chair & President 1967–1974

Robert A. Bandeen
President 1974–1982

David A. Anderson
Clifford Curtis
Pierre Des Marais II
Norman P. Dryden
James Raymond Griffith
Austin E. Hayes
James S. Hinds
Harris Huston
Walter C. Koerner
Charles Kroft
Lawrence Charles LaTouche Jolivet
David G. A. McLean
André Monast
Herbert Charles Pinder
Ewart Arthur Pratt
Yves Pratte
Fred D. Rosebrugh
Renault St. Laurent
Bernard Tailleur
William John Vancise

1959–1969

Norman J. MacMillan
Board Chair & President 1967–1974

Donald Gordon
Board Chair & President 1950–1966

David A. Anderson
G. E. Ayers
Edward W. Bickle
Ralph B. Brenan
Robert Arthur Brown
Guy Charbonneau
Walter Alexander Colquhoun
Clifford A. Curtis
Pierre Des Marais II
Norman P. Dryden
Wilfred Joseph Theophile Gagnon
James Raymond Griffith
Austin E. Hayes
Harris Huston
Walter C. Koerner
George-Emile Lapalme
Jean-Louis Levesque
Herbert Marsh
A. McD. McBain
François Norbert
James Alexander Northey
William James Parker
Herbert Charles Pinder
Chesley A. Pippy
Yves Pratte
H. I. Price
J. B. Sangster
Renault St. Laurent
W. Gerald Stewart
Bernard Tailleur

1949–1959

Donald Gordon
Board Chair & President 1950–1966

Robert Charles Vaughan
Board Chair & President 1943–1949

Edward W. Bickle
Ralph B. Brenan
Brenton Leo Daly
Wilfred Joseph Theophile Gagnon
James Raymond Griffith
Herbert Marsh
James Alexander Northey
William James Parker
W. Gerald Stewart
Herbert James Symington
Edward James Young

1939–1949

Robert Charles Vaughan
Board Chair & President 1943–1949
President 1941–1942

Samuel James Hungerford
Board Chair & President 1936–1942

Ralph B. Brenan
Brenton Leo Daly
Wilfred Joseph Theophile Gagnon
Robert John Moffat
James Young Murdoch
James Alexander Northey
Charles H. Read
Herbert James Symington
Edward James Young

1929–1939

Samuel James Hungerford
Board Chair & President 1936–1942
President 1933–1936

Charles Percy Fullerton
Board Chair 1933–1936

Major Gen. Sir Henry Worth Thornton
Board Chair & President 1922–1933

W. A. Boys
Hon. Edward Brown
W. J. Christie
James T. Cumming
Brenton Leo Daly
Frederick G. Dawson
Ernest R. Decary
Wilfrid Joseph Theophile Gagnon
James Gill Gardner
George Henderson
R. A. C. Henry
R. Byron Horner
Hon. M. Kennedy
Joseph Edouard Labelle
Hance J. Logan
D. J. McDougald
Donald Hugh McDougall
Robert John Moffat
Tom Moore
Lucien Moraud
Frederick K. Morrow
James Young Murdoch
James Alexander Northey
John D. Palmer
Gordon F. Perry
James Ramsey
Nelson Rattenbury
J. Stuart Rayside
Charles H. Read
S. E. Richards
Gerard G. Ruel
Valentine Irving Smart
Hon. E. A. Smith
J. Fyfe Smith
Herbert James Symington
Col. O. E. Talbot

1919–1929

Major Gen. Sir Henry Worth Thornton
Board Chair & President 1922–1933

David Blythe Hanna
President 1919–1921

Major Graham A. Bell
Hon. Edward Brown
Col. Thomas Cantley
Frederick G. Dawson
Ernest R. Decary
James Gill Gardner
Richard P. Gough
C. M. Hamilton
R. A. C. Henry
Robert Hobson
F. P. Jones
Sir Hormidas Laporte
Mathew Lodge
Hance J. Logan
R. H. MacKay
D. J. McDougald
A. J. Mitchell
Tom Moore
Nelson Rattenbury
J. Stuart Rayside
R. T. Riley
Gerard G. Ruel
John H. Sinclair
Hon. E. A. Smith
James Stewart
Col. O. E. Talbot
E. R. Wood

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3 # HOW TO READ THIS BOOK

4 ## Celebrating a Century

This book looks at CN's first 100 years through 100 different perspectives. What is a perspective? It's an identifiable point of view, a lens that illuminates an aspect of the railway's story. That could be a first-person account from a railroader about operating locomotives, an anecdote about one of the company's many technical innovations or an aerial shoot offering breathtaking views of the current rail network. Numerous quotes are excerpted (edited and condensed) from a series of interviews with employees for the CN Oral History Project, which can be found in the Canadian National Railway Company records (RG30) at Library and Archives Canada.

1 **TIMELINE**
The creation of the Canadian National Railway Company dates between 1918 and 1923, during which several Canadian railways were brought together under one banner. This book celebrates CN's official anniversary as June 6, 1919, when it was incorporated by an act of Parliament. Use the timeline to get situated with key dates (perspectives without a specific timeframe do not include a timeline).

2 **PERSPECTIVE NUMBER**
Count up from one to 100—or flip back and forth—as perspectives follow a rough chronology.

3 **PERSPECTIVE TITLE**
Find out what subject is being covered.

4 **INTRODUCTION**
Discover an aspect of the CN story.

5 **CAPTION**
Learn more about the photos, many sourced from the vast collection at the Canada Science and Technology Museum where CN donated some 750,000 historical images in 2000.

6 **NAVIGATION**
Navigate through the perspectives and get oriented within a multiple-page series.

FUN FACT

The format and the page layout grid for this book are based on the proportions of the doors of a shipping container, which has become a ubiquitous symbol of freight over the course of the last century.

1 / Standard cargo containers are 8 by 8.5 feet (2.43 x 2.59 m) and list empty weight and maximum capacity (2016).

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Laying the Foundation

Over the course of the 1920s, CN added thousands of miles of branch lines to its newly nationalized network, opening access to agricultural lands and natural resources and fostering settlement in rural areas. In a huge territory, with poor roadways and frozen waterways in winter to contend with, train stations at regular intervals were a lifeline to the rest of the world. Early railroading families might have moved 10 or 15 times over the course of a career, with their belongings packed up in a CN boxcar and sent to a new location. Some lived in the station itself, above the waiting room that doubled as a playroom and welcomed the wider community.

"In 1920, kissing in public was not done, except in train stations. Young couples used to sit in the big waiting room of the CNR station on Main Street in Winnipeg [Manitoba] and wait for a train to depart. Then they would go to the bottom of the stairs leading to the platform and kiss and hug 'goodbye.' After a few minutes they returned to the waiting room to wait for the next train to leave. Since lots of trains ran every day in the 1920s, this was a good strategy."

— From a story by Jim Blanchard in *Memories of the Moonlight Special and Grand Beach Train Era*

AT THE TRAIN STATION

"It was a mix of technology and people's stamina that determined how far apart the major terminals were: There was a reasonable distance a crew could travel during the course of a shift, and steam engines need water and fuel. So they established divisional points and crew-changing points every 100 or 125 miles [160 or 200 km] or so down the line, in addition to many smaller stations along the way. These locations had larger stations for passengers and railway office staff, engine-servicing facilities, bunkhouses and other structures. There were also section houses for the section foremen—responsible for track maintenance—and their families.

In the West, the places where railway stations were established became hubs of activity for people farming or working in sawmills, and those small settlements changed the future of the country, all the way from the Rockies to Prince Rupert [British Columbia], along the former Grand Trunk Pacific, and to Vancouver, along the former Canadian Northern Pacific."

— Robert D. Turner, author and Curator Emeritus, Royal BC Museum

1 / A new GP9 diesel locomotive, CN 4208, hauls a freight train past Yellowhead Station, in British Columbia's Robson Valley (1958).

Approximate cost in 1918 of the principal articles required to furnish an ordinary way station, from *Railroad Structures and Estimates*, by John Wilson Orrock:

Arm chair	2.50
Baggage truck	21.00
Battery jar	0.20
Bracket lamp	1.25
Broom	0.30
Bulletin board	3.00
Case for tickets	6.00
Cash till	3.50
Coal scuttle	0.35
Copying press	12.50
Desk for office	12.00
Desk for operator	12.00
Dustpan	0.15
Fire extinguisher	11.00
Fire pails	0.40
Fire shovel	0.25
Flag (green, red, white)	0.06
Funnel	0.06
Gang plank	2.50
Hammer	0.40
Hand axe	0.90
Hand saw	0.35
Lantern, red	1.15
Lantern, white	0.60
Mop handle	0.10
Oil can, 2 gallons	0.15
Oil can, 5 gallons	1.35
Oil filler	0.60
Pinch bar	0.95
Platform lamp	1.40
Platform scale	135.00
Scrub brush	0.20
Settees, seats, or chairs	Variable
Set planks for unloading freight	10.00
Stand, zinc-lined, for wringer	12.00
Stationery cabinet	17.00
Step ladder	1.20
Stove and pipes	15.00
Table	7.00
Table lamps	0.20
Towel rack	1.25
Water cooler	2.50
Water pails	0.65
Wick trimmer	0.30
Window blinds	1.50
Wringer	2.80

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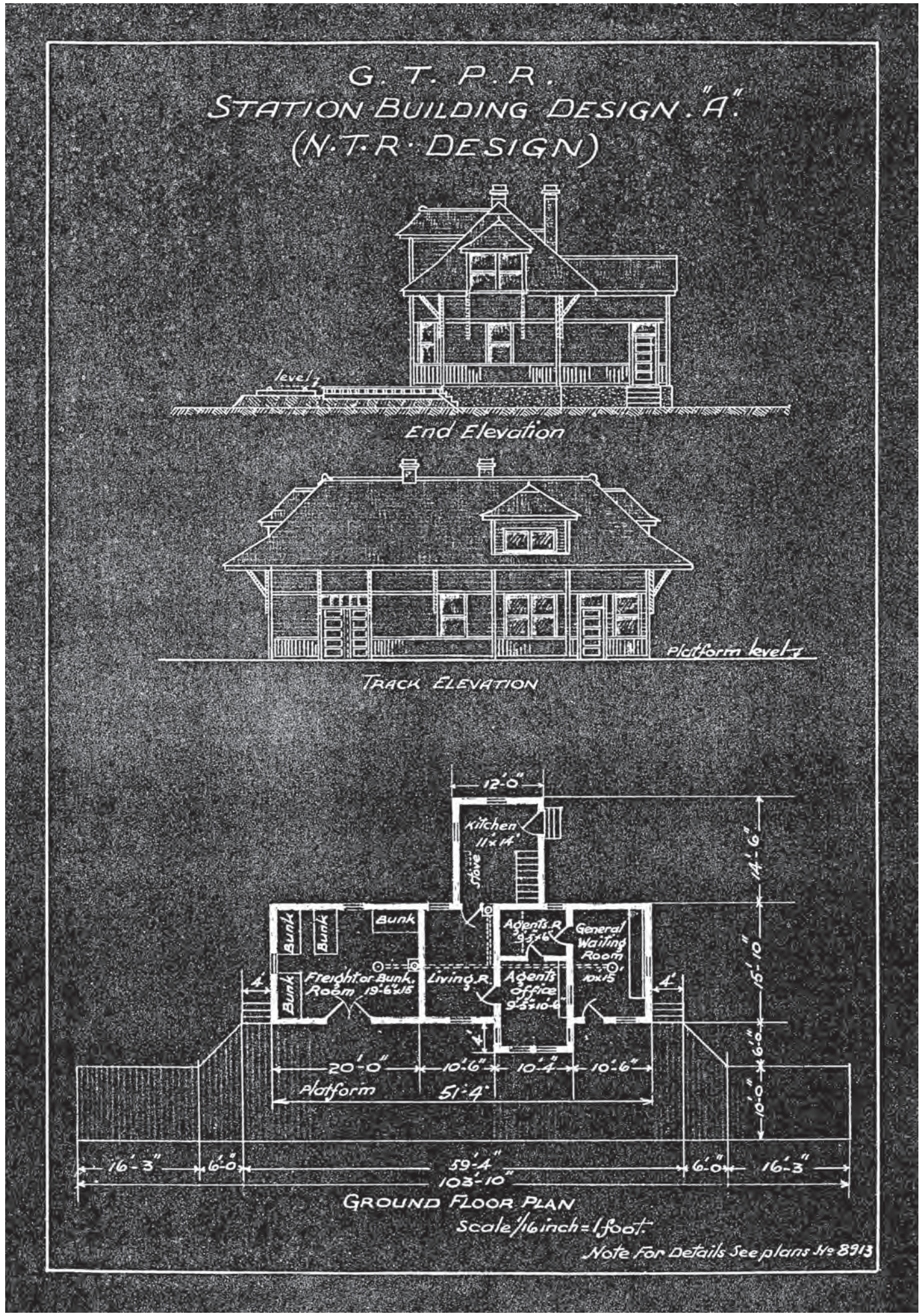
AT THE TRAIN STATION

2 / Track elevation and a floor plan for a typical station building design by Grand Trunk Pacific Railway, a CN predecessor (1919).



FIREMAN

On the

TRAIN
DISPATCHER

Job

Since the days of steam, it has always been people who keep the railway moving.

BRAKEMAN &
HOMEMAKER

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Getting Stoked

Keeping the boiler going to power a large steam locomotive was hot and heavy work. Without an automatic stoker, the coal had to be scooped into the firebox with a shovel. A fireman might shift as much as 15 tonnes of coal on a single day or night run.

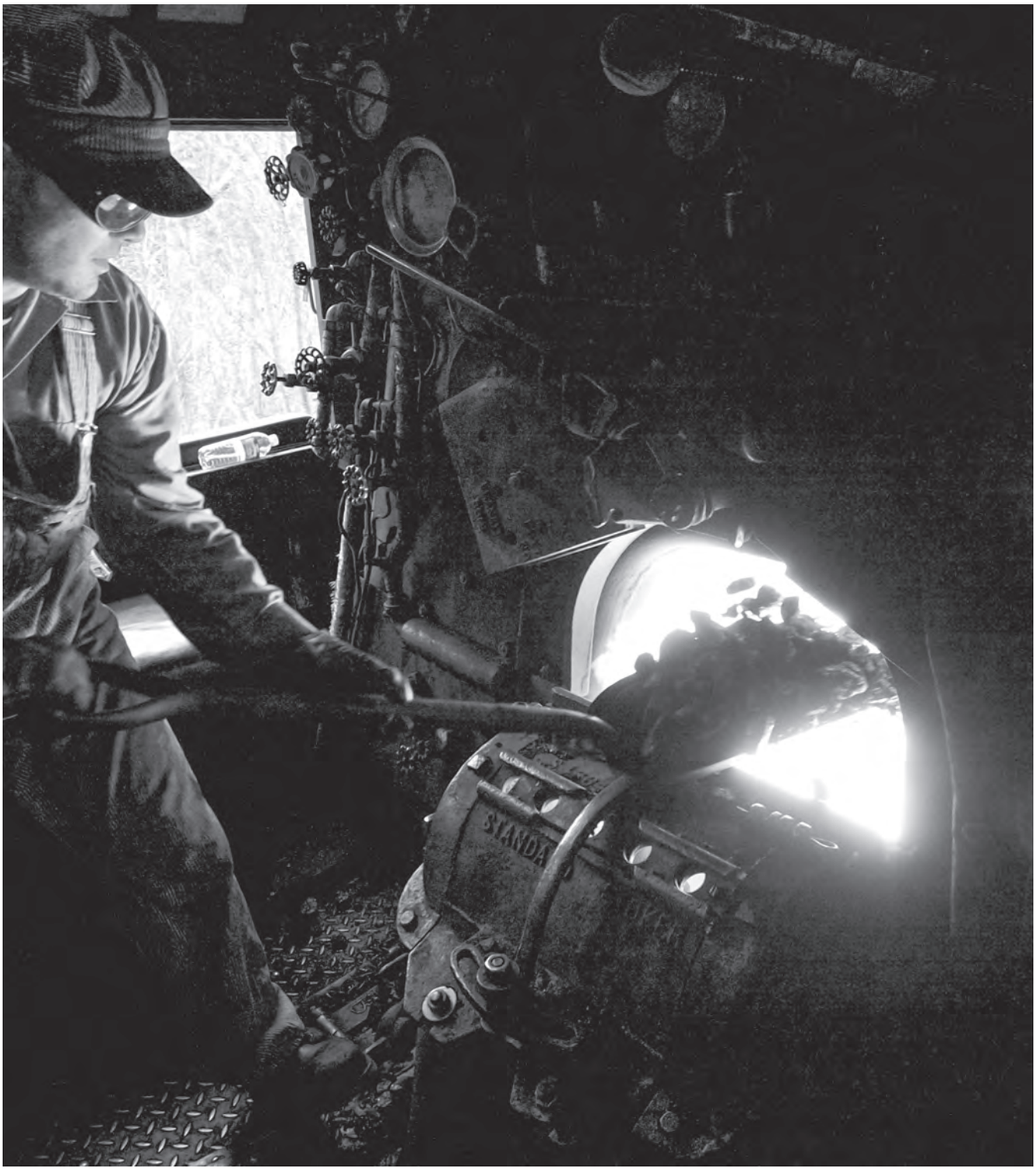
“The main thing was the knowledge of the steam engine—listening, knowing and getting a feel for it. It was more of an art than with diesel locomotives. There were many engineers who we firemen thought of as real artists. They could run over the road, keep a train moving, keep a swing on it, using less coal—a great benefit to us on hand-fired engines. Others wouldn’t use the right valve cut off and throttle setting, and the engine would be almost choking itself, so you were burning more coal. The colour of your fire told you a story, too: You needed a nice white, bright fire. Incandescent almost.

As a fireman, you had to know your road. Every train is different when it comes to braking. Depends on your grades, too. There’s places on the railroad between Toronto and Montreal where it’s the old Grand Trunk gradient from 1855. If you had a short, heavy coal and grain train with a steam locomotive of 60-some cars, the whole train would be on a grade. If you got a signal or somebody flagged you, you had to put the brake on. The men now have got all sorts of gauges and aids, they know exactly how their tonnage is distributed. We never had that. To this day, I can go from Toronto to Montreal in a night passenger train and if I’m sitting in the coach without looking I could tell you just by the way that thing was going where I am. You never forget it.”

— Lorne Brisbin, with CN 1945–1985

1 / CN 3254 serves as an excursion engine at Steamtown National Historic Site, where fireman Jack Emerick III bails coal in Scranton, Pennsylvania (2009).

FIREMAN



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ON THE JOB: FIREMAN

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Chess Game

It's a high-stakes world for train dispatchers, much like air traffic controllers, who oversee and direct the movement of the train traffic on the road at a given time, recording the locations and specifics of the engines and freight cars to keep things moving efficiently. In the days of the telegraph, the dispatcher issued orders over the wire, keeping in constant contact with station agents, who in turn passed train orders to the head and rear-end crew of a passing train.

TRAIN DISPATCHER

“It was kind of fun, like a huge chess game. You had to set up your railroad, issue your train orders, with a timetable as the basis of operation, of course. You tried to set it up so they met with a minimum of delay and no risk of collision.

It was to my advantage to know every curve and grade and every engineman. Some were gamblers, some were cautious. So when the chips were down, you could figure which guy would go and which would hang back. You had to know your engines because some steamed better than others, and who the fireman was, whether he could keep heavy steam up. All this counted, and if you got out and rode with them on your days off, you learned these things.

You couldn’t afford to make a mistake. In those days, you didn’t have radio communication. When you delivered orders to a station for a train on the line, and it passed that station, it was gone until the next station. And if you made a mistake on those orders, there was no way you could get hold of him to tell him to stop. He was headed for disaster. A lot of it depended on the crews hearing what the train orders said, and sometimes they made an error in interpreting those orders or forgot the content. Most of us, especially train dispatchers, feared the ring of the telephone when we got home.”

— Jim Munsey, with CN 1945–1983

1 / A movement director mans the traffic control board at Wellington Tower, Montreal (1948).

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/ 100

All in the Family

Railroading was truly a family affair, both in and out of the house. It was common for brakemen to come and go at all hours, on call for a perilous job that sometimes required climbing on top of a train to apply the brakes to individual cars. That meant a lot of work on the home front washing and preparing takeaway food to get the men through the days ahead.

“You had handkerchiefs around your neck to keep the cinders from going down your shirt. A lot of us got eye trouble from the cinders—you’d scratch your eyes trying to get them out. You used to tie the bottom of your pants if you had elastics, to try to keep the cinders and dirt from going up your legs. Especially when you had to do a lot of switching work on a way freight, because down the other end of the road, we didn’t have places to shower. But I liked the sound of that whistle and the puff of big black smoke. Where with diesel, you could go to church with your work clothes on.”

— Mel Humble, with CN circa 1940–1977

1 / Head-end brakeman J.A. Laferrière throws a switch at Cornwall yard, in Ontario, so that freight 495 can move into the siding and pick up cars destined for Toronto (1951).

BRAKEMAN & HOMEMAKER

“The men took pride in their appearance. When they went on freight, there was a complete change of clothes every time they came in. Overalls and smocks to wash, pants to press. I can iron white shirts with my eyes closed. The caps had to be starched and they’re hard to iron. I made a little form to fit in the top of them so that I could iron it and they’d be always standing up. You had to have enough starch to make them stand up by themselves.

I was stuck in a quandary with these railroading schedules. He would say, ‘I think I’ll be home at such and such a time,’ and probably the next day he got home, at 1 p.m. or 8 a.m. or the middle of the night. I always had to have food in the house to prepare two, three or four meals they carried in buckets, guessing at what they might need: bread and butter, cookies and tarts, meat pies that they could heat up on the stove when they weren’t near a restaurant. And if somebody else ran out because their wife hadn’t planned that they were going to be that long, they shared them, like family.”

— Jean Humble, Mel’s wife

In

THROUGH
THE FIELDS

the

FROM THE
FORESTS

Land-

Reaching natural
resources across
the network.

scape

TO THE MINES

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THROUGH THE FIELDS

Going with the Grain

Each year over the last century, the same scene has marked the end of harvest season in the Prairies: a seemingly endless series of freight trains filled with grain bound for ports east and west. The annual grain rush in Western Canada continues to be one of the railway's biggest challenges. Today's record-breaking hauls—like 2018's 25.5 million tonnes of grain and oil seed, moving on 200-car trains more than 2 miles (3 km) long—are of a size and scope that previous generations in Canada's breadbasket could only have imagined.

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FUN FACT

A number of spectacular trestles and bridges were engineered to traverse wide and deep river valleys in order to prevent excessive track grades for grain trains running between Winnipeg (Manitoba) and Halifax (Nova Scotia) on the former National Transcontinental Railway.

“Grain is Canada’s biggest task. The circle of growing, transporting, marketing and manufacturing keeps billions of dollars in circulation, and provides food, clothing and employment for millions of men and women throughout the world. When you are reading this, the whirr of the binder and combine will be heard throughout the Prairies…

The flow of grain begins in a barely noticeable trickle and increases daily until it becomes a stream, the stream a river and the river a torrent. The railways are kept working at top speed to keep the grain moving at an even flow. Long trains of boxcars carrying their prairie wealth thunder across the Prairies to Vancouver or the Lakehead where the ocean-going freighters are waiting to carry the staple food to the people of a dozen countries.”

— From a 1929 CN press release, by V. R. Dafoe

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IN THE LANDSCAPE:
THROUGH THE FIELDS

3

1 / CN’s promotional posters promised opportunities for young, robust settlers willing to work the land (1925).
2 / Grain is loaded into boxcars at a Saskatoon elevator, Saskatchewan (circa 1931).
3 / A farmer examines the barley crop, Manitoba (1946).
4 / Grain is transferred between an elevator and freight car, in Ste. Agathe, Manitoba (date unknown).

Prairie Postcards: There was once an elevator within 8 to 10 miles (12 to 16 km) of every farm, because that was as far as a horse could haul a load of grain in a day and get back home for dinnertime. As wheat production alone has grown—from 200 million bushels in 1929 to 390 million in 1976 to 420 million in 2017—old wooden elevators and branch lines have been consolidated into bigger operations, but the landscape they created remains part of Canadian culture.

5 / Elevators define the farmland near Regina, Saskatchewan (1967).

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FROM THE FORESTS

Touching Wood

White pine, red pine and oak. Spruce, balsam fir and hemlock. Birch, maple, poplar and aspen. With as many types of trees as there are uses for them, the railway has long carried Canadian softwood and hardwood to domestic and international markets. From early New Brunswick sawmills shipping to England, development moved west to Ontario and Quebec for squared timber and onwards through more Boreal and British Columbia forests. Today, CN is the largest rail carrier of forest products on the continent, with a 10,000-strong centrebeam fleet designed for handling packaged lumber.

2

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1 / In addition to logs and lumber, CN transports plywood, siding and oriented strand board panels for the housebuilding industry, as well as newsprint, printing paper, wood pulp, chips and pellets.

FUN FACT

Boxcar doors were colour-coded to denote their contents: green for lumber and yellow for delicate newsprint.

“The railway was a real catalyst in several ways to the development of Canada’s forest industries. It acted as a transport mechanism for lumber, but it also created demand for existing and new wood products because it was such a big buyer itself. The railway used a huge amount of wood for building its cars, stations and infrastructure, but most of it went into making railway ties. We live in a different time now, but early railway ties had to be replaced every seven to eight years. Before the advent of creosote, once railroads finished laying the track the first time, they literally had to go back and start relaying it again because many of the ties were rotting. Northwestern Ontario became a huge supplier for CN railway construction. A number of forest companies were involved in cutting first tamarack and later jack-pine logs in the woods, squaring them in the bush or processing them into ties at a mill, and then shipping them by the hundreds of thousands, even the low millions, to the Prairies and other parts of the country.”

— Mark Kuhlberg, author of *In the Power of the Government: The Rise and Fall of Newsprint in Ontario, 1894–1932*

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IN THE LANDSCAPE:
FROM THE FORESTS

3

2 / On the Prince Rupert line, lumber is loaded onto CN cars at Giscome, British Columbia (1947).

3 / An overhead pneumatic system unloading operation (1976).

4 / Logs from the deep forest are transferred onto trucks and then to ships at the wharves in Newcastle, New Brunswick (date unknown).

Rail Trails:
Former CN railbeds are getting a new lease on life as recreational paths in many parts of Canada. Among the highlights are Vancouver Island's Cowichan Valley Trail (part of the Great Trail), with its scenic Kinsol wooden trestle bridge, which was started by the Canadian Northern Pacific and completed by CN in 1920 to serve logging communities. British Columbia's Okanagan Rail Trail, which started development in 2017, passes wineries and small communities on lakeside routes once used to transport the region's plentiful produce and lumber.

5 / A shipment of lumber crosses a bridge heading west from the J. D. Irving Plant near Chipman, New Brunswick (1994).

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IN THE LANDSCAPE:
FROM THE FORESTS

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TO THE MINES

Northern Exposure

Natural resources from mining pushed the railroad into the northlands, where isolation, climate and tough terrain like the sheer rock of the Canadian Shield made constructing the line ultra-challenging. Rail transportation opened up communities like Kitimat to the rest of British Columbia, created access to the Great Slave Lake region of Alberta and the Northwest Territories, rich in ore deposits, notably lead and zinc, as well as Manitouwadge (Ontario) and the Abitibi gold belt (Quebec).

2

1

FUN FACT

To build the Great Slave Lake Railway, the first line into the Northwest Territories, CN used new automated building technologies, including a self-propelled machine that could lay 10 feet (3 m) of track per minute.

“The first major job I had was in Northern Quebec in 1936. Gold had been discovered near Val-d’Or and the company decided to build a 100-mile-long [160-km] branch line between Senneterre and Rouyn. I got allocated 10 miles [16 km] of the line to survey out in the bush. There was some mechanization, but it was mostly hand labour. We lived in a camp that we made ourselves, just three or four small buildings. In the summertime, we paddled on a lake alongside our camp to cover half the 10-mile section. And all winter long, we worked on snowshoes. The biggest problem was when it got terribly cold. That affects the track structure: it gets very solid and the rails get a little brittle. The trains freeze up because the steam won’t pass all the way through. You get a lot of snow that has to be cleared off the track, mostly by snowplows, but in the yard it was done by men with shovels at that time. And there were forest fires—we had one sweep very close to our track.”

— Frank Hutton, former civil engineer, with CN 1936–1971

4

3

1 / Mineral-rich ore, Montreal (1990).
2 / Iron ore is plentiful at the open-pit Steep Rock Mine, near Atikokan, in Ontario (1956).
3 / Workers screen coal in Drumheller, Alberta (1938).
4 / Noranda Mines thrives in the copper-rich Rouyn-Noranda area, Quebec (1952).

5 / Lighter, shorter aluminum cars for unit trains head east of Jasper, Alberta (1995).

1 / Totems on the University of British Columbia campus, where Totem Park opened in 1951 (date unknown).

2 / Field archaeologists from the firm Stantec work near Hamilton, Ontario (2018)

Going Deep:

Preserving ancestral heritage sometimes means digging below the surface. In preparation for the building of its new intermodal terminal in Milton (Ontario), CN's independent environmental assessments included teaming up for an archaeological dig with the participation of the Mississauga of the Credit, Six Nations of the Grand River and Huron-Wendat nations. The field program uncovered Indigenous and Euro-Canadian cultural resources, such as knives and projectile points fashioned from local flint. These artifacts are a testament to the earliest human presence in the Great Lakes area, dating back as far as 8400 B.C.

3 / CN employees participate in the annual Pulling Together Canoe Journey, touching on numerous traditional territories in British Columbia, including the Semiahmoo First Nation (circa 2012).

FUN FACT

The logo for CN's Aboriginal Affairs was created with input from the University of Winnipeg's Indigenous Studies program. Within the circle of life, symbolizing a hand drum, the First Nations are represented by an eagle feather, the Métis by the infinity symbol and the Inuit by an inuksuk.

"Six Nations is approximately one hour south of Toronto and one hour west of Niagara Falls. We are currently located on 45,000 acres [182,100 m²]. Homes are spread throughout the territory, with the small village of Ohsweken in the centre. We're very proud to maintain a large Carolinian forest, which can be seen on Google Maps. The forest was much larger than it is now, and we are working hard to protect what we have and to plant more trees. We also urge our community members to save the trees and to assist in maintaining the environment. We also look after our lands and resources, particularly if we feel that our rights might be impacted.

The railway tracks form a boundary on one side of the reserve and have been there as long as I can remember. Over the years, they have served the purpose of being used for the transportation of essential goods. We have also developed a beneficial relationship with CN and are grateful for their sponsorship for our young people who play hockey and are involved in other sports. They have also been a big supporter of the Six Nations Fire and Emergency Services at their annual fundraising gala. It is partnerships like these that we look forward to continuing."

—Chief Ava Hill, Six Nations of the Grand River, Ontario

“When a CN police officer found out about our experience with community policing, he thought it would be a terrific idea for other Indigenous communities across Canada that CN goes through. Since then we’ve had a great exchange, with CN staff coming on one of our canoe journeys, and the beginnings of a reconciliation and of providing services on the territory, starting with youth at risk. I think the relationship we have inspires other First Nations to aspire to doing those things.”

— Councillor Joanne Charles,
Semiahmoo First Nation, British Columbia

011 / 100

NEWCOMERS WELCOME

People on the Move

The history of the railway is, in many ways, the history of Canada and the United States. Almost two million people arrived on Canadian shores between 1900 and 1910, and it was the train that got them to their new homes. CN's predecessors—the Grand Trunk, Grand Trunk Pacific, Intercolonial, Canadian Northern and National Transcontinental railways—laid transcontinental tracks to keep up with the flow of settlers and the agricultural goods they needed and produced. World War I put the business of nation-building on hold and drove those early companies' finances in the hole—too many railways had been built in a competitive frenzy. CN was formed from them by the government in 1919, and began the challenging work of rationalizing the network while taking up the mantle for later waves of immigration.

"The year was 1964 and I was just shy of my sixth birthday. We had spent 10 days being sick on the ship that brought us from Italy to Canada. I remember distinctly what my first childhood thoughts and impressions were of Canada as they were formed on the train ride from Halifax to Toronto.

Basically, Canada was this: patches of snow, patches of green, an odd cow—this sequence repeating till we got to Toronto. The best part of the train was the corned beef. Maybe it was spending way too long on the ship, but I remember thinking that corned beef was heaven. That train ride is only a few seconds long in my memory reels, but it's burned in there as 'Canada.'"

— From a story by Italian immigrant Maria Griffin, in *Through the Window of a Train: A Canadian Railway Anthology*

Safe Trip:

Whether fleeing war or in search of fertile farmland, most immigrants came with the hope that life would be better in Canada, and CN played a large role in making those dreams come true. Some 400 field agents and 2,000 station agents from its Department of Colonization and Agriculture helped relocate thousand of European families in the 1920s alone. Through its head office in Manitoba, and district offices in Saskatchewan, Alberta and the American Midwest, it populated the Prairies—the emerging grain belt of Canada.

1 / The first wave of Dutch immigrants destined for Ontario farms arrives in Toronto (1950).

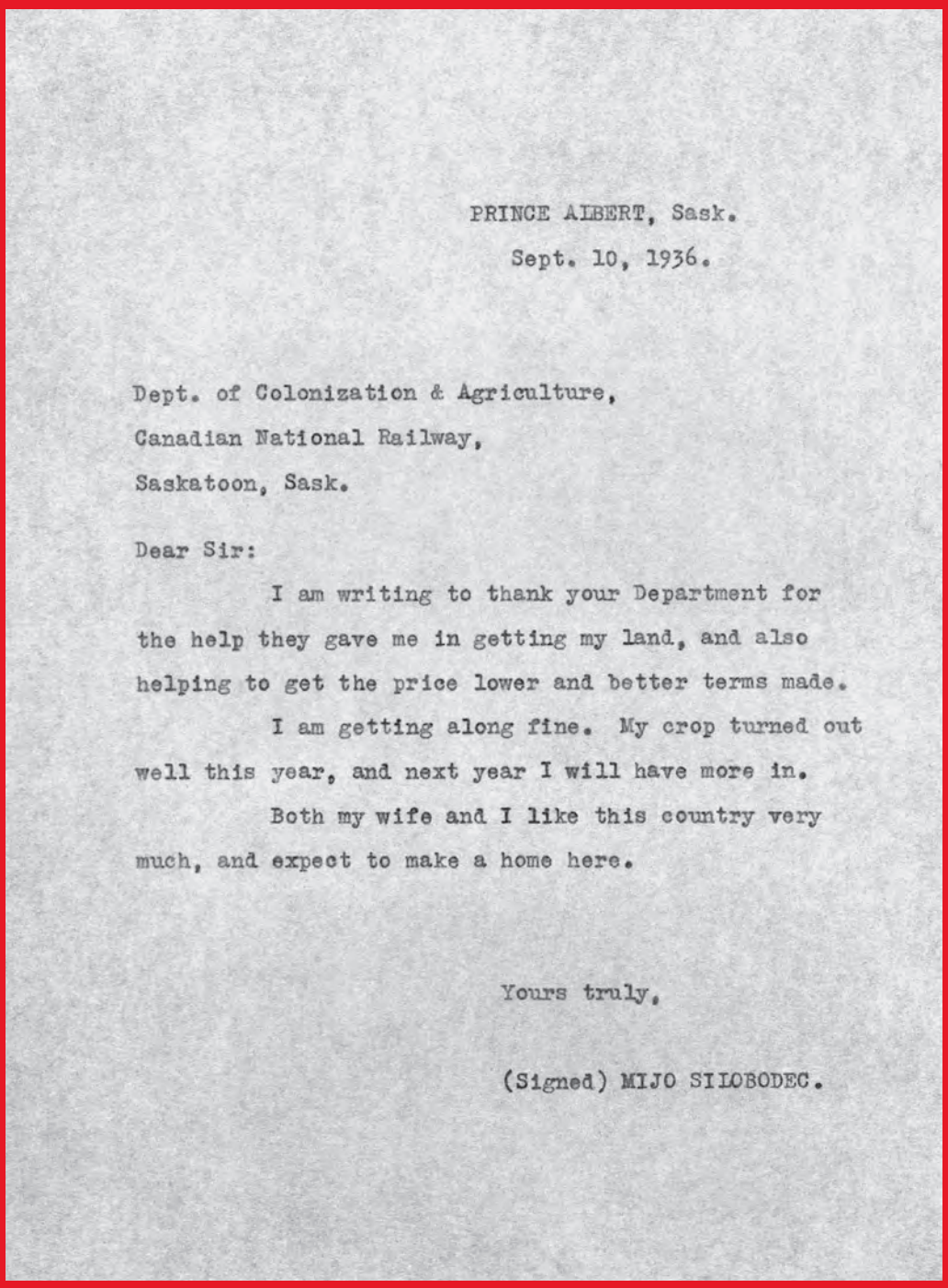
"The beauty of the snow-capped forest made me melancholy. I had not seen anything like this in years. Because in Western Germany, the temperature does not dip as low as we were used to back home in West Prussia. A longing for an almost forgotten land awakened cherished memories…

Luckily, it passed very quickly, because there was a lot of laughter coming from my fellow immigrants, who turned a sad moment quickly around. Well, we did have a lot of reasons to be laughing. After all, Canada is the land where milk and honey flows. The majority of the passengers were refugees, like I was, and we were looking forward to a new beginning."

— From a story by German/Prussian immigrant Erika Stenzel, in *Through the Window of a Train: A Canadian Railway Anthology*

2 / Dutch immigrant Henry Van Helvert and his family of 13 board a train in Halifax (1950).

3 / A thank-you letter from a Yugoslavian immigrant to CN's Department of Colonization and Agriculture (1936).



PRINCE ALBERT, Sask.
Sept. 10, 1936.

Dept. of Colonization & Agriculture,
Canadian National Railway,
Saskatoon, Sask.

Dear Sir:

I am writing to thank your Department for the help they gave me in getting my land, and also helping to get the price lower and better terms made.

I am getting along fine. My crop turned out well this year, and next year I will have more in.

Both my wife and I like this country very much, and expect to make a home here.

Yours truly,

(Signed) MIJO SILOBODEC.

012 / 100

CN POLICE SERVICE

Tour de Force

The current badge looks a lot like it did in 1923, when the force was first amalgamated. In the next decades, it would at one point grow to keep some 700 Canadian railway constables busy guarding property and chasing vandals. CN Police are vested with the same law enforcement powers as peace officers by the Railway Safety Act in Canada, while in the United States, their state-specific powers are augmented by Interstate Authority. From traffic safety enforcement around railway crossings to investigations of theft or fraud—along with a Corporate Security Team that ensures offsite backups for business continuity in case of cyber attacks or active shooters—they are CN's eyes and ears on the ground.

“We have 125 officers responsible for protecting some 19,500 route-miles [31,000 km], thousands of bridges and tens of thousands of railway crossings, which touch on populations of millions of people. So a single officer often covers a lot of territory. When I go for a ride-along with one of them on a shift, I tell them I don't just want them out there—they should know where they're going, why and what they need to do. In some ways, policing has come full circle. When my dad was an RCMP officer in New Brunswick in the 1970s, he'd be out in the community, and if something happened, people would know to call Gerry. Then policing shifted to being more technocratic as communities grew. In recent years, we've come back to community policing. Because the point is that safety is a shared responsibility.”

— Stephen Covey, chief of police and chief security officer, with CN since 2009

1 / Badges were redesigned in 2010, including the one for CN's chief of police and chief security officer, who works out of the railway's Montreal headquarters (2019).

From railway yard emergency response planning to criminal investigations, CN Police perform a number of duties:

0

Zero tolerance for trespassing has been enforced since 2008.

24/7

Always open, the communications centre has four full-time dispatchers fielding calls on the emergency line (1-800-465-9239) from all over the network about malfunctions and safety concerns.

500

Metres from CN property is the area in which officers have jurisdiction, including issuing speeding tickets.

2

Rail Incident Investigation Guides set protocols to help external police services in the U.S. and Canada work efficiently to reduce safety risks onsite and to lessen train delays.

2 / The 1923 CN police badge inspired the current design (2019).

1

CN Police officer works directly within RCMP headquarters, while the rest of the team is in daily contact to address issues of national security and terrorism-related threats.

100K

Students in Canadian and American schools are educated through the CN All Aboard for Safety presentation by police officers every year.

How

UNDERSTAND
WHISTLES

OPERATE A
LOCOMOTIVE

Making the grade
with lessons from
railway history.

USE
SIGNALS

KEEP
RAILROAD
TIME

To

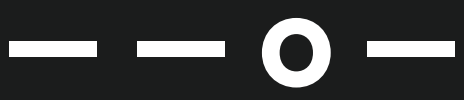
013
/100

HOW TO UNDERSTAND WHISTLES

Tooting Horns

Few sounds are as recognizable —or as evocative—as the sound of a train whistle in the distance. While modern-day engines don't produce the steam to blow their whistles, Canadian diesel units use that classic old-time harmonic whistle sound: It was found to resonate better with the human ear than the blast of a single-note diesel air horn, whose only fans seemed to be moose, attracted to the tracks when they mistook it for a mating call. Operating rules require trains to whistle as they approach most public grade crossings and stations, but different series of long and short toots are also used to communicate much more than warnings.

SHORT WHISTLE	o
LONG WHISTLE	–



APPROACHING PUBLIC GRADE CROSSING

WHEN THE TRAIN IS STANDING—BACK UP

APPROACHING STATION

CALL FOR SIGNALS

RELEASE BRAKES—PROCEED

FLAGMAN PROTECT REAR OF TRAIN

APPLY BRAKES—STOP

ANSWER TO ANY SIGNAL NOT OTHERWISE PROVIDED FOR

"That sound is the signature of the building of Canada. Over the great Canadian plains and over the mighty Rockies, that sound meant that there was another human being somewhere out there in that wilderness, and it wasn't an empty country. And as I vowed as a kid to be an engineer, I vowed that with the passing of steam that sound should never vanish into eternity, that sound should be preserved because it's the sound that built Canada."

— From a speech by Robert Swanson, inventor of the chiming horn used by North American diesels, including the 1967 Confederation Train that played the first four notes of "O Canada"

014
/100

HOW TO OPERATE A LOCOMOTIVE

In the Cab

The cab of a steam engine was noisy, hot and dirty, and the work was physically demanding—requiring both an engineer and a fireman working in close quarters. It might take hours to build up pressure in the boiler to get going, and once on the road, visibility could be limited by the smoke. Often, the engineer had to lean out the window to be able to see the track and signals ahead (challenging in winter, especially during a snowstorm), while the fireman furiously shovelled coal. In comparison, a diesel locomotive can be operated by one person, starts up quickly, requires far less maintenance and is safer for crews than ever before. With advanced electromechanical technology, today's trains are longer and heavier than in the past. While control panels have evolved, hauling a whole lot of railcars still requires a lot of skill and still brings a lot of satisfaction.

"The train goes up to 60 miles an hour, but your mind is going a hundred miles an hour. You have to think of everything. And be prepared to react to anything. It's about being disciplined, and keeping your concentration focused over a period of hours. I still get to run sometimes and it still feels good to be sitting in the cab, moving a two-mile [more than 3 km] train with the touch of two hands."

— Biagio Lamarca, assistant superintendent, with CN since 1984

1 / Interior of CN's 5702 at Exporail, Canadian Railway Museum, Saint-Constant, Quebec (2019).

Steam Locomotive Controls

Built by Montreal Locomotive Works during the 1930s, Hudsons (see 089/100) like CN's 5702 were capable of speeds of 100 miles per hour (160 km/h). The engineer occupied the right-hand side, and was experienced in how every part functioned, having begun as a fireman. At left, the fireman (and possibly a future engineer) operated the stoker to regulate the amount of coal entering the firebox and monitored the boiler water level and pressure.

BOILER PRESSURE GAUGE

STOKER STEAM PRESSURE GAUGE

EXHAUST STEAM INJECTOR INDICATOR GAUGE

STOKER JET PRESSURE GAUGES

BLOWER VALVE

STARTING VALVE FOR INJECTOR
(injects water into boiler)

STOKER ENGINE "BOOSTER" VALVE
(used to unblock mechanical stoker)

SHUT-OFF VALVE
(for water to water glass)

WASHOUT PLUG
(one of several)

INJECTOR WATER REGULATOR

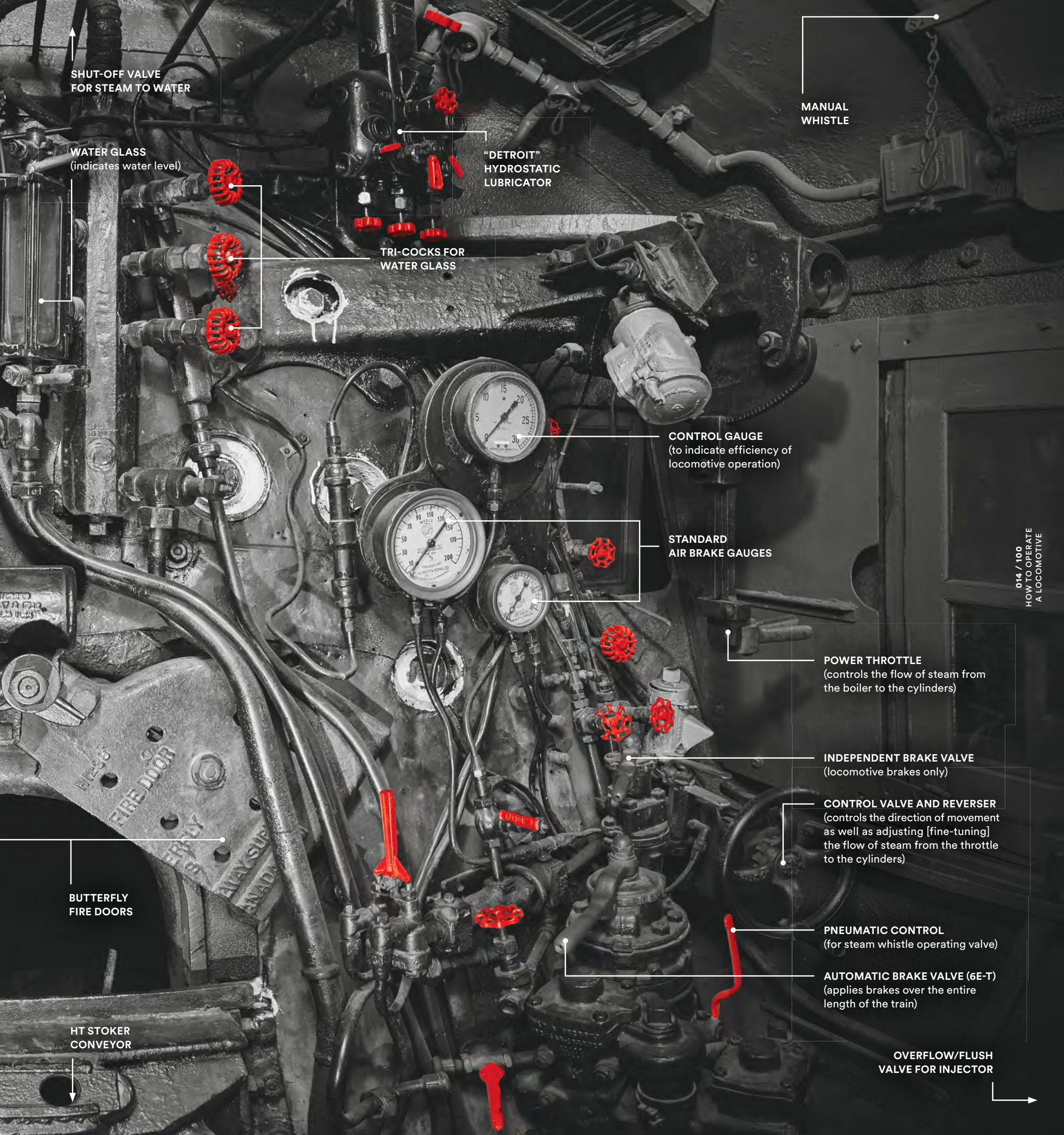
STOKER ENGINE OPERATING VALVE

FIRE DOOR HANDLE
(manual opening)

RATCHET LEVER
(to operate the exhaust steam injector)

STOKER JET PRESSURE CONTROLS

PNEUMATIC FIRE DOOR OPENER


SHUT-OFF VALVE
FOR STEAM TO WATER
WATER GLASS
(indicates water level)
"DETROIT"
HYDROSTATIC
LUBRICATOR
MANUAL
WHISTLE
TRI-COCKS FOR
WATER GLASS
CONTROL GAUGE
(to indicate efficiency of
locomotive operation)
STANDARD
AIR BRAKE GAUGES
POWER THROTTLE
(controls the flow of steam from
the boiler to the cylinders)
INDEPENDENT BRAKE VALVE
(locomotive brakes only)
CONTROL VALVE AND REVERSER
(controls the direction of movement
as well as adjusting [fine-tuning]
the flow of steam from the throttle
to the cylinders)
BUTTERFLY
FIRE DOORS
PNEUMATIC CONTROL
(for steam whistle operating valve)
AUTOMATIC BRAKE VALVE (6E-T)
(applies brakes over the entire
length of the train)
HT STOKER
CONVEYOR
OVERFLOW/FLUSH
VALVE FOR INJECTOR

1 / Interior of a CN's ES44AC Tier 4 locomotive (2019).

Diesel Locomotive Controls

A popular unit for CN from the GE Evolution Series (see 095/100), the ES44AC has a control-stand format, which many locomotive engineers prefer over desktop models for comfort of use. The cab has three seats: one for the engineer, one at the conductor's desk and one for additional crew, all facing forward. Not visible are a fridge, microwave, hot plate and bathroom —all the needs of a 10- to 12-hour haul.

ONBOARD CAMERA

POSITIVE TRAIN CONTROL
(safety protection system)

HORN
(whistle)

HORN
(with pre-sequenced warning sounds)

TOGGLE SWITCH
(for end-of-train device, can put the train in emergency from the rear-end unit)

RADIO
(to communicate with other trains or rail traffic controllers and members of the crew when in the field)

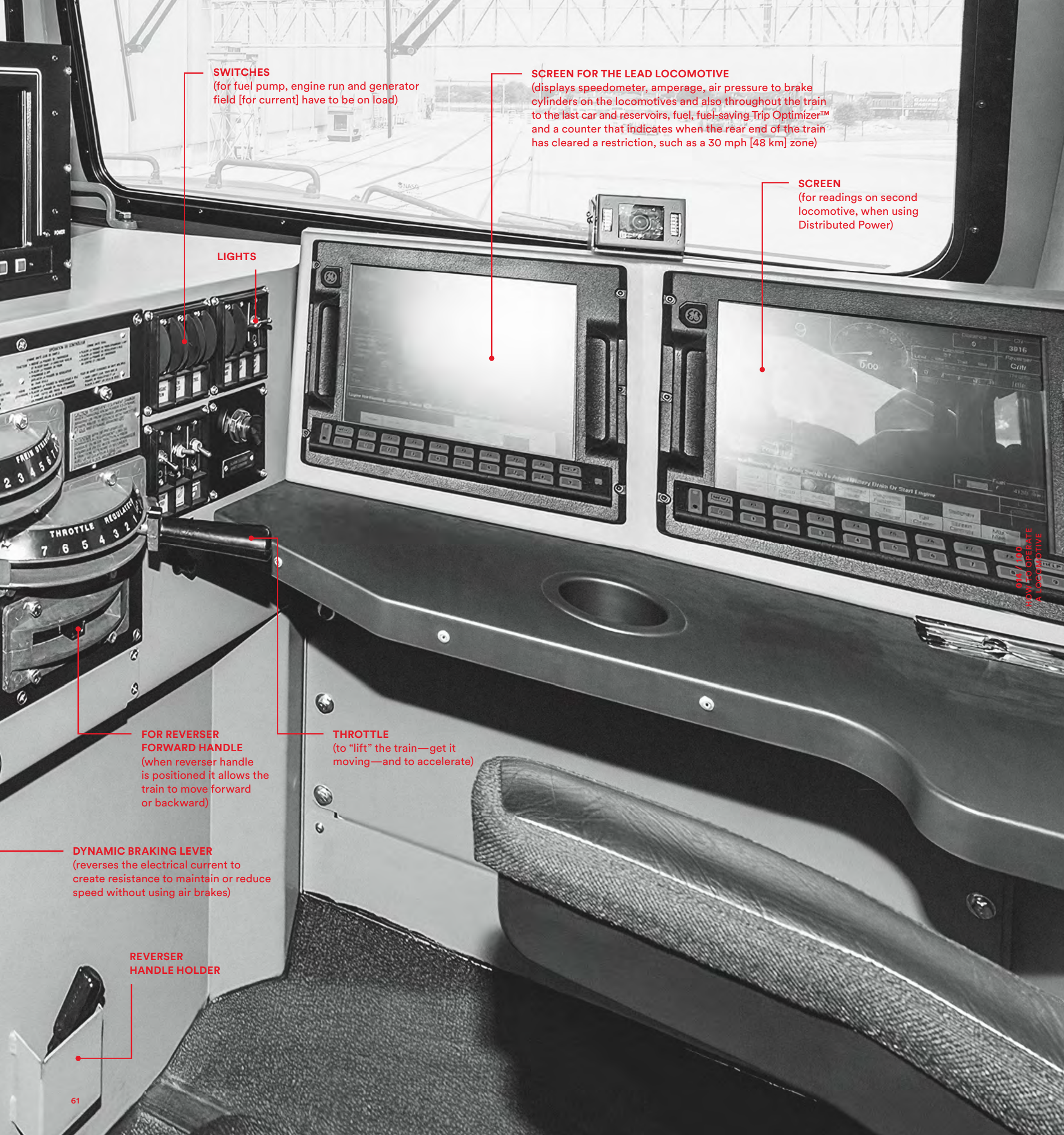
BELL

AUTOMATIC BRAKE LEVER
(when applied it reduces air in the brake pipe, which applies the brakes throughout train)

SAFETY CONTROL RESET (RSC)
(like dead man's pedal if driver is incapacitated)

INDEPENDENT BRAKE
(applies only on the locomotives in the consist)

SANDERS
(release fine purified sand in front of wheels to prevent slippage on wet rail)

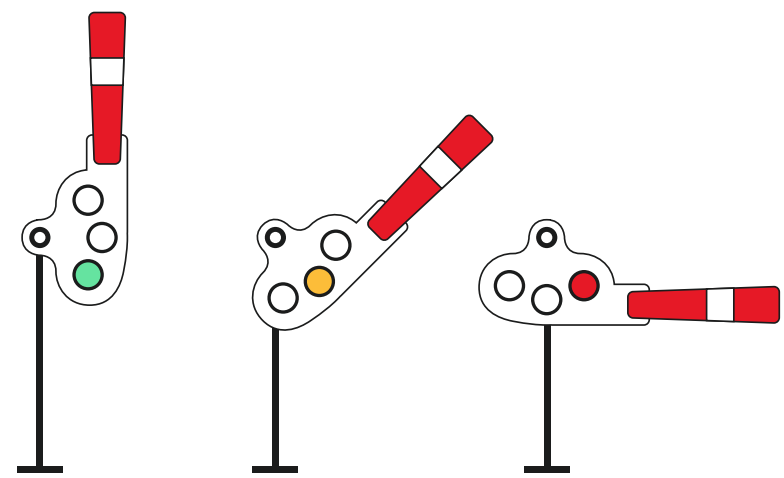

SWITCHES
(for fuel pump, engine run and generator field [for current] have to be on load)
SCREEN FOR THE LEAD LOCOMOTIVE
(displays speedometer, amperage, air pressure to brake cylinders on the locomotives and also throughout the train to the last car and reservoirs, fuel, fuel-saving Trip Optimizer™ and a counter that indicates when the rear end of the train has cleared a restriction, such as a 30 mph [48 km] zone)
SCREEN
(for readings on second locomotive, when using Distributed Power)
LIGHTS
FOR REVERSER FORWARD HANDLE
(when reverser handle is positioned it allows the train to move forward or backward)
THROTTLE
(to "lift" the train—get it moving—and to accelerate)
DYNAMIC BRAKING LEVER
(reverses the electrical current to create resistance to maintain or reduce speed without using air brakes)
REVERSER HANDLE HOLDER

015
/100

Body Talk

Like any language, railroaders developed different regional dialects when it came to communicating about the movement of trains. A system of hand signals, sometimes with flags or with lanterns after dark, was essential to communicate when out of earshot, in the yard switching or between the front and rear of a train. While the advent of portable radios facilitated those operations, manual gestures are still employed. On the line, the use and interpretation of multi-head signal electrical units—tall and dwarf installations, with solid or flashing colour lights, along with plaques and arrow directional indicators—also differed historically from railway to railway. To keep everyone on the same page, CN uses *Canadian Rail Operating Rules* and *United States Operating Rules.*

Illustrations based on instructions for signals and semaphores from a 1952 CN rule book.



HOW TO USE SIGNALS

Canadian National Magazine shared a few unofficial hand signals used by employees in August 1951:

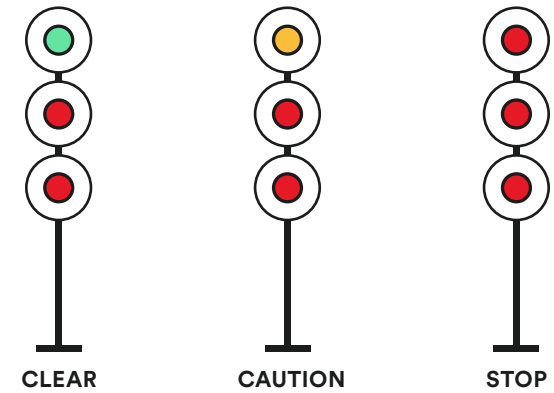
1

GET CARS OVER ON TRACK 9

"Ben Quelch, a yardman, calls this signal 'No. 9' or 'get those cars over on track 9.' There are more signals than smoke signals and every man in the yard must know them thoroughly before he is entrusted with the important job of moving the thousands of boxcars through the local yards."

GO TO
STOCKYARD

“Don’t get Arthur Wright, yard foreman, wrong here. He’s not trying to annoy the engineer with this display of hands. He is actually trying to imitate a cow. Hands in this position to indicate the horns of a cow actually tell the engineer the train is going to the stockyard.”



Lights, Semaphores, Action:

Used for railway signalling prior to widespread electrification, semaphores date back to the Napoleonic era. Atop a mast, the inclination of the arms, often operated by a lever in the station office, let crews know whether to proceed, slow or stop for train orders. For example, a 19-Y indicated slow, with Y for yellow and the arm angled partway up or down—why it was also called a 45 board. Paper orders would then be hooped up as the train passed and the hoop tossed back to the operator (or occasionally thrown into the woods if someone was having a bad day).

GOING INTO
CROSSOVER

“Ben is not trying to hold his chin up with his hands in this photo. He’s giving the signal that every engineer likes to get. The crossed arms tell the engineer that he is going into the crossover and once over he is in the clear... on his way out. To the travellers, the signals look like a lot of childish antics. But on them railwaymen continually risk millions of dollars worth of freight, as well as lives.”

016
/100

Synchronize Your Watches

In railway operations, where safety is measured in minutes and seconds, time and the rule book rule. Prior to centralized traffic control, trackside signals and telegraph communications between stations, personnel relied entirely on the timetable and the time to govern their movements. And before speedometers, time between mileposts was used to judge how fast a train was going. The railroad watch and station clock (regulated by daily time signals via Ottawa and Montreal) was synonymous with accuracy: If it was off more than 30 seconds in a 24-hour period, off to the watch service or a designated inspector it went. After six years of testing, CN authorized the use of wrist watches on January 1, 1964, breaking with pocket watch tradition. The Bulova Accutron was one of only two approved brands at the time.

1

1 / Conductor W. J. Byers checks his pocket watch with a time comparison wall clock at the registry office, Montreal (1946).

HOW TO KEEP RAILROAD TIME

“Each conductor, engineman, trainman, fireman, yard foreman, yardman, and such other employees as the company may direct, must carry, while on duty, a reliable railway-grade watch approved by the proper authority and for which there must be a prescribed certificate on file with the designated railway officer.

Employees required to use railway-grade watches must, unless otherwise directed, submit them to a designated watch inspector for examination and record at intervals not exceeding ninety days.”

— From the *Uniform Code of Operating Rules*, revision of 1962

It’s About Time:

While surveying Canada’s vast expanses in the mid-1800s, railway engineer Sandford Fleming advocated for standardized time zones in order to schedule long-distance trains, because clocks set to local times could vary by minutes. He also promoted the 24-hour clock—after missing a train due to an a.m./p.m. timetable error.

2 / The schedule for April 29 to October 27, 1962, as seen in *Canadian National Railways System Timetables*.
3 / Bulova watches (now Citizen Watch Company) are advertised in the CN employee magazine (1964).

HALIFAX—QUÉBEC—MONTRÉAL

Pool 155 Daily Quotidien	Maritime Express 3 Ex. Sun. Dim. exc.	Pool 153 Daily Quotidien	Ocean Limited 1 Daily Quotidien	Scotian 59 Daily Quotidien		Pool 154 Daily Quotidien	Maritim Express 4 Daily Quotidie
..	..	..	11.45 am	7.15 pm	Dp **Halifax** . . . . . **AST** Ar	..	..
..	7.30				. . . **AST** Ar	..	† 6.30 a
5.00 pm	..				. . . **EST** Dp	1.00 pm	..
..	¶ 2.50				. . . **F** Dp	..	3.50 p
..	¶ 6.30				. . . **EST**		
9.00 pm	..				re Centrale Dp	..	10.40 a
					are Windsor Dp	9.10 am	..

aux 24, 25, 26 donnent toutes les indic

—OTTAWA

Continental 3 Daily Quotidien	153 Sun. Dim.	51 Ex. S & Su Sam. dim. e				48 Ex. Sun. Dim. exc.	
8.30 pm	5.50 pm	4.30			. . . **EST** Ar	8.55 am	10.45 a
11.05 pm	9.05 pm	7.35			. . . . . Dp	6.45 am	8.00 a

au 27 donne toutes les indications

—DETROIT—CHICAGO

Inter-City Limited 17 Daily Quotidien	19 Ex. Sat. & Sun. Sam. et. dim. exc.	Intern Limi 15 Daily Quotidien	5 Daily Quotidien	7 Ex. Sun. Dim. exc.		Maple Leaf 20 Daily Quotidien	16 Daily Quotidien	NOTE Lakesho Express 8 Daily Ex. Sun Dim. exc
11.15 pm	E11.30 pm	..	9.15 am	8.15 am	Dp **Montréal** . . . . . **EST**	..	7.00 am	2.30 p
..	..	3.30 pm	..	..	Central Stn.–Gare Centrale Ar	..	..	..
7.00 am	E 8.45 am	9.45 pm	B 5.05 pm	2.30 pm	Windsor Stn.–Gare Windsor Ar	..	11.15 pm	8.15 a
	9				Ar **Toronto** . . . . . Dp			

017 /100

SCHOOLS ON WHEELS

Moving Education

For almost 40 years, Fred and Cela Sloman rolled with their wooden school-car into different railway sidings between Capreol and Foleyet (Ontario), remaining at each stop for about five days. Students would have their homework ready for the return of their mobile classroom, once it had done its 149-mile (240-km) tour. It was one of four train cars that CN retrofitted in collaboration with the Ontario Department of Education, with the goal of educating children in remote areas around Thunder Bay, Fort Frances, Sioux Lookout and the Manitoba border. Many of the students were from railway families stationed far from towns, and some were from local Indigenous communities.

“Education is a state of mind. If the child can get to us, we can show him a much easier way of unlocking doors for himself. If we are merely able to call to him cheerfully through the miles of bush, he goes on unlocking doors for himself. The school bell is a new voice in the wilderness. Let it continue to ring out its welcome call up in the hillsides and through the forest aisles of the North, for it carries a message of health and hope and power to the remote corners of our Northern heritage.”

— From a 1943 interview with Fred Sloman, teacher, in an Ontario Department of Education memo

1 / Teacher Fred Sloman uses every inch of his school car, which has foldaway desks for students of varying ages (1950).

2 / Fred Sloman organizes storage while daughter Fredda touches up the car's lettering (1951).

Family Pack:

The Slomans had five children who grew up on the rails in the 46 by 9 foot (14 × 2.7 m) school car and were among its 1,000 graduates. Their daughter Margaret recalled that the family had to pack up every time the classroom moved, including storing plants in the bathtub for the journey. "If you didn't, you really could have a mess," she said. That also meant clearing countertops, anchoring gas lamps, ensuring that cupboard doors were firmly closed, taking in the clothesline, toboggans, skis and sleds, and lowering the flagpole, which they clamped underneath the railcar.

3 / Blackboards slide aside to reveal maps of Canada to pupils Gene Latendress and David Langdon, of Anstice, Ontario (1950).

018 / 100

ON THE WATER
Marine Services

Shipping News

Between managing cruise ships, ferries and a good part of the Canadian Government Merchant Marine cargo ship fleet, CN was fully immersed in maritime activities for much of the 20th century. Canadian National Steamships brought vacationers to the Caribbean and Alaska in style. In Atlantic Canada, CN (and 1977–1986, CN Marine) passenger and cargo vessels served Prince Edward Island, Newfoundland and Labrador, including the world's largest ferry with ice-breaking capability. On both coasts, it also served isolated areas that roads and railways couldn't reach.

1 / The *Aquatrain*, operated by Foss Maritime in Seattle, Washington, makes the journey between Prince Rupert, British Columbia, and Whittier, Alaska (1983).

FUN FACT

Plying trade routes for sugar, flour, lumber and dried fish, CN's five luxury liners known as Lady Boats hit the sweet spot with sun-seekers. From the 1920s to the 1950s, members of the fleet cruised from Atlantic Canada to tropical destinations like Bermuda, Barbados and St. Kitts.

"The *Prince Rupert* was a lovely sea boat, the last of the old-timers on the coast. For a lot of coastal communities, we were one of the last connections: Powell River, Bella Bella, Ocean Falls [British Columbia] and Ketchikan [Alaska], which took us through the Dixon entrance, a rough spot open to the Pacific where every wave that left Japan was still rolling in. In the fall and winter, the northern lights would astound us, quivering blue and white in the sky as we were going north. We had about 350 tonnes of cargo, canned goods and supplies, and we carried the mail. But mostly we carried people, from all walks of life—native people, ministers, rabbis, all going to various communities. We'd have a huge crowd for Powell River coming back from Vancouver from the weekend. You could just feel the ship heave a sigh of relief to get all those people off."

— Patrick Hind, former assistant purser, with CN 1953–1954

Waterways:

Through its subsidiaries, CN's current maritime connections stretch far and wide.

1. CN *Aquatrain* (pictured), a link to Alaska operated by Foss Maritime, is one of the largest rail barges in the world—handling up to 45 railcars at once.

2. Transporting 500,000+ tonnes annually, CN *COGEMA* rail ferry services Baie-Comeau, Matane and Sept-Îles, in Quebec.

3. The Great Lakes Fleet has 9 carriers for bulk commodities.

019 /100

OVER LAND
Delivery Services

Part and Parcel

Moving mail for the post office was one of CN's missions until the 1970s, with letters sorted on board, then picked up and dropped off by kicking out a bag and pulling another from a catch post while moving—an impressive manoeuvre. And before UPS and FedEx, it was CN Express that moved parcels on scheduled passenger trains—adding mail and express cars to passenger runs offset some of the financial losses from those typically money-losing services. Highway transportation extended the reach of the company's freight and express services, working with local contractors and road vehicles from its own trucking division.

1 / Long before UPS and FedEx, CN Express delivered by rail and truck (circa 1942).

Christmas List:
To manage the holiday rush of 1967, CN developed a sortation device capable of processing 9,000 parcels an hour. The size of nine football fields, the Toronto automated express freight terminal was Canada's biggest road, rail and air shipment installation.

"When I started to work at the railway, it was to a large extent a retail organization. You could take a passenger train, send a telegram at the station and ship parcels by Express services. There were branch lines going to every place imaginable, so almost every soul had some connection to it. People shopped by catalogues: Eaton's and Simpsons-Sears had huge catalogue sales activities in Moncton [New Brunswick], Montreal [Quebec], Toronto [Ontario], Winnipeg [Manitoba], Regina [Saskatchewan] and to some degree Vancouver [British Columbia]. They were sending out thousands of shipments, which were the backbone of the traffic for the Express business. It was in many ways the originator of the courier services we know today."

— Howard Easton, former assistant vice-president, Atlantic Region, with CN 1954–1992

019 / 100
OVER LAND—DELIVERY SERVICES

020 / 100

IN THE AIR
Flight Services

Sky High

In the 1930s, the commercial aviation industry was taking off, and Canadian government interest in a flag carrier led CN to expand its horizons. Trans-Canada Air Lines started with two aircraft carrying passengers and mail between Vancouver (British Columbia) and Seattle (Washington). It soon offered regular cross-country freight runs and passenger flights between Vancouver and Montreal (Quebec) with stops in Edmonton and Lethbridge (Alberta); Regina (Saskatchewan); Winnipeg (Manitoba); and in Kapuskasing, North Bay and Ottawa (Ontario). Renamed Air Canada in 1965, it boasted the world's first all-turbine aircraft fleet, and would remain a CN corporate affiliate until 1977.

1 / With the acquisition of a fleet of Douglas DC-8 jet airliners in 1960, the carrier was able to offer faster service to Europe (date unknown).

"Kapuskasing, located on the rugged terrain of the Canadian Shield, was near the mid-point of the transcontinental route. Our Lockheed airliners of the early 1940s flying between Toronto and Winnipeg had to land for refuelling, so Kap became the airline's version of the railroad's water stop. Including the 10-minute stopover, the scheduled time Toronto-Winnipeg exceeded 7 hours. Heavily loaded flights sometimes required additional landings at North Bay and Armstrong.

One stormy night, the pilot radioed me to check snow conditions on the runway. Temporarily signing off the air, I drove the Department of Transport station wagon out of the hangar onto the runway and got stuck in a snowdrift. Returning by foot to my radio post, I informed Flight Two: 'The runway is unserviceable due to a truck stuck on it.' The flight proceeded on to its alternate, Porquis Junction, one of a series of emergency airports built across Northern Ontario at 100-mile [160-km] intervals as an anti-Depression project in the 1930s. I never told the pilot who put the truck on the runway."

— From *Aviation Memoirs (A Love Affair with Flight)*, by Ross Smyth, former TCA/Air Canada employee

Eastern Promises:

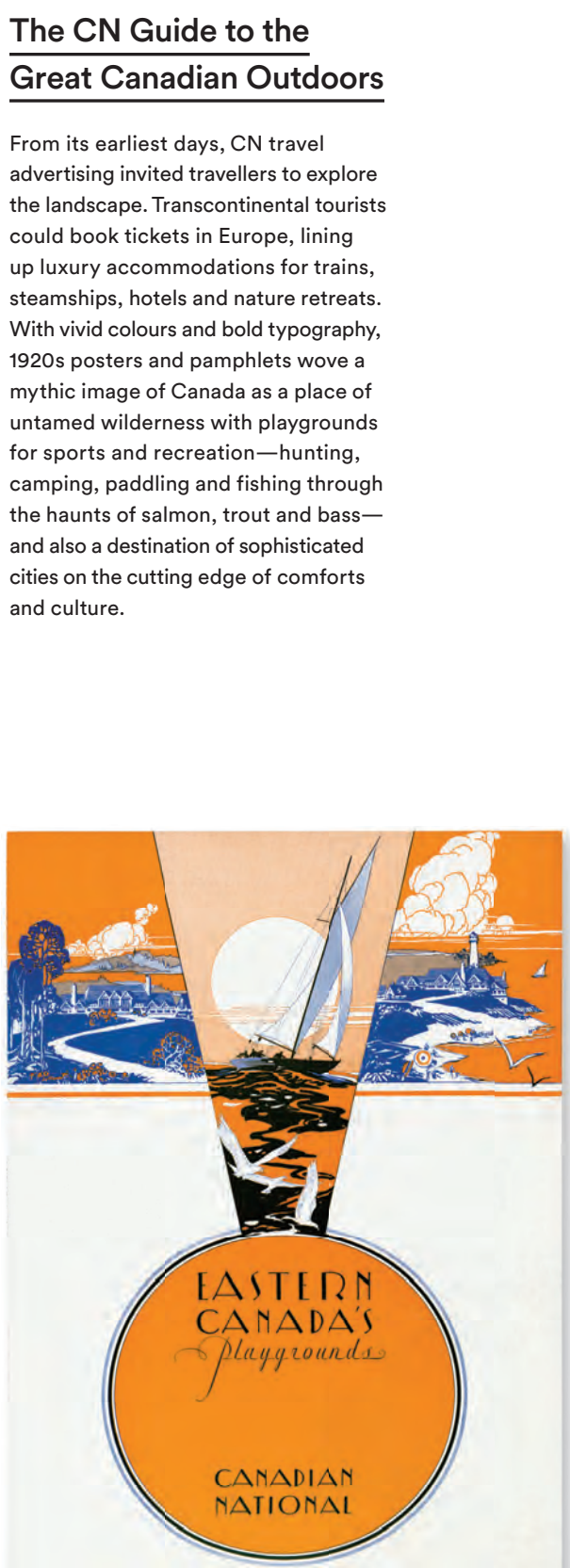
In 1966, CN collaborated with Air Canada on an overseas office in Hong Kong, one of the railway's many agencies throughout the Pacific Rim. Trade with the Far East had started to boom again following WWII, following through on the promise that had lured early Canadian railways to open northwest routes.

021 /100

ADVENTURE TRAVEL

The CN Guide to the Great Canadian Outdoors

From its earliest days, CN travel advertising invited travellers to explore the landscape. Transcontinental tourists could book tickets in Europe, lining up luxury accommodations for trains, steamships, hotels and nature retreats. With vivid colours and bold typography, 1920s posters and pamphlets wove a mythic image of Canada as a place of untamed wilderness with playgrounds for sports and recreation—hunting, camping, paddling and fishing through the haunts of salmon, trout and bass—and also a destination of sophisticated cities on the cutting edge of comforts and culture.



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1–8 / CN's Public Relations department produced numerous tourist booklets promoting destinations from the Pacific Coast to the mountains of New England in the 1920s and 1930s.

3

4

“The Out of Door appeals to every normal, healthy individual. Possibly it’s the blood of our ancestors that causes us to thrill at the thought of a holiday spent in the open, away from all the artificialities of modern life. But, whatever the cause, we revel in the bigness, the freshness and the wholesomeness of it all. And it is wholesome. The lungs expand to inhale the pure clean air. The muscles harden under the unwonted exercise of paddle and portage. It’s an education, too, to view at close range the marvels of nature and to learn something of the wondrous ways of the wild.”

— From the foreword to *Camp Craft and Woodlore*, 1929, by G. Herbert Lash, who would go on to become CN’s director of Public Relations

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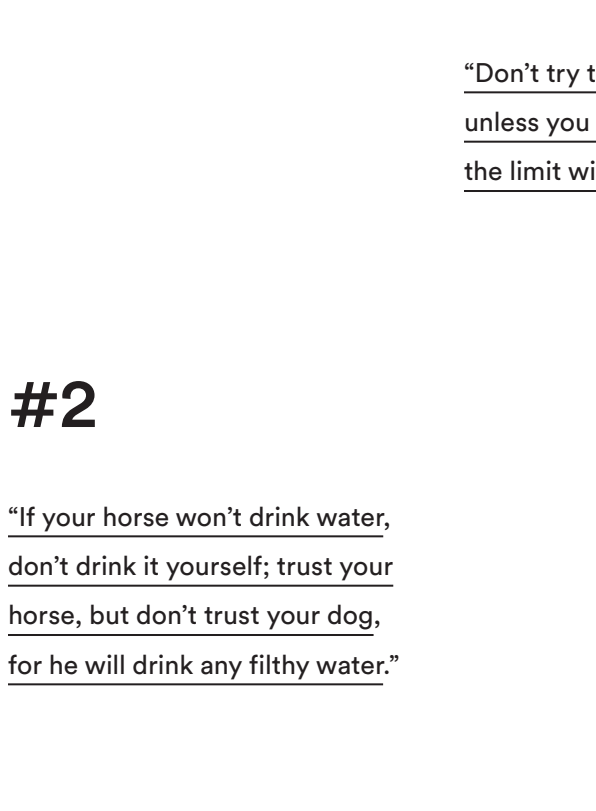

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10 helpful hints for 1920s travellers from CN's *Camp Craft and Woodlore*:

#1

"Don't try to kidnap a bear cub unless you are prepared to go the limit with its jealous mother."

7

#2

"If your horse won't drink water, don't drink it yourself; trust your horse, but don't trust your dog, for he will drink any filthy water."

#3

"Always carry two waterproof match boxes of the hard rubber kind that will float—one full of salt and one full of matches—and keep in reserve in case of accident. This is cheap life insurance."

#4

"Do not sit or lie on bare ground; it is harmful and likely to cause sickness. It is better if caught out in the rain to sit on your hat and go bareheaded than to sit on the ground."

#5

“If crossing logs on foot, keep your eye on the log, not on the moving water below. If the log is not newly felled, test the bark to see if it is loose.”

#6

“Talk to your dog or horse—he is just as lonely as you are.”

#7

“A little vinegar in water boiled in your pots will take away the smell of fish.”

#8

“Don’t think you know more about hunting than your guide. Remember, conditions vary in different places.”

#9

“If your boots are wet, scrape away some hot dirt or sand from under the fire and fill them with it. They will be dry in the morning.”

#10

“The tail of your sweater is fine for darning if you unravel a bit of it.”

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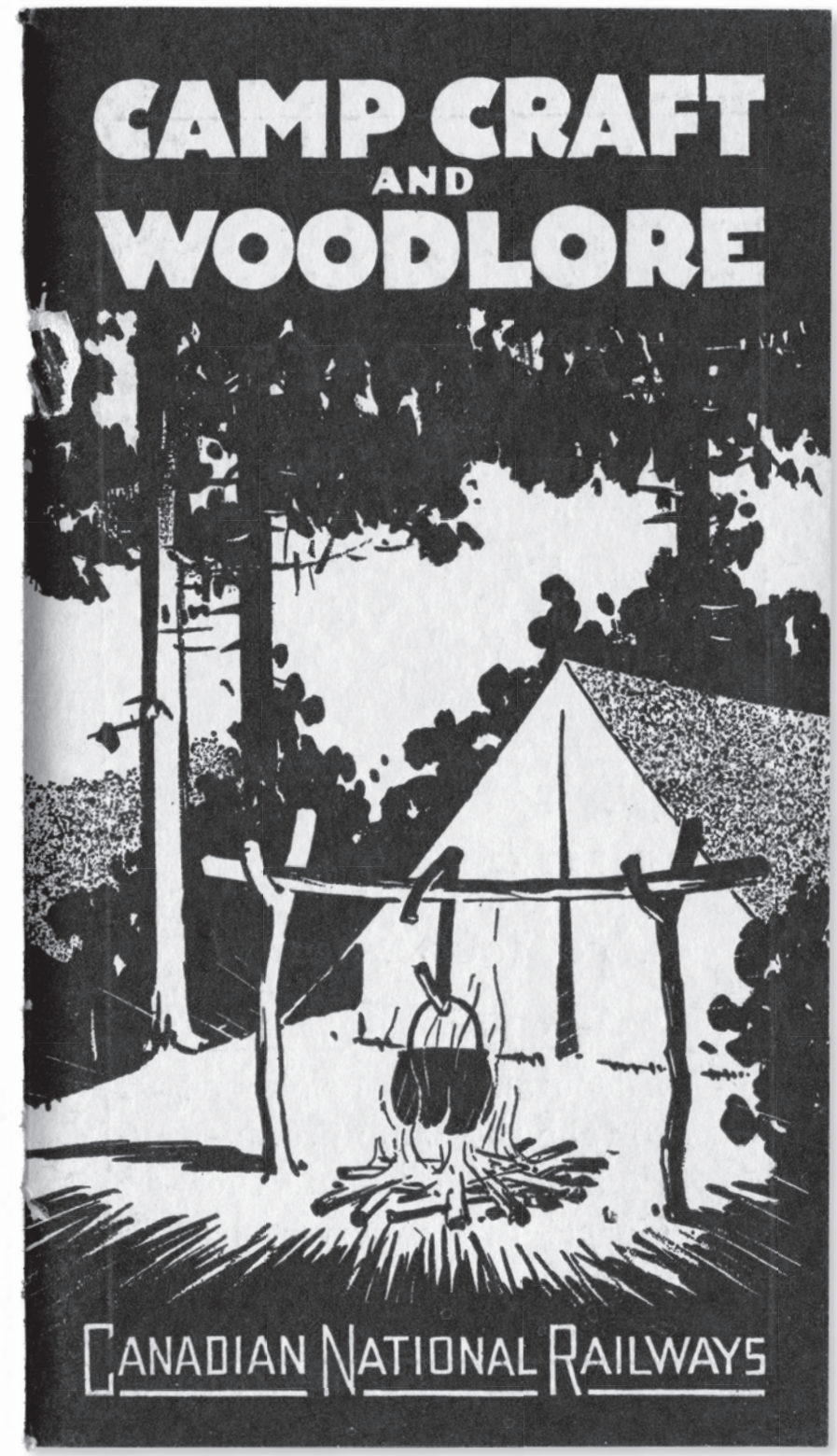

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JASPER NATIONAL PARK

Reaching New Heights

It would be hard to dream up a more spectacular tourist destination than Jasper National Park's approximately 4,250 square miles (11,000 km²) of spectacular mountains, glaciers, rivers and lakes in Alberta. Founded in 1907, the area is now part of a UNESCO World Heritage Site. CN put it on the map for generations to come with the construction of a resort and a new railway station in the 1920s, creating a luxurious entry point for visitors to explore the natural setting in any season.

1

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FUN FACT

A new outdoor concert venue at CN Place, the Jim Vena Stage, was named in 2018 for a former CN executive vice-president and chief of operations who grew up in Jasper and calls it home.

3

“Jasper was one of CN’s first forays into the recreation field. The company’s then-president Sir Henry Thornton bought what was called Tent City and replaced the canvas dwellings with new log cabins. He called the new development the Jasper Park Lodge. The railway’s chief architect, John Schofield, redesigned the facility using peeled logs and fieldstone, and created what was at the time the world’s largest single-storey log structure. Around it stood a village of bungalow cabins, and beside it they laid what remains one of the world’s most scenic golf courses. But the links attracted more than their share of local wildlife, and one unfortunate golfer watched as his golf ball disappeared in the jaws of a bear—still a hazard to this day.”

— Ron Brown, author, *Rails over the Mountains*

4

1 / The Jasper Park Lodge bus offers shuttle service around the hotel (1950).
2 / Trains at Jasper station, Alberta (1956).
3 / View of the town centre (1946).
4 / Guests of another era risk getting up close and personal with bear cubs (1937).

5 / Trains and trail riders in Jasper Yards (1946).
6 / Room service by bicycle at Jasper Park Lodge (1941).
7 / Guests on Beauvert Avenue (1947).
8 / Enjoying the swimming pool at Jasper Park Lodge (1951).
9 / An evening of dancing in the ballroom (1937).
10 / The lodge's tennis courts (1951).

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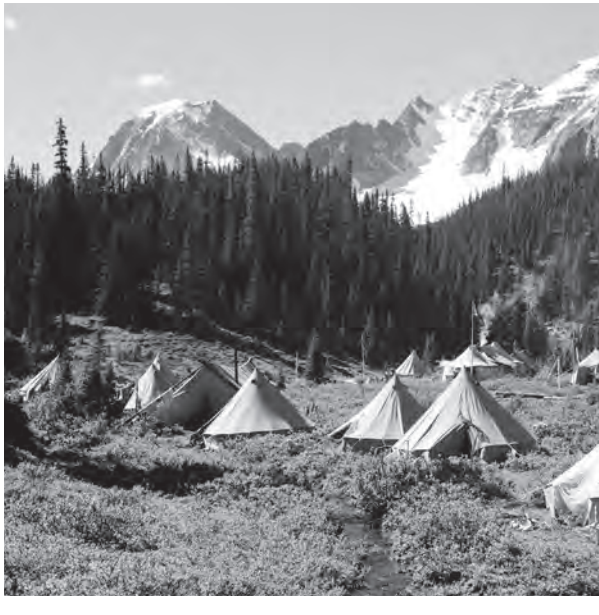

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11 / Stories and campfires at Amethyst Lake (1946).
12 / Climbing a rock wall in Cavell area (1940).
13 / Riders on a break on the Jasper Trail (1940).
14 / Bicycling in the park (1939).
15 / Eremite Mountain campsite (1945).

16 / Looking for fish on Honeymoon Lake (1946).
17 / Fishing for rainbow trout at Amethyst Lake (1945).
18 / Visiting with a fawn in the park (circa 1935).
19 / Party canoeing on Lac Beauvert (1942).
20 / Trail riding at Athabasca Glacier (1939).
21 / Conversation between riders (1946).

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Celebrity Magnet:

Big names came to Jasper. Many, like singer Bing Crosby, were drawn by the rugged wonders of the golf course designed by Stanley Thompson in the 1920s. Jasper Park Lodge boasts a number of films made on its grounds: *The Country Beyond* (1926), *The Emperor Waltz* (1948), *The Far Country* (1954) and *River of No Return* (1954), which starred Marilyn Monroe and Robert Mitchum.

23

25

22 / Bing Crosby on set while shooting *The Emperor Waltz*, released in 1948 (1946).
23 / Golfing at the foot of the mountains (1952).

24 / Ski run near Outpost Lake (1939).
25 / Party of skiers on Signal Mountain (1937).

023 / 100

STAR POWER

In the Pictures

When Marilyn Monroe rode the rails in her trademark blue jeans, thousands of people in the Alberta town of Jasper, came out to see her in the mid-1950s (though few caught sight of her when she was rumoured to be wearing only a bearskin). Future husband Joe DiMaggio also joined her in the mountains and entertained local baseball fans with stories from the field. With the release of *River of No Return*, a Western filmed in CinemaScope, critics debated whether the stunning natural scenery or the actress herself was the main attraction.

"I knew the movie train, which ran daily to the Devona siding, would soon be arriving so I went down to the station to see the stars getting off. There was a CNR telegraph office there, with a loudspeaker system. The voice came on, almost laughing, and said, 'Anyone around here seen Marilyn Monroe? I have a telegram for her from Joe DiMaggio.' It was perfect: I hadn't walked a hundred steps and there she was, right in front of me. So I said a dumb thing: 'Excuse me, are you Miss Monroe?' and we ended up speaking for quite a while. Not only was she very easy on the eyes, she was very easy to talk to. I walked her back down to the station and showed her where she could get the telegram. She was most appreciative. And it was a rare privilege at age 19 to walk Marilyn Monroe down the street all by myself."

— Harry Home, former locomotive engineer, with CN 1949–1998

1 / Marilyn Monroe, all smiles and hair blowing in the wind, greets the crowd upon her arrival in Jasper, Alberta, to film *River of No Return* (1953).

024 /100

THE TELEGRAPH

1

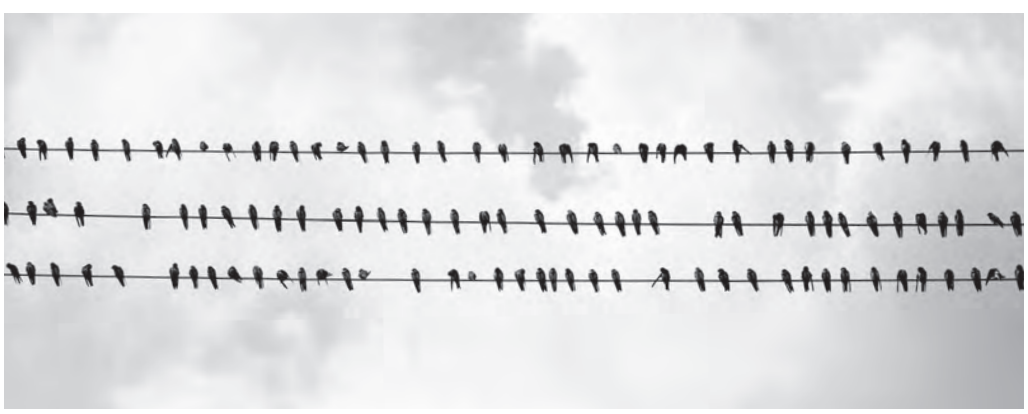
3

Connecting the Dots

Long before text messaging, there was the telegraph. Telegraph offices in every train station revolutionized railroad safety by allowing dispatchers to dictate orders to train operators over a wire, while offering public customers a means to send messages. By the time the last Morse code train order was sent in 1977, CN owned more than 23,000 miles (37,000 km) of telegraph and telephone circuitry and 135,000 miles (217,000 km) of wire.

Communication Skills:

CNCP Telecommunications, a joint venture between Canadian National and Canadian Pacific railways that was launched in 1967, would emerge as a telecom leader. By the 1980s, it was replacing poles and wires with fibre-optic cables, laying the groundwork for the information highway.



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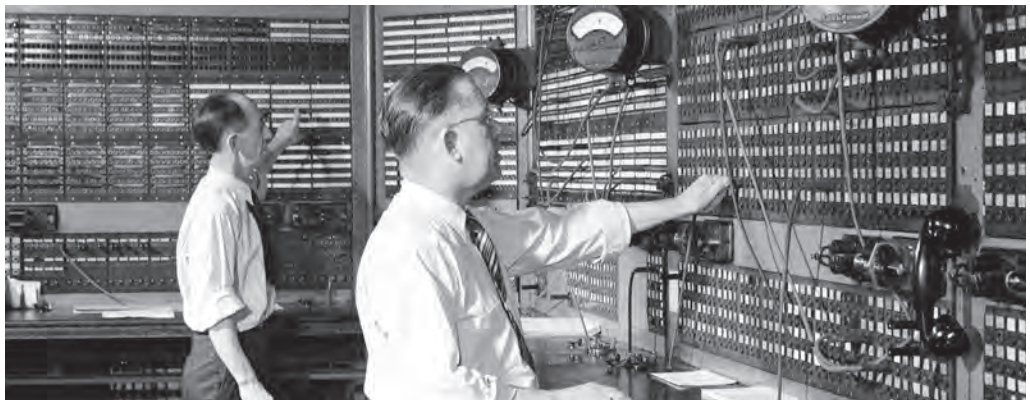
1 / CN ticket offices offer telegraph services, Quebec City (circa 1933).
2 / Swallows perch on telegraph wires in Lachine, Quebec (circa 1931).
3 / Logo detail on uniform of Messengerettes, who deliver telegrams (1945).
4 / An RCAF soldier writes a telegram (1943).

4

“You did all your dispatching on the telegraph key, rather than the telephone. One good thing about dispatching on the Morse code, there was no unnecessary conversation. It was strictly with men in the station that knew telegraph. You didn’t have conductors or brakemen butting in all the time and saying, ‘Look, what the hell are you doing? You’ve got me stuck on the siding somewhere. Why don’t you do this? Why don’t you do that?’ because they couldn’t read the wire.

The last message sent on the telegraph was sent right here in Moncton [New Brunswick]. A dispatcher by the name of Neil Campbell sent the last train order in Canada. The day that he sent it to the station agent in South Devon, outside Fredericton, he signed his initials, NMC, gave the operator the complete time and the wire went dead. That was the end of it.”

— Alfred Bureaux, former train dispatcher, with CN 1944–1987



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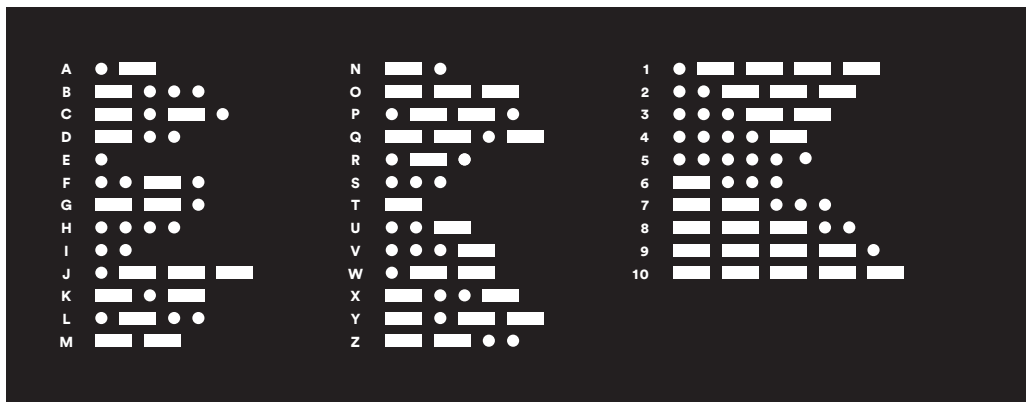
Layout based on the sign-off letters of the last train order.

FUN FACT

In transportation tradition, a dispatcher had to have three initials. If you didn’t have a middle name, you chose a letter, like “G.N.D.” at GO Transit in Toronto, who said the N stood for “Nothing.”



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5 / Telegraph equipment, Toronto (1950).
6 / Morse code alphabet and numbering system.
7 / Teletype machine (1952).

025 /100

BROADCAST RADIO

Making Air Waves

A decade before the government got into the public broadcasting business, CN set up a radio department in 1923, convinced that it had immense possibilities for advertising, passenger entertainment and even public service. A pioneer in offering radio as a regular service to its passengers on moving trains, it soon had 11 Canadian National Radio Stations from Moncton (New Brunswick) to Vancouver (British Columbia). This blazed a trail for coast-to-coast transmissions and programming in different languages, which would eventually become the Canadian Radio Broadcasting Commission (1932) and soon after the Canadian Broadcasting Corporation/Radio-Canada (1936).

“Broadcasting was an unforeseen offshoot of radio communications. But, by the mid-1920s, many people were testing its potential to convey information and entertainment across great distances. CN’s president, Sir Henry Thornton, had been given the monumental task of taking several railways that were in disarray and making them into one unified national system—and he had a vision that radio broadcasting could help him do that. A real experimenter, he saw that building a radio network could provide a unique service to travellers and also show the many employees that their railway was a leader. Around this time, CN also developed a new streamlined locomotive design (with the National Research Council of Canada) and introduced the first mainline diesel-electric locomotive in Canada. These innovations pointed the way to a great future and showed how forward-looking the company was. And radio was the perfect tool to promote these accomplishments across the country.”

—Sharon Babaian, curator,
Marine and Land Transportation, Ingenium,
Canada’s Museums of Science and Innovation

CN Radio Firsts:

1924
Network hockey game: Montreal Canadiens versus the Ottawa Senators, out of Ottawa.

1927
National hookup: Canada’s Diamond Jubilee, out of Ottawa.

1927
Radio drama series: *CNRV Players*, produced by Jack Gillmore, out of Vancouver.

1931
Docudrama series: *Romance of Canada*, written by Merrill Denison, some directed by Tyrone Guthrie, out of Montreal.

1–6 / Cars like the Maple Leaf and the St. Peter are equipped with radios, telephones and phonographs for passenger enjoyment, along with crews to operate the new onboard technology (1929–1930).

026 /100

CN HOTELS

Built to Last

Constructed over the last century, many of the grand railway hotels on the CN roster are still open for business today under different hospitality providers. Some of the properties were commissioned by earlier railways, while others were strategically erected—from the first stately Hotel Newfoundland in St. John's to the third iteration of the Hotel Vancouver in British Columbia—to promote the railway travel lifestyle or to support the economy in growing cities. Overseas, CN owned the Hôtel Scribe (now Sofitel) in Paris, which had its own storied history dating back to 1861. These airy Canadian castles remain landmarks in their cities and conjure dreams of fine living.

"When you arrive in the twilight, this huge castle-like edifice appears—it's Disneyland, but it's not a fantasy, it's a reality. The Chateau Laurier is impressive but it isn't overwhelming. Its many, many rooms have undergone the forces of history, changes, renovations, and yet the core is still there—it's a city hotel with a very warm heart. And one cannot duplicate the artisanship of a hundred years ago. When I come there, it's truly as if the time has evaporated. Most guests come and go. We lived there, which meant we were in a very different category from a regular guest.

I met the 20th century with Mr. Karsh, in and out of the hotel. For example, when Nelson Mandela got off the plane, he asked if he could be photographed. Because the hotel is basically sitting on Parliament Hill, it sort of moved with the tenor of the country, which was fascinating."

— Estrellita Karsh, former hotel resident and wife of photographer Yousuf Karsh, who photographed many visiting dignitaries in his studio at the Chateau Laurier, from 1973 to 1992

Erected in the last century, these properties are still taking reservations:

1 / PRINCE ARTHUR HOTEL, Thunder Bay (Ontario)—1911 (now Prince Arthur Waterfront Hotel)

2 / THE FORT GARRY, Winnipeg (Manitoba)—1913 (now independently owned)

3 / CHATEAU LAURIER
Ottawa (Ontario)—1912 (now Fairmont)

Capital Stay: Chateau Laurier

Ottawa

The third Chamber of Parliament, as it came to be known, was conceived by Charles Melville Hays, president of the Grand Trunk Railway, as a French castle. The hotel was attached to the downtown train station by a tunnel. CN expanded the property, and added cutting-edge technology and facilities: a 60-foot (18-m) indoor pool, wellness treatments, a tea room designed by artist Edwin Holgate, as well as early telephone service and broadcasting suites used by the CBC.

4 / THE MACDONALD
Edmonton (Alberta)—1915 (now Fairmont)

5 / HOTEL NEWFOUNDLAND
St. John's—1926, replaced in 1982 (now Sheraton)

6 / THE BESSBOROUGH
Saskatoon (Saskatchewan)—1935 (now Delta)

7 / HOTEL BEAUSEJOUR
Moncton (New Brunswick)—1972 (now Delta)

8 / JASPER PARK LODGE
Alberta—1922, rebuilt in 1953 (now Fairmont)

9 / HOTEL VANCOUVER
British Columbia—1939 (now Fairmont)

10 / PICTOU LODGE
Nova Scotia—1926 (now independently owned)

11 / THE NOVA SCOTIAN
Halifax (Nova Scotia)—1930 (now Westin)

12 / THE QUEEN ELIZABETH
Montreal (Quebec)—1958 (now Fairmont)

13 / L'HÔTEL
Toronto (Ontario)—1984 (now InterContinental)

Resting in Peace

HIGHLAND INN	Algonquin Provincial Park, Ontario, 1908–1957 (sold 1928)
PRINCE EDWARD HOTEL	Brandon, Manitoba, 1912–1980 (sold 1954)
MINAKI LODGE	Ontario, 1914–2003 (sold 1953)
GRAND BEACH HOTEL	Manitoba, 1916–1962 (sold 1950)

14 / HOTEL CHARLOTTETOWN
Prince Edward Island—1931 (now Rodd)

Princely Palace: Hotel Charlottetown

Prince Edward Island

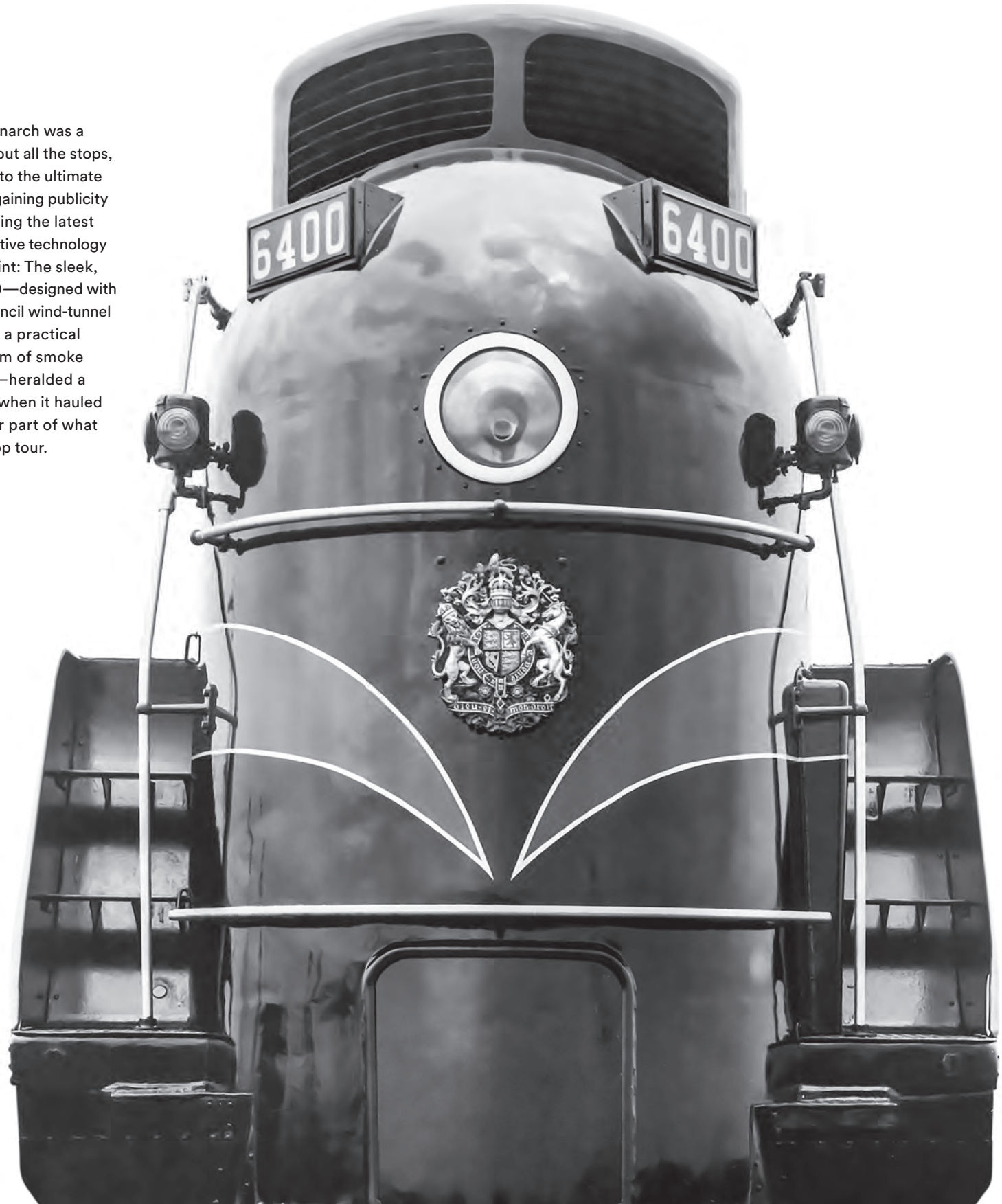
In 1929, seeing a need for more accommodations to keep up with growing tourism and business travellers, a group of PEI citizens requested that CN build a property in the capital. Two years later, the red brick edifice was unveiled, boasting an entrance flanked by stately columns, and a lobby with marble floors and barrel-vaulted ceilings. Originally called the Canadian National Hotel, the name was changed to the Hotel Charlottetown (now Rodd Charlottetown) after its city—the birthplace of Confederation.

027
/100

ROYAL TOURS

Fit for a King

Hosting the British monarch was a chance for CN to pull out all the stops, treating the sovereign to the ultimate in Canadian style and gaining publicity for the railway by putting the latest and greatest in locomotive technology on display. Case in point: The sleek, semi-streamlined 6400—designed with National Research Council wind-tunnel research engineers as a practical solution to the problem of smoke deflection from cabs—heralded a new era of innovation when it hauled the 1939 royal train for part of what was truly a whistle-stop tour.



1 / CN's shiny 6400 sports the Royal Coat of Arms for the 1939 royal visit. (The historic steam locomotive can be seen at the Canada Science and Technology Museum in Ottawa).

1939

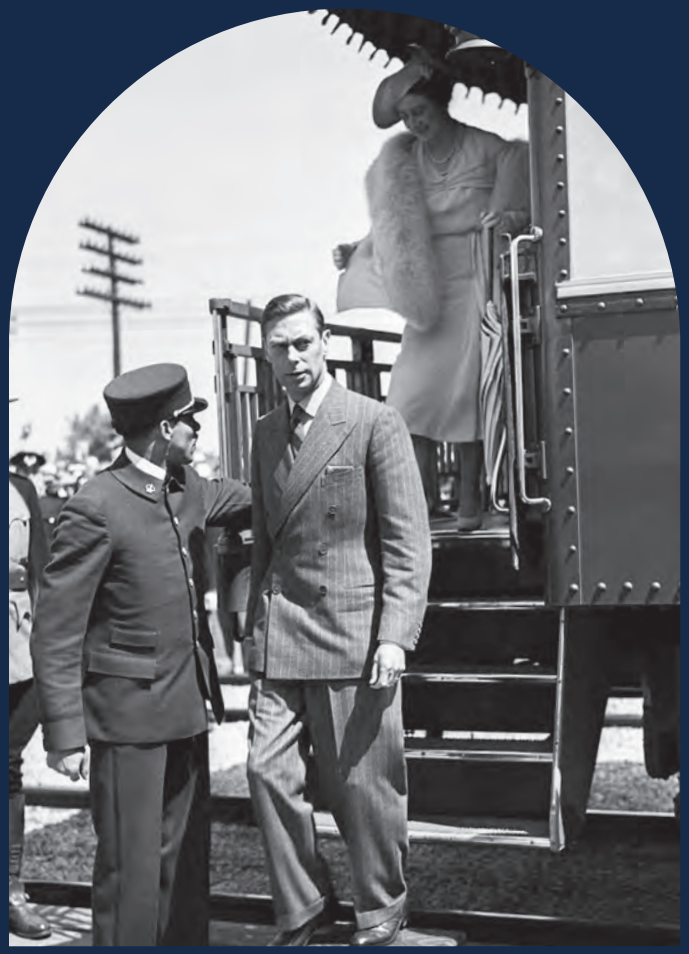
King George VI and Queen Elizabeth

With World War II looming, the British monarch travelled through Canada to raise patriotic spirits, on a 12-car train finished blue and aluminum, with coats of arms on the locomotive smokeboxes and tenders, and imperial crowns on the running boards. Aboard was an official Canadian post office, with its own stamp cancellation, and a telephone exchange interconnecting all rooms.

Duration: One month

Distance: 8,377 miles (13,481 km) total; westbound with CP and 5,153 miles (8,293 km) eastbound with CN—both headlining engines that pulled this train have been preserved.

Highlights: Jasper, Edmonton (Alberta), Toronto and London (Ontario) then into the United States for a reception in Washington, DC, and visits to the New York World's Fair and President Roosevelt. Then back through Montreal (Quebec) to Fredericton and Saint John (New Brunswick) and finally Halifax (Nova Scotia) on June 15.



2 / A porter helps the King and Queen from their railcar in Guelph, Ontario (1939).

"[Prime Minister] Mackenzie King made sure that the pillows on the Queen's bed on the royal train were properly soft. I am quite sure he felt them himself. He followed up every tiny detail to make sure that the train was absolutely right."

— From an anecdote by C. P. Stacey, historian and archivist, in *Royal Spring: The Royal Tour of 1939 and the Queen Mother in Canada*

1951

Princess Elizabeth and Prince Philip

The 25-year-old princess came without her father, whose illness delayed the trip. She shook hands at the rate of 30,000 times per week, heard the national anthem 150 times and inspected guards of honour 24 times.

Duration: 33 days

Distance: 12,000 miles (19,300 km) by train, plane, car and ship; 3,460 miles (5,568 km) on CN track, with the locomotive 6401 hauling 10 sleeper, buffet, baggage and private cars

Routes: Same as 1939, with varying modes of transportation

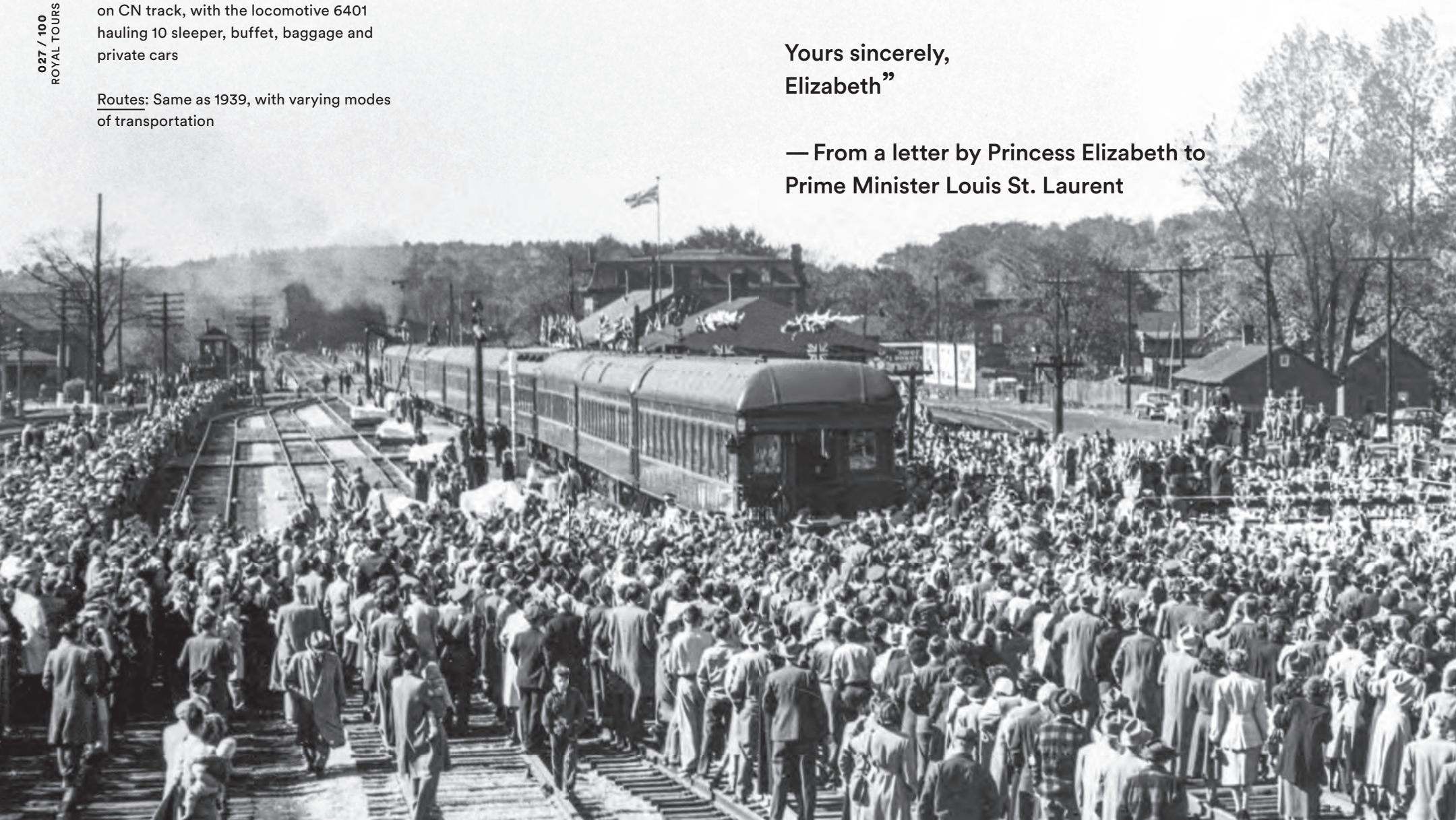
3 / A crowd gathers for the arrival of the royal train in Brockville, Ontario (1951).

“Before leaving I want to tell you how grateful my husband and I are to you and to your colleagues for having given us so great an experience on this journey across Canada. The welcome we received on all sides has far exceeded anything we could have believed possible, and we have been given a picture of the rich variety of Canadian life, which we shall never forget, and which has interested us profoundly.

It has given us infinite pleasure to have had the chance of meeting and talking to so many Canadians in every walk of life, and we have been happy to have had with us at various times on our journey your colleagues in the Cabinet…

Yours sincerely,
Elizabeth”

— From a letter by Princess Elizabeth to Prime Minister Louis St. Laurent



1959

Queen Elizabeth II and Prince Philip

CN again hosted the now-Queen, accompanied by Prince Philip, for the longest royal tour in Canadian history, celebrating the opening of the St. Lawrence Seaway and stopping in numerous outlying areas. They attended 17 military parades, received 193 bouquets and made 381 platform appearances.

Duration: 45 days

Distance: 15,000 miles (24,140 km)

Sites: All 10 provinces, 4 Great Lakes, 2 Territories (the total at the time) and a visit to the United States

4 / Queen Elizabeth II examines a model of her new namesake hotel and CN office complex in Montreal (1959).

“Few people realize how much meticulous planning is entailed for the Railway in the operation of a special train such as this one. I happen to have some idea of the care that has to be taken, of the many instructions that have to be issued, and of the great number of employees who are concerned. The Royal Train was handled with safety and comfort for all its passengers, and the result is but further evidence of the efficiency of the Railway’s organization and of the conscientiousness and loyalty of its officers and employees.”

— From a letter by George Hees, Canadian Minister of Transport, to CN president Donald Gordon

028 / 100

WAR EFFORTS

Joining Forces

While bombs were falling in Europe, the railway was the driving force behind the Canadian mobilization—it literally kept the country moving. Following up on the massive 1914–1918 military efforts of the companies that preceded it, newly formed CN welcomed back regiments like Montreal's 42nd Highlanders at the end of the First World War, and transported WWII troops and critical supplies such as ammunition and food, as well as personal correspondence that was a lifeline between overseas soldiers and their families. By 1946, it was war brides freshly off the boat from Europe who hopped on trains from Halifax to join their loved ones.

1

1 / Soldiers jostle to send telegrams at Bonaventure Station, Montreal (1942).

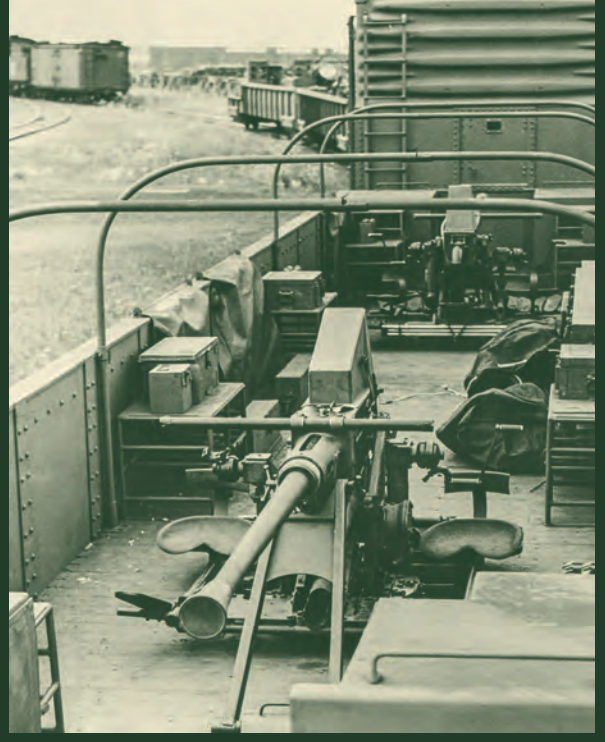
"Ours was a ghost ship—dazzling white all over—and we trudged through deep snow to stare over the side at the bright lights of the city of Halifax, and a mass of shipping in Bedford Basin. A few airmen joined us to stare at the strange illuminations—no blackout here. Then Canadian troops appeared, invalided home after suffering badly from the English climate. They were from the Prairies and they could not stand the dampness. Like everybody else, they stood around in silent groups, unable to take it all in.

Then a CNR switcher clanged its bell, exploded into action with a cut of boxcars down on the quayside, and blasted out a grade crossing warning on its chime. A mighty roar answered it from our decks, as troops cheered themselves hoarse. Now they knew they really were safe alongside, no longer at the mercy of the U-boats or the greater enemy, the North Atlantic itself."

— From a story by W. A. Corkill,
in *A National Passenger Chronicle, Volume 2*

CN's contributions during the first five years of WWII added up:

2



4

20,165

CN employees enlisted; 582 lost their lives, and 100 were decorated for gallantry

4.38 million

Troops transported

3

FUN FACT

Many food items for the army came in to Halifax by freight, including chocolate bars, weekly carloads of meat from Western Canada and bread every day that arrived fresh and warm —not only could CN employees smell it, but said they could feel the heat coming off the cars.

2 / The 1st Canadian Parachute Battalion returns home and boards one of the many CN passenger trains in the Halifax freight yards (1945).
3 / A tank is transported on a flatcar, Canada (1942).
4 / Armoured train in Winnipeg, Manitoba (1942).

5

5 / Injured soldiers rest and read newspapers in their bunks aboard one of CN's hospital cars (1943).

10

Hospital cars built, each with cots for injured soldiers, a doctor's office, a room for three nurses and a dispensary

6 / A Lockheed 14-H2 Super Electra, registration CF-TCE, is towed in front of a hangar shortly after delivery to TCA (1938).

6

13,358,000 lbs

Wartime mail (6,059,090 kg) delivered by Trans-Canada Air Lines

8

CN ships involved in the invasion of Europe; 3 were lost

7

7 / In Halifax, supplies are loaded onto the *SS Lady Hawkins*, a CN ocean liner that would be lost in the war (1939).

8

8 / U.S. Army equipment comes through Halifax (1942).

9 / En route to Europe, troops march from train to ship at the Halifax port (1940).

10 / Employees at a CN locomotive shop buy war bonds (circa 1942).

9

10

$168,372,700

Victory Loans and War Savings Certificates purchased by CN and its employees

11,110,000

Meals served to members of the armed forces

2,254,500

Loaves of bread consumed in dining cars

11

353 million

Train miles travelled (586 million km), freight and passenger aggregated

12

1,350

Number of employees working in CN's munitions plant

11 / Servicemen enjoy a meal in the dining car, Quebec City (1945).

12 / A Canadian workman inspects munitions to be used by British forces (1942).

029
/100

EMPOWERING WOMEN WORKERS

On the Home Front

While many railway men were involved in the war effort and fighting overseas during the Second World War, women found openings in positions that were previously unavailable to them—beyond the more common jobs of ticket-seller, stenographer and telegraph operator. CN hired female train operators, shop workers, interurban passenger-car conductors, welders, oilers and painters. They played a big role in the maintenance of a wide range of engine types, including Bullet-Nose Bettys—a series of steam engines with a cone-shaped front end built by Montreal Locomotive Works in 1944—and keeping them polished to a shine.

1

“I went to work in the dispatching office in 1941. Moncton [New Brunswick] was a railway city and all the trains went through it, from Halifax [Nova Scotia] and Saint John [New Brunswick]. There was a labour shortage at the time, and if you went through your tests and they saw that you were competent, they were only too glad to have you. I didn’t think it was unusual myself to be doing that work, maybe others did. When the war was over, if you were doing somebody else’s job, he would still have seniority when he came back.

I stayed on in the head office for the Maritime region. There were few women in management. In my time, we were the go-fers. Go for the coffee, and go for this. Nowadays, they’re liable to say, ‘Go get your own coffee.’ Still, it made you feel important, working for a big system, coast to coast. It wasn’t just a little corner drugstore. When anybody would ask where you were employed, you’d say with a bit of pride, ‘I’m with CN.’”

— Stella Wellard, former train dispatcher, with CN 1941–1975

FUN FACT

In a time when gender equality had a long way to go, among the women hired at a CN facility in Stratford (Ontario), was Canada's one and only female blacksmith.

3

2

4

1 / An employee assembles aircraft parts (1942).
2 / A telephone operator for the Royal Canadian Air Force Women's Division connects a call (1942).
3 / A worker sits among stacks of steel helmets at General Steel Wares, Toronto (1942).
4 / Repacking journal boxes on freight car equipment is dirty work, Sarnia, Ontario (1945).

030 / 100

RAIL ON THE ROCK

Eastern Horizons

When the island of Newfoundland entered Confederation in 1949, its railway came into the CN fold, along with responsibility for ferry and marine freight service linking its isolated outports to the mainland. Canada's newest province (later Newfoundland and Labrador) brought some challenges to the Crown corporation. Namely, its single-track, narrow-gauge mainline from St. John's to Channel-Port aux Basques—547 miles (880 km) of hills and winding track—for which the company acquired a special series of diesel locomotive designed to suit the conditions. Never speedy but much-loved passenger service on the Caribou (referred to as the Newfie Bullet) was replaced by CN buses in 1969. Freight operations evolved so mainland freight cars could run on the island without reloading, after the ferry trip and a change of running gear, and continued after subsidiary Terra Transport was created in 1979.

“We used to have the seas coming in with heavy winds, it would come right up on the track and leave small rocks over it. Along Conception Bay up through Topsail and Kelligrews and Seal Cove, we’d be out on the section with the horse trying to clean things up. I remember one storm, we had the three diesels and a caboose to go to Port aux Basques, and when we got to Cape Ray, the tracks were being covered with sand. It was blowing right in through the caboose, through the closed doors. You could feel it under your feet, like snow or rice. Right fine sand. And the engines rode up off the track.

But I enjoyed what I was doing. Out of my home terminal of St. John’s, you go out for a couple days and you’re back again, and you could spend a day and a half home. On a freight train, you’d be switching cars at just about every station and going into the Clarenville terminal. It would take us 15 or 20 hours, 267 miles [430 km]. I made a lot of friends, knew a lot of people at all those different stations.”

— Gilbert Oakley, former trainman, with CN 1954–1988

1 / Hugging the sea on narrow-gauge track, mixed train CN 207 rounds a curve at Seal Cove, Newfoundland and Labrador (1984).

Blown Away: Newfoundland and Labrador’s epic winds are strong enough to force a train off the tracks. Wreckhouse Winds, a term used for gusts over 125 miles per hour (200 km/h), refers to the home of one weather-sensitive Lauchie McDougall. He would warn railway agents if conditions were too dangerous near his place, which became known as Wreckhouse. After CN’s anemometer was swept off in a gale, he continued to work through 1965.

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TRAVELLING SPORTS STARS

Teaming Up

CN's passenger service scored high with leading athletes. Earlier in the last century, legendary baseball players like Babe Ruth might be seen breezing through Montreal's Bonaventure Station, while players from the National Hockey League's Original Six regularly hopped the train, including Jean Béliveau, Maurice "The Rocket" Richard and goalie Jacques Plante. And the puck couldn't drop until the train got in.

FUN FACT

Quebec speed skater Gaétan Boucher dedicated his 1984 Olympic gold medal to his father, Cyrenus Boucher, a CN analyst in freight handling, prevention and claims.

1 / The Toronto Maple Leafs score a goal against the Detroit Red Wings (circa 1945).

2 / Montreal Canadiens players (from left to right: Jimmy Peters, Maurice Richard and Kenny Mosdell) make the trip to Boston for the playoffs (1947).

“Some of the hockey teams used to travel with us—the six teams—between Montreal and Toronto. One trip we might catch the Toronto Maple Leafs or the New York Rangers playing Montreal, and then catch them again going to play in Toronto the next day. I made one trip with the Montreal Canadiens between Port Huron [Ontario] and Chicago on a special night train just for the team, with a sleeping car, dining car and coach. At three o’clock in the afternoon, we had to feed them steaks because they were playing that night: steak and tomato juice, no salad or radishes or condiments because it could give them cramps. Toe Blake gave us tickets to see the hockey game in Chicago—that was a thrill.”

— Albino Paolucci, former pantryman, cook, waiter and trainer of waiters, with CN 1936–1978

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SKI TRAINS

First Tracks

Practical, energy-efficient and inexpensive—with a designated driver—ski trains were vehicles for fun, known for an onboard experience that sometimes bordered on debaucherous. In Eastern Canada, cars that had once carried settlers or soldiers were converted for civilian use. In the 1930s, CN launched cent-a-mile ski trains to Huntsville (Ontario), for party weekends in Muskoka cottage country. Toronto skiers could get a ride on a Blue Mountain Special to Collingwood's Craigleith station, while Montreal snow hounds hopped on board for transport to tow lines in Quebec's Laurentian Mountains.

1 / Hill 70 at Saint-Sauveur is a short ride on the ski train from Montreal (1939).

“It is generally agreed among the observers of the winter railways scene in the Laurentians about 1955 that there was nothing in Eastern Canada to equal the sight of double-headed 5200-class Canadian National locomotives, sporting ‘elephant ears’ (smoke deflectors), coasting down the grade south of Morin Heights [Quebec] with 2 baggage cars and 10 arch-windowed, olive-green wooden coaches behind, brightly lighted and bulging with skiers and their paraphernalia. Passenger equipment that once had been the pride of CN’s transcontinental consist had been relegated to this exacting service. The otherwise redundant old green coaches bravely discharged their new responsibility and were very much appreciated by the tired holiday-makers.”

— From an article by Peter Murphy,
co-editor, *Canadian Rail*

2 / Skiers get off the train at Saint-Sauveur station, Quebec (1942).
3 / It’s time to hit the slopes in Saint-Sauveur in the Laurentians (1959).

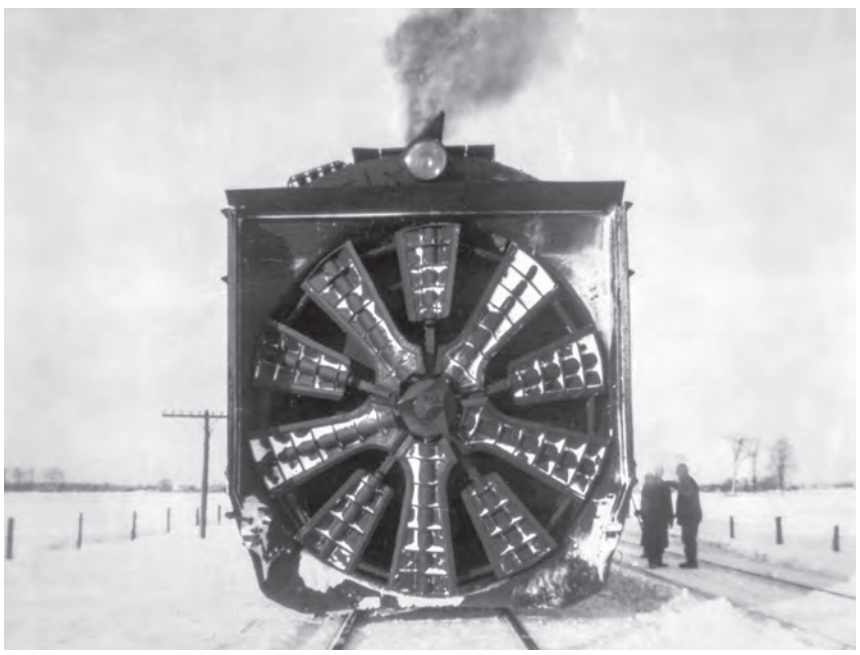
033 /100

WINTER FOR THE RAILWAY

Snow Days

Watching a railway-mounted rotary snowplow cut through a drift, it's clear that it had to be invented by a Canadian (J. W. Elliott, in 1869). The same twist of geography that brings extreme cold and heavy snow to a place brings resilience and resourcefulness to its people. For railroaders, the deep freeze means anticipating iced-over shipping channels, like the St. Lawrence Seaway, opened in 1959 to link the Great Lakes to the Atlantic Ocean. And it means adding a locomotive or air repeater cars to manage air braking systems and knowing that steel rails and wheels feel the pain, too.

1



"When I first arrived, the president, Norm MacMillan, decided I'd better learn a lot about CN and learn it fast. I remember him saying 'Now before you do anything else, if you're going to understand the railway, you've got to ride in the head end of a freight going through Northern-Quebec in the wintertime, that'll give you the drift of it. And treat yourself to the head end of number 57, going from Montreal to Toronto after a hockey game—you'll get the wits scared out of you as you go over the crossings!'"

—William Buchanan, former manager, Europe, with CN 1967–1986

2

“Taschereau in 1949 was a very small [Quebec] village, an old division point built in the 1920s for steam power. There was no highway to get out in winter, you had to go by snowmobile or horse. When I got there, I was 25 and I said, ‘Look, what am I going to do here?’ There was a rink in the schoolyard with a little hose for water. I took it back over the tracks where we had a freight siding and a nice big piece of land. I rented a bulldozer and we levelled the thing, and got some pine trees to make posts. I had three peewee hockey teams and three women’s broomball teams there. That’s all I had to do in my spare time when winter came—I organized sports. If you do those things, it’s easier to do your job.”

— Jacques Gauthier, former locomotive foreman, with CN 1942–1987

FUN FACT

During the ice storm of 1998, CN’s Montreal headquarters welcomed employees’ families who were without power to take shelter under its roof. In Boucherville (Quebec), CN drove a 2,000-hp locomotive down a paved street to the town hall to serve as a generator for area residents.

1 / A rotary snowplow takes on Canadian weather (1947).
2 / A winter storm stops traffic in Saskatchewan (1951).
3 / A wedge-type snowplow, built at CN’s Transcona shops, hits the rails for the trip east from Winnipeg, Manitoba (1938).

3

“It’s like you’re inside a Styrofoam cup. The snow creaks and groans and it does get a little scary. In the early 1980s, we’d get 20 to 23 feet of snow here over a winter. Sometimes we would clear the tracks all the way to Jasper [Alberta] and by the time we got back to Blue River [British Columbia], we’d have to start all over again.”

— From an interview with Jerry Demski, former track maintenance foreman, with CN 1980–2016, in *CN West*

4 / A snowplow clears the Deloraine Line, Manitoba (1949).

LOCOMOTIVE ENGINEER

On the

PUBLIC AFFAIRS OFFICER

Job

In the mid-century, increasing mechanization changed the way railroaders lived and worked.

ENGINE SERVICE BRAKEMAN

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/ 100

Driving On

The transition from steam to diesel meant that locomotive engineers—responsible for operating the trains and keeping the engines in running order on the road—had to make a major adjustment, too. Before the opening of the CN training centre in the 1970s in Gimli (Manitoba), some rode with builders' representatives who introduced them to the new units: less dirty, less noisy and ready to haul way more railcars.

"Now I think I loved steam more than I did diesel, but then I liked repairing diesels better. It was more mechanical, more fascinating. I was always known to patch up an engine: 'If Beaver couldn't fix it, it couldn't be fixed.' One night coming down the corner, right in the middle of the bush, we blew the water out of a 5000 and the brakeman said to me, 'I thought you could fix every engine.' So we went down to the bridge, got a few five-gallon pails and cut a water bottle to make a funnel. He carried water out of the river to fill up the diesel locomotive, which takes about a barrel and a half of water. He said, 'I'm the only brakeman that doesn't have to lean over to tie his shoes, my arms are stretched so bad.' We got out of that mess, got the engine working again and away we went...

I have a diesel engine on the second hand of my watch and it goes around as the watch ticks. A train was everything. A train delivered your mail at one time. A train delivered your family. A train delivered your goods to where there was no highway, such as out in Thunder Bay [Ontario]—it was into the '50s that we got highways to Atikokan [Ontario]."

—Alex "Beaver" Douglas, with CN 1951–1987

1 / Experienced steam locomotive engineers use the same knowing touch on diesels. At the throttle of an F3 diesel, engineer Ed Hone whistles for a crossing during his run to Brockville, Ontario, from Montreal on a fast freight (1951).

LOCOMOTIVE ENGINEER

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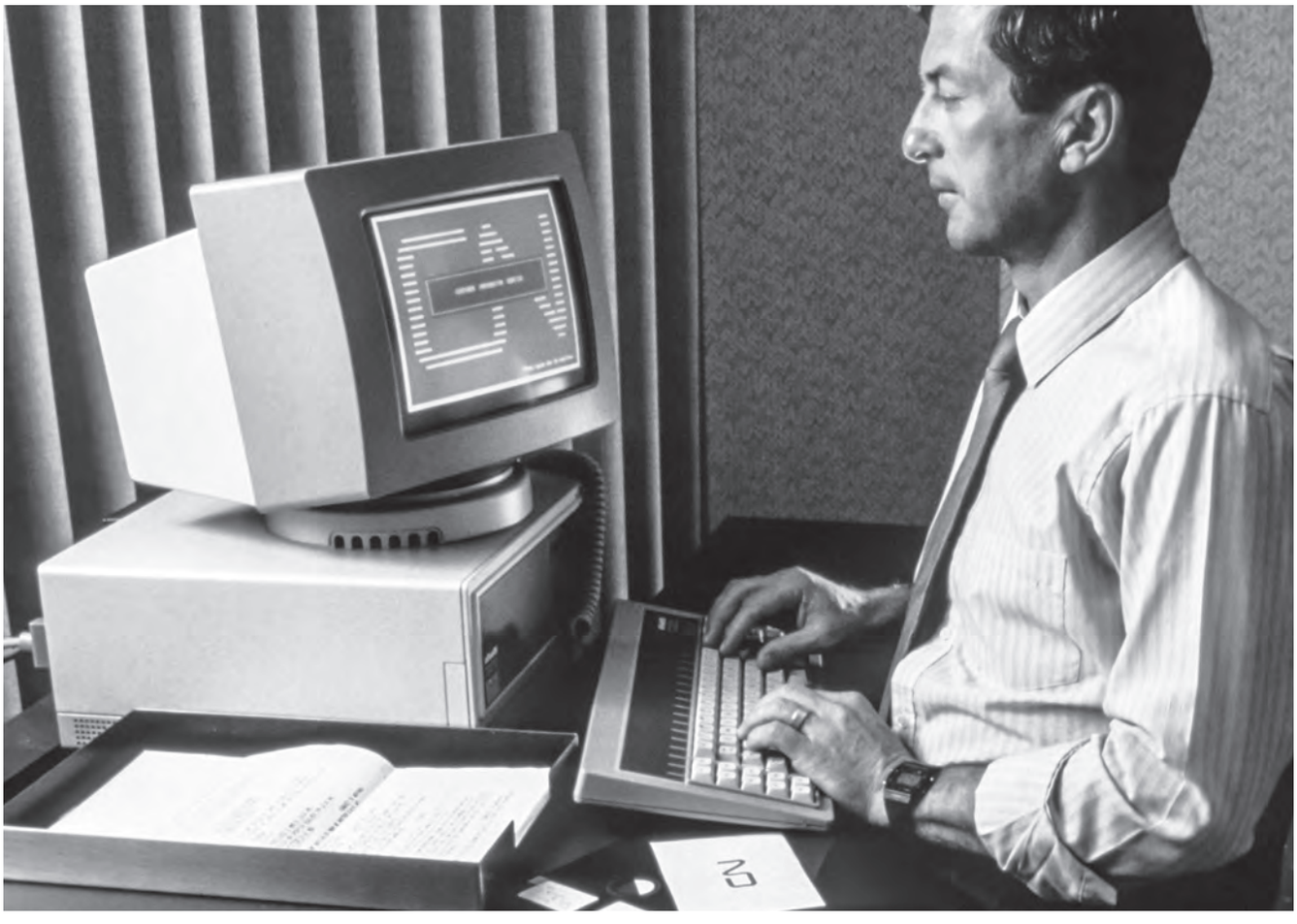
Image Making

As the logistics of the railway business were changing, so was the need for a refreshed corporate identity, one that would reflect the modernization that CN was undertaking. That meant a new company logo and a new look for equipment, hotels and communications branches—and a Public Relations team that could take that message where it needed to go.



PUBLIC AFFAIRS OFFICER

“The Canadian railway image was rooted in the past. People had the perception of dusty old green seats with cinders flying in the window. Billions had been spent but the public hadn’t noticed. At that time, in 1959, I was graphics coordinator in Public Relations, in a position to observe and, later on, to influence, the whole process of reviewing and revising the corporate image. I was in on the ground floor, getting prepared for the rollout of the new design program. Designers didn’t talk management language, and management didn’t talk the same language as designers, so I was the interpreter both ways.

All graphic production went through Public Relations, so I was also going to the shops to tell them how to do it—and railway enthusiast that I was, I loved the hustle and bustle, the noise, the fumes. When the first boxcar was painted with the CN logo on it, a union officer remarked, ‘I can see that this company is on its way to the future, and I’m going to get on board.’ It changed labour relations. It was evidence of real change that people responded to.

The company was wide-ranging in that era, so you’d switch your hat—today it’s new signs for the hotels or it might be the annual report or the use of the logo in advertisements. My favourite part of the job was design, because it could be a catalyst, a communications problem-solver. It was a mobile exhibit of what was going on in the power centres of Canada, a sales pitch for the advancement of design in physical form.”

— Lorne Perry, with CN 1952–1992

1 / Following CN’s highly publicized modernization campaign, employees across departments increasingly rely on computer systems (1987).

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Crew Change

In the 1980s, the demographics of train operations shifted, as women pushed for access to blue-collar positions such as engine service brakeman, which might move up to train conductor and then locomotive engineer, responsible in different ways for the safe operation of the locomotive and freight cars. With lines operating 365 days a year, 24 hours a day, requiring workers to be away from home for long stretches at irregular times, the heavy lifting of railroading had traditionally been seen as men's work.

"I was one of the first women. I remember the bosses would stop what they were doing just to stare at me go by. It really was a man's world at that time, and the company just didn't have the facilities for women. CN was still maintaining bunkhouses for crews back then, which was expensive for the railway and which meant sharing rooms and bathrooms. So they had to start putting me up in hotels, and then some guys would get envious. But in the end, I think hiring women improved conditions for everyone. And I knew I had found where I belonged, my way of life. Some of the old timers snubbed their noses at me, and tested me on hard switches, but I have always been very physically strong.

I was in the yards for a long time as a brakeman, then as a foreman. Later, I worked the mainlines, like between Montreal [Quebec] and Belleville [Ontario], as a locomotive engineer. I adored the independence, and all the different faces, different characters along the way. I'm an active person, I like being outside. Sure, there are days when it's -30 °C [-22 °F] and windy and you're trudging through thigh-high snow to uncouple cars and perform train manoeuvres. And the hours were tough, particularly as a mother of a child—that's the hardest part for women. Luckily my partner is a railroader, too, and he understood what the job entails. Equality starts at home as much as it does on the job.

1 / Francine Leclerc is at the controls in Taschereau Yard, Montreal (1994).

ENGINE SERVICE BRAKEMAN

So many people at CN have grandparents who worked there. It's always nice hearing 'My grandfather did this or that,' or 'Look at my grandfather's watch.' What I'd love to hear is more granddaughters saying, 'My grandmother worked there, too.'"

—Francine Leclerc, with CN 1981–2015

2 / Souvenir engineer's hat sold by CN, Montreal (2019).

FUN FACT

Classic railway caps get their stripes from ticking fabric. Originally used to encase feather pillows and straw mattresses, the denim-like material was cheap, resilient and readily at hand—and the pattern obscured dirt.

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/100

TICKETS, PLEASE!

Paper Trail

The ticket punch, used to track which tickets have been checked, was a signature item for a passenger-train conductor. The tools had different die shapes to create distinctive holes and chads, which allowed the conductors to recognize their own handiwork and know that the fare was valid: Beware the passenger who claimed their ticket was already punched. There was no shortage of paperwork, and paper punching, in CN's day-to-day affairs. In the 1950s, the accounting department was feeding punch cards into an electronic computer. Track workers were punching out at the end of a shift. And at the re-perforating switching centre in Montreal, telegraph messages were being punched on tape, torn off and put into a transmitter so that they didn't have to be retyped, in an early step toward automation—and an increasingly paperless future.

Pass and Present:

One of the perks given to CN senior officials, as well as some employees, pensioners and their spouses, was the railway pass. The red plastic trip pass card, issued for the last time in 1981 but still valid, is a ticket to ride: It allows free transportation for pleasure purposes only on many VIA Rail trains, most DRL Roadcruisers and some Marine Atlantic vessels.

038 /100

PORTERS PIONEERING CIVIL RIGHTS

Attending to History

For a good part of the 20th century, one of the only positions open to Black men was that of railway porter. Members of the African-Canadian community and immigrants from the Caribbean and the United States, often based out of Halifax and Montreal, catered to passengers from boarding through disembarkation. To fight discrimination and improve work conditions, they formed the Order of Sleeping Car Porters in 1917, which established itself with CN. Later the Brotherhood of Sleeping Car Porters, which at its height had 18,000 members across North America, would continue to pave the way for equality.

1

“My travels to many scattered communities and cities gave me a new faith in Canada’s future as a growing country. I thought of it as a stepping-stone to move forward in a country that was trying to settle immigrants from all over the world. The railway companies made it possible, like it or not...

I was busy making money; however, I was also learning about the bigger country I now lived in. While working my way across Canada, trip after trip by rail in a sleeping car, I watched the countryside roll by with its pristine forests and green meadows. Near the tracks, by the many lakes and rivers, I was often surprised by the wildlife. We also went through small towns with little churches and farms. Many times on a hot summer day, I would open the half door on the vestibule of my car to get a better view of the powerful locomotive in action up front, pulling and puffing to move the tons of steel forward at speed, while I dreamt about being a fireman and going on to become an engineer.”

— From *A Struggle to Walk with Dignity,* by Gerald A. Archambeau, former CN sleeping car porter

1 / Porters handle baggage at Central Station in Montreal (1951).

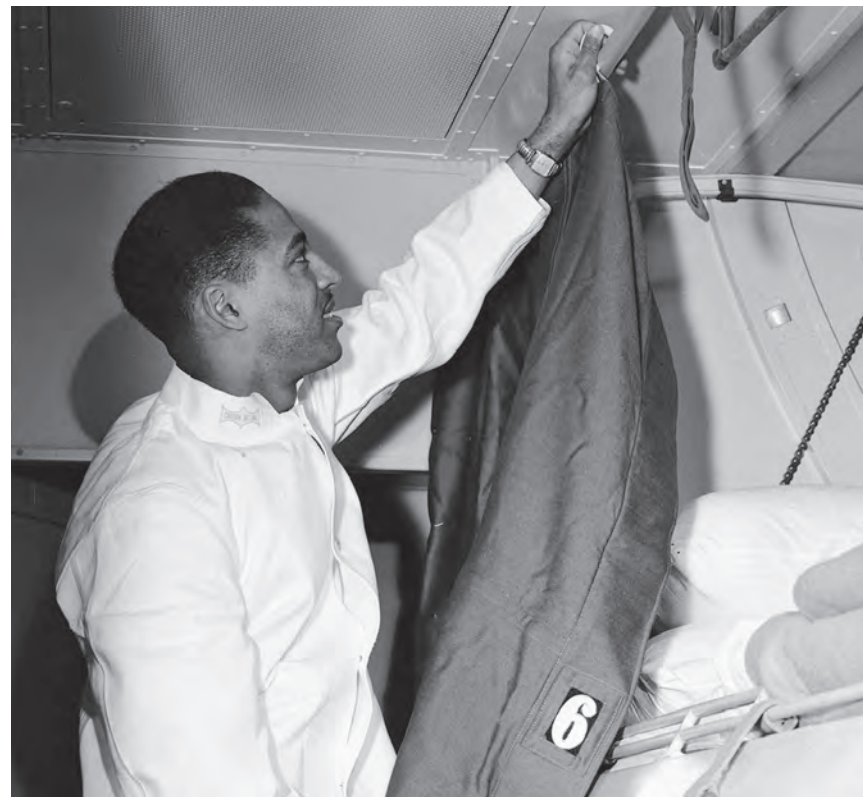
2 / In addition to carrying luggage and catering to passengers from boarding through disembarkment, porters are responsible for making up berths in the sleeper cars (1954).

3 / Royal train porters from CN and CP take a break. Left to right: R. Coker, W. L. Holmes, E. D. J. Bartholemew, W. T. Fraser, C. B. States, C. D. Frazier (1951).

Community Spirit:

With so many members of the community employed in sleeping and dining cars or as red caps, predominantly Black neighbourhoods arose in proximity to train stations—such as the Montreal area now known as Little Burgundy.

2



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039 /100

SLEEPER TRAINS

Hotels to Go

In 1953, CN set about modernizing its mainline passenger trains, a much-needed upgrade to equipment worn out during the war. Its order for 359 cars was the single largest for passenger equipment in Canadian railway history—with the company touting its investment as the best that $58,000,000 could buy. Its new flagship Super Continental, powered by multiple-unit diesels with slick black-and-green bodies, did Montreal–Vancouver in 73 hours, 20 minutes. (The Ocean Limited extended modernized sleeping-car service east to the Maritimes.) It offered accommodations and food options for different budgets, a more convenient arrival and departure schedule in major centres, and ideal timing for viewing scenery in daylight. They may have had to wait 10 years more for dome cars, but on its first run on April 24, 1955, Super Continental passengers weren't just travelling, they were "travel-living."

039 / 100
SLEEPER TRAINS

Name Trains:

Before the Super Continental, there was the Continental Limited. Inaugurated in 1920, it boasted a sunroom, lounges with settees, chesterfields and deep-cushioned chairs, library tables with shaded lamps and a buffet equipped with a soda fountain.

“Shoe shine: A complimentary service to you from CN. Leave your shoes under the lower berth when you retire. Your porter will pick them up and return them with a sparkling polish.”

039 / 100
SLEEPER TRAINS

CN advertisements for its new flagship passenger service in 1955 touted “Design for Travel-Living!”

“Lower and upper berths are partitioned for privacy and there’s even a small kitchen for heating water and baby foods.”

“Not only is it as modern as tomorrow, the Super Continental steps out, too —up to 14 hours clipped from previous coast-to-coast schedules.”

“Main dining room is a perfect setting for a perfect meal, with its pastel decorations, brilliant lighting, homespun curtains and bleached wood furniture.”

“Sweet dreams by night, a leisurely living room by day—a bedroom is the ideal choice for a small family.”

“Smoke cigarettes anywhere.”

“More smart-styled rooms than ever before: single and double bedrooms, bedrooms en-suite, duplex roomettes... And, of course, the traditional lower and upper berths are longer, wider, better lighted and perfectly ventilated.”

“Foam mattresses, liberal luggage space, personal control of heat, light and air-conditioning, mechanically cooled drinking water, toilet facilities.”

“Those who prefer deluxe coach travel will find our new cars ideal for long journeys. Foam rubber, reclining seats with individual lighting and big picture windows.”

“The smooth starting and smooth stopping feature of the direct-drive diesel locomotive gives a glide-ride sensation.”

040 /100

MEALS ON WHEELS

Dinner Is Served

In the heyday of passenger rail, CN's roast beef dinners were famous across North America. Prior to onboard food and beverage service, passengers grabbed a bite at a station meal stop, often with only 15 minutes to order, pay and eat. Deluxe dining debuted on the Continental Limited in the 1920s, with tiny kitchens turning out expert soufflés on pristine tableware. By the mid-century, high-quality dining cars and buffet lounges were common, as were lunch cars called dinettes, with long counters where aproned chefs served hot meals. For thirsty travellers, there were casual bar cars, and later a bistro car with live piano music on the Rapido to wet their whistles.

1 / The buffet car menu on the Vermont line offered breakfast of bacon and eggs, boiled, fried or scrambled (1954).

"It was always first-class service in the dining car aboard those trains: the gleaming silverware and the white tablecloths, everything impeccable, and the waiters were so perfect. It was the most elegance that many people travelling had ever seen. When I was equipment inspector, it would take three hours to check all the dishes: bread and butter plates, cereal bowls, dessert bowls, soup bowls, dinner plates, side plates, cups and saucers and knives—regular dinner knife, butter knife, little fish fork and regular fork. You'd get your potatoes in one bowl, peas in another. Just imagine how much washing those guys had to do in the kitchen.

We had really good food. The meats and fish were always fresh. In those days, the dining car stewards had to print their own menus. They had a typewriter, and they'd run off copies on a little stencil machine, one menu at a time. The cooks used to bake their own pies on the train, do huge roasts and 25-pound [11-kg] turkeys. The facilities were not that big, maybe a foot and a half clearance between the stove and the cupboard. And hot? Those fellows must have lost 20 pounds [9 kg] a trip."

— Pat Bennett, former Sleeping and Dining Car Department employee, with CN from 1941, later with VIA

MENU

CANADIAN
NATIONAL
RAILWAYS

Canadian National Railways *Central Vermont*

BUFFET CAR SERVICE

Breakfast

A LA CARTE

Blended Fruit Juice 30c

Orange Juice 35c Tomato Juice 30c

Grapefruit (½) 40c

CEREALS WITH CREAM 40c; WITH MILK 30c

EGGS, ETC.

Grilled Bacon with Fried Eggs $1.30; (with 1 Egg) $1.10

Grilled Ham with Fried Eggs $1.30; (with 1 Egg) $1.10

Boiled or Fried Eggs (2) 75c; (1) 40c Scrambled Eggs 75c

OMELETS

Plain 90c Jelly, Cheese or Tomato 95c

PRESERVES, ETC.

Assorted Jams 25c

Orange Marmalade 25c

Preserved Fruits 40c Strained Honey 35c

BREADS

Bread or Rolls 20c

Toast 20c

TEA, COFFEE, ETC.

Tea (per pot) 30c Coffee (per cup) 20c

Individual Special Milk 20c

Instant Postum (per pot) 30c

Half portions served to children under twelve years of age at half price.

It will be appreciated if patrons will report any unusual service or attention on the part of employees of Sleeping, Dining and Parlor Cars to Superintendent at Montreal, Que., as this will enable the Management to recognize exceptional efficiency.

H. B. PARR, General Manager
Sleeping, Dining and Parlor Car Department
Montreal, Que.

BUFFET CAR SERVICE

Club Breakfasts

Price opposite main course includes complete meal.

Orange Juice — Tomato Juice

Blended Fruit Juice — Grapefruit (½)

Fruit or Juice or Cereal with Cream

SELECTIONS

Two Eggs, Boiled, Fried or Scrambled	$1.35
Broiled Ham or Bacon with one Fried Egg	$1.60
Broiled Ham or Bacon with two Fried Eggs	$1.85
Western or Tomato Omelet with strip of Bacon	$1.85

Toast — Hot Rolls

Marmalade — Jam — Strained Honey

Tea — Coffee — Milk

ITEMS IN THE ABOVE CLUB BREAKFASTS MAY ALSO BE ORDERED A LA CARTE IF DESIRED.

MB-261-A
(AT-3)

The Coupe Champlain

From “Cook’s Corner” in *Keeping Track*, 1964

SERVES 4

— 4 tart apples, peeled and slightly lemony

— 15 ml (1 tbsp) sugar

— 30 ml (2 tbsp) melted butter

— A few drops of vanilla extract

— 4 scoops of vanilla ice cream

— 60 ml (¼ cup) almonds or other nuts, toasted

— Chopped maraschino cherries (optional)

1. Preheat the oven to 180 °C (350 °F). Core the apples. In a small bowl, mix the sugar, butter and vanilla.

2. Place the apples in an ovenproof dish and brush with the butter mixture.

3. Bake uncovered for 40–60 minutes until the apples are soft and browned. Baste the apples occasionally during baking.

4. Serve the apples in cups topped with a scoop of ice cream and sprinkled with toasted almonds. If desired, garnish with maraschino cherries.

2 / The Coupe Champlain as photographed for *100 Years of Canadian Railway Recipes* by Marie-Paule Partikian and Jean-Paul Viaud (2013).

FUN FACT

This dessert recipe was whipped up in 1964 by supervisory chef Bernie Desanlis for service aboard the Champlain, a new train running between Montreal and Quebec City.


CANADA DRY
GINGER ALE

3 / Passengers settle into the quiet refreshment area of a lounge car for a drink (1954).

Beverages · Cigarettes and Cigars

Wines, Etc.

	Indiv.
Port	.40
Sherry	.40
Sherry Cocktail	.40

Ales and Beers

	Pints
Various	.40

Mineral Waters, Etc.

	Splits	Pints
Sparkling Water	.15	.25
Club Soda	.15	.25
Dry Ginger Ale	.15	.25
Soft Drinks (Various)	.15	

	Glass
Bromo Seltzer	.15

Cigars and Cigarettes

(City Prices)

Choice Havana Cigars	15c, 20c and 25c each.
Cigarettes	33c per pkg.

(M-4) PRINTED IN CANADA

4

4 / CN has a selection of beverages, cigarettes and cigars (circa 1950s).

5 / Hungry travellers look over the menu in a dining car (1964).

041
/100

DIESELIZATION

Fuelling the Future

CN's original twin-unit diesel 9000 ushered in the Diesel Age of mainline railroading on the North American continent. Although early experiments in the 1920s, under visionary chief of Motive Power Ned Brooks, put the railway ahead of the game, there was a long pause before widespread implementation. Then, the company moved methodically under president Donald Gordon—by 1958, the fleet was 80% dieselized, starting with Eastern Canada. When the CN 6043 came thundering into Winnipeg from The Pas (Manitoba), on April 25, 1960, it ended 124 years of steam service on CN and its ancestors. Diesels were faster, cleaner and more efficient, but many were sad to see the old steam engines go, because each had a different personality, some cranky, some good-natured and spirited—much like the many engineers who operated them.

"I recall everyone's excitement when the towering engines replaced the little friendly black engines. The new guys could certainly pull a long train in and out of a station without making a sound, without even a jerk. But I didn't like the smell they made and I couldn't open the windows anymore, no matter how I tried. It didn't help a bit when my father hoisted me up into the engine so I could make the train go either. I just missed those cute black little puffers I was used to. They were so huggable."

— From a story by Sheila Reid, in *Through the Window of a Train: A Canadian Railway Anthology*

My engine now is cold and still,
No water does my boiler fill.
My wood affords its flame no more,
My days of usefulness are o'er...

— From an old English poem "An Engineer's Epitaph," cited by railway historian Omer Lavallée at a retirement party in Belleville (Ontario), for the steam engine—6218's last excursion run was July 4, 1971

Steam

1 / Built by Montreal Locomotive Works, 5107 steams ahead in excursion service (circa 1960s). Today, this historic CN locomotive can be seen at the Ron Morel Memorial Museum in Kapuskasing, Ontario.

“The first diesel engine that came into this part of the country was around 1955. I remember it very well. I was working Springhill Junction [Nova Scotia], and everything was coal there. Somebody said, ‘There’s a diesel engine coming down through here today,’ —6700, I think it was. It rolled through there on one of the passenger trains. Somebody said, ‘Don’t worry about that. That’s just a fad. That’ll go away. It’ll never work down here. The winters’ll kill it. It’s not heavy enough. There’s too many breakdowns. What’ll they do in the snow?’ and things like that. Well, as we all know, it wasn’t just a fad. In a few years’ time, the steam engines were on their way out and everything turned to diesel.”

— Webb Vance, former CN Express clerk, and regional vice-president, Canadian Brotherhood of Railway, Transport and General Workers, with CN 1940–1985

to

Diesel Island:
Prince Edward Island was the first province where CN's operations were fully dieselized, as a small and contained region for CN to start its project and save costs transporting coal to the island. By 1951, it had seen the last of steam—which put it ahead of the rest of Canada by more than a decade.

Diesel

2 / Two 70-tonners, CN 30 and CN 40, return to Charlottetown from Souris with their wooden caboose in tow, Prince Edward Island (1977).

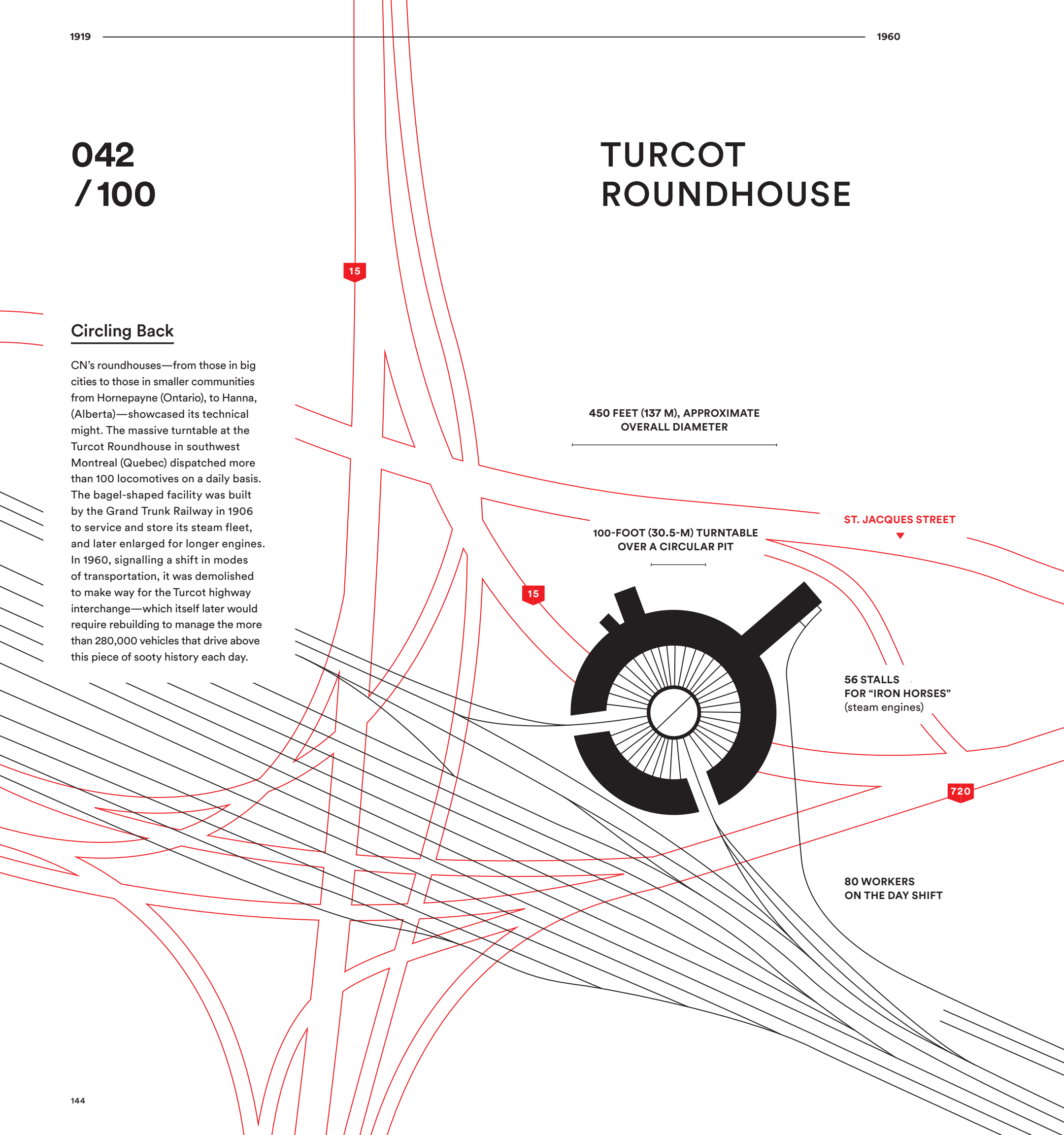
1919 — 1960

042 /100

TURCOT ROUNDHOUSE

Circling Back

CN's roundhouses—from those in big cities to those in smaller communities from Hornepayne (Ontario), to Hanna, (Alberta)—showcased its technical might. The massive turntable at the Turcot Roundhouse in southwest Montreal (Quebec) dispatched more than 100 locomotives on a daily basis. The bagel-shaped facility was built by the Grand Trunk Railway in 1906 to service and store its steam fleet, and later enlarged for longer engines. In 1960, signalling a shift in modes of transportation, it was demolished to make way for the Turcot highway interchange—which itself later would require rebuilding to manage the more than 280,000 vehicles that drive above this piece of sooty history each day.



— 1906 ROUNDHOUSE STRUCTURE
— 1960s HIGHWAY INTERCHANGE

Getting Around:

Only traces remain of the hundreds of roundhouses that once punctuated the landscape in Canada and the United States. CN's Spadina Roundhouse, built in Toronto in 1928, counted an impressive 36 stalls. The Illinois Central Railroad had two at 27th Street, right on the Chicago lakefront, the larger of which stood until the 1960s. One former CN roundhouse, built by Canadian Northern in 1913 between Saskatoon (Saskatchewan) and Calgary (Alberta), is being restored by the Hanna Roundhouse Society (named after Canadian Northern and CN executive David Blythe Hanna).

"It was the biggest roundhouse in Canada, and I was only a kid. At the peak, I had about 400 to 450 men working under me—machinists, boilermakers, electricians and so forth—who were working in the maintenance of the locomotives. We had 30 pits, but we didn't have enough. Oftentimes the locomotives were serviced outside, even in winter. And I tell you, we had to give those men full marks for the way in which they handled those locomotives in the most severe weather. Mind you, the locomotive is a hot thing, but at the same time, you had to keep things from freezing. So there were all sorts of problems: keeping the fires going, keeping coal from freezing up and keeping enough coal there. You had to keep the water coming. We had to put in new pumping arrangements."

— Douglas V. Gonder, former vice-president, Operations, with CN 1925–1973

1 / The enormous Turcot Roundhouse, used for servicing and storing steam and later diesel locomotives, was the biggest of its kind in Canada, Montreal (1943).

043 /100

THE CN LOGO

From Maple Leaf to Modernity

When he was hired to give CN a new look for 1960, New York designer James Valkus and his team didn't think a maple leaf was meant to go by at 60 miles an hour (100 km/h) and were wary of trademark symbols that would soon appear dated. They saw a brand that was investing in the future rather than looking to the past. Young Toronto-based creative director Allan Fleming puzzled over how to tackle this design challenge, going through dozens of ideas. It was at the 11th hour that the idea struck him, on a flight to New York. He quickly sketched it out on a cocktail napkin, bringing together the C and N as one continuous symbol: "Apart they are two separate letters—joined together they become a single line running from one point to another." The result conveyed a railroad on the move.

1919

The Canadian Northern logo inspired this early version.

1923

The tilted lettering reflected the style of newly acquired Grand Trunk.

1943

A new slogan, and a maple leaf, defined a patriotic mission.

1954

Slight modifications and a red-gold colour scheme for a modern era.

1961

“The continuum of the line is obviously of a train in motion, travelling across the country. I remember as a seven year old that the train was a great icon. I wanted to travel across the country, and every time I see this logo, I think of that freedom, that journey.”

— From a comment by industrial designer Karim Rashid, in “World’s Top 50 Logos”

Recognition Factor:
In 2000, it was declared one of the "World's Top 50 Logos" by a panel of judges assembled by *Report on Business* magazine: "A perfect blend of symbol, typography and intent," according to Jasper Morrison.

1 / The new logo was used for a variety of materials and surfaces, including carpet in passenger cars (1968).
2 / Allan Fleming, executive art director at MacLaren Advertising in Toronto, works his craft at a drafting table (1964).

Media guru Marshall McLuhan called the logo an “icon.”

“To suddenly have the railway—here’s the ‘backbone of Canada,’ you know—taking this attitude toward design is bound to have an impact upon the whole field of industrial design in Canada. I kept thinking of myself working on this project and I really felt a tremendous sense of responsibility. I could just see myself in 15 or 20 years from now sitting at a level crossing, watching the cars go by and saying, ‘Did I do that?’ I have to be able, 20 years from now, to sit there and be happy about it. And I happen to feel that good design is a part of living, it affects everyday lives.”

— From an interview with Allan Fleming, logo designer, in *Keeping Track*

044 /100

LONG-LIVED LIVERY

Changing Stripes

The colours and designs have changed over the years, but CN's locomotives and rolling stock remain among the most recognizable on the road. No wonder model-train enthusiasts painstakingly recreate the olive green and maple leaf logo of mid-century equipment, freight car mineral brown from 1943 (or iron oxide red, Red No. 11) and the more contemporary bold, reduced palette of black and light grey stripes, bright red locomotive front-ends (known as CN orange) and large lettering that made it instantly identifiable at a distance. When the new livery was introduced in 1961, the Public Relations department found that it took only 10 new freight cars out of 100 for a whole train to pop—the older cars simply receded into the background.

“A lot goes into the choices we make for paint colours and finishes. CN in 1954 used a green colour on its locomotives and passenger cars, and it’s always a challenge to get that right. Same with CN’s yellow on its passenger cars. Right now we’re debating what colour the red on the nose of a CN locomotive should be, with different experts from the model railroad community. We aim to match the original colour chips when we have them, but we generally need to lighten them a touch, or people will think the colours are too dark. When you look at a real train, you are looking at it through several hundred feet of atmosphere. That lightens the colours as perceived. So we need to mimic that with our models because when you are three feet away from a model it is as if you are several hundred feet away from the real thing. It’s huge, the lengths to which people will go to be accurate—you put two guys in a room and talk about CN colours, you’re going to get three opinions.”

— Jason Shron, president of model train manufacturer Rapido Trains

Living Colour:
Model trains were used at CN headquarters to show livery concepts to management. And the Montreal Model Railway Club was housed below the Central Station viaduct for 38 years, where the 4,900-foot (1,493-m) fully operational layout was reputed to be the largest in Canada.

1 / A pair of CN FPA-4/FPB-4 locomotives haul a complete nine-car Rapido train, by leading Canadian model railroad manufacturers Rapido Trains, at Exporail in Saint-Constant, Quebec (2019).

045
/100

MOVING PICTURES

Screen Shots

Film production and sponsorship brought CN to the big screen in technical works and travelogues, inviting audiences sightseeing to Churchill (Manitoba), with *North to Hudson Bay* (1950), or angling Algonquin Park speckled trout in *King of Snowshoe Rapids* (1931). *The Railrodder* with Buster Keaton, produced with the National Film Board in 1965, saw the silent-film star travel from Lawrencetown (Nova Scotia) to White Rock (British Columbia) on a railway speeder. This classic Canadiana was among the movie selections given to Syrian refugees in 2015 to help them discover their new country.

“The only reason we got the movie was because Buster Keaton was a railroad fan. He loved the railway and all the people that worked on it, and he even had a model train running around the fence in his garden. For the six weeks of shooting from the Atlantic to the Pacific, we all lived on a private rail car that CN lent us. They would pick us up in the middle of the night, when most of us would be asleep, and we’d wake up in the middle of the prairie in Manitoba or somewhere and we’d have to ask, ‘Where are we now?’”

— Gerald Potterton, director, *The Railrodder*

1 / Railroad fan and Hollywood silent-movie star Buster Keaton travels across Canada by rail during filming of *The Railrodder* (1964).

046
/100

BIRD'S-EYE VIEWS

CN lines unfold through incredibly diverse terrain, going deep into areas of intensive manufacturing, urban density and wilderness that stretches as far as the eye—or drone—can see.

1 / Zanardi Rapids Bridge between Kaien Island and Watson Island, Prince Rupert area, British Columbia (2019).
Latitude: 54° 14' 41.382" N.
Longitude: 130° 18' 11.802" W.

2 / Fields near the community of Convent, St. James Parish, Louisiana (2019). Latitude: 30° 1' 11.63" N. Longitude: 90° 48' 9.888" W.

3 / Red River Bridge near Saint Boniface, Winnipeg area, Manitoba (2019).
Latitude: 49° 53' 47.43" N.
Longitude: 97° 7' 38.276" W.

4 / Outside the community of Ste. Agathe, Winnipeg area, Manitoba (2019).
Lattitude : 49° 34' 26.7" N.
Longitude : 97° 12' 14.6" W.

5 / Kaien Island on the Skeena River,
Prince Rupert area, British Columbia (2019).
Latitude: 54° 16' 28.218" N.
Longitude: 130° 21' 33.51" W.

6 / Rimouski area, Lower St. Lawrence, Quebec (2019).
Latitude: 48° 25' 24.39" N.
Longitude: 68° 36' 19.866" W.

7 / St. James Parish,
near Lake Pontchartrain,
Louisiana (2019).
Latitude: 30° 5' 29.8" N.
Longitude: 90° 25' 7.8" W.

8 / Rockingham Yard, Halifax area, Nova Scotia (2019).
Latitude: 44° 40' 34.626" N.
Longitude: 63° 38' 48.738" W.

9 / Salmon River trestle bridge near the village of Drummond, Victoria County, New Brunswick (2019).
Latitude: 47° 1' 42.371" N.
Longitude: 67° 36' 15.588" W.

10 / Bridge on Lake Pontchartrain between the communities of Norco and La Place, Louisiana (2019).
Latitude: 30° 3' 36.572" N.
Longitude: 90° 22' 53.556" W.

11 / Kaien Island, Prince Rupert area,
British Columbia (2019).
Latitude: 54° 14' 51.3" N.
Longitude: 130° 18' 30" W.

12 / Moose Lake in Jasper National Park, Alberta (2019).
Latitude: 52° 58' 10.392" N.
Longitude: 118° 56' 5.736" W.

Cleaner Scenery:

Risk assessments, wildlife management and remediation of contaminated sites are some of the ways that CN aims to minimize its environmental impact on the many national parks and the forest, wetland and prairie ecosystems that the network passes through.

CN leads the North American rail industry in terms of fuel efficiency, consuming 15% less fuel per gross-ton-mile overall than the industry average, and is 3.5 times more fuel efficient than transport by trucking alone. It also diverts 90% of its waste from landfills.

1 / Zanardi Rapids Bridge between Kaien Island and Watson Island, Prince Rupert area, British Columbia (2019).
Latitude: 54° 14' 41.382" N.
Longitude: 130° 18' 11.802" W.

"Seen from above, the tracks running through the landscape become some sort of abstract art. For the camera, it's all about forms and curves and especially textures. We were looking for variety in the terrain, because shooting with a drone from 395 feet [120 m] in height you're not getting the volumes of the land, so it's really about sensing the textures of the sand, the snow or the rocks. Even 10 years ago, this perspective would have been much more difficult to achieve. For a moment, we almost forget the functionality of the train and just pause to appreciate the beauty of the scene."

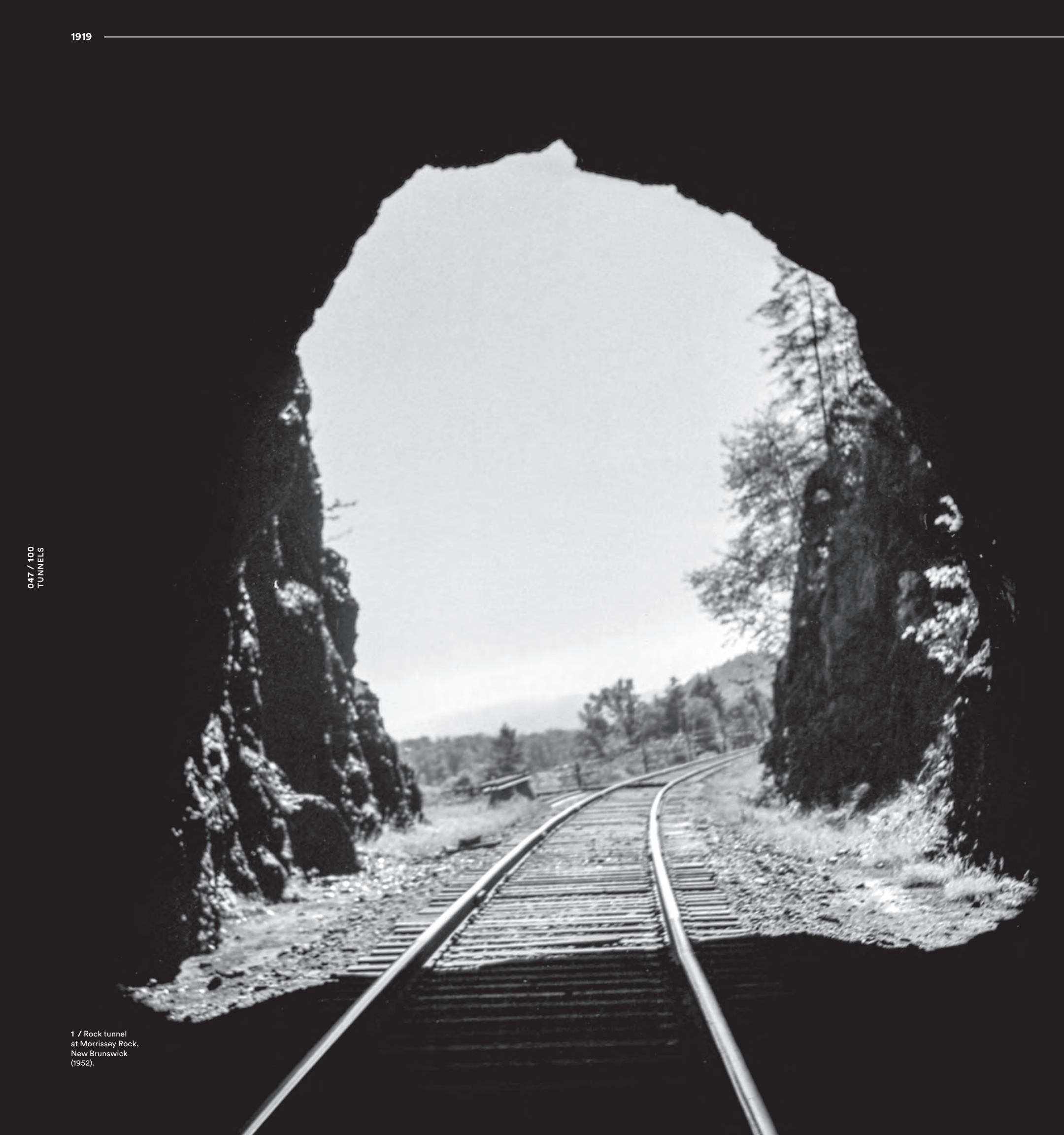
— Pier-Philippe Chevigny,
art director of photo shoot, DAVAI (2019)

Tunnels

&

Bridges

Going over, under and through notable CN infrastructure.



1 / Rock tunnel at Morrissey Rock, New Brunswick (1952).

047
/100

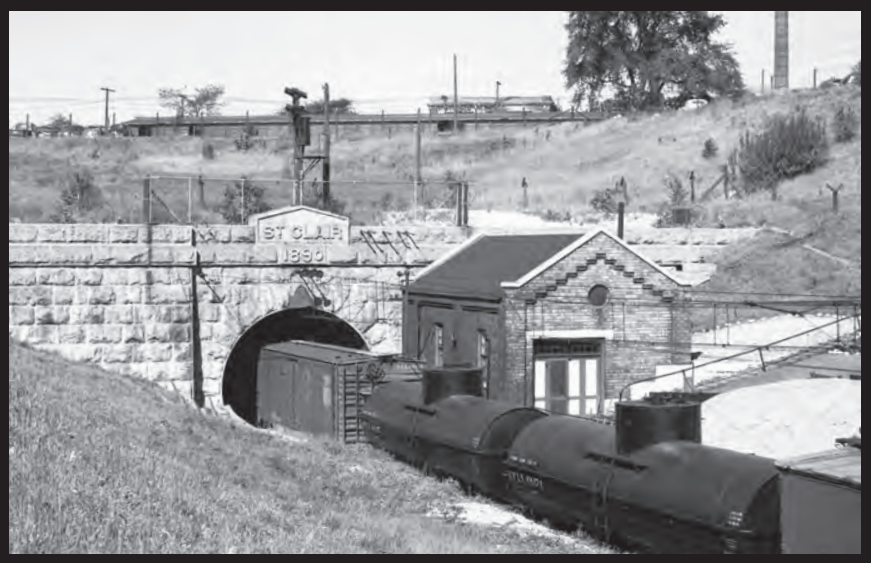
TUNNELS

Getting Through

Rather than going over or around it, sometimes it's better to dig right through it. Whether under water or inside mountains, the more than 80 tunnels in the CN system are key pieces of infrastructure—not counting those less than 135 feet (41 m) in length, and a number of snow sheds and rock sheds along the way. Many tunnels from the railway's past were at the cutting edge of engineering when they were first constructed.

St. Clair Tunnel

Ontario to Michigan



3

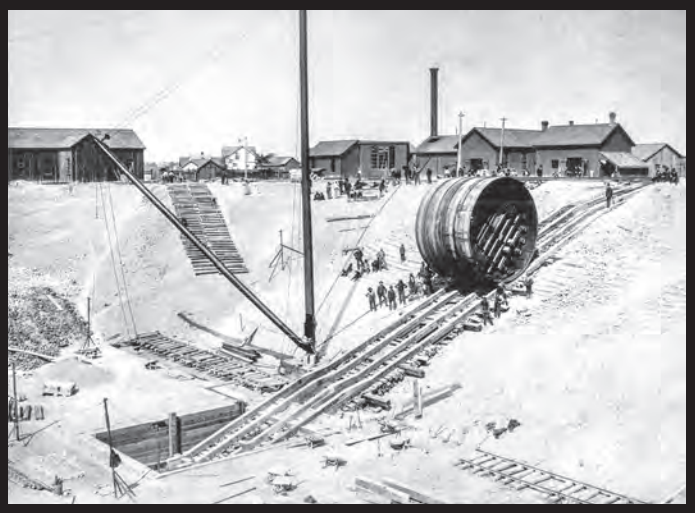
Opened: 1891

Length: 6,025 ft. (1,836 m)

Traverse: St. Clair River

Linking the United States and Canada, it was one of the engineering marvels of its time, built by the Grand Trunk Railway using a tunnelling shield and compressed air in its construction. Connecting Sarnia (Ontario), and Port Huron (Michigan), until its replacement in 1994, it's one of few tunnels to have seen steam, electric and diesel rail traffic.

2



FUN FACT

The St. Clair Tunnel was the first full-size underwater tunnel linking two countries, and the longest in the world when completed.

2 / Lowering the shield during construction of the St. Clair Tunnel (circa 1890).

3 / St. Clair Tunnel at Sarnia, Ontario (1952).

4

Brule Tunnel
Alberta

Opened: 1912–1913

Length: 2,640 ft. (805 m)

Traverse: Canadian Rockies

On the border of Jasper National Park, along the Athabasca River, the curved Brule tunnel on CN's Edson Subdivision comes up fast for trains going 60 miles per hour (100 km/h) then slowing down to 25 miles per hour (40 km/h).

4 / East portal of Brule Tunnel, Alberta (1918).

5 / New south section near completion, Montreal (1959).

6

The Mount Royal Tunnel
Quebec

Opened: 1918

Length: 3 mi. (4.9 km)

Traverse: Mount Royal and urban Montreal neighbourhoods

Connecting today's Central Station and the Town of Mount Royal, it has been called Canada's first subway. Because of its length and the lack of ventilation, it wasn't possible to run steam engines through the tunnel, so Canadian Northern employed electrification with a 2,400-volt catenary overhead.

5

6 / Tunnel at the end of Burrard Inlet lift bridge, Vancouver (1968).
7 / Wolverine Tunnel through the Canadian Rockies (2001).
8 / Canadian side of the tunnel beneath the St. Clair River (2012).

Thornton Tunnel
British Columbia

Opened: 1969

Length: 2.1 mi. (3.4 km)

Traverse:
Urban Vancouver neighbourhoods

On the edge of Burrard Inlet, CN's second-longest tunnel is named for former president, Sir Henry Thornton. It connects Second Narrows Bridge to the Joint Section mainline, burrowing under Willingdon Heights and Vancouver Heights in Burnaby for access to the North Shore terminals.

Paul M. Tellier Tunnel
Ontario to Michigan

8

Opened: 1994

Length: 6,129 ft. (1,868 m)

Traverse: St. Clair River

The second St. Clair tunnel, named for a former CN president, was built to accommodate the taller double-stack cars and multi-level auto carriers on the same Toronto–Chicago line. With a 25.5-foot (8.4-m) interior diameter, it was built using large-bore technology similar to that used for the Chunnel between the United Kingdom and France.

7

Tumbler Ridge tunnels
British Columbia

Opened: 1983

Length: 5.6 mi. (9 km)
and 3.7 mi. (6 km), respectively

Traverse: Canadian Rockies

Running through the Tumbler Ridge subdivision in the Rockies, Table Tunnel and Wolverine Tunnel were built by BC Rail in the 1980s to serve coal mines north of the Prince George area, and were among the few electrified freight tunnels on the continent.

048 /100

BRIDGES

Time Spans

CN's 7,250 bridges stretch for a total of 195 miles (315 km). Built from wooden timbers, poured concrete or steel, they range from short expanses over streams to impressive trestles. British Columbia's Fraser River boasts numerous crossings, including the orange truss arch Cisco Bridge that's a favourite of train enthusiasts (see 064/100). Some are constructed with beams, trusses, trestles and cantilevers, others have swing span and lift designs that make way for water traffic and a few still rest on the original stone piers that are remnants of the very first Canadian railways. Little wonder the company employs 36 full-time bridge inspectors.

1

FUN FACT

The Victoria Bridge was such a feat of engineering and logistics that it was called "the Eighth Wonder of the World" in the 1850s.

Victoria Bridge

St. Lawrence River, Quebec

2

Opened: 1859

Length: 5,906 ft. (1,800 m)

Type: Steel Truss

Built by CN predecessor the Grand Trunk Railway and named for Queen Victoria, the tubular structure of riveted iron plates was the first bridge over the St. Lawrence. Though the bridge was rebuilt, its original piers are still in place and used for rail (and automobile) traffic between Montreal and Saint-Lambert (Quebec).

1 / Original Victoria Bridge before the 1897 renovations (circa 1878).
2 / Aerial view of the Victoria Bridge (1960).

International Railway Bridge

Niagara River, Ontario

Opened: 1873

Length: 3,651 ft. (1,113 m)

Type: Pin-Connected Truss

About 10 to 15 trains a day cross between Buffalo (New York) and Fort Erie (Ontario) on this swing span bridge, redesigned in 1901 and 2000. It's one of several notable bridges to have graced the region, including the pioneering Niagara Falls Suspension Bridge, constructed in 1855.

4

Cairo Bridge

Ohio River, Illinois and Kentucky

3

Opened: 1889

Length: 5,863 ft. (1,787 m)

Type: Through Truss

On the line between Chicago and New Orleans, the current 1952 structure uses some of the same stone piers (now encased in concrete) as the original, which was the longest steel bridge in the world in its time.

3 / IC freight crosses the Ohio River (1993).
4 / View from Bridgeburg, Ontario (date unknown).

Dubuque Rail Bridge

Mississippi River, Illinois and Iowa

5

Opened: 1899

Length: 1,260 ft. (384 m)

Type: Swing

Built over the Mississippi for the Illinois Central Railroad, this is a single-track swing bridge with connecting tunnel. The first bridge at this location was built by industrialist Andrew Carnegie shortly after the end of the American Civil War.

7 / Intermodal train on Fabyan Trestle Bridge, Alberta (2005).

Cap-Rouge Trestle

Rivière du Cap Rouge, Quebec

6

Opened: 1908

Length: 3,280 ft. (1,000 m)

Type: Steel Trestle

Built by the National Transcontinental Railway in the Rivière du Cap Rouge valley, this structure soars to 180 feet (55 m) and trains are limited to 10 miles per hour (16 km/h).

5 / View from Dubuque, Iowa (2015).
6 / View from the Cap-Rouge marina, Quebec (2005).

Fabyan Trestle Bridge

Battle River, Alberta

Opened: 1908

Length: 2,775 ft. (846 m)

Traverse: Steel Trestle

This steel trestle, completed by the Grand Trunk Pacific in 1908, is the second-largest in Canada, and stands 195 feet (60 m) high. Located near Wainwright (Alberta), it's still in use on CN's mainline between Edmonton (Alberta) and Saskatoon (Saskatchewan).

Pembina River Bridge

Pembina River, Alberta

8

Opened: 1910

Length: 910 ft. (277 m)

Type: Steel Trestle

Towering at 214 feet (65 m) high, it was built by the Grand Trunk Pacific Railway as part of its westward push. The steel trestle structure was prefabricated in Scotland and reassembled near Entwistle (Alberta).

8 / View of the trusses spanning the river (2016).
9 / Aerial view with double-stacked containers (1992).
10 / View of rail and highway access over the Fraser (1947).

10

Salmon River Trestle

Little Salmon River Valley, New Brunswick

Opened: 1911

Length: 3,920 ft. (1,195 m)

Type: Steel Trestle

Near Grand Falls, this 195-foot-tall (60-m) structure on CN's eastern mainline was constructed by the National Transcontinental Railway and is part of a Winnipeg–Halifax (Manitoba–Nova Scotia) main route freight-hauling operation.

9

11 / View from the *Lady Rodney* passenger ship (1949).
12 / View of the bridge before its reconstruction (1934).

Prince George Railway Bridge

Fraser River, British Columbia

Opened: 1914

Length: 2,641 ft. (815 m)

Type: Through Truss

The half-mile-long steel through truss bridge (formerly rail and road) over the Fraser River has a vertical lift span, which has rarely been raised since 1920, and was built by Grand Trunk Pacific.

Quebec Bridge

Lower St. Lawrence River, Quebec

11

Opened: 1919

Length: 3,238 ft. (987 m)

Type: Cantilever

The Quebec Bridge was built by National Transcontinental Railway, linking the provincial capital's Sainte-Foy neighbourhood and Lévis with rail, roadway and walkway. A total of 88 lives were lost in two tragedies that occurred during the construction of the longest cantilever railway span in the world.

Second Narrows Rail Bridge

Burrard Inlet, British Columbia

Opened: 1968

Length: 5,981 ft. (1,823 m)

Type: Vertical Lift

Connecting Vancouver to the North Shore, the original 1926 rail bridge was replaced with a larger, higher lift bridge (151 ft., or 46 m) in the 1960s. It is usually left open, and the bridge tender activates cables and counterweights to lower the span.

12

049 / 100

CN TOWER

Building an Icon

CN broke new ground—literally and figuratively—with the construction of the world's tallest free-standing tower, a title the CN Tower maintained for 32 years until Dubai's Burj Khalifa surpassed it. Begun in 1973 and completed in 1976 as a telecommunications structure for the railway, with an antenna that would send microwave signals clear above Toronto's growing high-rises, it also had television, radio and mobile transmission capabilities that are still used by media outlets today (under different ownership). With its distinctive shape and downtown location that invites the public in to explore, it continues to make the city instantly recognizable across the globe.

"CN went ahead on its own with the tower, which was to be twice as high as anything else in Toronto and 400 feet [122 m] taller than the Empire State Building. The concept had grown from a relatively simple communications tower to serve radio and TV stations, which were having trouble with their signals, to a structure that could bring in money as a tourist attraction… By year's end a million visitors had passed through the turnstiles of the world's tallest free-standing structure to visit three observation decks and a 400-seat revolving restaurant."

—From *The People's Railway*, by Donald MacKay

CN Tower

“This 1,800-foot [550-m] tower is enough to make King Kong dizzy.”

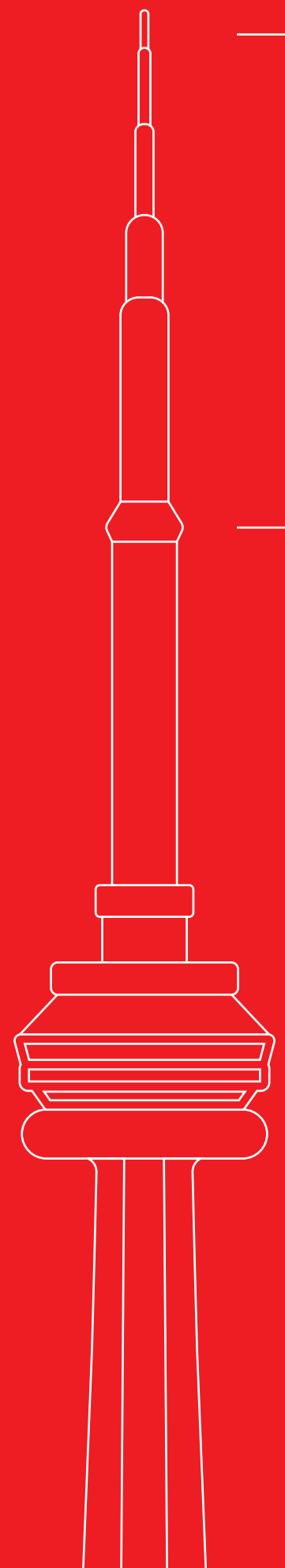
— From a report by Bill Harrington, CBC News, 1976

1 / In the heart of the CN Tower is a hexagon-shaped hollow concrete core (1976).

The ins and outs of the CN Tower construction process with Jamil Mardukhi, structural engineer, NCK Engineering:

Coating the broadcasting antenna to protect against ice was a tall order.

“We have to climb the inside of the antenna to do inspections, and the top portion is very tight. So we have to employ slim engineers to do the job!”



Top of Antenna

553 M

Space Deck (now Sky Pod)

447 M

Sky Pod

363 M	MECHANICAL
360 M	FM TRANSMISSION
356 M	UHF TRANSMISSION
351 M	RESTAURANT
346 M	INDOOR OBSERVATION
342 M	OUTDOOR OBSERVATION
338 M	MICROWAVE

The tower is concrete from its base to the top.

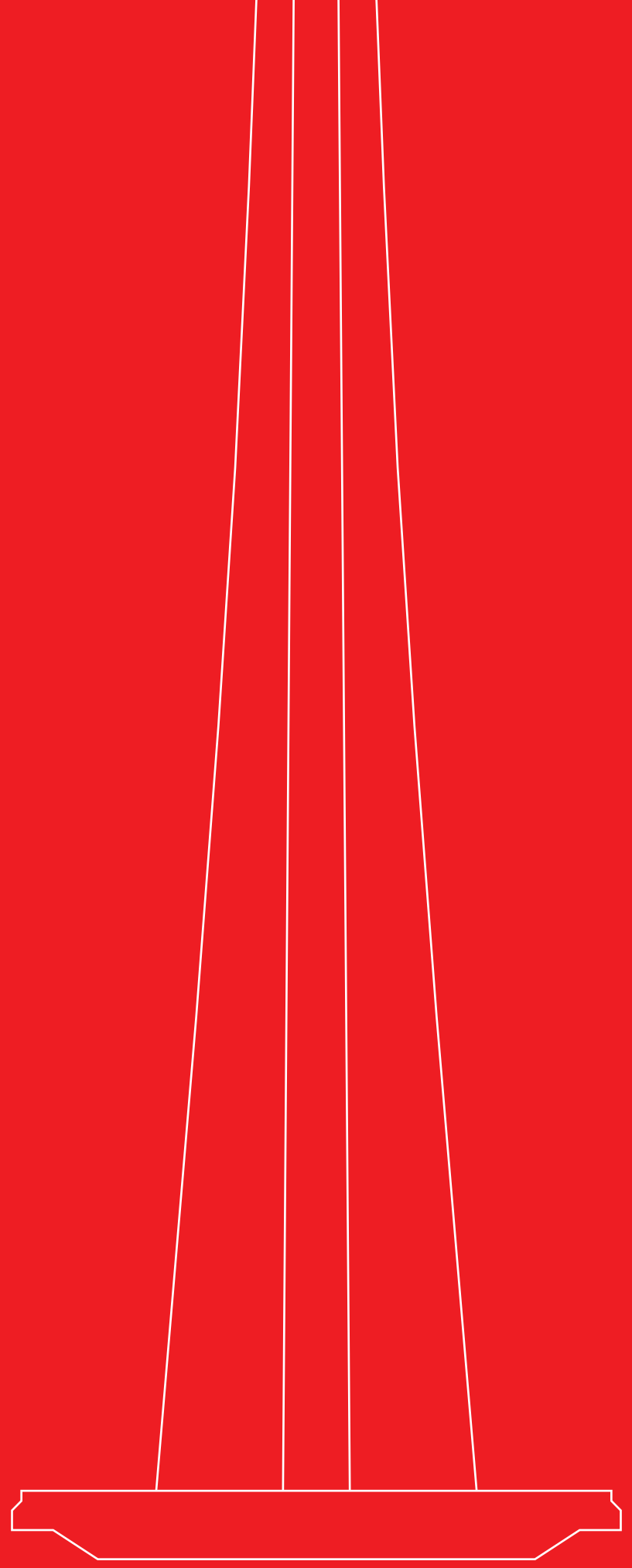
“The concrete was placed 24 hours a day, five days a week. We had a mixing plant onsite to meet demand and maintain temperatures. During those cold Toronto winters, the concrete had to be kept heated and covered during placement to make sure it wouldn’t freeze.”

It’s protected against outside forces.

“CN Tower is under wind constantly. We put post-tensioning cables inside the foundation and the tower walls so the concrete will not crack it when it bends.”

The form work for the sky pod included huge brackets that could support the equivalent of a seven-storey building, housing the restaurant, observation level mechanical room and broadcasting room.

“When they started lifting the tower head support brackets, the jacks and cables were slipping, so they had to bring in new ones. If we couldn’t lift these brackets, there wouldn’t be a sky deck or a tower as we have it now.”



Lower Accomodations

049 / 100
CN TOWER

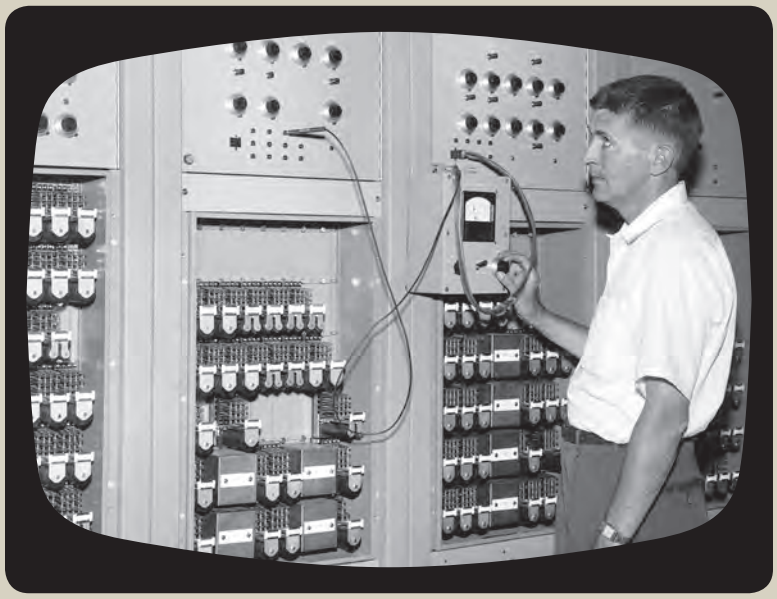
2 / The observation levels, the Sky Pod and the steel antenna rise skywards (date unknown).

050
/100

EARLY ADOPTERS OF COMPUTERS

Let's Get Digital

Computerization is so essential—for everything from keeping track of rolling stock to supply chain automation to safety testing—that it's hard to imagine the railway ever ran without it. An industry leader in the digital domain, CN developed the Traffic Reporting and Control System (TRACS) in the 1960s to leverage data related to car movements: 24-hour monitoring of some 2,500 locomotives and more than 100,000 freight cars all over North America eliminated a huge amount of paperwork—and guesswork. The company took part in early "cybernetics" conferences and established the first network designed for computers with CNCP Telecommunications, experimenting with packet switching that broke down information into small packages for transmission, satellite voice, data and video signals and the start of fibre optics.



1

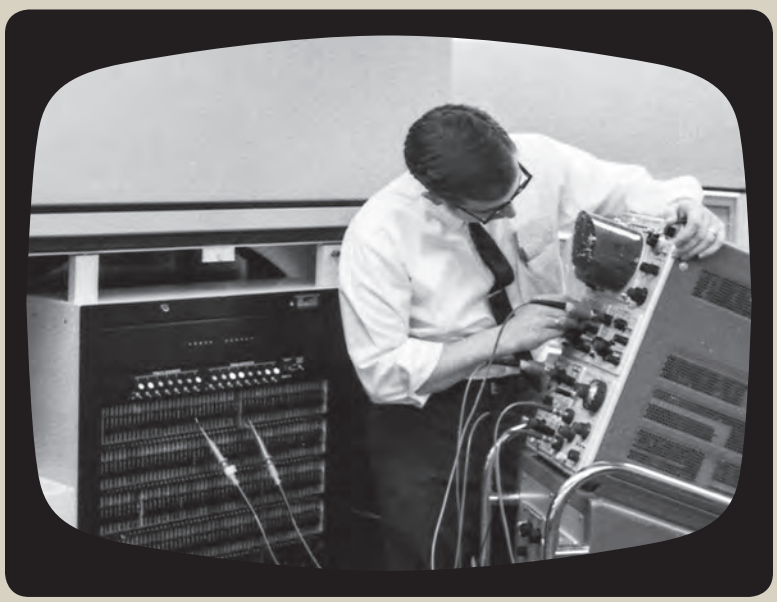
2

1 / Testing computers in the main retarder tower at the hump yard in Moncton, New Brunswick (1960).
2 / Employees learn to operate IBM electronic computers at the hump yard in Moncton (1960).
3 / Computers are central to the operations of Canadian National Telecommunications Data Centre, Toronto (1968).
4 / The Collins C-8500 computer, specially built for CNCP Telecommunications, Toronto (1968).
5 / C-8500 hard at work in Toronto (1968).

3

“When I came on, men with green eyeshades were keeping track of little pieces of paper that moved cars around the country. It was pretty clear that the world was on the threshold of a development in computer technology, and that there was perhaps no better application for it than in the railway. The idea for the Traffic Reporting and Control System came from the computer people, from operational research and an acknowledgement in the operating departments that more modern, expansive systems were needed. The full and integrated system was probably unequalled in the railroad world. I question whether anyone could claim to have the sophistication and the extent of proven systems that Canadian National has. So that was a major step forward: It was not only technology, it was people and systems.”

— Charles Armstrong, former chief of transportation, with CN 1953–1982



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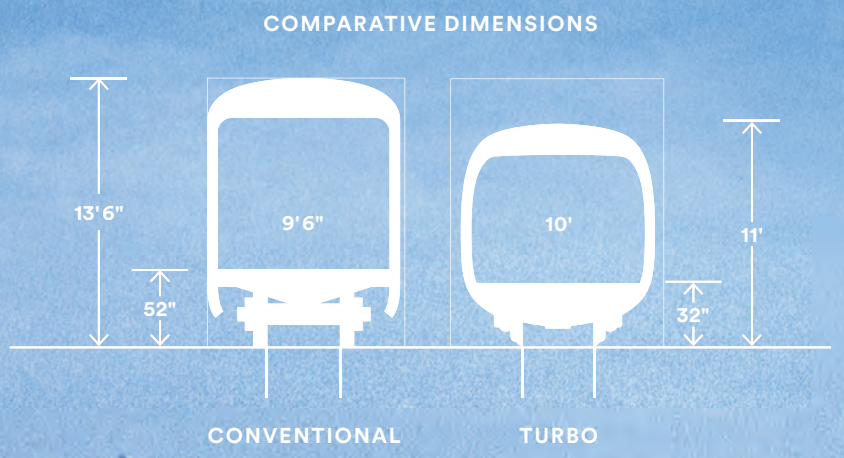
5

051 / 100

TURBO

Jet, Set, Go

Streamlined, glossy white, with a distinctive red nose, the Turbo propelled passenger travel into the future in 1968. The top-to-bottom design that achieved speeds of 140 miles per hour (225 km/h)—even capped at 95 miles per hour (153 km/h), its 3 hour and 59 minute run between Montreal and Toronto shaved an hour off the trip—to customized coffee cups that would avoid spills in the considerable sway from the suspension system (there were only two wheels per car). With its folding tables in the seatbacks, individual lights and vents overhead, it called to mind airline travel (as did the built-in-Montreal train retention toilets and “Remain in your seats” announcement when leaving terminal areas). And the ride only got smoother the faster it went.



1 / First day of Turbo service, covering the Quebec–Southern Ontario corridor (1968).

“The Turbo concept was so extraordinary, so ‘avant garde,’ you know. It was developed by United Aircraft in the United States. And it was almost like a plane. It didn’t look like a train. It was very light, almost floating on rail. It captured the imagination of a great number of people. I suppose at one stage I thought that possibly if the Turbo had been successful technologically from the start… But from the very first trip on, there was some mechanical defect every third or fourth trip. It had speed, it had comfort, it had beauty. It was well designed internally and externally. However, there’s one thing rail has got to offer, and that’s reliability.”

— Jean Richer, former vice-president, Passenger Sales and Services, with CN in the 1960s

Riding in Style: The best seats in the house were in the dome car after dark, where reserved Turboclub swivel chairs featured leather upholstery, and cocktails were most definitely served.

052
/100

RED, WHITE AND BLUE FARES

Colour Scheme

Travelling became a lot simpler, onboard and offboard, when CN introduced a revolutionary fare structure for its railway passenger business. The red, white and blue system successfully boosted ridership on low-demand days. As for the catchy name, then-general sales manager (and future vice-president, Passenger Sales and Service) Pierre Delagrave admitted that he borrowed it from a newspaper ad in the *Montreal Star* for a red, white and blue sale at Eaton's department store.

"We wanted a system of fares that people could remember. Because there were literally hundreds of fares on the books between any two points in Canada, and they just kept piling up: If you had red hair, travelled on Tuesday afternoon and had pimples, you got a special rate. If you were military, you got a special rate. If you were a widow with 16 kids, you got a special rate. Montreal–Toronto, the regular coach fare was $29.35 and the all-inclusive coach fare included meals for $26. Now, try to estimate how many people travelled at the regular fare—not many!

We set up a year-round, three-level pricing system. We alternated between the middle and the lower fares in winter, and the middle and top ones in high periods of summer, Christmas and Easter. And the easiest way to identify it was by colour—people got to know very quickly which day was which."

— Garth Campbell, former vice-president, Passenger Service, with CN from 1956, later with VIA

NOV 1965

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MAY 1966

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MAR 1966

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JUN 1966

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JAN 1966

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APR 1966

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JUL 1966

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Red

Bargain fares during the lowest-demand travel days of the year

White

Standard economy fares for periods of increased traffic

Blue

More expensive fares during peak vacation and holiday travel periods

05 / 100
RED, WHITE AND BLUE FARES

053 /100

Motion Carried

Time and motion were the themes of the CN pavilion at Expo 67 in Montreal. Fitting, for a billion-dollar event held on an island built on the excavations of the city's new metro system. Steps from the fully automated Expo Express train and between the Canada and Russia pavilions, the series of interlocking cell-shaped structures—designed by architects John Parkin and PGL—immersed visitors in a rapid succession of images that conveyed the relentless movement of people, places and the planet.

1

1 / The Expo-Liner, running between Belleville, Ontario, and Montreal's Central Station, Quebec, brings passengers to the action (1967).

AT THE WORLD'S FAIR

"Outside, a cluster of black polyhedrons, many-faceted like an exotic jewel. Inside, complex passageways. There to be sensed, beyond the glitter and welter of Expo, the toil of thinkers who, through the ages, sought to relate Time and Motion.

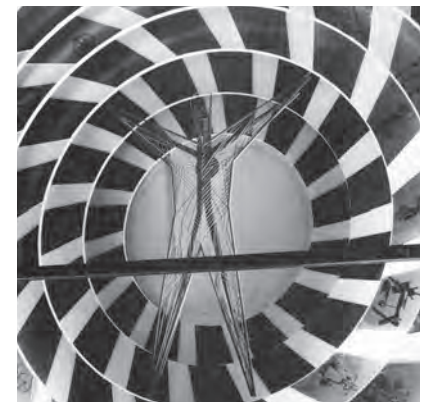
A national railways and communications agency, Canadian National conjured up this pavilion to entice us into grappling with time, through motion. A pretty demanding theme—yet it is less the daring that strikes one, than the clean, colourful presentation, intriguing for casual fair-goer and serious student alike. A dark room. Violet light. A screen, spiralling away. We gropingly sense the fourth dimension. Pivoting globes, spinning dials, swivelling lights: an Einsteinian world of relativity, where we dizzily wonder whether a meteor ages more slowly as it hurtles through space...

And thus we see Man, 1967. Set in a mirror, circled with rotating discs portraying the latest advances in transportation and communications. This room deals with the problems of logistics, the moving of men and supplies, the transmission of messages, the circulatory and nervous systems of civilization."

— From the Expo 67 memorial album

World Stage:
With its own pavilion and outdoor exhibits on uniform, circular, accelerated and oscillatory motion, plus the Canada Pavilion (now Canada Place), CN made a $10 million investment at Expo 86 in Vancouver. The railway also requested the National Film Board to produce a film about the development of transportation. *Transitions*, the first IMAX film in 3D, required a dedicated theatre for its 70 by 50 foot (21 × 15 m) screen and twin projectors.

2



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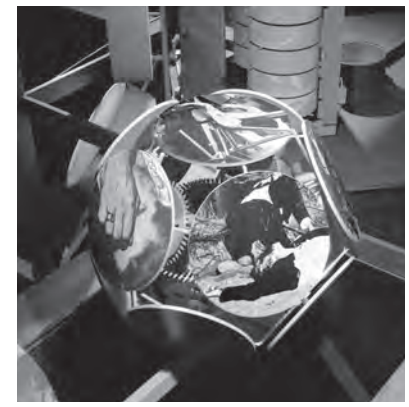

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FUN FACT

More than 50 million people came through Expo 67, including Ethiopian emperor Haile Selassie, who travelled on CN lines in a royal car for a nine-day tour of the country—along with his dog, Lulu.

2–4 / Interior and exterior views of the CN pavilion, Montreal (1967).

054 /100

PASSENGER SERVICE

All Aboard

“To everywhere in Canada” was a key CN slogan in the last century. The only railway serving all 10 provinces, including Prince Edward Island and Newfoundland and Labrador, along with 11 states, it moved millions on long-haul overnight trains, intercity day trains, local day trains, branch lines covering small communities and mixed trains carrying both people and freight. Along with passenger coaches, the consists would usually include baggage, Express and mail cars, and possibly a railway post office. While the 1950 passenger timetable was 85 pages of fine print, the writing was on the wall: Cars and planes had become preferred modes of travel after WWII. Despite the 1970s oil crisis and smart train branding like Turbo (see 051/100), Rapido and Tempo creating temporary upticks in the popularity of rail, by the end of the decade, CN had transferred its largely unprofitable passenger service to the newly created VIA Rail Canada.

“In the 1960s, CN provided some of the fastest, most convenient and cheapest rail travel ever seen in Canada, and boasted about it. Innovation was everywhere, from the paint scheme on the trains to the price of riding them… Across North America, it was recognized that CN was not only doing an excellent job of moving people, it was lowering deficits and approaching a financial break-even point for some of its passenger service. Of course, there are as many ways of defining ‘break even’ in rail passenger service as there are accountants given the task.”

— From a 1989 article by Bill Palmer, in *Keeping Track*

1 / The observation level of the Sceneramic car offers visual interest inside and out, as the Super Continental passes through the Canadian Rockies (1973).

Lost & Found:
About 5,000 items were left behind in CN's stations and trains each year, from umbrellas, gloves and sunglasses to the truly bizarre: $32,000 in a paper bag, moose antlers, tents, typewriters, axes, love letters, bathing suits, picnic hampers and a dog, grey owl and rabbit (all alive and well). About half the articles were reclaimed by owners, and the remainder sold at auction in Toronto.

Some of CN's passenger trains, several of them operated jointly with other railways, strongly evoked history and places in their naming:

THE ACADIAN – Montreal–Halifax, 1927–1930
BONAVENTURE – Toronto–Montreal, 1965–1977 (later VIA)
BYTOWNER – Montreal–Ottawa, 1965–1967
THE CABOT – Sydney, Nova Scotia–Montreal, 1967 only
CAVALIER – Montreal/Ottawa–Toronto, 1965–1977 (later VIA)
THE CHALEUR – Montreal–Gaspé, Quebec, 1964–1977 (later VIA)
DOWN EASTER – New York City–Halifax, 1929 only
THE FOREST CITY – Toronto–London, Ontario, 1925; 1956–1977 (later VIA)
GREAT LAKES SPECIAL – Winnipeg, Manitoba–Port Arthur, Ontario, 1935–1937; 1940
GREEN MOUNTAIN FLYER – Boston/New York City–Montreal, 1928–1953
(with B&M, New York Central and Rutland)
THE GULL – Halifax/Maritimes–Boston, 1930–1960
(with CP, Maine Central and B&M)
HIGHLANDER – Toronto–Haliburton, Ontario, circa 1930–1955
THE LA SALLE – Chicago–Montreal, 1937–1963 (later Chicago–Toronto)
THE MAPLE LEAF – Montreal/Toronto–Chicago, 1927–1971
(with Grand Trunk Western)
THE NORTHLAND – Toronto–Timmins, Ontario, 1937–1977 (later VIA)
(with Ontario Northland, previously Temiskaming & Northern Ontario)
THE OCEAN LIMITED/THE OCEAN – Montreal–Halifax, pre 1919–1977 (later VIA)
PANORAMA – Montreal/Toronto–Vancouver, 1964–1969
PINE TREE ACADIAN – Boston–Halifax, 1929 only
(with B&M, Maine Central and CP)
ST. LAWRENCE SPECIAL – Montreal–Métis Beach, Quebec, 1921–circa 1959
(with Canada & Gulf Terminal Railway)
THE SCOTIAN – Montreal–Halifax, 1941–1977 (later VIA)
STEAMBOAT EXPRESS – Toronto–Sarnia, Ontario, 1935–1940

Way to Go:

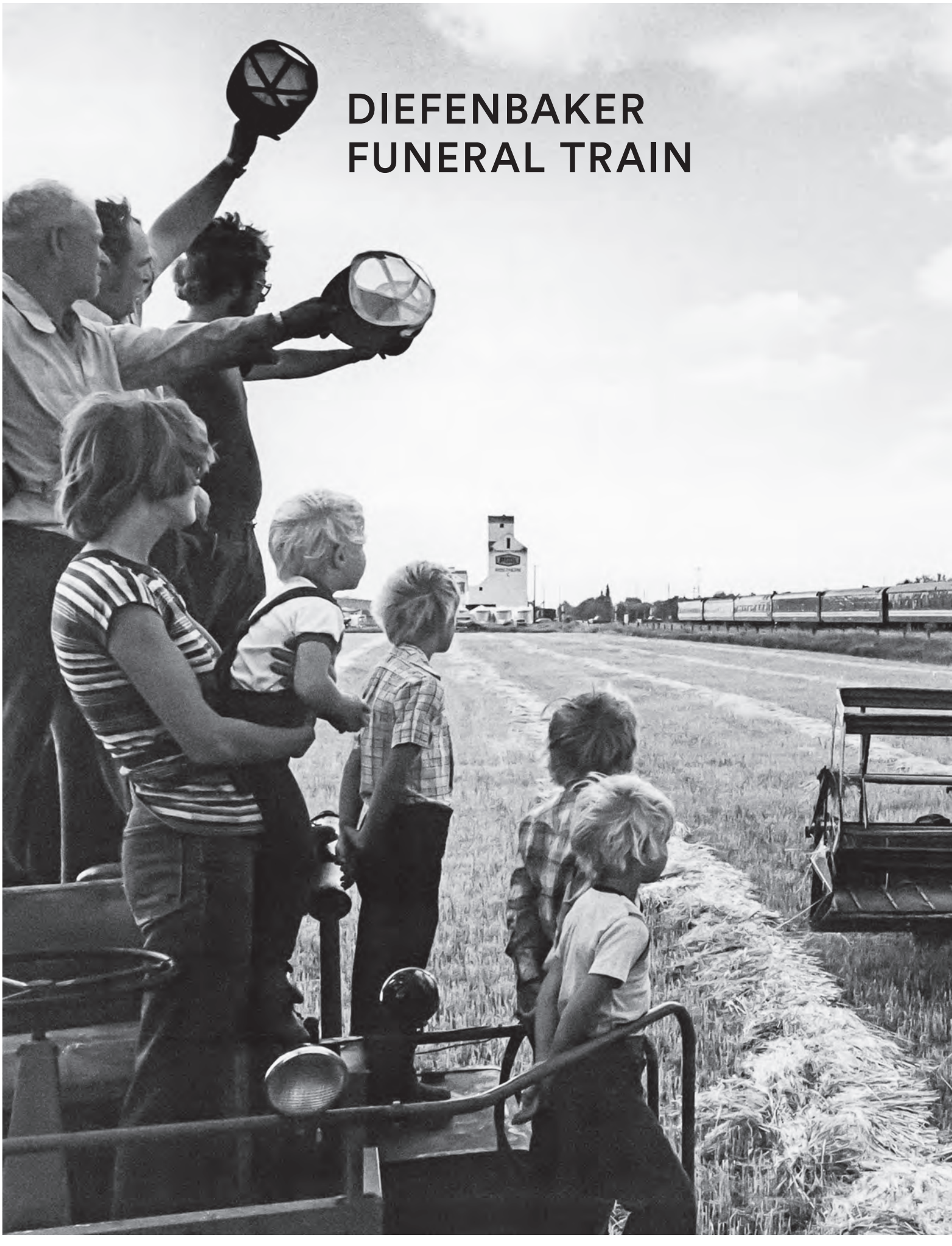
In 1976, CN packaged up its two-thirds of the national intercity passenger service in blue and yellow, and tagged it with the branding “VIA CN.” Little more than a year later, that colour scheme, logo and slogan would come to define the new national carrier, VIA Rail Canada. The independent Crown corporation continues to operate more than 500 trains a week.

055
/100

DIEFENBAKER FUNERAL TRAIN

Final Farewell

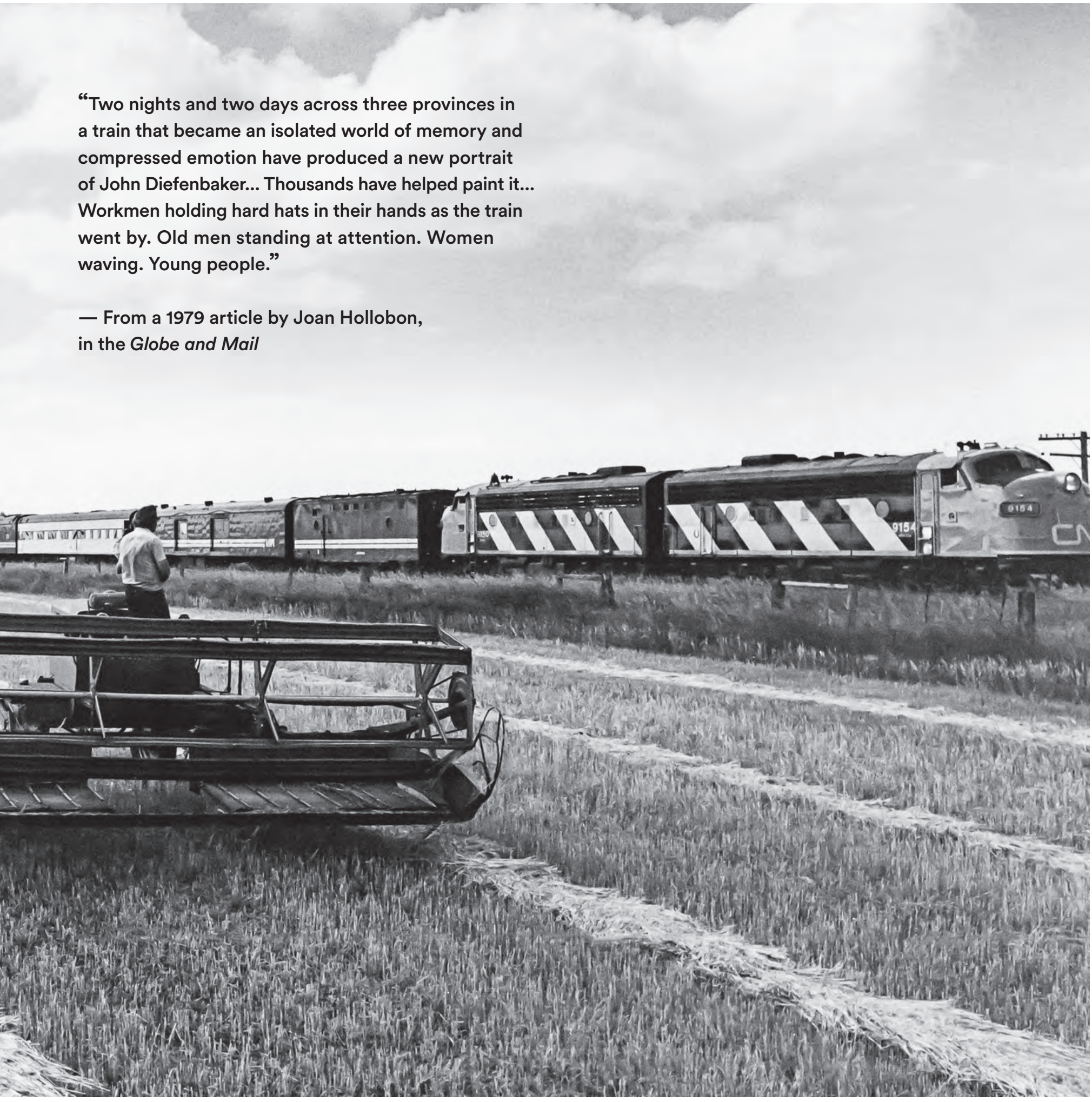
In 1979, when former Prime Minister John Diefenbaker (in office 1957–1963) died in Ottawa at the age of 83, a sweeping two-day train ride to Saskatchewan became his funeral procession, complete with a specially converted baggage car to house the casket. A champion of the Canadian Bill of Rights, the Conservative leader was returning to the Prairies where he had practiced law, and thousands of Canadians in small towns came out to pay their respects along the way.



1 / Three generations of the Janzen family stand at attention in a barley field as former prime minister John Diefenbaker's funeral train passes by, near Rosthern, Saskatchewan (1979).

"Two nights and two days across three provinces in a train that became an isolated world of memory and compressed emotion have produced a new portrait of John Diefenbaker... Thousands have helped paint it... Workmen holding hard hats in their hands as the train went by. Old men standing at attention. Women waving. Young people."

— From a 1979 article by Joan Hollobon, in the *Globe and Mail*



055 / 100
DIEFENBAKER FUNERAL TRAIN

056 / 100

Thinking Inside the Box

Take the wheels off a boxcar, and goods can move by rail, highway and water without being unpacked along the way. Like many ideas whose time has come, containerization came to different places at the same moment. Early in the game, CN was putting prototypes of domestic containers on its Atlantic ferries, while the Port of Vancouver handled commercial containers from the White Pass & Yukon Route and trucking entrepreneur Malcolm McLean introduced a similar concept in the U.S. In 1968, CN's renewed container development program heralded changes to shipping on a global scale, particularly for Pacific Rim trade. Fast forward to the 1.5 million import-export containers the railway transports annually today.

1

1 / Small freight containers, like early versions from the William Carson, would grow in size (1954).
2 / Aerial view of containers at Prince Rupert port, British Columbia (2007).

SHIPPING REVOLUTIONS

"Another major change was the requirement not to manhandle traffic in and out of boxcars—to adapt to 20 tons in one move was all very strange to the traditional railroaders in those early days. It was not foreseen then that 90% of conventional cargo would soon be moving in containers."

— From an interview cited in *The Magic Box: A History of Containerization*, with Ronald Lawless, former CN vice-president of freight sales (and later president), with CN 1941–1992

Timing Is Everything:

In another shipping revolution, CN became the first truly scheduled railway on the continent in the 1990s. President and CEO E. Hunter Harrison, who had experimented with the approach at Illinois Central, applied the same principle used for passenger travel to freight.

Instead of departure times depending on customers to fill cargo loads to capacity, Precision Scheduled Railroading works by planning for when and how each car will move, and the most efficient use of locomotives, crews, connections, yards and routes between destinations.

“CN’s first experience with domestic containers came as far back as 1958 when containers were loaded on the passenger and freight ferry William Carson in Cabot Strait service linking North Sydney [Nova Scotia] and Port aux Basques [Newfoundland]. Initially, the containers in this service were six feet by six feet by eight feet high, and were put into service to speed the loading and unloading of the ship at the two ferry terminals. These early containers soon gave way to the standard-sized 20-footers and, with the introduction of rail-car ferries, containers began moving direct to Port aux Basques on flat cars.”

— From a 1969 freight container guide, by CN Public Relations

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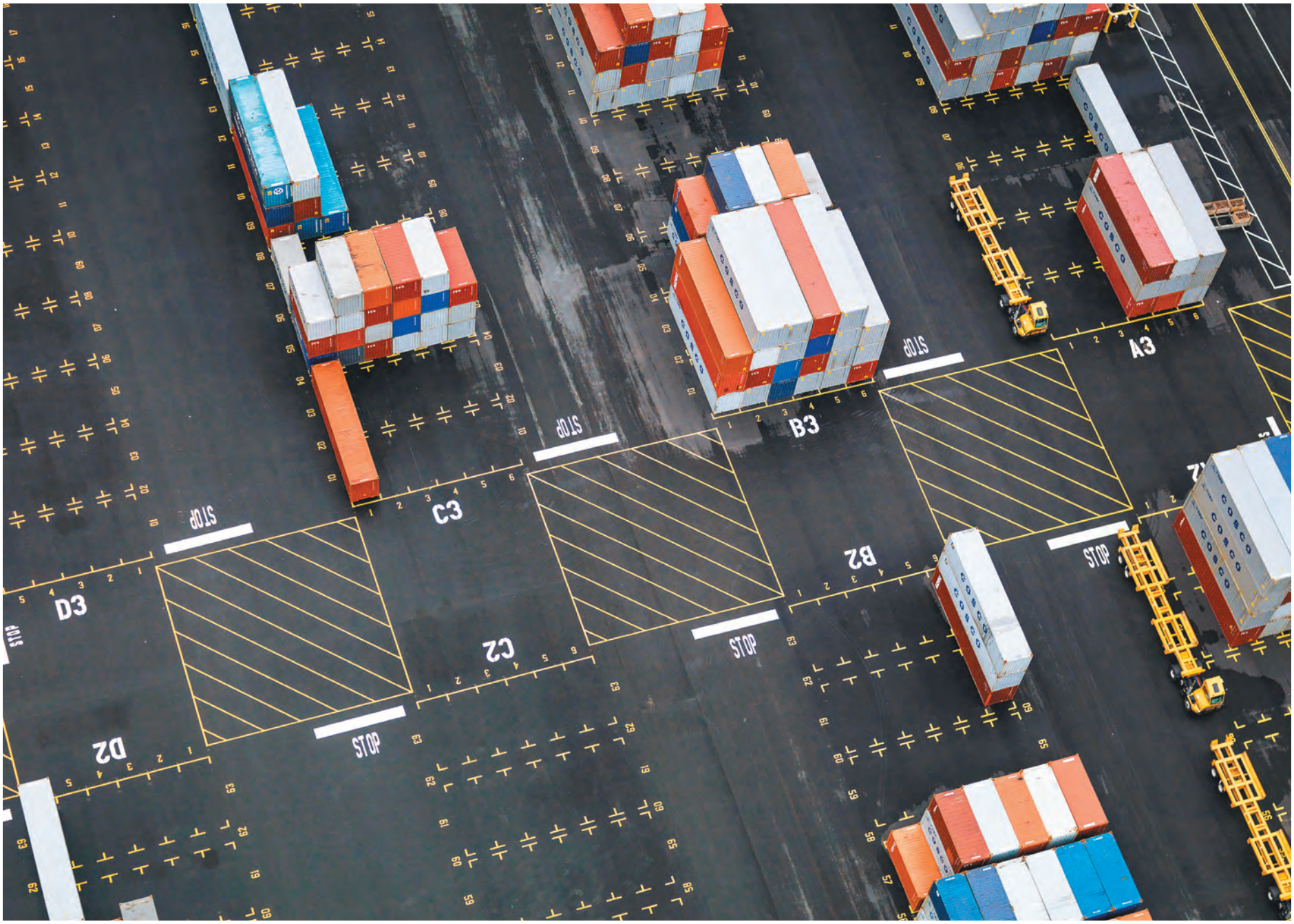


057 / 100

DITCH LIGHTS

Seeing Is Believing

In the Canadian Rockies, CN has low grades but tight curves cutting through the mountains, and the tracks ahead may be obstructed by debris from avalanches, mudslides and rock falls. While steam-era crews used steerable headlights for better visibility, it wasn't until CN diesels arrived in the 1950s that ditch lights got their first trials. Attached with wooden planks to the front end of the locomotive and angled to shine on either side of the right of way, they were only temporarily installed for the terrain between Jasper or Edmonton, in Alberta, and Vancouver. This solution to regional challenges would go on to illuminate the whole industry by the 1990s.

"In the early '80s, we thought, 'This portable thing is a pain. Why don't we just put some fixed ditch lights on all the locomotives? We'll make a little housing and a switch inside the cab to turn them on and off and mount them permanently.' And every locomotive after that came with ditch lights. Then the regulators got into the act. The predecessor of Transport Canada in Ottawa said, 'These things are really bright,' because at nighttime, you saw not only headlights but the form of a triangle. They thought it would be great at level crossings to make trains more visible to people, and eventually enshrined ditch lights in regulations. So what started out as a steerable headlight on a steam locomotive in the CN Mountain Region ended up as a grade-crossing warning system for making locomotives much more visible day and night."

— William Blevins, former chief mechanical and electrical engineer, with CN 1968–2018

1 / In the morning fog, a southbound CN Q-train on the move at the diamond in Duplainville, Wisconsin (2012).

Bright Ideas:
Thomas Edison's brief career as a night shift telegraph operator for the Grand Trunk Railway in Stratford (Ontario), in 1864, ended after he experimented with devices to deliver train orders—nearly causing a collision. He went on to invent the phonograph and perfect the incandescent lightbulb, after purchasing the patent from two Canadian inventors.

058
/100

The Right Ideas

A steel wheel on a steel rail is one of the few technologies that has remained relatively unchanged for more than 150 years, largely because of the very low friction it provides. From afar, the fundamentals of the railway appear much the same as they have since dieselization, yet a closer look reveals a high-tech industry where ultrasound and induction make it possible to find microscopic defects inside the rail and rail welds. Driven by the dual goals of safety and cost efficiency, CN had embraced innovations from the beginning, initially under its Bureau of Economics, renamed Research and Development in 1939, and later its Technical Research department. Located in Montreal's Ville St. Laurent, it was the second-largest facility of its kind in North America, responsible for testing, improving and developing sophisticated railway technology. In 1992, activities were transferred to its previously formed international railway consulting subsidiary, CANAC. CN also developed the Draper Taper, a notched-out design that improved visibility on wide-body locomotives, and became a leader in continuous welded rail that solidified the track structure.

1 / Switchman with beltpack, MacMillan Yard, Ontario (2007).

TECHNICAL RESEARCH CENTRE

"The railway is the only industry that takes wheel and rail material in the wheel/rail contact up to and beyond its customary elastic limitations. In the Technical Research department, we had the freedom to get into new ideas based on some of the operational problems the company had experienced. A number of novel ideas came out of that."

— Nelson Caldwell, former assistant chief, Mechanical and Civil Engineering, with CN 1960–1992, later with CANAC

01

Improving Wheel Performance

Positive Traction Control (PTC) brought better wheel slip control to locomotives in the 1960s and 1970s. By automatically and very quickly reducing power if a wheel started to slip and restoring tractive load slowly after wheel slip had stopped, it prevented traction-motor damage and boosted adhesion by 15%—representing significant savings in maintenance and on new locomotive purchases. The Technical Research Centre also experimented with Wheel Impact Load Detector (WILD) to measure rail wheel conditions for the prevention of derailments.

After CN's Technical Research Centre opened in 1964, many of its innovations would go on to be adopted by the industry at large:

FUN FACT

Technical Research started as a quality-control lab to test materials—spikes, ties, rail, textiles and paints—setting and enforcing standards for all company purchases.

1

03

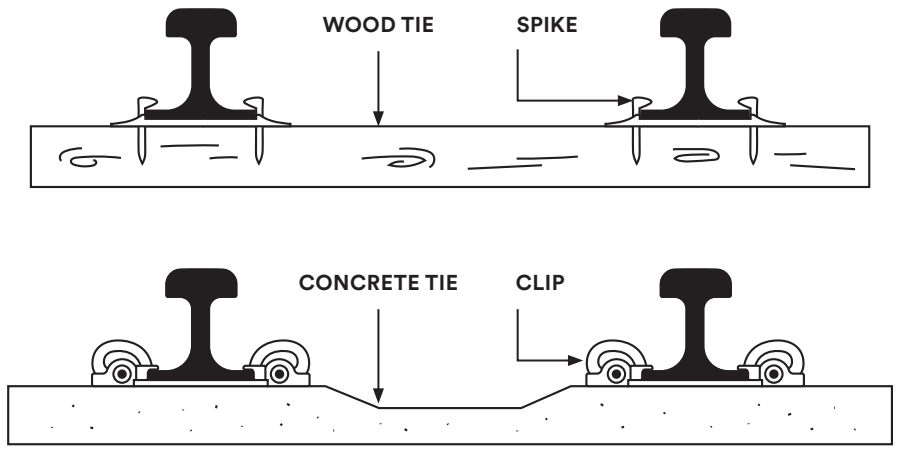
Moving with Remote Control

A portable remote-controlled device, the Beltpack enables a single yard worker to operate a switching locomotive from the ground by sending messages to an onboard computer. Started in the early 1980s when hump yard technology was still 1950s vacuum tube electronics, it was later introduced to flat yards.

02

Making Concrete Decisions

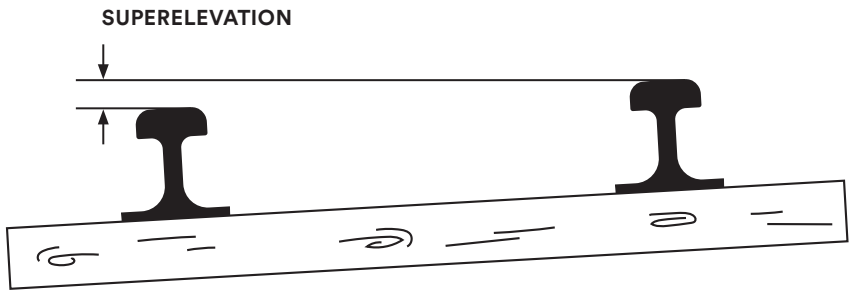
CN was the North American leader in the use of concrete ties, which better keep rails from spreading apart and were expected to be longer lasting than wood (and hardwood was becoming scarce). After some early issues with a supplier's concrete tie product, the Technical Research Centre devised a quick testing procedure to ensure that the gravel component of the proposed concrete mix would not chemically react adversely with the cement powder—a winning formula. In 1978, CN decided to install 4 million concrete ties in sharp curves on the mainline.

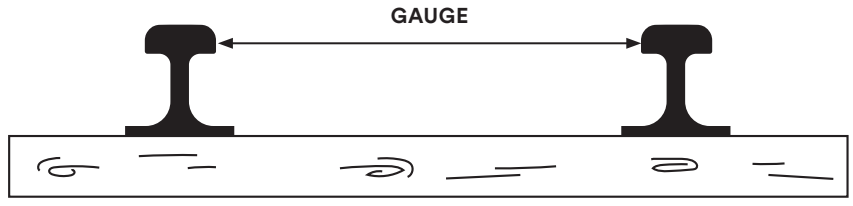


04

Testing Track Geometry

Originally built by Technical Research from a refurbished passenger car in the early 1960s, and later a dual passenger and variable weight freight car system, TEST cars (short for Track Evaluation Systems) use sensors to measure the geometry of the track—cross level, super elevation, gauge, curvature, alignment and surface profile—while in motion and under load. Data is collected at subdivision-rated axle load at speeds of up to 60 miles per hour (100 km/h) and some 100 tonnes of freight-car weight. Prior to this development, measurements were done by eye on unloaded track, using cross-level boards, string lines and blocks.





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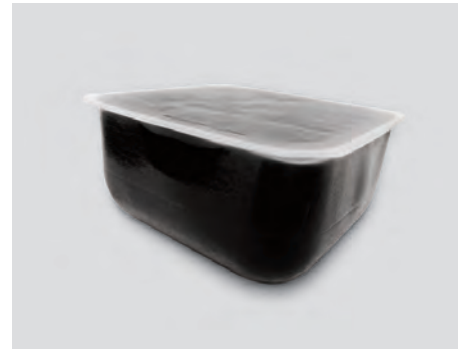
2 / The TEST car's autonomous track geometry system looks for track defects in Otto, Illinois (2015).

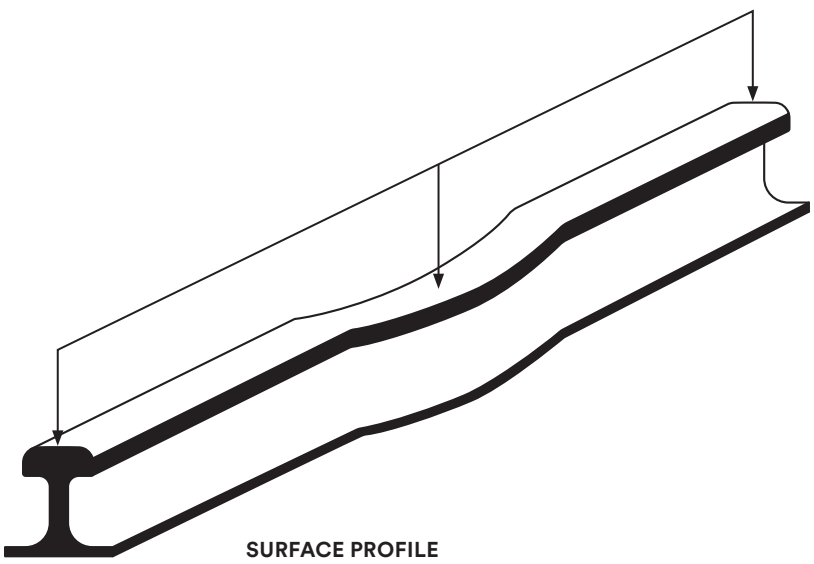
3 / CanaPux™ is a CN innovation (circa 2018).



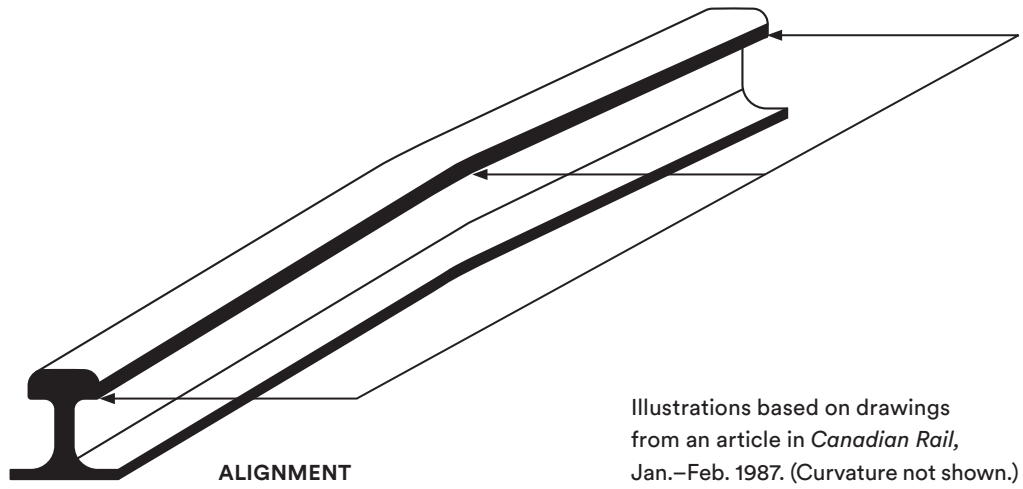
3

More Solid Ideas:

CN continues to innovate today, with advances to cars and communications, and developments like this patented method of solidifying bitumen that aims to minimize environmental risk when transporting crude oil. Non-flammable and buoyant, with a resistant polymer shell, CanaPux™ pellets are also easy to collect. Will oil pucks soon travel in gondola cars, ready to be restored to liquid after shipping?



SURFACE PROFILE



ALIGNMENT

Illustrations based on drawings from an article in *Canadian Rail,* Jan.–Feb. 1987. (Curvature not shown.)

059
/100

CONNECTING EMPLOYEES

Print Run

Since the beginning, CN kept in touch with its employees and pensioners through a print magazine, embracing the challenge of building a workplace culture in two languages and connecting a workforce that totalled more than 126,859 in 1956. Issues of the earliest publication, *Canadian Government Railways Magazine*, were offered at 15 cents to the general public, and free to employees, from whom editor E. E. Stevens, based in Moncton (New Brunswick), requested contributions and photos. In the spring of 1919, issues reported on the Safety First campaign, welcomed back WWI soldiers (including Montreal's famous 42nd Highlanders), listed injuries, births and deaths, along with a few show reviews and mother-in-law jokes. The pages contained ads for steel structures by the Dominion Bridge Company, Carhartt overalls and Stag chewing tobacco.

While the publications' designs changed over the century—as did the names—they continue to connect the CN community:

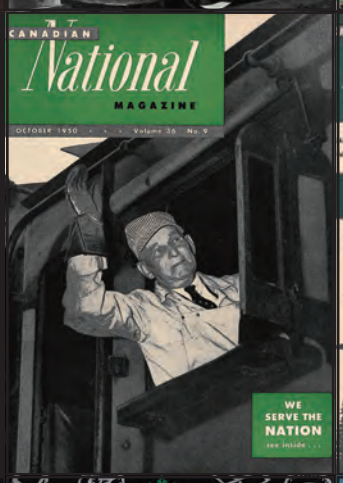
1920–1937	*Canadian National Railways Magazine*
1937–1957	*Canadian National Magazine*
1958–1996	*Keeping Track / Au fil du rail*
SINCE 1997	*CN People / Les gens du CN*
SINCE 1968	*Movin / En Voie* (Marketing Communications title)

1920s

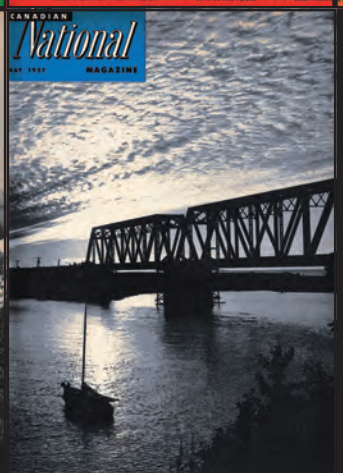
1930s

1940s

1950s



1958
French version launched



1960s

1961
Introduction of the new logo and a new graphic design approach

1968
Switch to larger tabloid-style format

1970s

1980s

1990s

2000s

060
/100

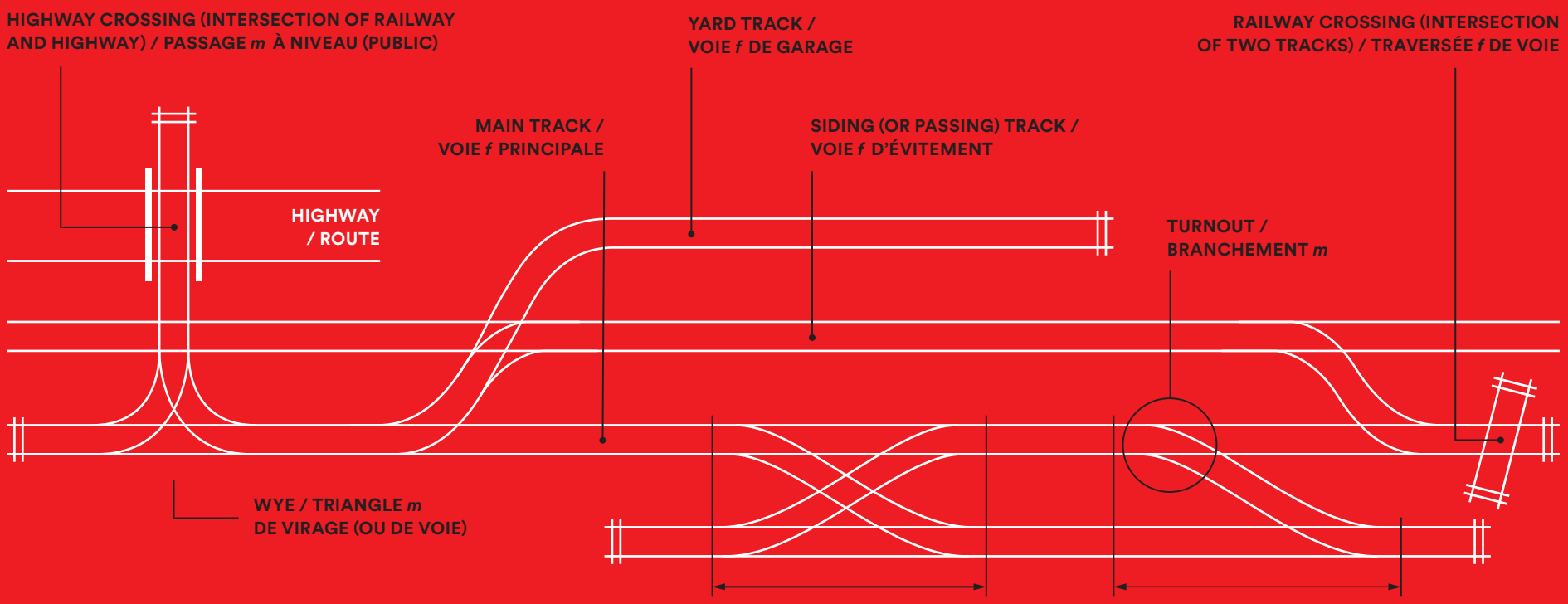
BILINGUAL BUSINESS

En anglais and in French

While CN had mostly operated in two languages, with English and French employees working side by side, the reality wasn't always the same in the echelons of higher management. By the late 1950s, Quebec nationalism was rising in opposition to the naming of CN's new Montreal hotel The Queen Elizabeth—translated as Le Reine Elizabeth—and demands for more francophone representation in the Crown corporation's upper ranks would lead to the Royal Commission on Bilingualism and Biculturalism (1963–1969). CN appointed its first French-Canadian vice-president, Brigadier-General Maurice Archer, in 1963.

Double Vision:
With its sleek new 1961 logo, CN dropped the word Railway from its name. However the large lettering that accompanied the logo on boxcars spelled the English "Canadian National" on one side and the French "Canadien National" on the other, leading to mail about spelling mistakes from the U.S.

FUN FACT
Before official bilingualism, instead of "Yellow Block," Quebec enginemen called out "Block Yell-OH", because the word "jaune" didn't appear in the English-only rule book.



Technical terminology for switches and crossings from *Vocabs*, published by CN's Linguistic Services in the 1960s.

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INITIAL PUBLIC OFFERING

Making Headlines

On November 17, 1995, CN shares began trading on the New York Stock Exchange under the symbol CNI, and on the Toronto Stock Exchange, CNR, in what was then the largest IPO in Canadian history. When the Canadian government completed the process for privatization, it had broken records not only for how big it was but also how fast it was accomplished. The CN Commercialization Act marked a historic transfer of state-owned assets, following that of Air Canada some 10 years earlier—and with the railway seen as even more of a national institution, the deal had its doubters. Under the leadership of Paul Tellier (president and CEO, 1992–2002) and Michael Sabia (CFO, 1995–1999), the company had entered a new chapter. It was one that took it far from its creation on the heels of the First World War, as the consolidation of five railways facing insolvency, and from the heavy debt load and constrictions it had faced during many of its years as a Crown corporation. The stock value would double in just over a year. From that initial $2.2 billion, CN's market capitalization reached $90 billion in 2019.

CN DNA:

A number of enterprises with different areas of expertise have CN parentage.

RADIO COMMUNICATIONS:
CBC / Radio-Canada
(1936)

PASSENGER SERVICES:
VIA Rail Canada
(1977)

AIR TRANSPORTATION:
Air Canada
(1965)

MARITIME OPERATIONS:
Marine Atlantic
(1986)

INTERNATIONAL CONSULTING:
CANAC
(1971)

TELECOMMUNICATIONS:
CNCP Telecommunications
(1988)

REMOTE CONTROL:
Beltpack / Cattron
(2004)

“CN Rail issue burns up the tracks”

—*The Globe and Mail*, November 18, 1995

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INITIAL PUBLIC OFFERING

062
/100

BECOMING NORTH AMERICA'S RAILROAD

From North to South

In the previous century, most CN traffic moved across Canada on an east-west axis. The railway traditionally had strong ties to the American market, and long counted the Central Vermont Railway, Grand Trunk Western Railroad and Duluth, Winnipeg & Pacific Railway among its holdings. But it was in the mid-1990s, on the heels of the North American Free Trade Agreement and its own internal structural changes, that the company turned its attention south. The purchase of a historic all-American railroad, the Illinois Central, made Chicago the primary link between Canada and the Gulf of Mexico. CN gained traction over the next decade from the northern border of Minnesota into the American Midwest and south to Louisiana. What emerged was a truly transcontinental railway—a unified line in the form of a Y (see 009/100)—from Halifax (Nova Scotia) on the Atlantic coast to Vancouver and Prince Rupert (British Columbia) on the Pacific, and from Toronto (Ontario) and Winnipeg (Manitoba) to New Orleans (Louisiana).

1 / Buildings rise above refrigerator cars at the South Water Street Illinois Central Railroad freight terminal, Chicago (1943).

"As a north-south railroad in the east-west railroad world of North America, the Illinois Central was unusual. You start out in the middle of a cold winter in Chicago and when you get down to New Orleans, it's practically summer—those are the temperature differences. Running parallel to the Mississippi River, when water was the way that goods were transported, it supplanted the river system because it was much faster. In drought periods, when they couldn't load the barges as heavy, the IC was the carrier for bulk commodities like corn, coal and soybeans. It took passenger business from the riverboats, too. In the early days, the system was a spider web of lines off the mainline, going as far east as Indianapolis and as far west as Omaha, Nebraska, and Sioux City, Iowa, and serving the agricultural midwestern area north into Minnesota. And it would interchange with railroads east and west of the Mississippi, wherever the freight was going."

— Nick Kallas, executive director,
Illinois Railway Museum

FUN FACT

The extensive Southern Region, in the United States, now represents almost a third of CN's workforce and rail network.

Illinois Central Railroad

Established: 1851

Purchased: 1998

Known as the “Main Line of Mid-America,” IC came into the CN fold with its own 150-year-old legacy of nation building. In the 1850s, future U.S. President Abraham Lincoln had been its lawyer. It had moved Union soldiers during the Civil War. The line influenced the economic and physical development of Chicago, as millions of African Americans moved from rural southern states during the Great Migration.

2

Great Lakes Transportation

Component origins: 1865–1892

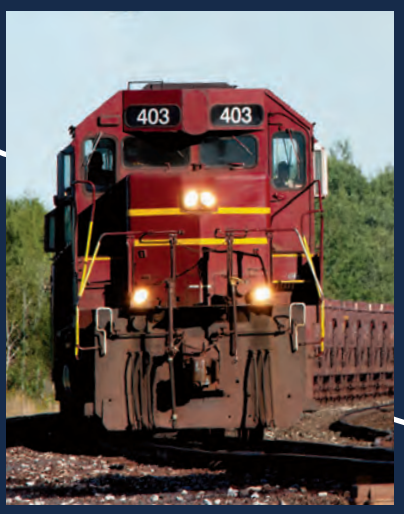
Purchased: 2004

With the acquisition of the assets of Great Lakes Transportation came the Duluth, Missabe and Iron Range Railway, the iron ore-hauling Bessemer & Lake Erie Railroad, built by Andrew Carnegie, the Pittsburgh & Conneaut Dock Company, and a fleet of eight lake vessels.

In the 15 years following the IPO, CN invested over $8 billion in acquisitions:

3

4



Wisconsin Central Limited

Origins: 1871–1899

Purchased: 2001

Operating in the Great Lakes region—Illinois, Minnesota, Wisconsin and Ontario—numerous railroads made up the Wisconsin Central, including the Soo Line Railroad, Algoma Central Railway and Green Bay & Western Railroad. One role for railroads in Wisconsin was to move ore from down in the southwest region of the state for water transport to smelters in the east, as well as agriculture and lumber.

5

Elgin, Joliet & Eastern Railway

Origins: 1887

Purchased: 2009

CN finalized its acquisition of the EJ&E, a strategic 198 miles (318 km) of mainline track on the perimeter of Chicago, allowing trains to bypass the bottlenecks and complex interchanges with other railways inside the urban core.

6

2 / CN (IC) 1019 leads the charge along the frozen Mohawk River, New York (2015).

3 / A B&LE locomotive passes through Wales, Minnesota (2013).
4 / In DM&IR colours, 403 hides CN-painted sister 404 in Proctor, Minnesota (2013).

5 / Led by WC 6656, train no. 50 curves through Rugby, Wisconsin (1997).
6 / The J local departs the Waukegan yard and parallels Pershing Road, Waukegan, Illinois (2010).

1 / Circus animals get some air near a Central Vermont Railway steam locomotive in St. Albans, Vermont (circa 1930).

063
/ 100

CIRCUS TRAINS

Show on the Road

For a good part of the last century, the combined Ringling Bros. and Barnum & Bailey 60-car circus train toured Canada on CN lines, drawing entire towns from their homes. The speed at which it unloaded was legendary in transportation circles (some of its methods were said to be copied by the military). Circus acts may have changed from then to now, but remain synonymous with travelling entertainment—and logistics.

1957—Royal American Shows

Iowa to Alberta

The train carried 142 pieces of rolling stock (wagons, trucks, tractors), moving in a yearly convoy from Davenport (Iowa) to Winnipeg (Manitoba), where a CN engine swung it across Western Canada.

1999—Cirque du Soleil

Canada to Australia

For *Saltimbanco,* CN loaded 60 containers with props and material for delivery from Montreal to Chicago, which went on to port at Los Angeles en route to Sydney.

064
/100

Common Ground

The track record of co-productions—collaborating with competitors to benefit from the most efficient routing—goes back to Depression-era pool trains. At the demand of the Canadian government, CN and CP shared equipment and resources between Montreal's Windsor Station and Toronto's Union Station, and elsewhere, to save time and costs. More recent agreements instituting directional running, or track sharing, in tricky terrain—such as in Fraser Canyon (British Columbia), and between Parry Sound and Sudbury (Ontario)—have created win-win scenarios for modern railroading. CN has over 150 co-productions with all major North American railways, including CP, NS, CSX, KCS, UP and BNSF.

DIRECTIONAL RUNNING ZONES

"In 1999, the CEOs of CN and CP decided to begin exploring market-neutral co-productions, despite the long-standing rivalry between both railways—as intense as the Montreal Canadiens and the Toronto Maple Leafs. A joint team selected Fraser Canyon Directional Running as the first initiative. In this tough corridor through the Columbia Mountains in BC, CN and CP each operated on a single track along sheer-rock cliffs and through several tunnels on opposite sides of the river. Over a 155-mile [249-km] stretch between Kamloops and Vancouver, CP had a roller-coaster route requiring twice as many locomotives, while CN had gentler grades. By running directionally, all westbound trains were routed over CN's track and the lighter eastbound trains over CP's track—trains no longer had to stop for meets.

It took nine months of intense negotiations, but the toughest obstacle was the cultural mindset that resisted working with a competitor. Ironically, we later found that a study had recommended doing this in 1936, so here we were 64 years later, doing it the smart way."

— François Hébert, former vice-president, Corporate Development, with CN 1974–2016

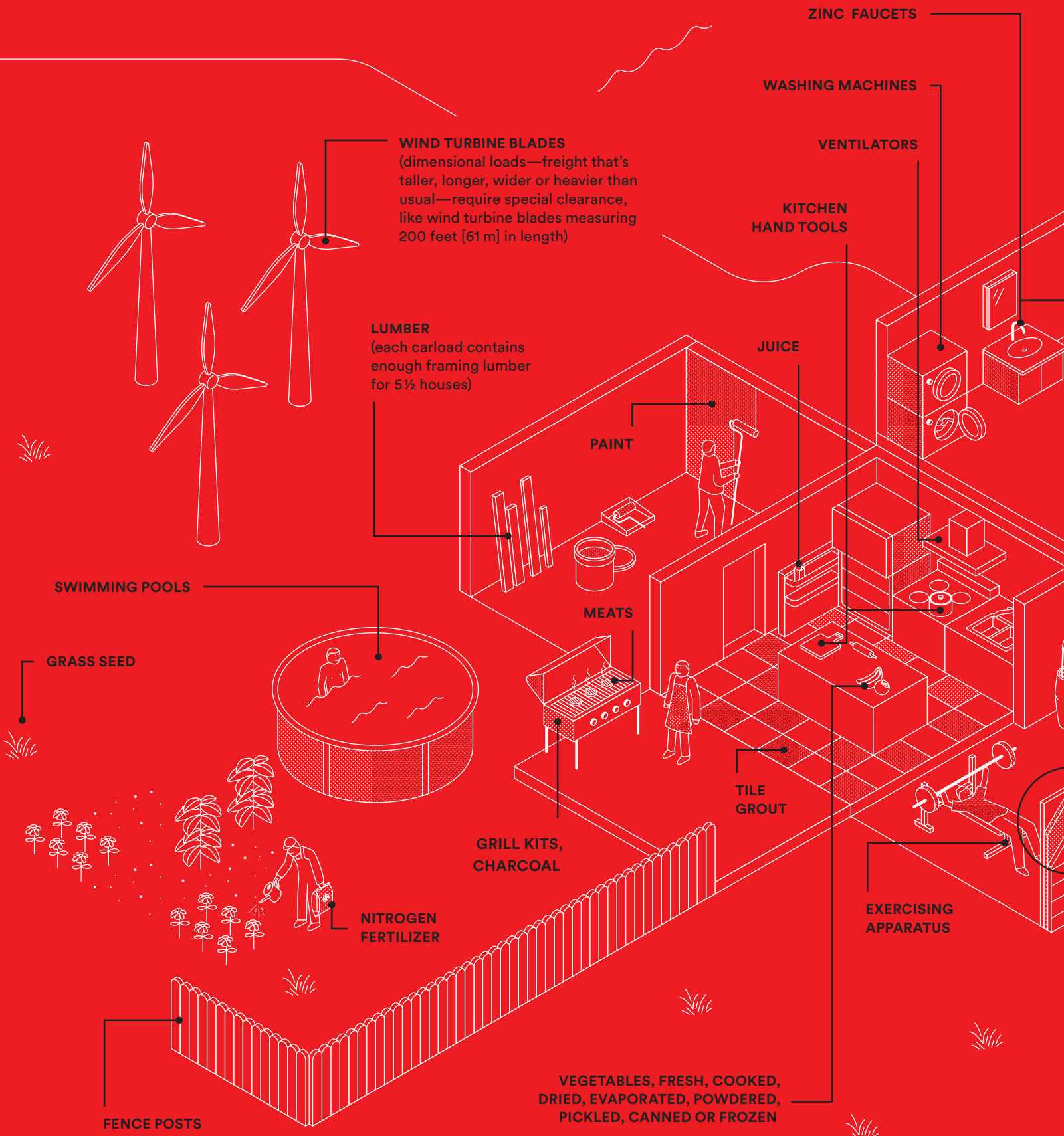
1 / A westbound CN train crosses the Fraser Canyon, British Columbia, a directional running zone established in 1999 (2010).

064 / 100
DIRECTIONAL RUNNING
ZONES

THE ECONOMY ON WHEELS

Bringing it Home

Responsible for transporting more than 300 million tonnes of cargo each year—that's about $250 billion worth of goods—CN touches the lives of millions of people every day. If people are eating it, driving it or using it, chances are that CN is moving it: Raw materials like grain, logs and metals, intermediate goods such as construction materials and consumer products like food in every form—including chocolate. From 157,891 carloads of automobiles to 98 carloads of pickles (that's a whole lot of sauerkraut) to three carloads of zinc faucets in 2017, CN trains carry a real A to Z of everyday items. Just take a look around the house.



FAK FAQ:

In addition to thousands of specific categories of commodities, CN shipped 1,388,286 carloads of "Freight All Kinds" in 2017, which refers to containers of mixed cargo that could be sneakers or the latest electronics.


YACHTS
WHEAT
(each carload contains enough grain for 258,000 loaves of bread)
ROOFING
RAFTERS
TRACTOR PARTS
COMPUTERS
FLOWER POTS
CARPET
BATHTUBS
QUILTS
FURNITURE, RESIDENTIAL
ICE CREAM
STUFFED TOY ANIMALS
XENON
GOLF CLUBS
HARDWARE FOR DOORS, FRAMES AND RESIDENTIAL CONSTRUCTION
DIAPERS
GASOLINE
(each carload contains enough crude oil to make 13,500 gallons of gasoline)
UNICYCLES AND BICYCLES
ASPHALT
PLYWOOD, INSULATION FIBRE, SIDING
AUTOMOBILES

066
/100

HUMAN RESOURCES

Job Market

While job titles have changed over time—beaver controller is now a water management technician, and it's no longer the responsibility of call boys on bicycles to ensure that workers show up for their shifts—it's the people behind the scenes who have powered CN over the last century. According to the 1931 census, almost 5% of Canadians claiming gainful occupation were railway workers. And in a 1950 report, CN called itself the "largest single employer of labour"—with well more than 100,000 on the payroll, it developed a strong history of cooperatives and unions. By the 1980s, a workforce of about 50,000 was moving more than half of Canada's entire gross national product. In 2019, CN counts just under 24,000 employees and a wider community of some 34,000 pensioners.

100 positions for 100 years:
This sampling of non-management job classifications is taken from archival files of Track Workers (1918 and 2018), the Canadian Brotherhood of Railway Transport and General Workers (1924), the Brotherhood of Railroad Trainmen (1929), the Order of Railroad Telegraphers and the Brotherhood of Railway and Steamship Clerks (1947), Signals Workers (1965) as well as lists from the Brotherhood of Locomotive Engineers, Railway Shopcraft Unions and Accounting and Other Clerks.

Ashpitman / Baggageman / Beaver Controller / Biller / Bookbinder / Blacksmith / Boilermaker / Brakeman / Bridgetender / Bunkroom Attendant / Bushelman / Caboose Supply Checker / Carman / Carpenter / Charwoman / Cashier / Chemical Man / Chief Linen Clerk / Chore Boy / Clerk-typist / Coalheaver / Comptometer Operator / Conductor / Cook / Crane Operator / Crew Caller / Customer Support Representative / Dispatcher / Electrician /

Engine Preparer / Field Maintainer / Firebuilder / Fireman / Flagman / Grease Machine Operator / Grinder Operator / Heavy Equipment Operator / Hostler / Ice Gang Foreman / Information Bureau Attendant / Intermodal Clerk / Inventory Maintainer / Investigator / Inwards Requisition Clerk / Issuer / Janitress / Labeller / Lampman / Locomotive Engineer / Locomotive Tester / Machinist / Maintenance of Way Clerk / Mason / Matron / Morse-Teleprinter Operator / Painter / Pile Driver Ditching and Hoist Engineer / Pipefitter / Plasterer / Plumber / Pumpman / Railroad Constable / Rate Clerk / Report Writer / Requisition Filler / Sandhouseman / Sawyer / Scotcher / Sealer / Seamstress / Sheetmetal Worker / Signal Maintainer / Signal Mechanic / Signalman / Signals and Communications Coordinator / Snow Plow Foreman / Station Master / Station Porter / Stenographer / Stower / Switchtender / Telephone Switchboard Operator / Teletype Operator / Thermite Welder / Ticket Agent / Tinsmith / Toll Collector / Track and Bridge Watchman / Trackman / Traffic Coordinator / Train Announcer / Transcription Typist / Travelling Time Adjustor / Turntable Operator / Typewriter Repairman / Ultrasonic Operator / Voucher Clerk / Waybill Sorter / Wheel Roller / Yardmaster

067
/ 100

GETTING SCHOOLED

Top Marks

Railroading was traditionally learned on the job, with more experienced employees transmitting knowledge and skills about different operations to newer ones. With the end of steam locomotives, CN was no longer hiring firemen, the starting point for future locomotive engineers. From the mid-1970s to 1995, CN's transportation school in Gimli (Manitoba), centralized the training process. The dorm-style campus, previously a WWII pilot practice centre, brought together the latest technology and instruction from 21 veteran employees—with a combined 587 years of experience. The teaching mission continues today at two new CN campuses, in Canada and the United States, where coaching and structured field training happen on a big scale. Hands-on learning covers everything from how to change a coupler knuckle to using peer-to-peer communication for best safety practices.

Programs

/ Car mechanic
/ Communications technician
/ Conductor
/ Crane operator
/ Electrician
/ Locomotive engineer
/ Locomotive mechanic
/ Signal maintainer
/ Track foreman
/ Track labourer
/ Track supervisor
/ Welder

Facilities

/ Air brake models
/ Boxcar and tank car models
/ Centralized traffic control track
/ Crane simulators
/ Dispatch stations
/ Dual control switches
/ Locomotive simulators
/ Model trains
/ Rail defect yard
/ Remote-control simulators
/ Rolling stock
/ Signal detectors

1 / A "golden reverser," awarded for top performance, is kept at the Montreal headquarters (2019).

1

"When we opened the doors of the new training centres, we created a competition where whoever is best in class gets a golden reverser—it's something you always carry with you, because your locomotive can't go forwards or backwards without it. Like the brass ones from the old days, this one is made of pewter and painted gold, so it's very symbolic."

— Denis Hoziel, senior manager, Operating Practices, with CN since 1984

Close to 35,000 employees, new hires and customers have attended classes since 2014 at CN's two state-of-the-art facilities:

2

CN Claude Mongeau National Training Centre
Winnipeg, Manitoba

Opened: September 9, 2014

Campus property:
100,000 sq. ft. (9,290 m²), $35 million invested, 23 classrooms, 3 learning labs and 9.5 acres (38,450 m²) of outdoor facilities

Students: Up to 350/week

Choice cafeteria lunch: Taco day

CN Campus
Homewood, Illinois

Opened: October 14, 2014

Campus property:
55,000 sq. ft. (5,510 m²), $25 million invested, 13 classrooms, 5 conference rooms doubling as classrooms, 4 learning labs and a 10-acre (40,470 m²) field-training facility

Number of students: Up to 250/week

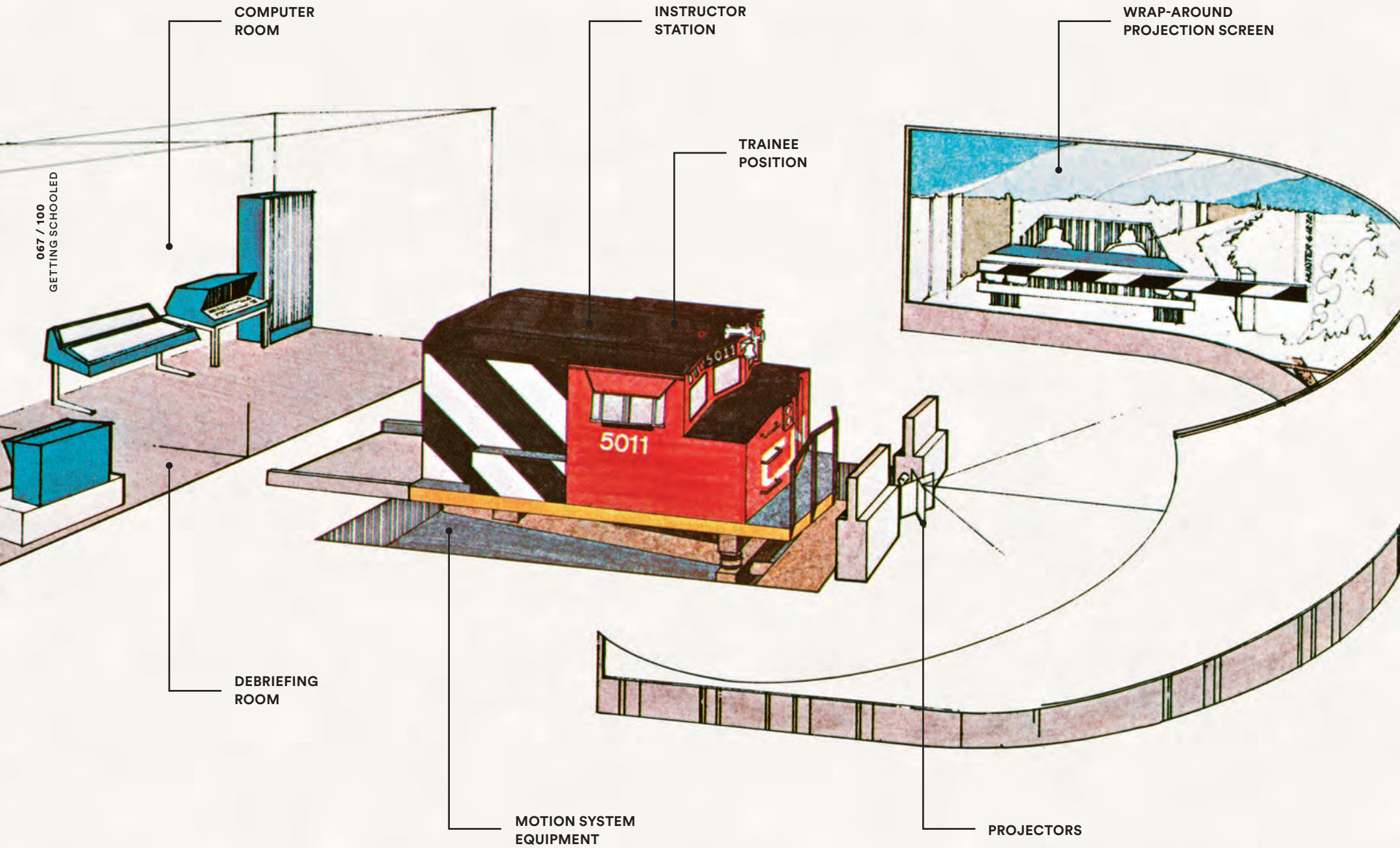
Choice cafeteria lunch: Meatloaf, and the salad bar

3

2 / CN's Claude Mongeau campus welcomes railroaders to Winnipeg (date unknown).
3 / CN's American employee training centre is located in suburban Chicago (date unknown).

FUN FACT

So realistic were the locomotive simulators called Oscar—one of which used hydraulics and film projections of actual subdivisions to create an immersive experience for training engineers—that there were stains on the wall at Gimli from coffee being tossed out of the cab while "on the road."



CN in the City

Making stops in key spots along the railway's network.

VANCOUVER

EDMONTON

SASKATOON

WINNIPEG

TORONTO

MONTREAL

MONCTON

HALIFAX

CHICAGO

MEMPHIS

NEW ORLEANS

068 / 100

CN STOP: VANCOUVER

Province: British Columbia

City population (est., metropolitan area):

1919: 115,000
2019: 2,571,262

CN focus:

Port of Vancouver; coal, grain, potash and intermodal traffic; distribution centres for forest products, metals, automotive; CargoFlo bulk handling; intermodal terminals; Thornton Yard.

Hidden history:

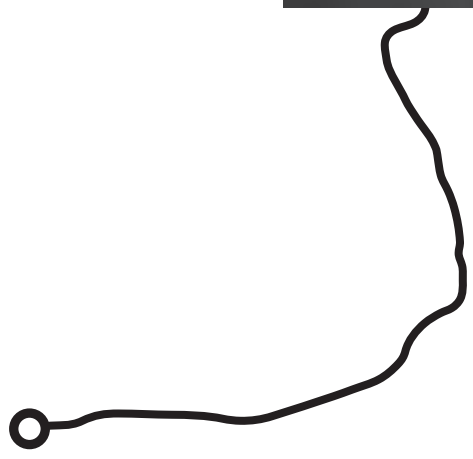
The 2-mile (3.4-km) Thornton Tunnel, named for CN's larger-than-life second president, Sir Henry Thornton, runs under a residential neighbourhood in Burnaby. Its ventilation facilities are disguised as a bungalow near East Hastings, in Willingdon Heights.

For the railfan:

The best view of port activities is from a Seabus between Waterfront Station and Lonsdale Quay on the North Shore.

Vancouver got the nickname "Terminal City" because it was the end point for grain shipments arriving by rail from the Prairies.

1 / Aerial view of the intermodal terminal in the port of Vancouver (1997).



Port of Vancouver

Today, Canada's largest port ships more than $200 billion worth of cargo each year. In the 1920s, its highest priority—above Pacific salmon and Okanagan fruits—was silk from Japan, which was whisked eastward in sealed, paper-lined cars on hotshot "silk trains" guarded by CN Police.

069
/100

CN STOP: EDMONTON

Province: Alberta

City population (est., metropolitan area):

1919: 59,000
2019: 1,411,945

CN focus:

Oil, coal, natural gas liquids, petrochemicals and grain traffic; automotive distribution facility; Walker Yard; McBain Intermodal Terminal; CargoFlo bulk handling; metals and forest products distribution.

Hidden history:

Edmonton is home to Canada's other CN Tower. When built in 1966 over the former train station, the 26-storey skyscraper was Western Canada's tallest building. The CN logo still crowns the top.

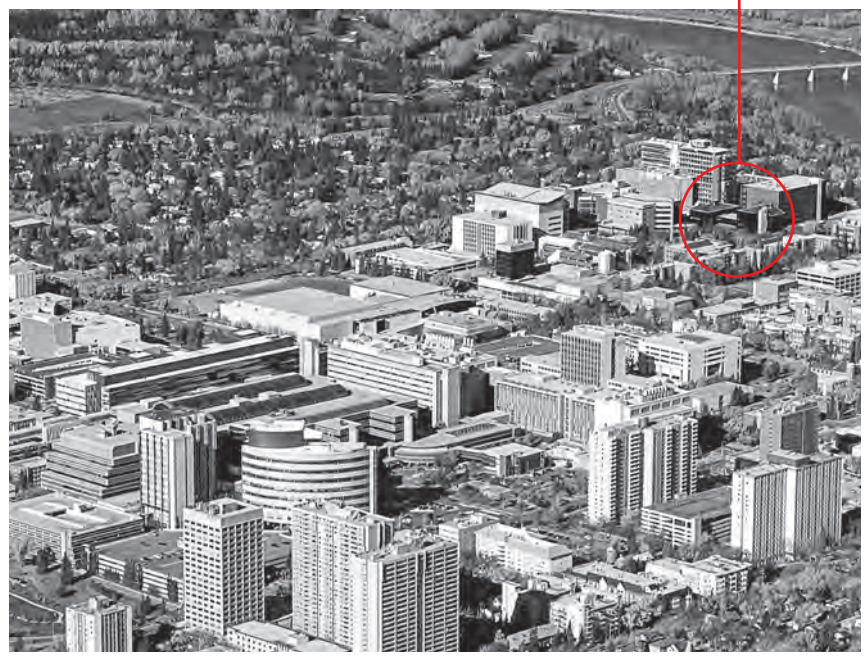
Historical moment:

An industry leader in fuel efficiency, CN ran trials on two modified CN SD40-2W diesel-electric locomotives using a substantial amount of liquefied natural gas, with combustion piloted with smaller amounts of conventional diesel fuel. This operated between Edmonton and Fort McMurray in 2012.

1 / University of Alberta, Edmonton (date unknown).

Canada's highest-latitude metropolis, the "Gateway to the North," has convenient access to resource-rich northern Alberta and the Northwest Territories—where the rails went long before the roads.

FACULTY OF ENGINEERING



Canadian Rail Lab

CN collaborates with the University of Alberta's Faculty of Engineering on the Canadian Rail Research Laboratory, established in 2010. The program is developing new technologies for track and equipment performance, improvements to safety and taking on the very Canadian challenge of winter service reliability.

070
/100

CN STOP: SASKATOON

Province: Saskatchewan

City population (est., metropolitan area):

1919: 50,000
2019: 323,809

CN focus:

Grains and fertilizers, especially potash; intermodal terminal; metals and automotive distribution facilities; Chappell Yard.

Historical moment:

Built at the behest of the booming Saskatoon business community, The Bessborough hotel (now a Delta property) opened in 1935. Designed to resemble a Bavarian castle, using Saskatchewan brick and tile and Tyndall stone from Manitoba, the hotel still makes a best-in-Prairies impression.

For the railfan:

While hopper cars are still the traditional way to transport grain, Saskatoon is now the hub of CN's intermodal grain train movement. Product is loaded into containers and sealed at the source, for shipping from an individual farmer to an overseas buyer.

Saskatoon is nicknamed "POW," short for potash, oil and wheat, in recognition of the impact that these resources have had on the development of the province's largest city.

1 / Grand Trunk Pacific Railway Bridge over the South Saskatchewan River, Saskatoon (2015).

Canadian National Railway Bridge

The city can count no fewer than 10 bridges, including this steel trestle, also known as the Grand Trunk Bridge. Completed in 1908, it's the city's oldest surviving bridge. Spanning the South Saskatchewan River, it cemented the link to Edmonton and Winnipeg—and Saskatoon's pivotal position in the breadbasket of Canada, along with its now-diversifying economy.

071
/ 100

CN STOP:
WINNIPEG

Province: Manitoba

City population (est., metropolitan area):

1919: 179,000
2019: 825,713

CN focus:

Symington hump yard; Claude Mongeau National Training Centre; Transcona Shops; CargoFlo bulk handling; forest products and automotive distribution; intermodal terminal.

Historical moment:

Remote-control Beltpack technology for moving locomotives, developed in Symington Yard in the 1980s, is now used across the industry.

For the railfan:

Since 2018, CN Stage and Field is the name of the outdoor venue at the Forks, the city's historical rail hub turned public event space bounded by the railway's mainline.

Manitoba's capital, called the "Gateway to the West" because it sits at the edge of the Prairies, is often referred to as "Winterpeg" for its legendary harsh cold.

1 / Transcona repair shops, Winnipeg (date unknown).

Transcona Shops

The CN work whistle was a common sound for generations of railroaders in the suburb of Transcona. CN's main repair shop complex was opened in 1909 by the Grand Trunk Pacific and National Transcontinental railways, and manufactured munitions during WWI. It's currently working with railcar wheels made locally from 100% recycled steel.

072 / 100

CN STOP: TORONTO

Livestock markets surrounded the railyards of Fort York, which used to be the centre of Toronto's meat industry—"Hogtown" was noted for its pork.

Province: Ontario

City population (est., metropolitan area):

1919: 515,000
2019: 6,346,088

CN focus:

Industrial, automotive and petrochemical traffic; MacMillan hump yard (Vaughan), CN's largest rail classification yard; Brampton Intermodal Terminal; logistics park; automotive, forest and metals products distribution; CargoFlo bulk handling.

Hidden history:

The Rogers Centre, formerly the Skydome, isn't the only circular structure to have occupied this location south of Front Street—it was erected on the site of CN's old Spadina Roundhouse (1927–1986).

Historical moment:

While supervising the construction of MacMillan Yard in the 1960s, CN's Jack Cann (colourful future vice president, Operations) liked to tour the work site on horseback.

1 / A look inside Union Station, Toronto (1949).

The Prince of Wales arrived on a new 6100-series steam locomotive to open the new Beaux-Arts building in 1927. (CN Police used the rooftop as a shooting range for many years.) It's now Canada's busiest transit hub, home of GO Transit commuter rail service, originally a CN collaboration (including the design of the logo).

Union Station

073 / 100

CN STOP: MONTREAL

A subterranean concourse known as the “Underground City” links Central Station, Place Ville Marie, Place Bonaventure and Fairmont The Queen Elizabeth—which served 8 million martinis in its first 20 years as a CN hotel.

Province:

Quebec

City population (est., metropolitan area):

1919: 600,000
2019: 4,138,254

CN focus:

Corporate headquarters; Port of Montreal; Taschereau marshalling and intermodal yard in Ville St. Laurent; logistics park; forest products; automotive and metals distribution; CargoFlo bulk handling.

Historical moment:

When Central Station opened in 1943, it replaced Grand Trunk’s Bonaventure Station, the Moreau Street Station and Canadian Northern’s terminal on land that the railway had secretly purchased for its Mount Royal Tunnel.

For the railfan:

The Canadian Railway Museum, also known as Exporail, is Canada’s largest, with 180 pieces of rolling stock. It’s located in nearby Saint-Constant (Quebec).

In 1961, the company moved into its new air-conditioned, 17-storey offices—erected on pillars above Central Station’s below-street-level tracks. Originally planned to consolidate trackage in the 1920s, the development of a centralized terminal area on a 21-acre (85,000 m²) plot of railway property completely transformed the downtown core and introduced the city to the term “air rights” for building atop existing facilities.

CN Headquarters

1 / CN Headquarters in downtown Montreal (1994).

074
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CN STOP: MONCTON

Province: New Brunswick

City population (est., metropolitan area):

1919: 13,000
2019: 152,169

CN focus:

Forest products and consumer goods; intermodal traffic; automotive distribution centre; CargoFlo bulk handling; Gordon Yard; Logistics Park.

Historical moment:

In 1922, CNRA Moncton opened with a broadcasting power of 500 watts. Known as the Voice of the Maritimes, it was one of three CN-owned radio stations, along with Ottawa and Vancouver.

For the railfan:

When inaugurating the new CN Terminal on Main Street in 1962, CN's Scottish-born president, Donald Gordon, sealed a time capsule to be opened October 19, 2062. It has since been moved to a monument on Avenir Centre plaza, but remains intact. Save the date!

With CN's mainlines to and from the Maritimes passing through it—and as the home of the Intercolonial Railway of Canada and later CN's Atlantic Region headquarters—Moncton became known as "Hub City."

CN Sportsplex

Moncton's largest recreational facility, redeveloped on 265 acres (1,000 m²) of former railway land by Canada Lands Company, features 10 baseball diamonds, six soccer fields, four indoor rinks, a facility for paintball, golf, soccer and football and a bike park. The Field of Dreams, opened in 2017, has level-ground pitchers' mounds and dugouts for kids with cognitive or physical disabilities.

1 / Former Moncton shops, New Brunswick (2003).

075
/100

CN STOP: HALIFAX

Province: Nova Scotia

City population (est., metropolitan area):

1919: 50,000
2019: 431,701

CN focus:

Eastern Passage Autoport; grain, steel, forestry products and rubber traffic; CN Halifax Intermodal Terminal; Halterm Container Terminal; Fairview Cove Container Terminal.

Historical moment:

No stranger to tall ships in its earlier history, Halifax's deep-water harbour welcomed its longest cargo ship ever in 2017. With a capacity of 10,000 containers, the 1,293-foot (394-m) *Zim Antwerp* out-measured the highest office tower in Canada.

Hidden history:

Launched in 1904 for service between Montreal and Halifax, and originally run by the Intercolonial Railway, then CN and now VIA Rail, the Ocean (previously Ocean Limited) is one of the oldest continuously operated named passenger trains in North America.

The neighbourhood of Africville, once home to 400 Canadians of colour, was demolished in the 1960s. At the Africville Museum, a large panel honours the many CN railway porters who made their homes in the area.

Pier 21

This port terminal was the first stop for more than a million newcomers to Canada between 1928 and 1971. Many Europeans, including 48,000 war brides, barely got their land legs before boarding CN trains to the west. The Canadian Museum of Immigration at Pier 21 includes a colonist car, complete with hard seats and overstuffed luggage.

1 / Canadian Museum of Immigration, Halifax (circa 2015).

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CN STOP: CHICAGO

State: Illinois

City population (est., metropolitan area):

1919: 270,000
2019: 9,500,000

CN focus:

U.S. regional headquarters; link between Canada and Gulf of Mexico; intermodal terminals; CargoFlo bulk handling; forest and metals distribution; logistics park; CN training campus, Kirk hump yard, Markham Yard and Woodcrest Shop (Homewood).

Hidden history:

In the first half of the last century, CN served passengers between Montreal, Toronto and Chicago several times a day. And in 1932 only, the Jasper Park Special covered Chicago-Jasper-Vancouver.

Historical moment:

A young Louis Armstrong arrived in Chicago from New Orleans on the Illinois Central in 1922, following jazz musicians like Jelly Roll Morton and Sidney Bechet.

Short for elevated train, "The L" started back in 1892. The early rapid-transit service is credited with developing Chicago's densely populated urban core.

The Matteson Connection

CN purchased the EJ&E Railroad in 2009, allowing it to route trains around the perimeter of Chicago. As a result, on the south side of the city, CN's cloverleaf-shaped rail exchange was built in 2012 to allow trains to come in and out from different directions, bypassing city congestion. Views of trains crossing and looping back on themselves are so captivating that a railfan viewing platform was installed.

1 / Matteson Connection, Chicago (date unknown).

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/100

CN STOP: MEMPHIS

State: Tennessee

City population (est., metropolitan area):

1919: 157,000
2019: 1,348,260

CN focus:

Industrial, petrochemical, coal, grain, fertilizer, automotive and consumer goods; Harrison Yard; CN mechanical shop; Intermodal Gateway Memphis; distribution facilities for forest products, metals and automobiles; CargoFlo bulk handling; logistics park.

Historical moment:

In 2011, Memphis unveiled its master plan to transform into an "aerotropolis," a term for a city where the airport is at the centre, rather than on the fringes, of urban development.

For the railfan:

Legendary Illinois Central engineer Casey Jones gave his life saving his passengers in a collision near Vaughan, Mississippi, in 1900. "The Ballad of Casey Jones," recorded by artists from Johnny Cash to the Grateful Dead, honours his heroism, as does the nearby Casey Jones Home & Railroad Museum.

"North America's Distribution Center" boasts five Class 1 railways, the world's second-busiest freight airport, the second-largest inland port in the U.S. and a mid-southern position within convenient trucking distance to major American cities.

1 / University of Memphis student plaza (2012).

Intermodal Freight Transportation Institute

With its active railways, runways, roadways and waterways, the city is a veritable logistics lab for the shipping industry—the focus of an institute at the University of Memphis. Opened on campus in 2008, the CN – E. Hunter Harrison Center for Intermodal Safety and Emergency Preparedness is named for the former company president, a Memphis native.

078
/ 100

CN STOP: NEW ORLEANS

Three hundred years ago, the “Crescent City” began to take shape around a graceful arc in a bend of the Lower Mississippi River—what’s now the French Quarter.

State: Louisiana

City population (est., metropolitan area):

1919: 387,000
2019: 1,275,762

CN focus:

Petrochemical, coal, steel and grain rail traffic; southern terminus of CN’s network, Port of New Orleans, Destrehan and Mays yards, and one in Baton Rouge.

Historical moment:

Arlo Guthrie popularized “The City of New Orleans,” a song written by Steve Goodman about the train, now operated by Amtrak on CN track. Guthrie actually rode it for the first time in December 2005 for a Hurricane Katrina fundraising tour.

For the railfan:

The Huey P. Long Bridge is a favourite location to watch the active New Orleans Public Belt switching railroad, which serves the seaport with connections to CN and five other Class 1 railways. Ownership of the NOPB was recently transferred from the city to the port.

1 / Port of New Orleans and cityscape (date unknown).

Port NOLA

Gulf of Mexico is a gateway to global trade. The port recently increased capacity, with a 12-acre (48,560 m²) intermodal terminal for on-dock rail transfers. Coffee has long been among its top imports—amounting to some 20 billion cups annually—and has been sipped at Café du Monde on Decatur Street since 1862, ideally with a beignet.

079
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SUPPLY CHAINS

Going with the Flow

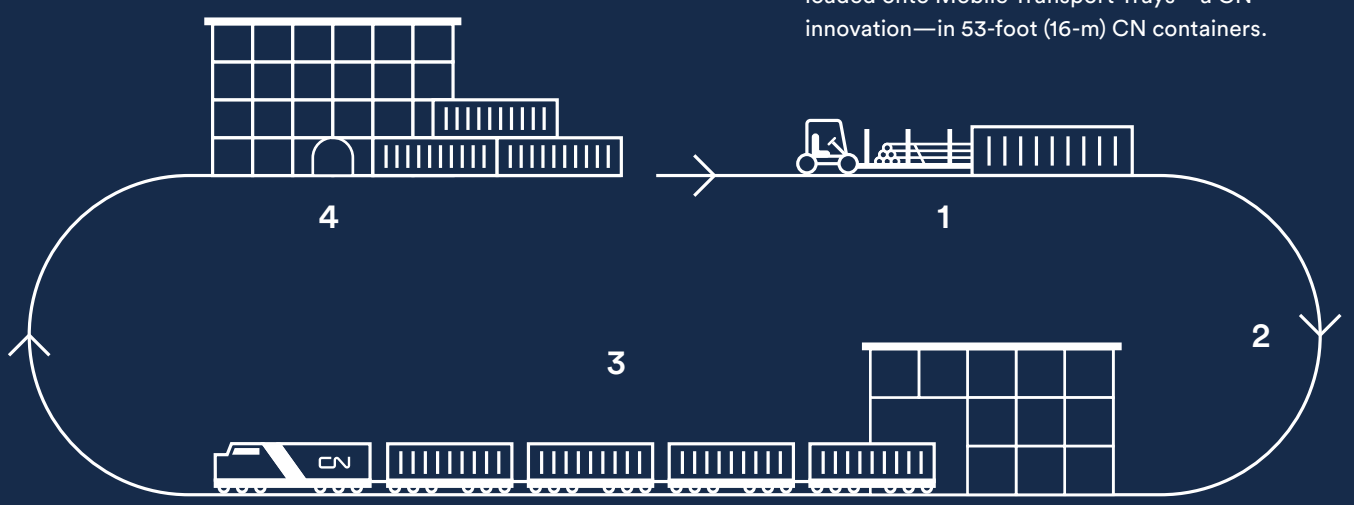
Having a global reach means having a world view. Beyond the Port of Vancouver, Prince Rupert (British Columbia) provides CN with North America's shortest ocean crossing to Asia. Via the Maritimes, the Eastern Passage in Halifax (Nova Scotia) connects it to Europe, the Middle East and the Caribbean, while the Gulf of Mexico opens up Central and South America, the Caribbean, Africa and Australia. In the 2000s, under president and CEO Claude Mongeau, the company took a big-picture view of the logistics of a commodity's journey, from raw materials to finished consumer goods, and at various stages in between—including keeping close tabs on ground inventory. The supply chain tracks merchandise across different modes of transportation, from its place of manufacture to its final destination, making links from farm to factory, ship to shore and train to truck.

Three supply chains that follow CN's thinking along the line:

01 Spin Cycle: Intermodal
Canada, the United States and Mexico

1 / Manufacturing facility

In Woodstock (Ontario), steel tubing destined to be transformed into automotive parts is loaded onto Mobile Transport Trays—a CN innovation—in 53-foot (16-m) CN containers.



2 / Rail

For the 2,800-mile (4,500-km) journey to and from Mexico, CN partners with railways such as Kansas City Southern/Kansas City Southern de México (KSC/KCSM) and Ferromex (FXE).

3 / Unloading and loading

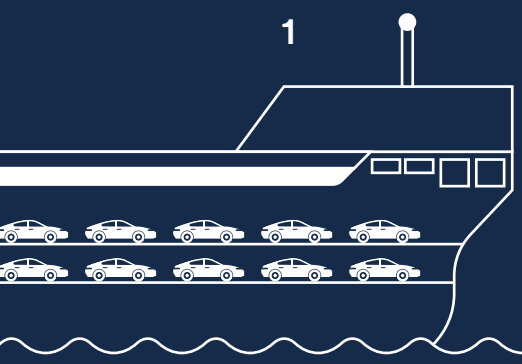
Containers are unloaded at a local yard in Silao, Mexico. Now-empty containers travel by truck to the Whirlpool facility to pick up white goods for transport back to the rail yard.

4 / Distribution centre

Back in Canada, refrigerators, washers and dryers are delivered via CN's door-to-door intermodal service. Once unloaded at the Whirlpool distribution centre in Milton (Ontario), merchandise is distributed in the Eastern Canada and Winnipeg (Manitoba) markets.

02 At the Wheel: Automotive

Europe to Central Canada

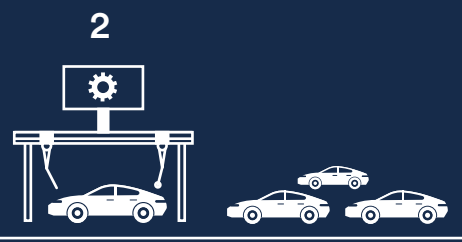


1 / Ship from Europe

Roll-on, roll-off (RoRo) vessels leave Europe for CN's Eastern Passage Autoport facility, carrying up to 2,000 vehicles. The Atlantic crossing takes 8 days.

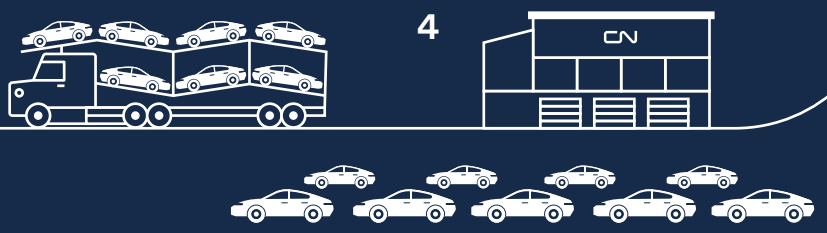
2 / Port to Autoport

At the Port of Halifax, they are offloaded from the vessel by stevedores and placed in bays by Autoport, a 100-plus acre facility (400,000 m²), for rail loading, truck loading or vehicle customization. They'll be inspected for damage at various checkpoints along the way.



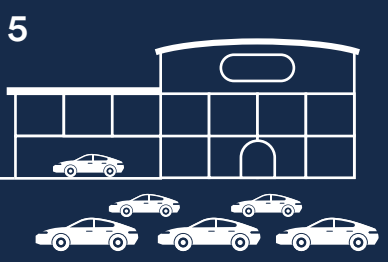
3 / Rail

Vehicles are loaded onto multilevel railcars, which can hold 15 sedans on a tri-level and 10 SUVs on a bi-level. CN shipped 15,400 carloads in 2018.



4 / Truck

In local yards, vehicles are offloaded and staged in parking bays, where haul-away truck carriers will deliver them to dealerships.



5 / Dealerships

CN handled more than 179,000 imported European vehicles in 2018, including Audi, BMW, Porsche, Mercedes Benz, VW, Jaguar, Land Rover and Volvo.

03 Hauling the Harvest: Grain

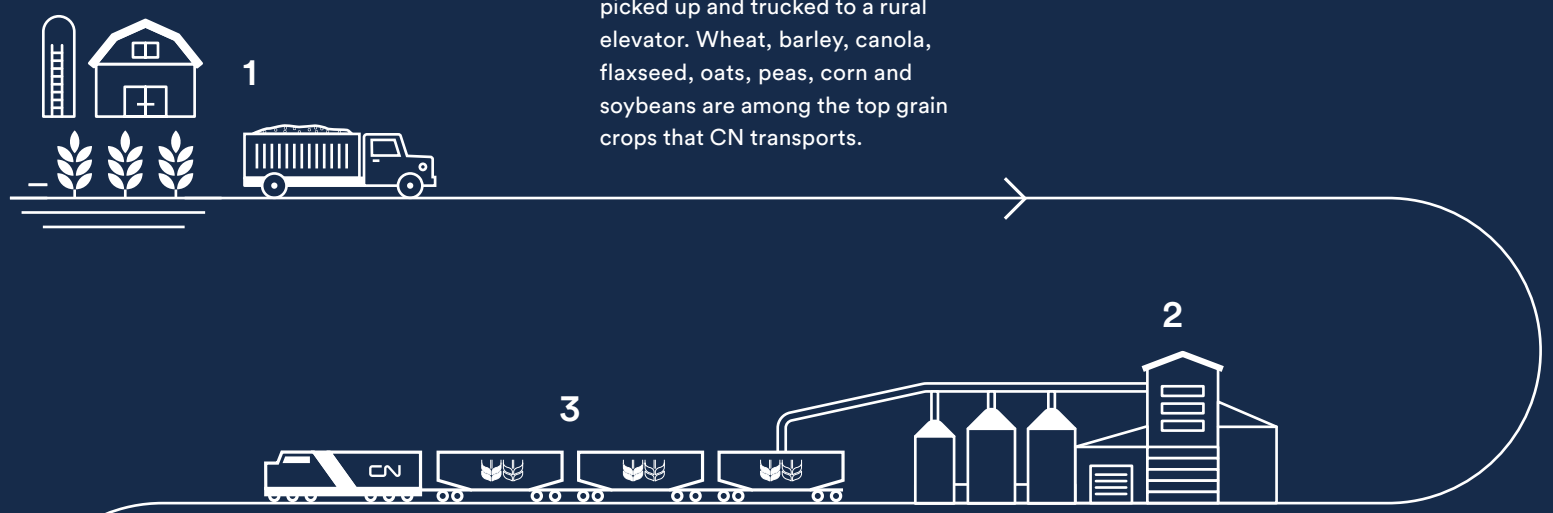
Western Canada to Asia

FUN FACT

CN's warehousing space adds up to 23 footballs fields.

1 / Truck

In the Canadian Prairies, grain is picked up and trucked to a rural elevator. Wheat, barley, canola, flaxseed, oats, peas, corn and soybeans are among the top grain crops that CN transports.

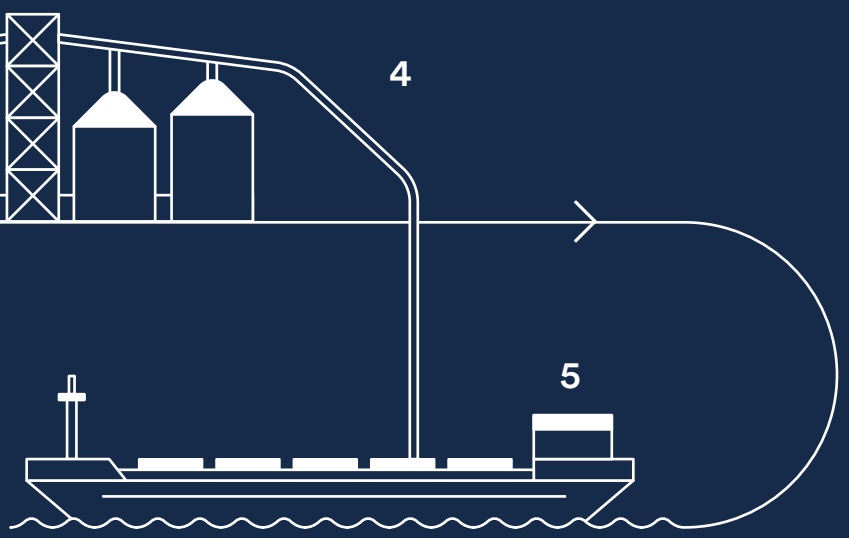


2 / Grain elevator

The grain is loaded through a spout into the hopper car, as locomotives pull the cars along a loop track or using a car progressor. CN serves more than 80 grain facilities across Manitoba, Saskatchewan, Alberta and the Peace River region of British Columbia.

3 / Rail

Once loaded onto a train, grain travels to export terminals, container stuffing facilities, and wheat mills, malt plants, feed mills and processing facilities.



4 / Port

At export facilities in the ports of Vancouver and Prince Rupert, grain is loaded into bulk export vessels that can hold upwards of 60,000 to 75,000 tonnes. Average load rates on the Canadian West Coast range from 500 to more than 3,000 tonnes per hour.

5 / Ship

Vessels loaded with grain make the 4,000 to 7,500 nautical-mile journey across the Pacific to many destinations in Asia, including China, Japan, Indonesia, Malaysia, Thailand and Vietnam, which takes 8 to 10 days. It's used for milling and feed, making malt, meal or oil.

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MULTI-DIMENSIONAL MAPPING

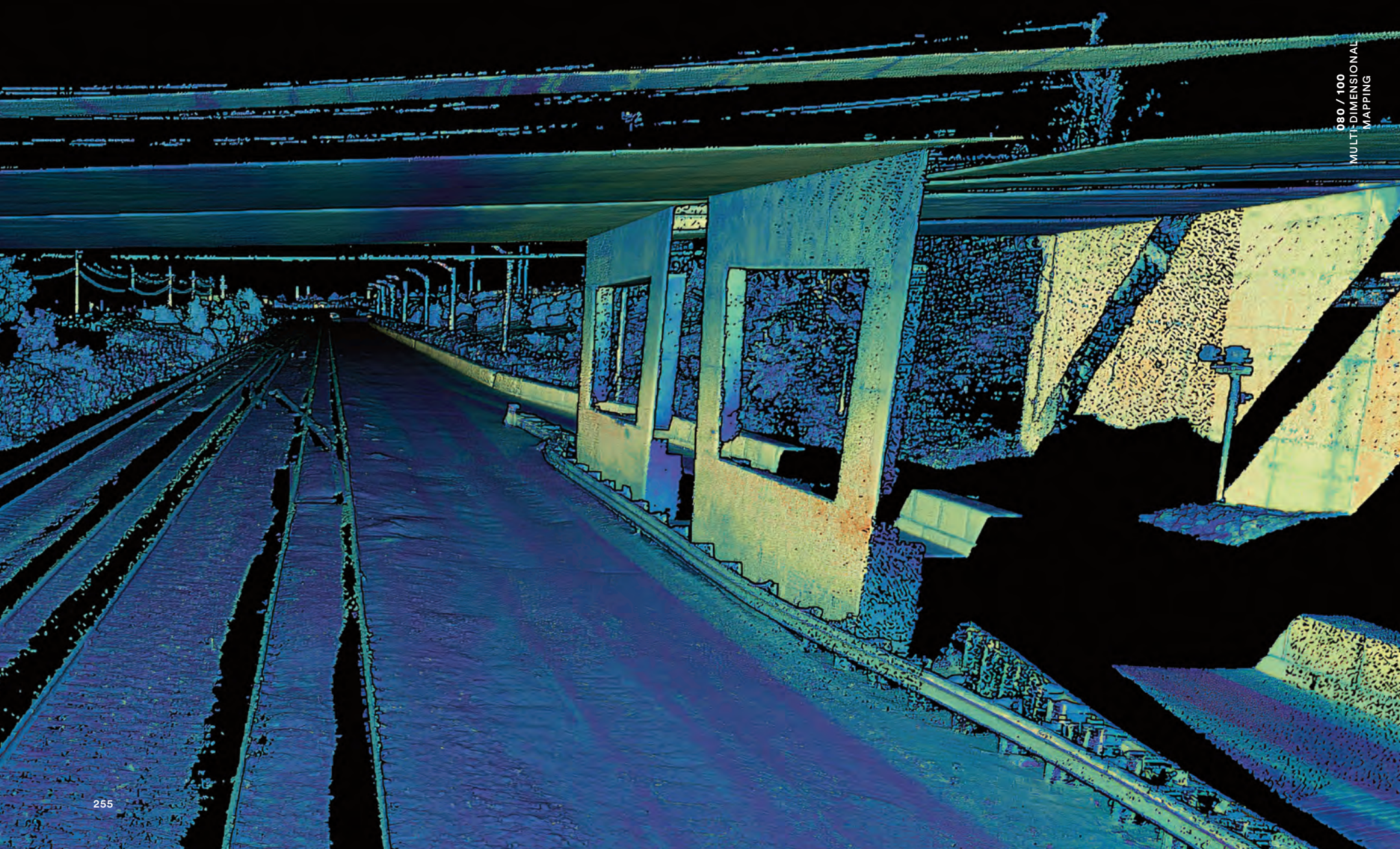
Full-Spectrum Routes

CN's network looks a lot different than it did even a decade ago. Now, a map of a particular route, or subdivision file, containing all the topological data and limitations (such as speed limits and grades) is sent directly to the locomotive's computer. Location intelligence keeps track of a host of constantly changing factors as a train moves along its route. Behind this new-generation mapping are massive data sets gathered from across the company. AutoCAD drawings are used for as-built design and construction references, while as-is measurements are collected by geographic information systems travelling the line. The result is an immersive interface that goes well beyond 3D to take into account everything from upcoming rail repairs to clearance for dimensional loads. Precision Scheduled Railroading has never been more precise.

1 / A 3D visualization, created from a mobile laser scanner that measures one million points per second, renders materials such as metal, asphalt or wood in varying intensities for CN's Walk the Track app developed in Montreal (2019).

“We’re working shoulder to shoulder with all groups that add or change our track infrastructure or operating conditions to consolidate various sources of information so we can share one view. With traditional cartography, you would have only two lines and mile points or a rough polygon to represent a yard boundary. Now, we are capturing a much richer set of information that provides a detailed view of the track infrastructure and surrounding environment. This includes details such as track curvatures and grades, measurements of individual track components, and surrounding assets such as wayside devices, signals, switches and grade crossings. We can then evaluate and calculate characteristics such as maximum weight capacity and a track quality index. Our tools allow the user to navigate a train corridor and see a three dimensional view of the environment. We call it ‘walk the track.’”

—Yves St. Julien, technical manager,
GIS Technologies and Solutions,
with CN since 2011



RAILROADERS IN THE COMMUNITY

Face Values

Get talking about trains, and it seems that almost everyone knows someone whose uncle, grandfather, sister or friend worked for the railway at one time or another. CN touches millions of people every day: indirectly, through the goods it transports, and directly, through the men and women who make it all happen. On and off the job, some employees not only make a difference in the workplace but also make the world around them a better place by contributing their time to local projects. To encourage those efforts, in 2008 CN's Railroaders in the Community program began providing grants to charitable organizations, for a total of $1 million annually, through its employees and pensioners who volunteer to go the extra mile. Each year on June 6, employees are encouraged to go out and do volunteer work, marking the company's anniversary with CN in Your Community Day.

CN employees take the prize with a number of initiatives:

People Awards for Excellence

Previously known as the President's Awards, these top honours go to individuals and small teams with notable achievements. In addition to Railroaders in the Community, categories range from Rail Operations and Supply Chain Service to Innovations and Safety, along with Terminal of the Year.

Service Awards

The company has a long history of employee service that often stretches well into the decades. At five-year increments, key milestones at the railway are marked with a CN pin and a gift of choice.

Generation Scholarships Program

Financial support is given to children and grandchildren of CN employees, in reward for academic performance.

Looking Out for Each Other Recognition Program

Promoting safety practices in the workplace, this program recognizes the contributions of peers who go out of their way to create and maintain a safe, secure and healthy environment.

Corinne Li

Property tax manager

I can most often be found in:

CN Headquarters, Montreal (Quebec).

I started with CN in: August 2015

The best part of my job:

Coming to the office.

The toughest part of my job:

Coming to the office!

My favourite workday lunch:

Poke bowl.

My role as a Railroader in the Community is:

Organizing the music scores, maintaining the music library and accompanying the musicians to musical camp and rehearsals for L'Association des orchestres de jeunes de la Montérégie where my son, Noah, is a violinist.

Volunteering my time is important to me because:

While Noah is learning how to be focused, disciplined and organized, it gives me the opportunity to network with other parents outside my field of work.

The words of wisdom I live by:

Live simply. Give more. Expect nothing.

The theme song of my life is:

"You Raise Me Up," by Josh Groban.

Barry Girvan

Garage foreman

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RAILROADERS IN THE COMMUNITY

I can most often be found in:

Gordon Yard, Fleet Services Garage, Moncton (New Brunswick).

I started with CN in: April 2008

The best part of my job:

Helping people and dealing with the daily challenges.

The toughest part of my job:

How to handle not being able to make everyone happy.

My favourite workday lunch:

Leftovers from last night's supper.

My role as a Railroader in the Community is:

When my daughter was an active member of the Roofers Volleyball Club, I sat on the committee and was also the club equipment manager along with my wife, Mary-Lynne.

Volunteering my time is important to me because:

It helps young adults develop to be better, stronger, confident people.

The words of wisdom I live by:

You only have control of one person.

The theme song of my life is:

"No Place That Far," by Sara Evans.

Josette Fletcher

Materials coordinator

I can most often be found in:

Homewood (Illinois).

I started with CN in: May 2010

The best part of my job:

Knowing that I help supply material for major projects to get completed.

The toughest part of my job:

Keeping up with the ever-changing needs of the industry and program needs.

My favourite workday lunch:

Potbelly turkey flatbread sandwich.

My role as a Railroader in the Community is:

Member of Epsilon Nu Sigma Chapter of Sigma Gamma Rho Sorority in Matteson, Illinois, and was Chair of scholarship banquet for high school students in the Chicago suburbs.

Volunteering my time is important to me because:

Not everyone has all the same resources. Doing my part to spread knowledge or give help has always been my calling.

The words of wisdom I live by:

Do unto others as you want them to do unto you.

The theme song of my life is:

“Add to Me,” by Ledisi.

Aaron Knuth

Technical training officer

I can most often be found in:

The Lake and Valley zones in Wisconsin, Minnesota and Upper Michigan.

I started with CN in: April 1995

The best part of my job:

Getting to know all the great employees I train.

The toughest part of my job:

Being away from my family because I have to travel so much.

My favourite workday lunch:

Whatever is on the menu.
I'm not picky.

My role as a Railroader in the Community is:

I help loading and transporting equipment for the local high school marching band, with the Pulaski Community Schools Music Boosters, outside Green Bay (Wisconsin). I also help students with any problem they may have with their instruments.

Volunteering my time is important to me because:

With our help, students participate in some of largest and oldest parades in the country. It's a great honour for a school to be selected, and a once-in-a-lifetime experience.

The words of wisdom I live by:

Treat others as you want to be treated.

The theme song of my life is:

"Staying Alive," by the Bee Gees. (Because, you know, I am a rules instructor after all.)

Marianne Vurinaris

**Service delivery manager,
Intermodal Domestic**

I can most often be found in:

Brampton Intermodal Offices,
Brampton (Ontario).

I started with CN in: March 2000

The best part of my job:

Working with such great people in an ever-evolving and fast-paced environment.

The toughest part of my job:

Knowing when to draw the line and deciding that I have been as effective as I can be for the day—there is always more to do and it's always tempting to do it.

My favourite workday lunch:

Our team shares sandwiches from a different place every Thursday.

My role as a Railroader in the Community is:

Manager of my son's soccer team, the Vaughan Soccer Club.

Volunteering my time is important to me because:

I have the opportunity to spend time with my family on an activity that we all love. And I really enjoy watching them play.

The words of wisdom I live by:

Afford people the same courtesy that you want them to afford you.

The theme song of my life is:

"Life Is a Highway," by Tom Cochrane.

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RAILROADERS IN THE COMMUNITY

Kurt Kohlenberg

Car mechanic

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RAILROADERS IN THE COMMUNITY

I can most often be found in:

Melville Yard (Saskatchewan).

I started with CN in: March 2008

The best part of my job:

Being outside.

The toughest part of my job:

Cold winters.

My favourite workday lunch:

Leftovers from the night before, especially if it's meatloaf and mashed potatoes.

My role as a Railroader in the Community is:

Fundraising for Cystic Fibrosis Canada.

Volunteering my time is important to me because:

I have hope that a cure for my daughter will one day be found.

The words of wisdom I live by:

Don't put off until tomorrow what you can do today.

The theme song of my life is:

"Family Man," by Craig Campbell.

TRACK
SUPERVISOR

On the

CONDUCTOR

Job

Technological advances are shaping the future of the railway and the working experience.

BUSINESS
TRANSFORMATION
MANAGER

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/ 100

Staying in Line

The team responsible for the general day-to-day maintenance of the track has to see the big picture and the smallest details all at once. They ensure the line is clear, ready to respond to ever-changing weather conditions at a moment's notice. And they also look for wear and tear on the rail and on turnouts, where the train deviates from one track to another, and in the yards. The track supervisor has eyes on the future, always planning ahead for upgrades.

TRACK SUPERVISOR

“From the outside, track looks simple, but an awful lot goes into maintaining it correctly. Alberta’s Grand Cache South subdivision is remote, it’s a 114-mile [180-km] subsidiary line built to serve the coal mine. We’ve got 38 turnouts, and the components of the switches come in all different sizes, depending on the speed of the track and how old it is, and the many different weights of rail, which can be 60 to 142 pounds [27–65 kg].

When I started, I was swinging a hammer, and I still do sometimes. The biggest change over the years is technology. Now we’ve got modern testing equipment, trucks that can measure the geometry of rail and dynamic forces on the rail, which gives much more accurate readings. It has made work much safer and more efficient. By the end of 2019, my line will be 100% continuous welded rail. It means better train handling, you don’t have the oscillation in the train, and it’s easier on the track roadbed, because the wheels aren’t going bang, bang, bang over the joints, so that’s a lot less maintenance. An investment, but well worth it.

My top priority is everyone’s safety and to ensure the line runs smooth. The challenge is Mother Nature. In the Rockies, everything changes constantly: snow, rain, rockslides, floods. We still walk the whole line every year, walk the yards, looking at everything: tie condition, fasteners like spikes or clips, the anchors on each side, the quality of the rail, seeing what needs to be replaced so we can get it ordered well ahead of time.”

— John Hughes, with CN since 1999

1 / Foreman Bill Freese measures track in Port Huron, Michigan (2013).

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Marking Miles

CN hired, and in many cases invested in training, 1,250 new qualified conductors to meet shipping demands in 2018. One of the most iconic railway positions, the conductor obtains train authorizations from the dispatchers, coordinates switching, organizes information for each tour of duty and participates in the all-important job briefing with the engineer and brakeman to ensure that everyone's on the same page before hitting the road. Waving to passersby is, of course, optional.

"I'm a second-generation railroader. One of my cousins was a road foreman, and that really piqued my interest. We'd go to the yard and watch the crews switch cars. Once I had the opportunity to come aboard on the engine. When I was younger, looking down at my friends—pretty much sold me. On the road, I wave to people when we are going by and blow the horn for the kids. We get to see some scenery that you can't get off the interstate. Here in Louisiana, coming through the bayous, we see alligators and water moccasins. I enjoy those times going down the rail, you talk to RTC [rail traffic controller], and it's just you, the engineer and the train.

I started on the extra board, which means you're on call day and night. One day you're pulling and spotting a grain elevator, it might be industry work the next day, or taking a road train to Jackson, Mississippi. I like it because it's always something different. You get to cover a lot of ground, working with different crews, and overall, I think it makes you a better conductor.

The main thing for me is being a positive influence on the new conductors. CN has hired an influx of conductors within the last couple of years. I remember how I felt when I started railroading and was truly blessed that some of the old head conductors and engineers took the time to train me. I still reach out for advice. I just want to pay it forward."

—Terrance Dawson, Jr., with CN since 2006

1 / Conductor Michel Martin surveys the territory between Montreal and Belleville, Ontario (2009).

CONDUCTOR

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/ 100

Fully Mobile

The railway business is transforming in the new millennium, as day-to-day operations shift away from a paper-based environment to digitally enabled processes. An electronic version of the operating manuals heralds an end to the era of the printed five-pound [2-kg] rule book that railroaders have always carried with them. Handheld interactive devices will also be phasing out printed train journals, general operating bulletins, work instructions and handwritten recording.

BUSINESS TRANSFORMATION MANAGER

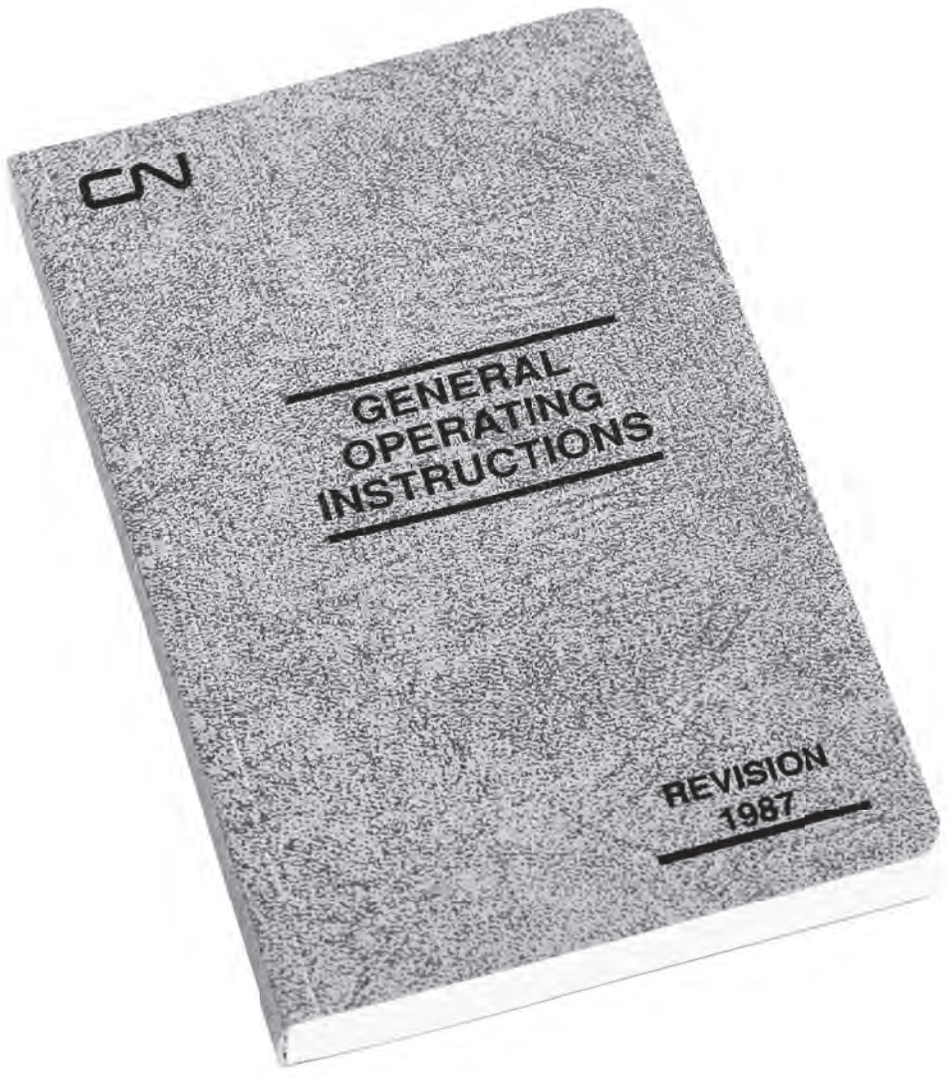
“One of the things I enjoy is seeing how we are opening to modernity. CN has been a pioneer and that’s continuing right now with a digital transformation agenda that’s bringing better data, insights and real-time visibility. My background is in Mechanical Engineering, and when I joined CN, I had the opportunity to train in the yard, shadow teams and discover many aspects of our operations and opportunities to improve a business that’s asset-intensive and dispersed over a wide geographical area.

Working in mobility is very exciting. In our lives, we’re all using phones to pay bills, communicate with family and friends, buy products and services, so why wouldn’t we have a modern toolbox for employees to use? The vision is to go paperless, to develop solutions to make the workforce more efficient and safe, and to provide good, rugged devices. In my department, we’re a bunch of business-driven techies, and I think it’s important that we’re co-designing with field employees, getting their ideas on what works best and improving our products with their feedback. They’re our heroes, doing hard work with a lot of responsibility. We have fun testing devices in cold rooms, doing drop tests, submerging mobiles in water—as we say, the railway is an outdoor sports company and we need the gear that goes with that.”

—Kim Valcourt, with CN since 2007

1 / Carman Josh Thompson-Kylie and carman Jerrott McIntyre make use of a mobile app for car mechanics, in Halifax (2019).

2 / *General Operating Instructions* from 1987, Montreal (2019).



FUN FACT

To ensure the safe movement of trains, railways developed their own systems of rules that governed employee conduct, codified in printed working manuals that covered everything from yard operations to car sealing.

READING CN

Open Books

When CN commissioned Lieutenant-Colonel G. R. Stevens to write its first corporate history in the late 1950s, then-president Donald Gordon noted that the company's long and storied past was tied to the development of Canada as an industrial economy. So it wasn't surprising that the first 517-page volume of *Canadian National Railways: Sixty Years of Trial and Error* only took readers to 1896 (Clarke, Irwin & Company Limited, 1960) and was followed by a second instalment two years later.

CN Stories Are People Stories: For *The People's Railway: A History of Canadian National* (Douglas & McIntyre, 1992), journalist Donald MacKay gathered employee interviews in the CN Oral History Project at Library and Archives Canada.

Titles on locomotives, stations and business-management style, along with magazines like *Canadian Rail* (Canadian Railroad Historical Association) and *CN Lines* (Canadian National Railways Historical Association), keep new chapters coming.

1 / A selection of books about CN (2019). For full bibliographical information on these and other suggested titles, see Sources.

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/ 100

TREE PLANTING

Branching Out

Since its partnership with Tree Canada and America in Bloom took root in 2012, CN has become Canada's largest non-forestry tree-planting company. Along with the railway's centennial anniversary, another significant milestone is on the horizon for CN as it aims for two million trees planted across Canada. These are tangible and long-lasting ways to help the planet and its people: mass reforestation, greening municipalities and Indigenous communities along the rail corridor and honouring the environmental achievements of clients with gifts that keep on growing.

Almost

2 000 000

Canada's 150th:
In 2017, CN planted large ceremonial trees in 150 communities and First Nations in every province and territory, from Iqaluit (Nunavut), to St. John's (Newfoundland and Labrador), including a $1 million investment in Montreal.

Operation ReLeaf Fort McMurray:
CN donated $1 million to restore urban green spaces and natural forests in ways designed to reduce damage in the event of wildfire, after this part of Alberta was devastated by fires in 2016.

EcoChampions:
More than 750 employees have been trained in ways to conserve energy and reduce waste at the company's yards and offices across North America since 2011, supported by the $5-million CN EcoFund.

"The concept behind Tree Canada is to raise awareness of the positive role of trees, both in rural and urban settings. The Prairies are always an interesting, and maybe unexpected, place for a tree project, because it's naturally a non-treed landscape. Trees are naturally only present along river valleys. Tree Canada did a large tree planting in Regina's Victoria Park for Canada's 150th just before a snowstorm—typical Saskatchewan April weather—and several hundred people turned out, including CN's board of directors, who were in town for a meeting, members of Parliament and members of the Star Blanket Cree Nation. It's nice to remember that all of those trees were planted by real people, who came out and gave their time on a really cold spring day."

— Michael Rosen, president, Tree Canada

Trees

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/100

GOOD NEIGHBOURS

Staying Safe

Rail safety is a shared responsibility. That's why CN partners with the public year-round to raise awareness in order to keep trespassing and motor vehicle incidents trending down. Outreach through Operation Lifesaver, founded in 1981 by the Railway Association of Canada and Transport Canada, educates people about the hazards of the tracks. Rail Safety Week, which now brings together communities on both sides of the border, is already big—with 158 municipalities participating in Canada and the United States in 2018—and only getting bigger. In addition, CN's Structured Community Engagement Program focuses on preparing for potential incidents by reviewing safety practices, sharing information on dangerous goods traffic and establishing emergency response protocols with local responders. And better communication makes better communities for everyone who works, lives and plays in them.

Whether it's on the job or in the public realm, there are no shortcuts—literally—when it comes to safety:

#1

Remember that trains need more than a mile (1.6 km) to come to a stop.

#2

Keep speed in mind. Trains are probably closer and travelling faster than they may appear to be.

#3

Be aware that stopped railway cars can begin moving at any moment.

#4

At 5,000 tonnes, a train is a heavyweight compared to a 1.5 tonne automobile.

“When I was 10 or 11, I was walking back from the beach with my family and I found a shortcut across rail tracks. Thinking I was so clever, I darted across. Maybe 20 seconds passed and a train went right by—I felt the wind. I could see my family on the other side of the rail tracks, white as ghosts because they thought I’d been hit. It was terrifying how quickly it happened, and it made me much more mindful when it comes to safety. Now, I help develop national Indigenous outreach strategies for Operation Lifesaver. That’s typically a demographic that’s been excluded from more targeted engagement when it comes to safety, and there’s a relationship that’s different from other Canadians with the creation of the railroad. We’re interested in capturing the experiences of First Nations, Métis and Inuit—and giving a voice to individuals, families and communities impacted by rail injuries and incidents, not just survivors but family members and first responders.”

— Melissa Santoro Greyeyes-Brant, Indigenous outreach coordinator, Operation Lifesaver

#5

Wide loads and equipment can overhang the sides of the track, so maintain a distance.

#6

Anytime is train time: They can come by any minute from either direction.

088
/100

SAFETY AS A CORE VALUE

Ahead of the Curve

CN's centenary heralds record investments in safe operations, from state-of-the-art training to infrastructure improvements to new technologies. Safety culture starts with people first, and the railway's campuses in Winnipeg (Manitoba) and Homewood (Illinois) not only coach employees but also offer customers an immersion in CN's safety culture. Meanwhile, technological advances are driving an era of preventative maintenance—detecting conditions that could cause a safety hazard before an incident occurs. Coming online through 2020 are automated inspection portals that capture high-definition 360° views of a train, in order to identify any needed repairs as it passes by, as well as more autonomous track inspection cars that improve reliability by generating stronger predictive models. Along with risk assessments along key corridors that run through communities or environmentally sensitive areas, a finely tuned Emergency Response Preparedness and Planning program strengthens the safety net around railway-related incidents. CN's Dangerous Goods team, strategically located at major terminals across the network, provides 24/7 emergency response and hazmat expertise, aided by the AskRail app provides real-time information on railcar contents to local first responders. By going beyond compliance, CN's goal is to become the safest railroad in North America.

"CN has always been focused on safety, from evolving inspection and maintenance processes, to employees who look out for each other. Building on our pioneering history in railway technology, we now have sensors and capabilities at our disposal that provide information to enable us to proactively make decisions that railroaders may not have been able to dream of 100 years ago, or even 10 years ago."

— René Roy, manager, Solution Architecture, with CN since 1996

FUN FACT

CN has trained more than 100,000 first responders across its rail network since 1988.

Evolution of Motive Power

STARS OF STEAM

STARS OF DIESEL

Spotlighting locomotives that propelled CN forward over the years.

089
/100

STARS OF STEAM

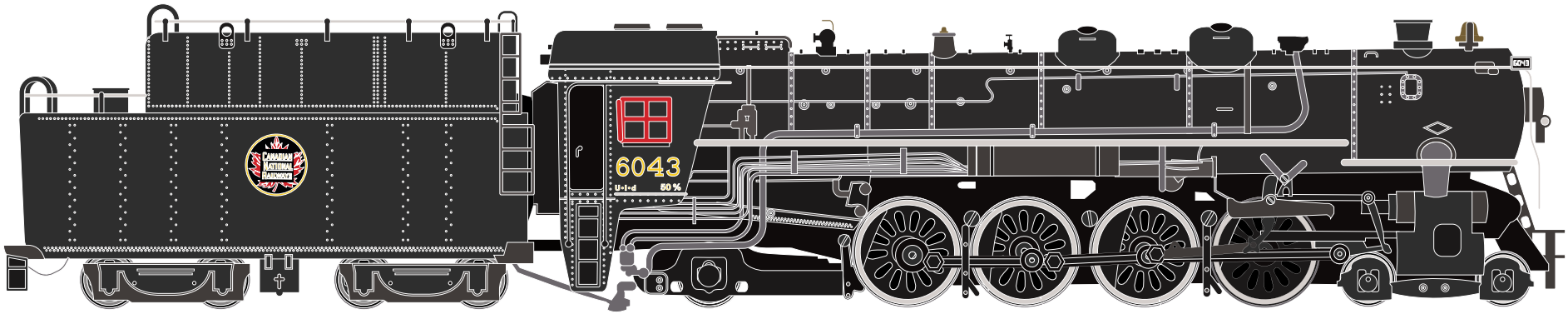
Motive Power Moments

Notable locomotives in CN history, selected by Don McQueen,
author of *Canadian National Steam!*

1920s

6000 series
U-1 4-8-2 Mountain Type

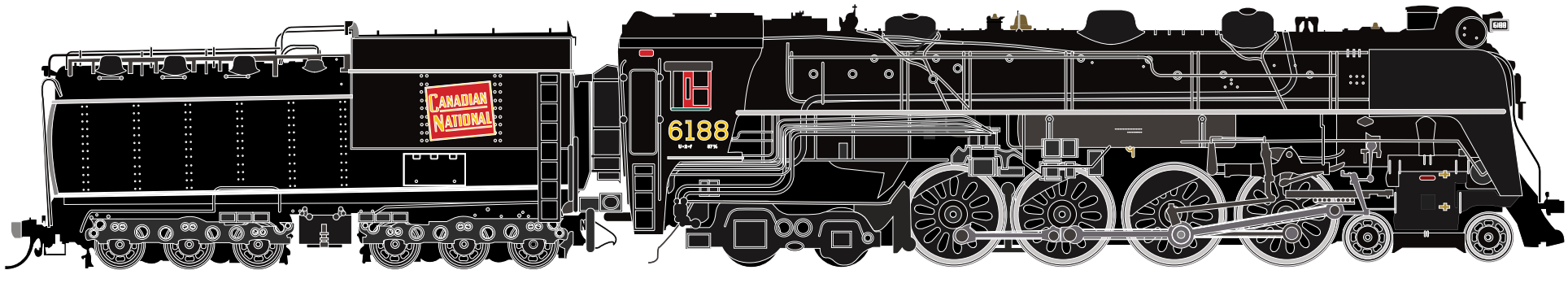
"During its formative years, CN had to integrate the hand-me-down power it acquired from the nationalized group of railways decimated by WWI. Initially assigned to Maritime trains, this type was one of the first and last new steam locomotives acquired by CN."



1920s

6100 series
U-2 4-8-4 Northern Type

"The first of its type in Canada, these large, lightweight, dual-service eight-drivered engines were ideal for spreading their weight on the lighter rail lines. They also operated for longer distances without change between intermediate terminals."

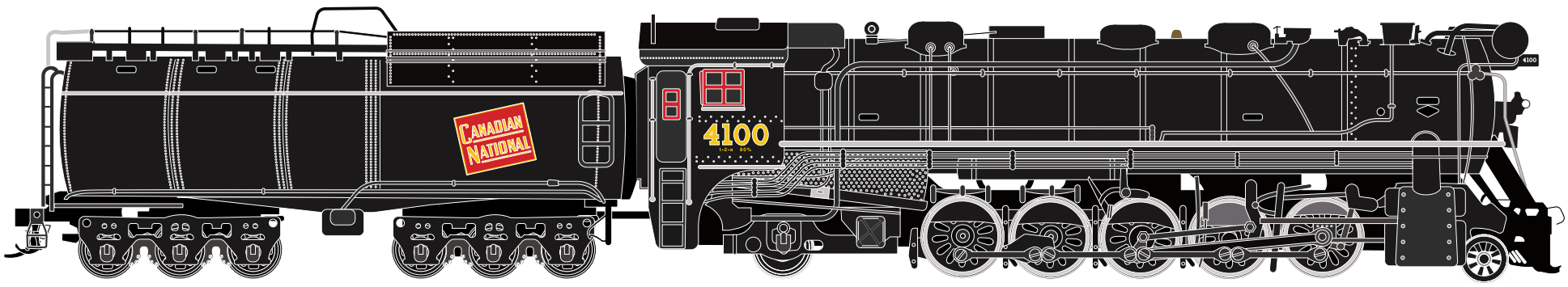


1920s

4100 series

T-2 2-10-2 Santa Fe Type

"Built in Kingston [Ontario] with 80,000 pounds [36,287 kg] of tractive effort for heavy transfer trains, 4100–4104 were the heaviest locomotives at the time—and the most powerful in the Commonwealth."

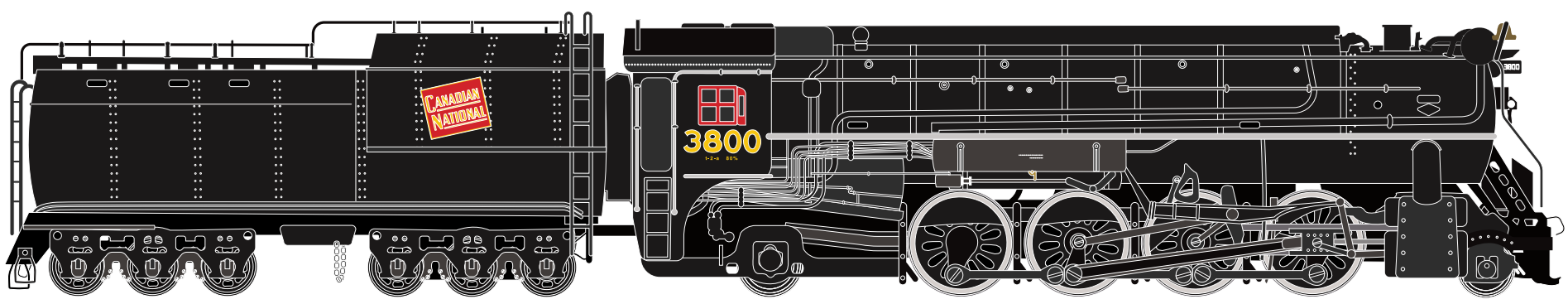


1930s

3800 series

S-4 2-8-2 Mikado Type

"In an era of experimentation, this specialty group of six was designed by CN and Canadian Locomotive Company to prevent sludge and boiler sediment from bad water in the Prairies clogging superheaters and cylinders. Westerners knew with a good 3800, we'll get there."

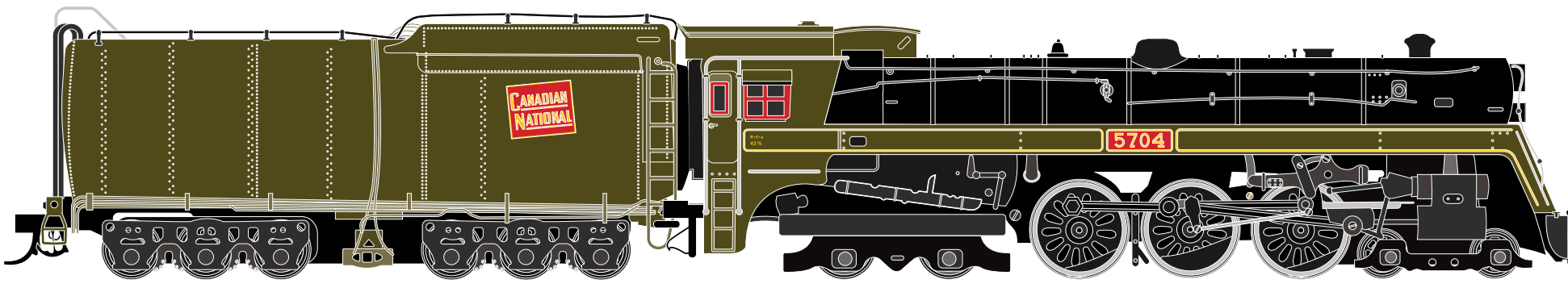


1930s

5700 series

K-5 4-6-4 Hudson Type

"Designed for speed, the Hudson could operate trains at 90–100 miles per hour [145–160 km/h]. Assigned to premier Montreal–Toronto passenger trains, then transferred to Western Ontario when heavier all-steel cars became common, they served until the end of steam."



090 / 100

STARS OF DIESEL

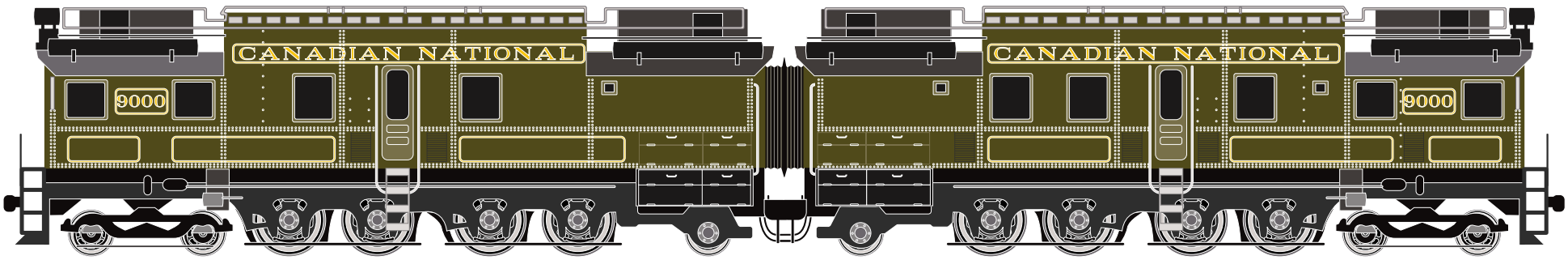
Motive Power Moments

Notable locomotives in CN history, selected by Kevin J. Holland, editor of the Canadian National Railways Historical Association's *CN Lines* and co-author of *Canadian National Railways Diesel Locomotives*.

1920s

9000 - 9001

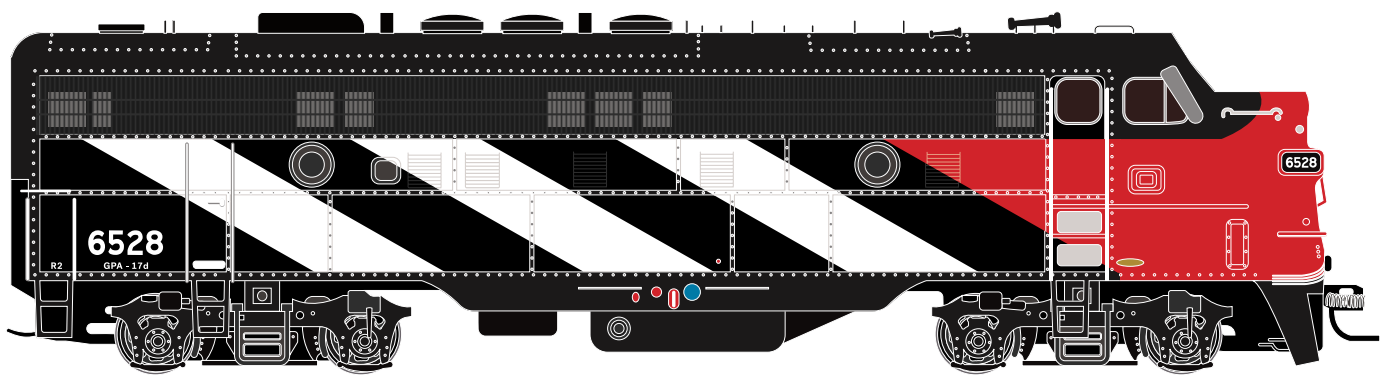
"CN was far ahead of other North American railroads in the development and implementation of internal combustion. Twin-unit locomotive 9000 was proof of concept for mainline passenger and freight use, and switching locomotive 7700 was a pioneer in Canadian yard service."



1950s

FP9

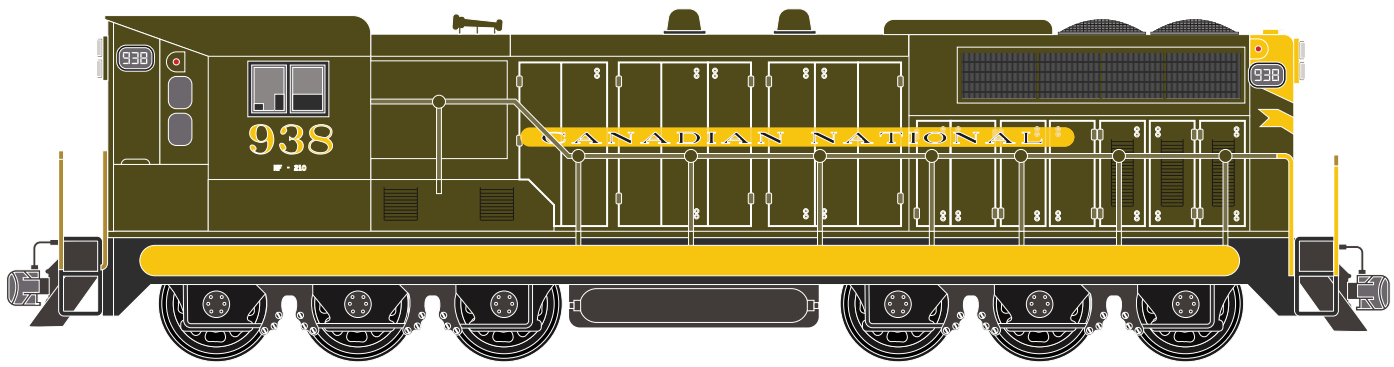
"CN reinvented its premiere passenger trains in the mid-1950s with the Super Continental, which was the face of the company for the travelling public. The FP9 and FPA-4 locomotives became icons in CN's advertising."



1950s

NF210

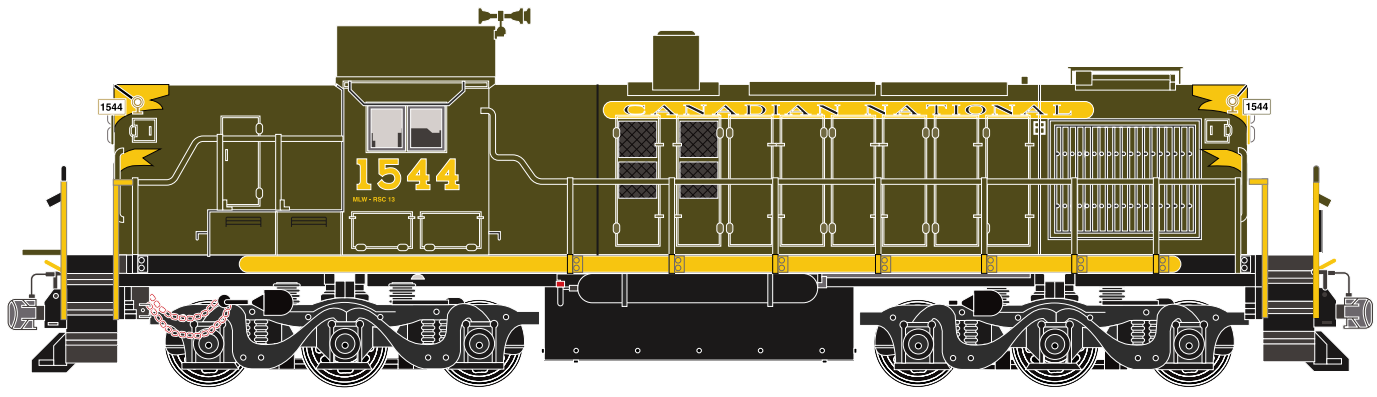
"A great example of CN innovation, the company approached builders for a specially adapted diesel unit to run on Newfoundland's narrow-gauge, lightweight track. GM came through with the NF110 and NF210, derived from contemporary mainline models, but the running gear was completely customized."



1950s

RSC-13

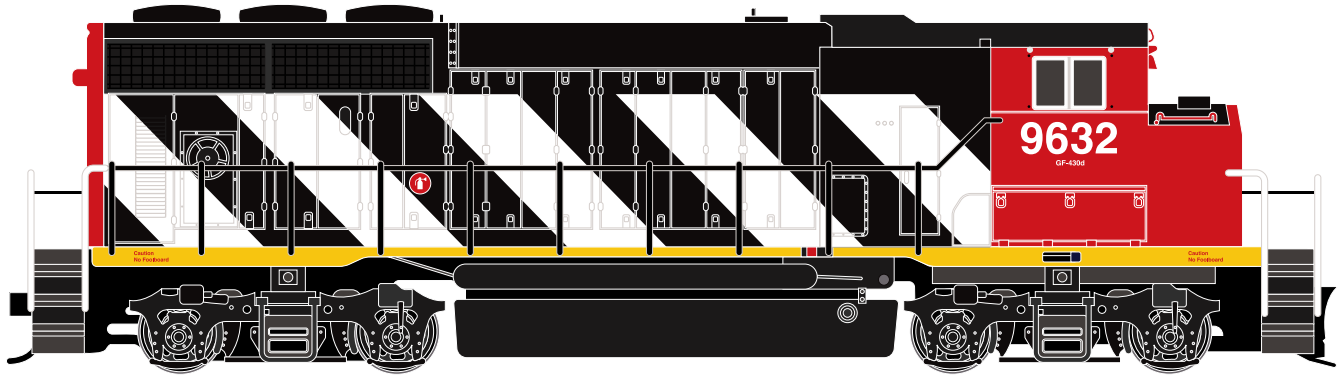
"The GMD-1 and RSC-13 were unique to the CN family, designed to operate on 'lightweight' track. The railway inherited a lot of light rail and bridges from its predecessors, not designed for heavy modern equipment, and customized diesel models were needed to serve these routes."



1950s

GP40-2L

"With the Comfort Cab, CN made major improvements to working conditions aboard its locomotives. The design was an industry changer, with many U.S. railroads adopting versions of the design. Today's railroads owe a debt to CN on this one."



6711

15820

6060

9445

Loco-motive

Profiling the CN engines that could—and did.

3150

Closeups

091 /100

6711
Electrifying History

Builder: Canadian General Electric Company, Peterborough (Ontario)

Model: GE Boxcabs 6710–6715

Release dates: 1914–1917

Type: Electric passenger locomotive

Motive power: Electric traction, 2,400 volts DC overhead catenary, 1,280 hp when built

1 / CN Boxcab 6711 at the 75th anniversary of the Mount Royal Tunnel at Val-Royal station, Quebec (1993).

1914–1995

Tunnel Vision

Steam engines were prohibited in Montreal's Mount Royal tunnel from downtown to Val-Royal (now Bois-Franc, Quebec), so the trains had to be electric. CN predecessor Canadian Northern purchased six 2,400-volt boxcabs similar to those built a few years earlier by GE for Butte Anaconda & Pacific in the U.S.

All the Buzz

The same locomotive that hauled the first train into Tunnel Terminal in 1918 pulled the last train into Montreal's Central Station in 1995, before the network was overhauled by the Metropolitan Transportation Agency (AMT, today EXO). The long-lived 6711, originally number 601, operated for more than 76 years before retiring to the Exporail museum in Saint-Constant (Quebec).

Plugging In

CN's electric interurban lines served millions. Montreal & Southern Counties Railway linked the city to the South Shore, while Quebec Railway Light & Power Company offered views of Montmorency Falls. The Niagara, St. Catharines & Toronto Railway had hourly service to Niagara Falls, while Toronto Suburban Railway operated to and from Guelph (Ontario), and the Oshawa Railway had trolley freight after streetcar service ended.

1 / View of self-propelled passenger car No. 15820 (1925).

092 /100

15820
Diesel's Early Ride

Builder: Bodies from Ottawa Car Manufacturing with National Steel Car trucks, assembled by CN in its Montreal Pointe-Saint-Charles shops.

Series: 15819–15825

Release date: 1925

Type: Self-propelled internal-combustion railcar

Motive power: Beardmore engine, oil-electric, 185 hp

1925–1959

Power Pioneer

In 1923, CN's head of Motive Power, C.E. "Ned" Brooks, visited Scotland where he found engine manufacturer William Beardmore and Co.'s relatively lightweight yet high-power engine, designed for airships but seemingly suited to railway applications. By 1926, CN was using them in six newly built oil-electric railcars, including the soon-to-be famous 15820.

The Future of Fuel

The 60-foot (18.3-m) self-propelled cars had an engine compartment, as well as baggage and passenger compartments. The cost savings compared to steam surpassed even Brooks' expectations, coming in at less than two cents per mile in fuel. North America's first diesel-electric mainline locomotives, CN's 9000 and 9001, were on the horizon.

Record Dash

15820's attention-grabbing cross-Canada run showed what CN's new diesel experiment could do. On November 1, 1925, it left Montreal for Vancouver, with food and bedding for the crew and extra fuel on board. It made the nearly 2,937-mile (4,725-km) trip in an astonishing running time of 67 hours. That, despite a collision with a moose, a broken brake-pipe and a close brush with a sectionman on a speeder.

1 / Side view of locomotive CN 6060 (date unknown).

093 /100

6060 Still Steaming

Builder: Montreal Locomotive Works

Series: 6060–6079

Nickname: Bullet-Nose Betty

Release date: 1944

Type: U-1-f 4-8-2
Mountain Type locomotive

Motive power: Steam

1944–1959
1970s–ongoing
(occasional excursion service)

Modern History

The last new steam engine built before CN's conversion to diesel was produced during WWII when efficiency was a top priority. Maintained by a largely female wartime workforce, the one-piece cast-metal frame was less labour-intensive to produce, and the modern inner workings more cost-effective to run.

Inside and Out

Featuring flared stacks and a conical nose on the smoke box, Bullet-Nose Bettys were sleek, speedy and painted olive green. Relatively easy to maintain, they boasted thermic siphons to reduce fuel consumption and an improved suspension system. The cylindrical Vanderbilt tender was lighter than the traditional flat-sided designs.

Career Highs

The 6060 retired from revenue service in 1959 and was displayed beside the Jasper (Alberta) station in 1962. It was restored by CN in the 1970s for tourist excursions in Ontario and Quebec. Later, it was gifted to the people of Alberta, where the Rocky Mountain Rail Society continues to ensure that it still operates under its own steam from time to time.

1 / View of CN 9445 in London, Ontario (1985).

094 /100

9445
Introducing Modern Comforts

Builder:
General Motors Diesel, Canada

Model: GP40-2L, 9400-9632

Nickname: Comfort Cab, Safety Cab

Release date: 1974–1975

Type: Road freight

Motive power: Diesel-electric, 16 cylinder, 3,000 hp

See technical plan on pages 288–289.

1974–ONGOING

Raising the Bar

CN spearheaded a revolution in design that became widely known as the Comfort Cab, or the Safety Cab, because it made strides on both counts. Although it wasn't the first Comfort Cab model in CN service, the Canadian division of General Motors Diesel produced a total of 233 of the GP40-2L of a versatile four-axle workhorse, with an L designating the lightweight frame (it's often tagged with a W, in reference to the wide nose).

On the Safe Side

Broad-nose configuration meant more space for crew members and a safer workplace. With an outside access door in the nose, and better reinforcement from ½ inch-thick (1.3-cm) steel plates and two collision posts, it had more armour to protect it from impact with outside objects. The four-panel windshield also improved visibility and rollover protection.

Input from Crews

The interior design took employee feedback into account. Seating was more comfortable, with higher backs and armrests. Electric lighting, improvements to temperature control with insulation and central heating and more conveniently located washrooms, plus amenities like a fridge, hot plate and coffee pot, covered crews' needs for longer runs.

095 /100

3150 Moving Forward

Builder:
General Electric Transportation

Model: GE Evolution Series Tier 4, ET44AC, 3133–3162

Nickname: GEVO

Release date: 2018

Type: Freight locomotive

Motive power: Diesel-electric, AC traction, 4,400 hp

1 / View of CN 3150 GE Tier 4 locomotive (2018).

2018–ONGOING

Top Tier

The ET44AC is the third model CN has acquired since GE introduced the Evolution Series in 2005, each with more advanced digital capabilities, fuel efficiency and environmental friendliness. CN's order for 200 Tier 3 and Tier 4 locomotives was the largest among Class 1 railways in recent history, with units being delivered through 2020.

Cleaner and Greener

Designed to meet U.S. Environmental Protection Agency (EPA) Tier 4 emissions standards, these heavy haulers release 90% less particulate matter and NOx (oxides of nitrogen) into the air than models produced 15 years earlier. An innovative system for exhaust gas recirculation results in a slight hump in the design of the midsection.

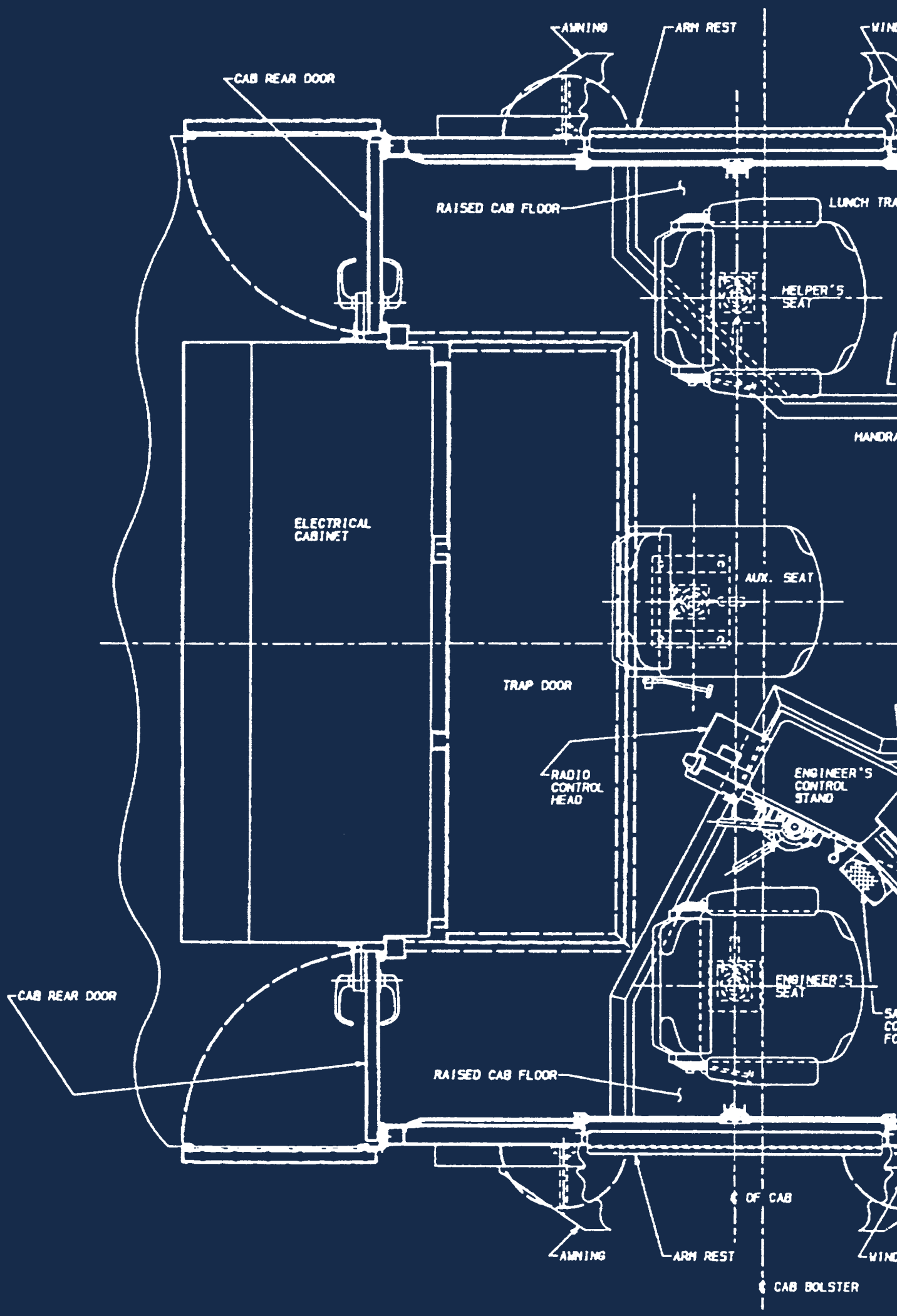
Performance Power

Alternating current (AC), rather than direct current (DC), provides pulling power with more reliability and less maintenance. Features like Trip Optimizer™, a form of cruise control, work with the onboard computer to calculate the optimal way of running, such as slowing down more gradually to save on fuel.

094 / 100
LOCOMOTIVE CLOSEUPS:
CN 9445

In the Cab:

The Comfort Cab/Safety Cab was designed by CN under the presidency of Norman MacMillan, leading an era of motive-power developments that would continue with his successor, Robert Bandeen. The design and layout was conducted by CN's chief mechanical and electrical engineer, Robert W. Radford, and his staff. A full-size mock-up was constructed at the Pointe-Saint-Charles shop, with comments and suggestions solicited from the relevant unions. Two locomotive builders—Montreal Locomotive Works and General Motors—were contracted to produce all future new locomotives with cabs to CN specifications, from 1973 onwards.



D DEFLECTOR
FLAG BRACKET
END STEP
RADIO TRANSMITTER -RECIEVER
SAND BOX
FOOT REST
EMERGENCY BRAKE VALVE
RADIO EQUIP. ROOM DOOR
COLLISION POST
CAB FRONT DOOR
REFRIGERATOR & WATER COOLER
VALET
SPEED INDICATOR
ANTI-CLIMBER
STEP WELL TO SHORT HOOD
℄ LOCO
FIRE EXTINGUISHER
INNER CAB DOOR
HEADLIGHT
TOILET ROOM DOOR
EQUIPMENT BOX
HOT PLATE
COLLISION POST
TOILET
SAND BOX
END STEP
LUNCH TRAY
HANDRAIL
D DEFLECTOR

094 / 100
LOCOMOTIVE CLOSEUPS:
CN 9445

2 / Plan view of the Comfort Cab, General Motors CN GP38-2 unit, which debuted in 1973.

Evolution of Cars

GRAIN CARRIERS

INTERMODAL

CENTREBEAMS

REEFERS

Following CN freight through rolling stock history.

096 /100

GRAIN CARRIERS
Growing for bumper crops

1951

“Clean Lading Only”

To adapt the new 40-foot (12-m) steel boxcar (see technical plan on pages 292–293), a temporary grain door made of planks or cardboard was inserted on the interior for loading and unloading of grain (which would later be lifted and tilted for emptying). CN often marked the sides of these cars with “Clean Lading Only” or the emblem of a sheaf of wheat.

1

1972

Taking Shape

With a capacity of 4,100 to 4,550 cubic feet (116–127m³) capacity, the shape of cylindrical covered hopper cars held more grain and allowed for faster loading and bottom unloading. The Canadian government began purchasing 2,000 of them when reforms to railway freight rates and the grain-carrying network were pressing. By 1980, there were over 8,600 such cars marked CNWX, for the Canadian Wheat Board.

2

2018

Going Jumbo

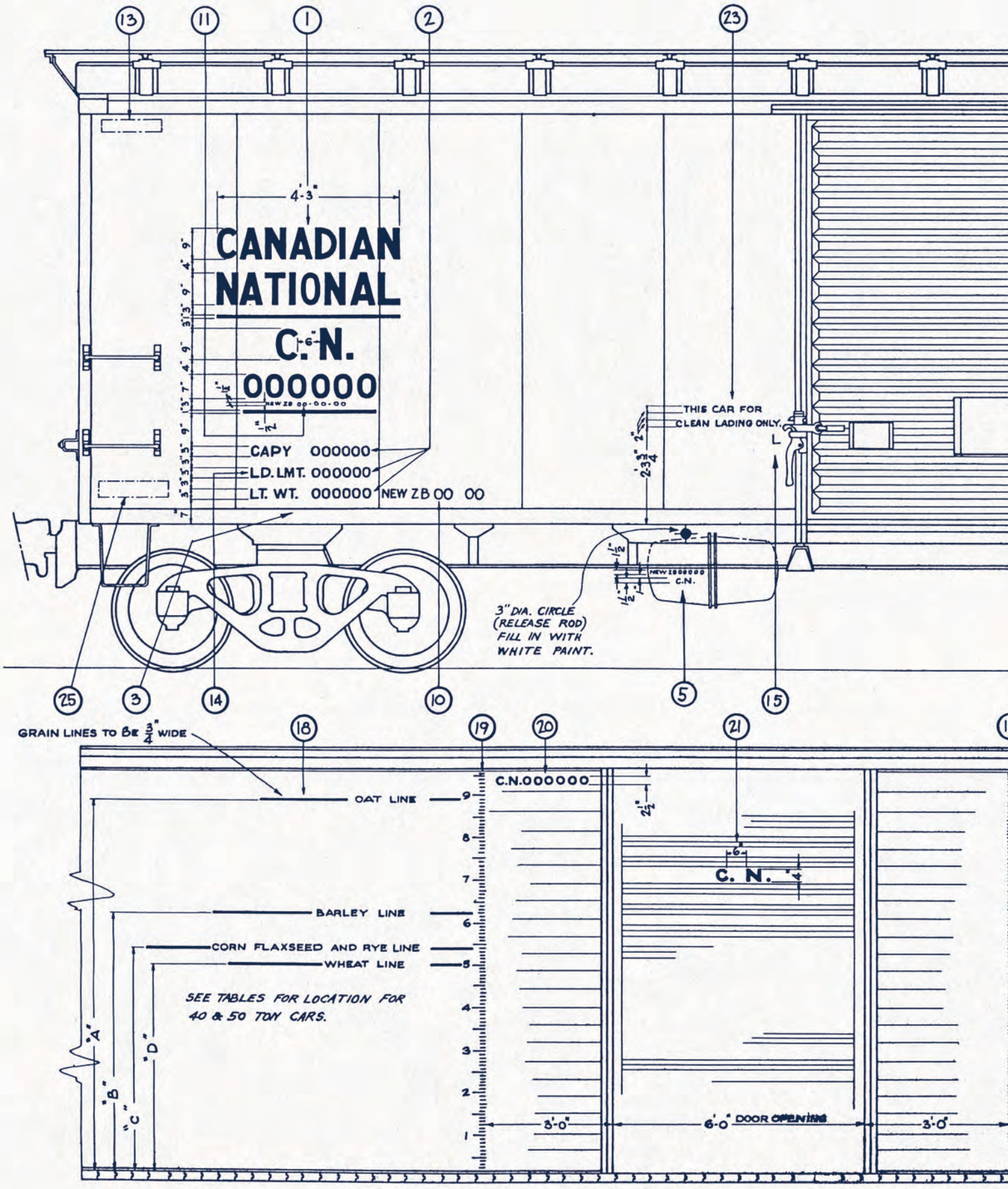
The aging federal fleet is being phased out and replaced with new-generation cars that are railway-owned, leased or belong to private customers. CN invested in 55-foot-plus (17-m) jumbo hopper cars that have a bigger-than-ever capacity of 5,431 cubic feet (154 m³) for bigger-than-ever harvests.

3

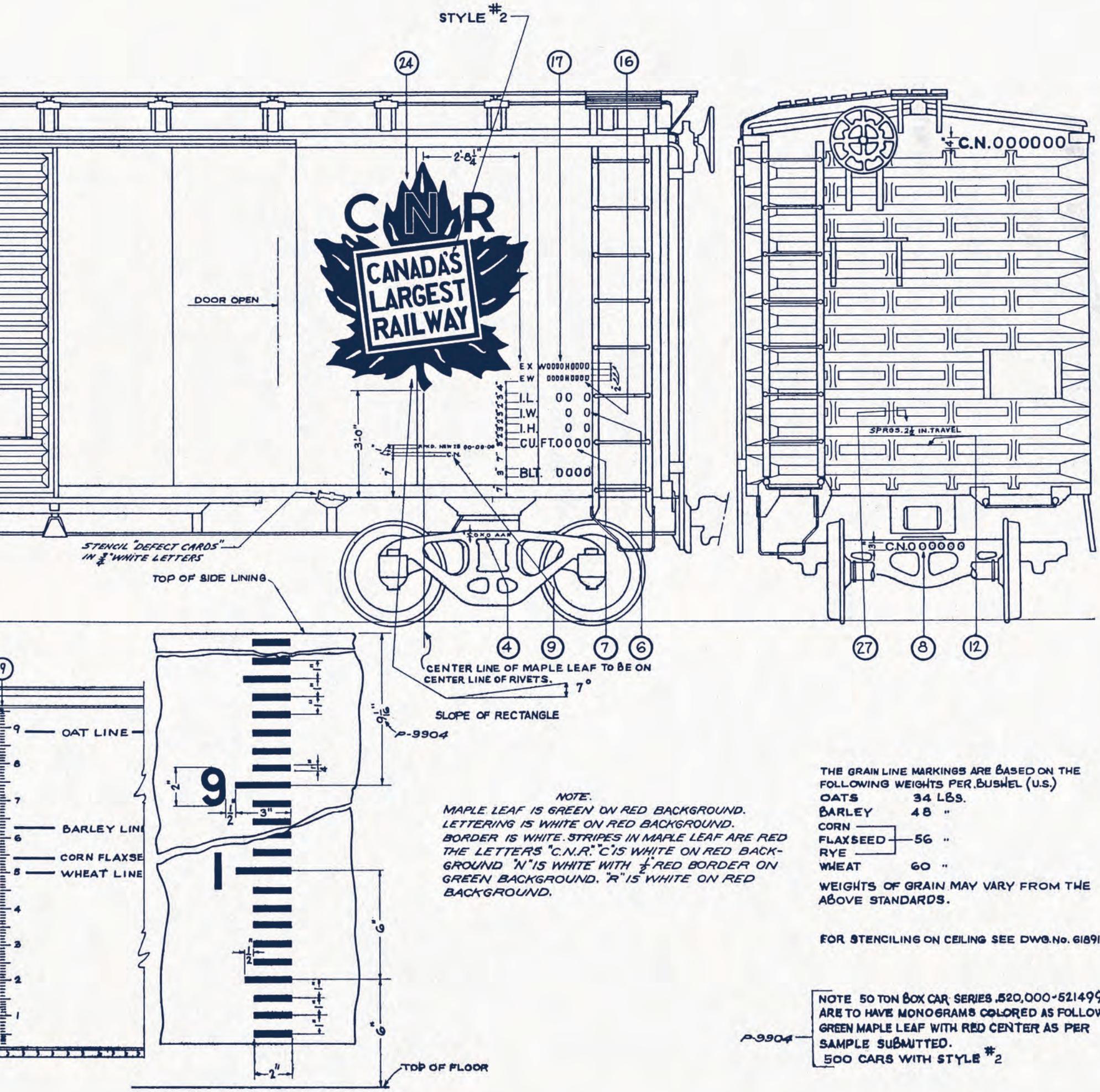
1 / Boxcar by National Steel Car, Hamilton, Ontario (date unknown).
2 / Aluminum Government of Canada hopper for the Canadian Wheat Board, CNWX LO 107012, Jasper, Alberta (1976).
3 / CN LO-type hopper by National Steel Car, Burlington, Ontario (date unknown).

In the Box:

For much of railway history, boxcars were the building blocks of freight transportation. In the late 1930s, the Association of American Railroads' 40-foot (12-m) steel box design became the standard for carrying cargo. Wooden boxcars would become fewer and farther between, as larger steel models took to the rails, growing to today's 50- to 60-foot (15- to 18-m) high-capacity models, carrying double the weight of goods. CN painted its fleet with iron oxide-based paint that was both inexpensive and hid the dirt. Boxcars are still used and shipments transloaded for local delivery—as they were before intermodal was even a word.



1 / Stencilling diagram of a boxcar, National Steel Car Corporation (1944).



NOTE.
MAPLE LEAF IS GREEN ON RED BACKGROUND. LETTERING IS WHITE ON RED BACKGROUND. BORDER IS WHITE. STRIPES IN MAPLE LEAF ARE RED THE LETTERS "C.N.R." "C" IS WHITE ON RED BACKGROUND "N" IS WHITE WITH ½" RED BORDER ON GREEN BACKGROUND. "R" IS WHITE ON RED BACKGROUND.

THE GRAIN LINE MARKINGS ARE BASED ON THE FOLLOWING WEIGHTS PER BUSHEL (U.S.)

OATS	34 LBS.
BARLEY	48 "
CORN, FLAXSEED, RYE	56 "
WHEAT	60 "

WEIGHTS OF GRAIN MAY VARY FROM THE ABOVE STANDARDS.

FOR STENCILING ON CEILING SEE DWG. No. 61891

P-9904

NOTE 50 TON BOX CAR SERIES 520,000-521499 ARE TO HAVE MONOGRAMS COLORED AS FOLLOWS GREEN MAPLE LEAF WITH RED CENTER AS PER SAMPLE SUBMITTED.
500 CARS WITH STYLE #2

097 / 100

INTERMODAL
From Here to There

2 / Piggyback units loaded in the circus method, Montreal (1958).
3 / CN FC 635066 loaded with four Terra Transport containers, Gordon Yard, Moncton, New Brunswick (1982).
4 / Double-stacked containers on five-platform intermodal cars loading by overhead crane at Monterm, Montreal (1990).

1952

Piggybacking

Putting 20-foot (6-m) transport trailers onto flatcars meant that truckload cargo could be shipped by highway and then transferred to rail, or go directly from rail to barge, without unloading and reloading between different modes of transport. By 1959, CN had Canada-wide piggybacking.

2

1961

Container on Flat Car

In the early 1960s, CN experimented with highway-railway containers, which stood on their own legs and could be disengaged from the truck to free it for other jobs. The shift from TOFC (trailer on flat car) to COFC (container on flat car) brought major changes to shipping modes, from terminal facilities to freight rates, as most cargo began to move in boxes.

3

1989

Seeing Double

Double stack intermodal railcars allow for twice as much cargo on the same train—though trains got higher as a result, requiring increased tunnel clearances. CN owns and leases several types of well cars for containers, including multi-level cars used for shipping automobiles.

4

098 /100

CENTREBEAMS Loaded for Lumber

1 / Bulkhead flat CN FBS 604902 fitted with centre posts designed for wood product loads, Hamilton, Ontario (2007).
2 / Bulkhead flat CN FBC 623057 with opera window centrebeam structure, Kerwood, Ontario (2014).
3 / Bulkhead flat CN FBC 624944 with overhead centrebeam, Brantford, Ontario (2008).

1963

Restructuring

CN engineers teamed up with lumber companies on Canada's West Coast to look at reducing the structural weight of cars. A bulkhead flatcar was reinforced with a central beam, supported by posts down the middle, which also provided a means for securing loads. The patent was acquired by Thrall Car Company in 1966.

1

1980s

Opera Window

The distinctive cut-out "opera window" design was a common sight, before giving way to an open-frame truss arrangement with straps and cables to tie down bundled forestry products, including boards and plywood. The key to safety was to load and unload evenly, keeping the weight of the payload on either side balanced to avoid tipping.

2

2018

Safer and Sounder

Designed and patented by CN and built by National Steel Car in Hamilton (Ontario) new 73-foot (22-m) centrebeams use a novel system for the draft gear, which connects the couplings, reducing unwanted train separations by more than 60%. The cars carry a huge load of over 220,000 pounds (100,000 kg) of packaged lumber.

3

099 / 100

REEFERS
Changing how we eat

1 / Wooden double-sheathed reefer fitted with divided basket ice and brine bunkers and roof hatches, London, Ontario (1973).
2 / Insulated boxcar in SuperTherm livery, London, Ontario (1982).
3 / Double-stacked 53-foot refrigerated container in Cargocool livery, on articulated DTTX well car, Komoka, Ontario (2014).

1920s

On Ice

Food safety has come a long way. Before refrigerated cars—reefers, in railway slang—the availability of meat was limited by how far livestock could travel. Until the 1960s, insulated wood or steel refrigerator cars were cooled with blocks of ice in bunkers at either end or under the roof, requiring frequent stops as it melted.

1

1976

SuperTherm

Trailers and boxcars insulated with polyurethane up to 1½ inches thick (1.3 cm) reduced the need for refrigeration, so perishables had to be loaded at specified temperatures. After extensive testing with potatoes, high on the list of items CN announced its equipment could safely ship: beer (in bottles or cans), followed by butter and cheese.

2

2013

CargoCool

Each container has the power of nearly 1,000 fridges, but one special engine-generator set can run up to 17 of them. There's digital monitoring all the way: geo-tracking, fuel consumption and remote temperature control, whether it's keeping apples between -1 to +4 °C (30.2 to 39.2 °F) or French fries frozen.

3

4 / Ice is used for air conditioning in passenger cars as well as for cooling freight refrigerator cars, like this one at the Montreal Fruit Terminal (1939).

"We used to store ice and haul it up with our little trucks. We had big ice boxes underneath the cars and a generator that pushed air through the ice and back into the car to cool the air. That was air conditioning at that time. Back before refrigerators, those cars were run the same way as the ice box in my kitchen."

— Gerry Bourgeois, former foreman,
with CN starting in the 1920s

100 / 100

GOODBYE, CABOOSE

Last but Not Least

By the late 1980s, it was time for CN to say hello to a new era in safety and visibility. The adoption of extensive rail traffic control technology was well under way. A series of public hearings, and intensive negotiations between unions and management, led up to the replacement of the old red caboose with an end of train unit or flashing rear-end device (FRED). The metal box ranges from a “dumb” unit, which turns on automatically at night and flashes to alert approaching locomotives, to a “smart” one that uses radio telemetry to send data, like brake line pressure levels, to a front-of-train device (aka “Wilma”) so that the engineer can access the information. The company had inherited hundreds of wooden cabooses from its predecessor railways between 1919 and 1923. New cabooses built between 1925 and 1957, many of them reconstructed from wood boxcars, were gradually replaced with steel models — the last of which were in revenue service as late as 1993.

“As the conductor, you had your own caboose. A home away from home. You had your own bedclothes in the caboose; you kept it clean. It was a personal thing. Some of the boys had linoleum on the floor and curtains on the windows. On occasion, the brakeman or the conductor would be a good cook, and they’d cook up a roast. The old cabooses could be pretty rough, no springs, nothing. You got to know where the run-in and the run-outs were, going up and down the grades, so you’d simply hang on and wait for the jolt. The old coal stoves in the cabooses were all bolted to the floor, but once, the jar was so bad it just lifted it right up out of the floor. The new cabooses were just dandy. They had a sliding frame that took the shocks; it was real pleasure to work on them.”

— J. D. Cryon, former conductor, with CN 1940–1980

1 / From the rear platform of the caboose, brakeman E.N. Montgomery monitors his surroundings and other trains, on freight service between Montreal and Brockville, Ontario (1951).

2 / A red caboose, CN 79662, trails a westbound freight train through Saint-Pierre, Quebec (1978).

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066/100

› With files from Doug Fisher. October 2018.

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067/100

› Interview with Denis Hoziel. February 2019.

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› Interview with Michael Rosen. October 2018.

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087/100

› Interview with Melissa Santoro Greyeyes-Brant. December 2018.

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088/100

› Interview with René Roy. May 2019.

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089/100

› Interview with Don McQueen. November 2018.

• cam&leon Studio (Lucile Guarnaccia)

090/100

› Interview with Kevin J. Holland. November 2018.

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091/100

› With files from William Blevins, Kevin J. Holland, Don McQueen. December 2018–March 2019.

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1 / Don McQueen 15885 **2** / Ken Goslett Collection

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1 / National Steel Car Limited (CNR Historical Association collection)
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Additional resources for the train enthusiast

Alberta Railway Museum
albertarailwaymuseum.com

Canadian National Railways Historical Association
cnrha.ca

Canadian Railway Club
canadianrailwayclub.ca

Center for Railroad Photography & Art
railphoto-art.org

Central Vermont Railway Historical Society
cvrhs.com

Exporail, The Canadian Railway Museum (Canadian Railroad Historical Association)
exporail.org

Illinois Railway Museum
irm.org

Ingenium, Canada Science and Technology Museum
ingeniumcanada.org

National Railroad Museum
nationalrrmuseum.org

National Railway Historical Society
nrhs.com

Operation Lifesaver
operationlifesaver.ca
oli.org

Railway Association of Canada
railcan.ca

Railway & Locomotive Historical Society, Inc.
rlhs.org

West Coast Railway Association
www.wcra.org

For more information on CN, visit cn.ca.

Written by
Sarah Musgrave

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Creative Director: Marie-Elaine Benoit
CN100 Creative Director: Christian Ayotte
Art Direction and Graphic Design: Audrey-Claude Roy
Group Account Director: Geneviève Boulanger
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The CN railway wouldn’t exist without the women and men who built it, powered it and rolled with it over the course of the last century. This book brings to life personal stories and photos that crisscross the decades, and shares new and diverse perspectives of North America’s railroad as a driving force in shaping the economy and the social landscape—both on and off the track.