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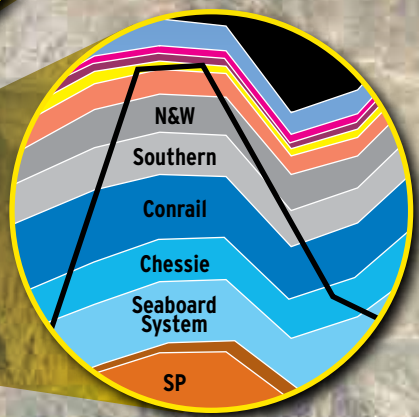

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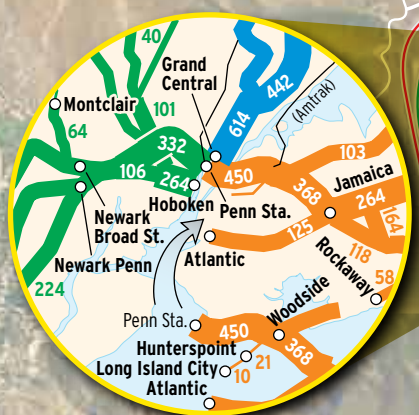

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RAILROAD MAPS

ON THE COVER: A close-up of California's Cajon Pass (main illustration); details (clockwise) CSX's predecessors, U.S. ton-miles, Pittsburgh, Northeast commuter trains. Back cover: A coal train nears Bill, Wyo. Main cover illustration, Bill Metzger; back cover photo, TRAINS: Matt Van Hattem

RAILROAD MAPS

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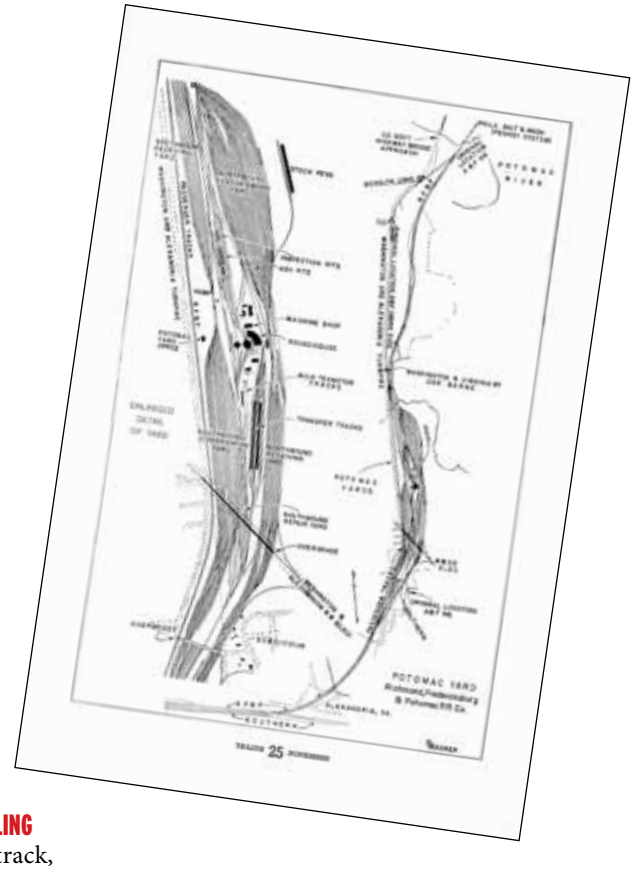
Matt Van Hattem

A map tells a story



This track diagram of Potomac Yard in Alexandria, Va., appeared in the first issue of TRAINS in November 1940.

HOW MANY TIMES WHEN YOU'RE TRAVELING have you come across a railroad track, and suddenly the questions start forming in your mind. *Whose railroad is this? Where does it go? Whose railroad was it? What do the trains carry?*

RAILROAD MAPS attempts to answer those questions, using detailed illustrations, charts, and tables to tell the story of North America's railroads and its most important routes. This is not a state-by-state railroad atlas. Rather, it's a collection of graphics that explore railroading's history, operations, geography, traffic flows, and challenges.

Most of these illustrations first appeared in TRAINS magazine, although all of them have been modernized for this publication. Many have also been updated with the latest information, including the maps showing daily passenger train volumes and all of the maps in the first chapter tracing the predecessors and mergers that formed today's seven Class I railroads. In addition, we've prepared four brand-new illustrations specifically for RAILROAD MAPS, comparing coal tonnages out of Wyoming in the 2000s, tracing what happened to the Burlington Route, looking at America's signaled rail lines, and detailing the history of lines in the Seattle-Tacoma region.

TRAINS has been well-known for publishing detailed railroad maps since our first one (shown above) appeared in November 1940, our first issue.

However, that reputation took a great leap forward in 2001, when a geography professor and Federal Railroad Administration consultant named Curtis W. Richards, came to our office with an idea. Arriving with an armload of railroad maps, Curt spent a morning with Mark W. Hemphill, the editor of TRAINS from 2000 to 2004, going through the collection.

Together, they agreed on a new feature for the magazine: a stand-alone illustration that would combine elements of geography, history, and operations to tell a story about railroading. Curt even proposed a name: "Map of the Month." The name stuck, and the feature premiered in the October 2001 issue. (We've included that first map on pages 66-67: a look at the changes in freight tonnage on the main lines serving Chicago, America's railroad capital.)

Curtis W. Richards

Mark W. Hemphill

Bill Metzger

Rick Johnson

Since that first appearance, the "Map of the Month" has become one of the most popular features in Trains, even as the people behind the map have changed. As a Trains correspondent, Curt continued coming up with ideas and research for the maps until he passed away in 2012. He was aided since 2005 by me, as the primary editor of "Map of the Month," and by Bill Metzger, a contributing illustrator who helped us raise the bar even higher. Bill's research skills, artistic eye, and knowledge of the North American rail network (he spent years escorting high-wide loads by rail around the country) have added layers of depth to the kinds of information we can present as well as the look of the maps.

At Kalmbach Publishing Co., Rick Johnson, Trains magazine's lead illustrator, is always on the lookout for new and better ways to apply techniques, such as topographic relief, to the maps in the magazine. Rick, a talented mapmaker who grew up in a railroad family, prepares most of the other graphics and illustrations that appear in Trains.

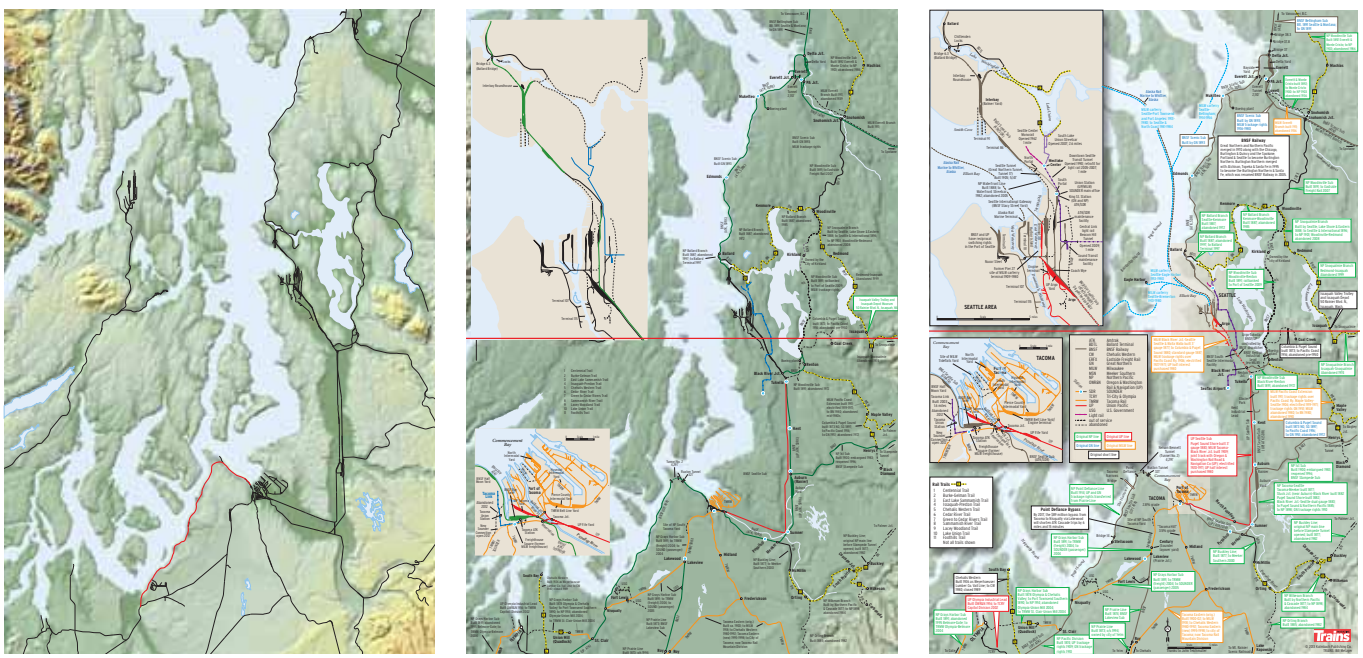
Every map begins with two questions. First: Can you find the information? If you don't have the data, you don't have a map. (George Gloff, a longtime art director at Trains, used to say, "A good map is 85 percent research and 15 percent execution.") Once you've determined that the information is available, you can begin to answer the second question: What is the map going to look like? The right look is as critical as the right data, and the illustrators and editors at Trains work together to determine the coverage and scope of each graphic. It's a process that can take days to sort out, as drafts and ideas are sent back and forth.

To draw the maps you see in Trains, the drafting tables and technical pens of the past have given way to computerized illustration software. One of the unique attributes of these programs is that every element of a map can be drawn as a different layer, which you can turn on or off. If you wanted to make all of the town names on a map disappear, you could do so with just a click of the mouse, while everything else would remain visible. (And since the town names aren't actually deleted, just deactivated, you could bring them back in an instant, if needed.)

Railroaders have long known the value of maps. (Two recent railroad-themed dramas even used maps as key plot points: the motion picture "Atlas Shrugged: Part II" and the cable TV series "Hell on Wheels.") Maps are critical to answering the fundamental question "Where should a railroad go?" In the 19th century that question determined where tracks would first be laid. In more recent times, the question has helped strategists decide which lines to abandon or sell off, or which railroads to merge with.

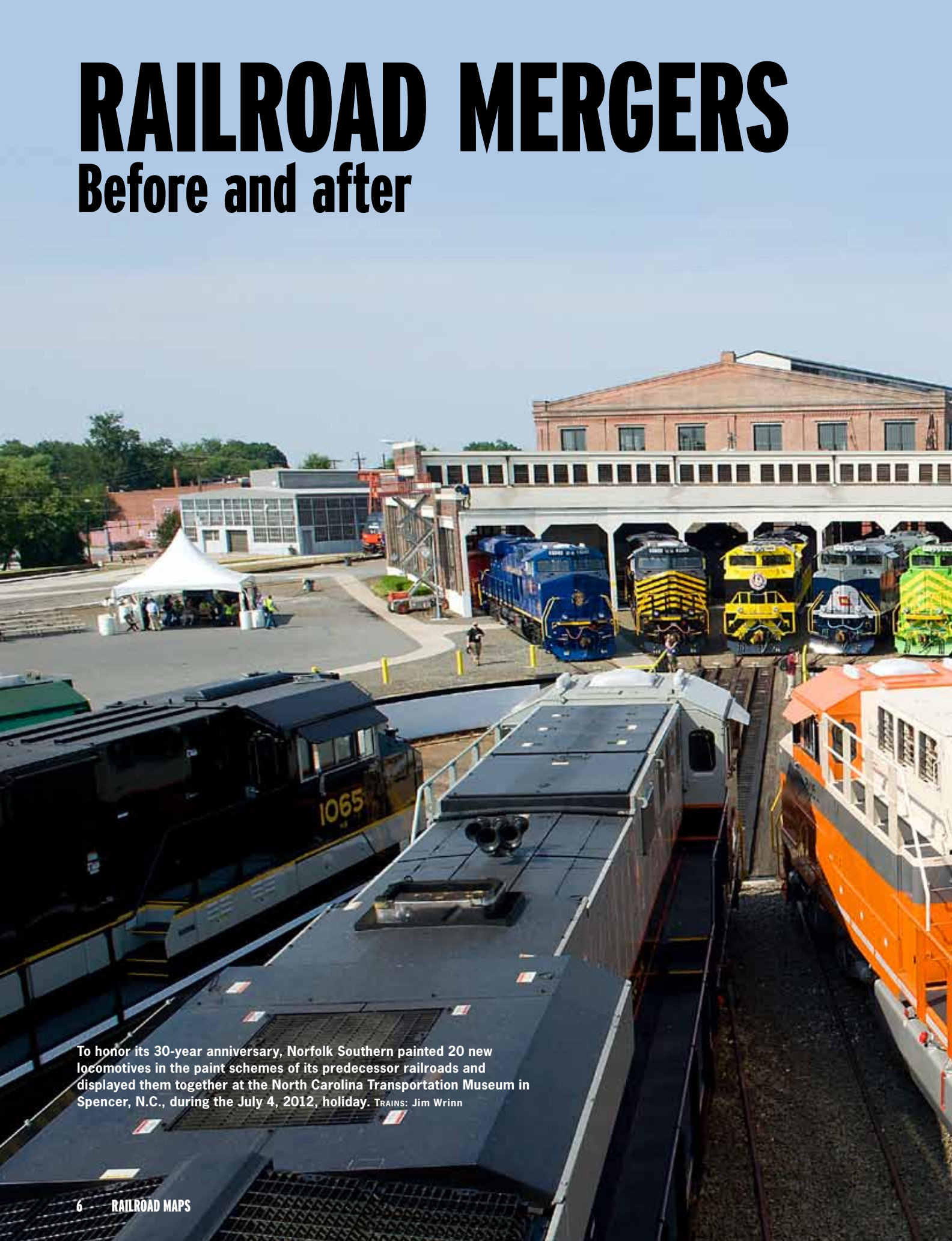
All of the Class I railroads have provided assistance at one stage or another in the preparation of many of the maps you see here, as have representatives from Amtrak, commuter railroads, state transportation departments, the Federal Railroad Administration, and the Association of American Railroads. Each has played a role in bringing these maps to life, and we're grateful for their cooperation.

As traffic levels and trade patterns change, the question of where a railroad ought to go will remain as vital as ever. That will give us at Trains the ability to continue Curt Richards' legacy of a monthly map well into the future, as we continue to illustrate the triumphant story of North American railroads.



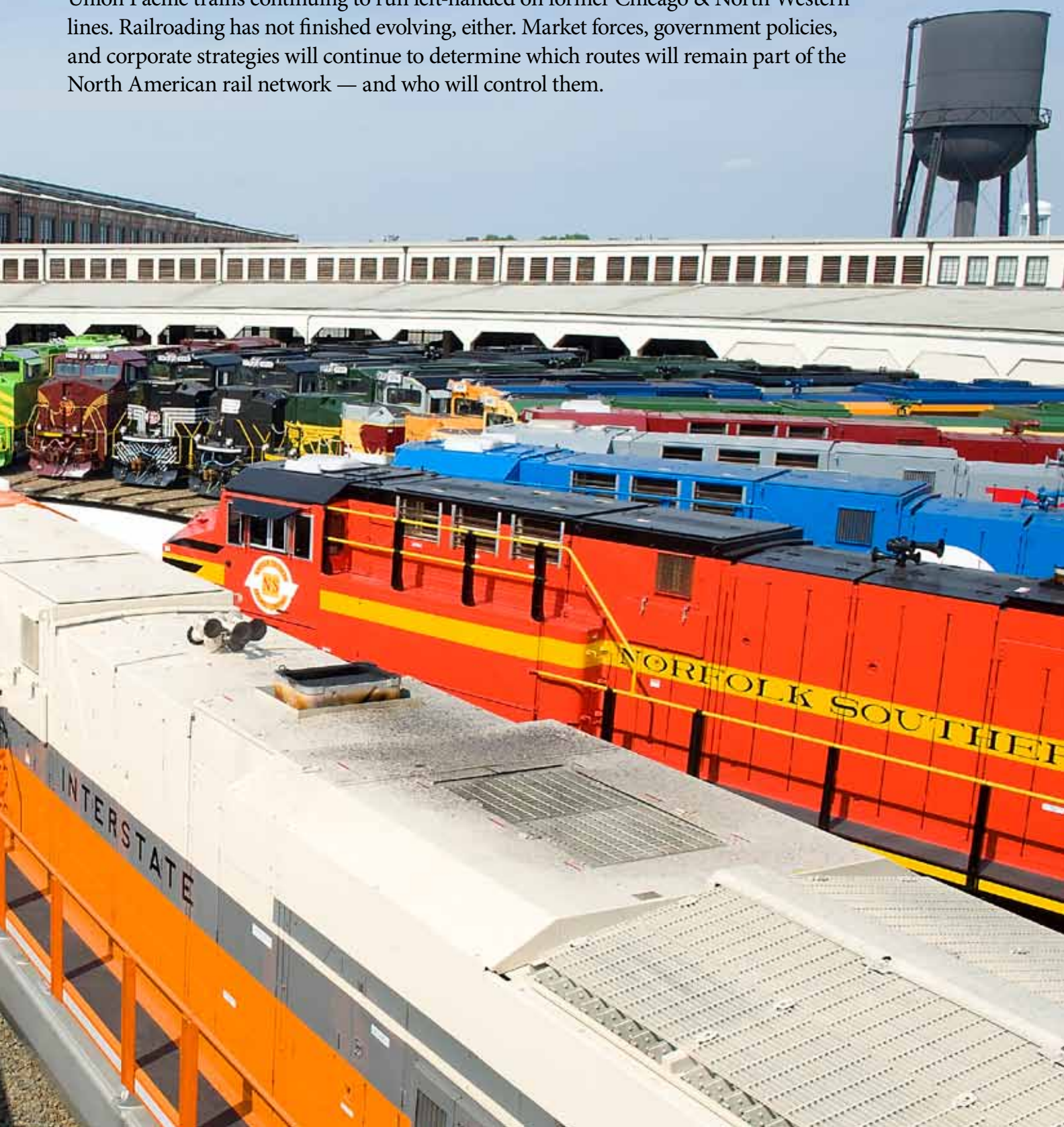
How do you draw a map? Here are drafts prepared by Bill Metzger of the Seattle-Tacoma map that appears on pages 70-71. We began with topographic landforms (left) and decided how much area to cover, leaving room for the insets. A second stage (center) shows all of the insets and rail lines drawn in, with color-coding in progress. Then we added the history boxes (right) and all of the place names.

RAILROAD MERGERS
Before and after



To honor its 30-year anniversary, Norfolk Southern painted 20 new locomotives in the paint schemes of its predecessor railroads and displayed them together at the North Carolina Transportation Museum in Spencer, N.C., during the July 4, 2012, holiday. TRAINS: Jim Wrinn

THE SEVEN CLASS I RAILROADS that move most of North America's freight today are the result of cumulative decisions made in the past 180 years. Each railroad is like a Jenga tower, built from historic names and routes, all combined in successive waves of mergers. Yet even as the big railroads have gotten bigger, the DNA from those long-gone operations still manifests itself, in ways both obvious and subtle. Venture trackside and you'll find vintage Louisville & Nashville mileposts still lining the CSX routes out of Cincinnati, or Union Pacific trains continuing to run left-handed on former Chicago & North Western lines. Railroading has not finished evolving, either. Market forces, government policies, and corporate strategies will continue to determine which routes will remain part of the North American rail network — and who will control them.



BNSF Railway's predecessors

Lines on a map connect — or do they? BNSF's system is big and sprawling, but in many ways it's still three or four railroads

WHAT HAVE THE MERGERS that built today's BNSF Railway accomplished? It's important to ask this question, because it predicts where BNSF might be headed in the future. In basic terms, mergers have four outcomes. Strategic mergers create seamless service in new or existing traffic lanes and open new markets. Tactical mergers reduce operating costs by eliminating parallel or poorly located lines. Overhead mergers reduce duplicate shops and headquarters, and gain purchasing power. And accretion mergers recognize it's probably better to take the partners — and work out the operating details later — than leave them to wander into the camp of the enemy ... in this case, Union Pacific.

While the Burlington Northern merger of 1970 had a tactical outcome, the additions of St. Louis-San Francisco in 1980 and the Santa Fe in 1995 so far are accretion mergers. In contrast, the mergers that created today's Union Pacific had broad strategic outcomes, creating new traffic lanes: Memphis-Los Angeles on the Texas & Pacific and Southern Pacific; Chicago-Los Angeles on the Golden State and Sunset routes. This last lane is made possible, curiously, by trackage rights on the Santa Fe between Chicago and Kansas City granted to SP as a condition of the BNSF merger. UP's merger with Chicago & North Western gave it access to the prized Powder River Basin coal mines of Wyoming.

Few new lanes were created by adding Santa Fe to Burlington-Frisco in 1995, with the exception of corn from Minnesota, Iowa, and South Dakota and oil from North Dakota moving into Santa Fe territory. The BN and Santa Fe intermodal lanes are distinctly separate and operate much as they did 30 years ago. Rather than augmenting each other like UP, Missouri Pacific, and SP, the BN and Santa Fe overlap along a West Texas-Chicago axis like two halves of a badly assembled plastic model, with the Frisco dangling from the rim like a piece from another kit.

BNSF's 32,514-mile system (as of 2012) includes 9,266 miles of trackage rights, an amount so vast it enables BNSF to eclipse Union Pacific's 31,868-mile franchise, though UP is bigger when all trackage rights are removed. The question for the future is how BNSF managers will find traffic and profits in the system created from its predecessors. — *Mark W. Hemphill*

Legend

ATSF	Atchison, Topeka & Santa Fe
CB&Q	Chicago, Burlington & Quincy
MILW	Chicago, Milwaukee, St. Paul & Pacific
C&S	Colorado & Southern
DRGW	Denver & Rio Grande Western
FW&D	Fort Worth & Denver
GN	Great Northern
NP	Northern Pacific
SP	Southern Pacific
SP&S	Spokane, Portland & Seattle
SLSF	St. Louis-San Francisco (Frisco)
UP	Union Pacific
WP	Western Pacific
	Other lines - as identified

Dashed gray lines indicate rights on UP lines (with initials of predecessor) BNSF was awarded in 1996 UP-SP merger.

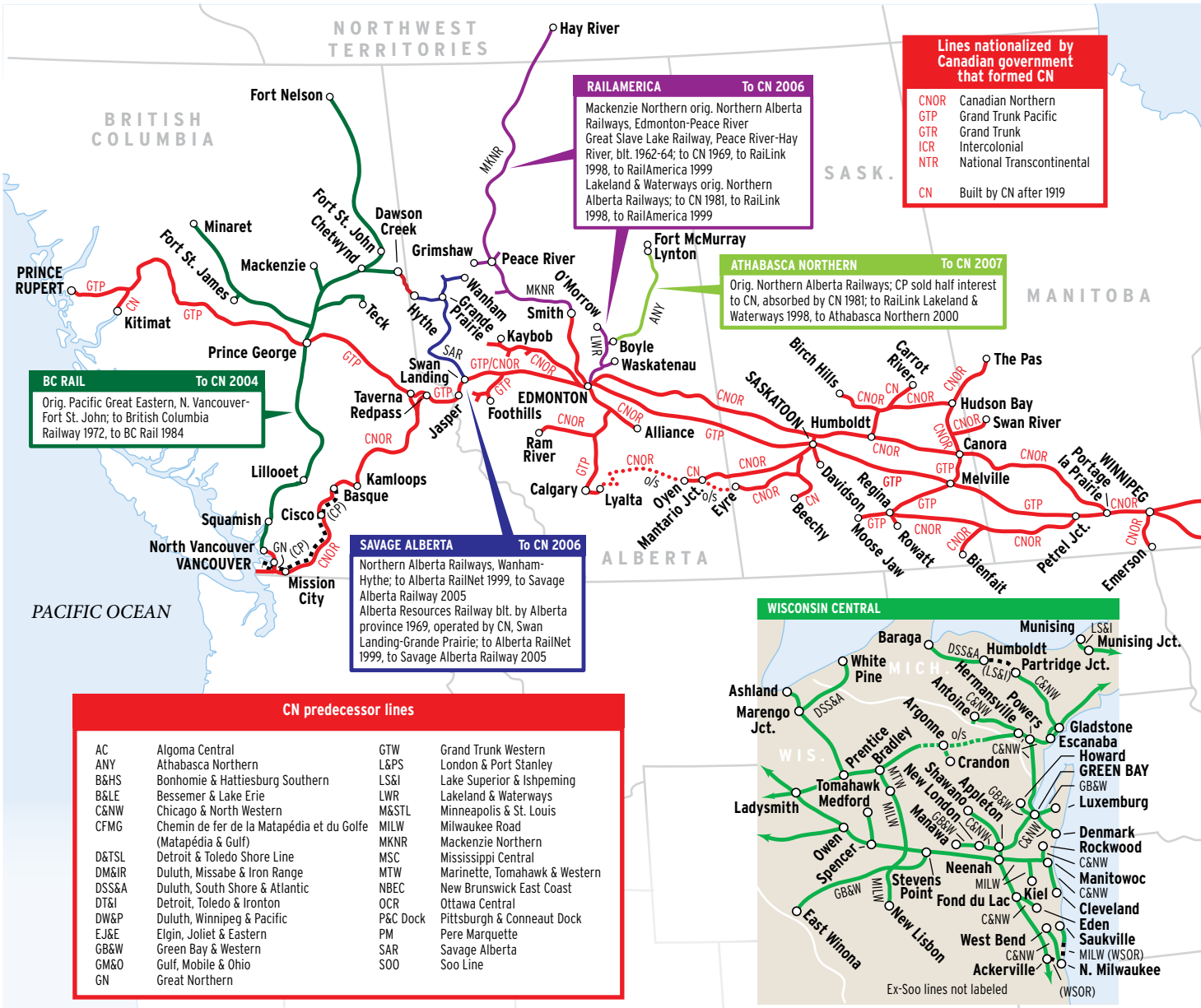
Dashed lines in other colors indicate rights on lines unrelated to UP-SP merger.

Trains MAGAZINE

UNION PACIFIC PREDECESSORS

C&EI	Chicago & Eastern Illinois
CNW	Chicago & North Western
DRGW	Denver & Rio Grande Western
MP	Missouri Pacific
MKT	Missouri-Kansas-Texas
RI	Chicago, Rock Island & Pacific
SP	Southern Pacific
SSW	St. Louis Southwestern (Cotton Belt)
T&P	Texas & Pacific
WP	Western Pacific

BNSF RAILWAY



CN predecessor lines

AC	Algoma Central	GTW	Grand Trunk Western
ANY	Athabasca Northern	L&PS	London & Port Stanley
B&HS	Bonhomie & Hattiesburg Southern	LS&I	Lake Superior & Ishpeming
B&LE	Bessemer & Lake Erie	LWR	Lakeland & Waterways
C&NW	Chicago & North Western	M&STL	Minneapolis & St. Louis
CFMG	Chemin de fer de la Matapédia et du Golfe (Matapédia & Gulf)	MILW	Milwaukee Road
		MKNR	Mackenzie Northern
D&TSL	Detroit & Toledo Shore Line	MSC	Mississippi Central
DM&IR	Duluth, Missabe & Iron Range	MTW	Marinette, Tomahawk & Western
DSS&A	Duluth, South Shore & Atlantic	NBEC	New Brunswick East Coast
DT&I	Detroit, Toledo & Ironton	OCR	Ottawa Central
DW&P	Duluth, Winnipeg & Pacific	P&C Dock	Pittsburgh & Conneaut Dock
EJ&E	Elgin, Joliet & Eastern	PM	Pere Marquette
GB&W	Green Bay & Western	SAR	Savage Alberta
GM&O	Gulf, Mobile & Ohio	SOO	Soo Line
GN	Great Northern		

CN trackage rights

(AA)	Ann Arbor
(CP)	Canadian Pacific
(CSX)	CSX Transportation
(GO)	GO Transit
(KCS)	Kansas City Southern
(LS&I)	Lake Superior & Ishpeming
(UP)	Union Pacific
(VIA)	VIA Rail Canada
(WSOR)	Wisconsin & Southern
o/s	Out of service

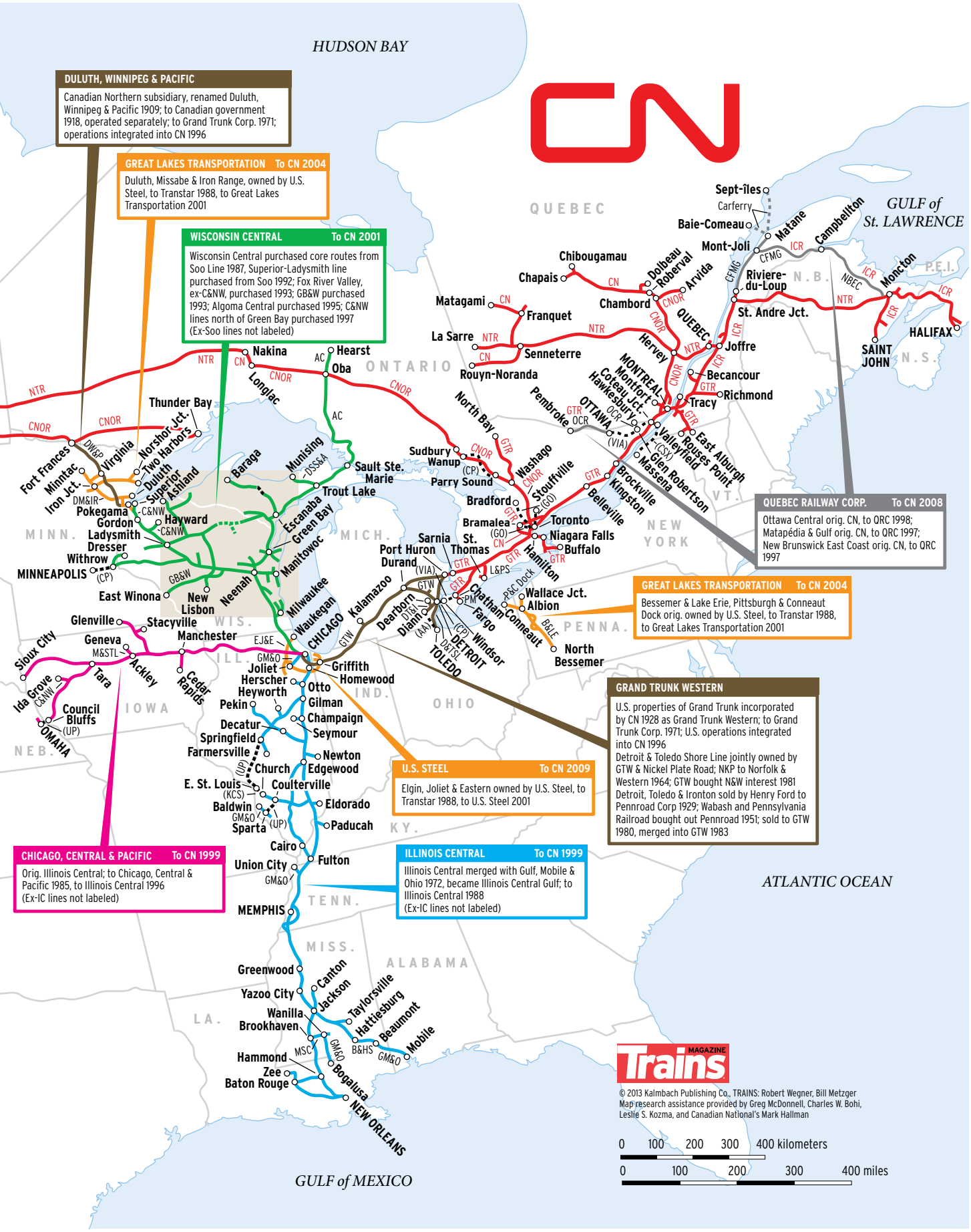
CN's predecessors

Since 1999, Canadian National has added 10,000 miles to its network

SHAPED LIKE A T-BONE STEAK, and spanning five time zones, Canadian National's reach is enormous. From a diverse collection of nationalized trunk lines, reformed interurbans, and wilderness short lines that ran from nowhere to nowhere came today's 20,100-mile network. And while the French they speak in New Orleans may sound nothing like the French spoken in Quebec, one railroad links the two.

Canada's foothold in the United States was well-established by 1880, when CN predecessor Grand Trunk opened a line from Maine to Chicago via Montreal, but CN's recent acquisitions (detailed in the boxes above) have made it a deeply multinational company. On the heels of CN's 1995 privatization came a decade of growth, jump-started by the 1999 merger of Illinois Central, that continued through the 2009 acquisition of the Elgin, Joliet & Eastern.

This map of CN would have looked vastly different 20 years ago. What it will look like 20 years in the future is anyone's guess. — *Bill Metzger and Matt Van Hattem*


HUDSON BAY
DULUTH, WINNIPEG & PACIFIC
Canadian Northern subsidiary, renamed Duluth, Winnipeg & Pacific 1909; to Canadian government 1918, operated separately; to Grand Trunk Corp. 1971; operations integrated into CN 1996
GREAT LAKES TRANSPORTATION To CN 2004
Duluth, Missabe & Iron Range, owned by U.S. Steel, to Transtar 1988, to Great Lakes Transportation 2001
WISCONSIN CENTRAL To CN 2001
Wisconsin Central purchased core routes from Soo Line 1987, Superior-Ladysmith line purchased from Soo 1992; Fox River Valley, ex-C&NW, purchased 1993; GB&W purchased 1993; Algoma Central purchased 1995; C&NW lines north of Green Bay purchased 1997 (Ex-Soo lines not labeled)
CN
QUEBEC
ONTARIO
MINN.
MICH.
WIS.
ILL.
IOWA
IND.
OHIO
PENNA.
NEW YORK
VT.
N.B.
P.E.I.
N.S.
NEB.
KY.
TENN.
MISS.
ALABAMA
LA.
GULF of MEXICO
ATLANTIC OCEAN
GULF of St. LAWRENCE
Sept-Îles
Carferry
Baie-Comeau
Matane
Campbellton
Mont-Joli
Riviere-du-Loup
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Massena
Valleyfield
Glen Robertson
Rouses Point
East Alburgh
Nakina
Hearst
Oba
Longlac
Thunder Bay
Fort Frances
Minntac
Iron Jct.
Virginia
Norshor Jct.
Two Harbors
Duluth
Superior
Ashland
Pokegama
Gordon
Ladysmith
Dresser
Withrow
MINNEAPOLIS
Hayward
Baraga
Munising
Escanaba
Green Bay
Manitowoc
Trout Lake
Sault Ste. Marie
East Winona
New Lisbon
Neenah
Milwaukee
Waukegan
CHICAGO
Glenville
Stacyville
Manchester
Geneva
Sioux City
Ida Grove
Tara
Ackley
Cedar Rapids
Council Bluffs
OMAHA
Joliet
Griffith
Homewood
Herscher
Heyworth
Otto
Gilman
Champaign
Seymour
Pekin
Decatur
Springfield
Farmersville
Newton
Edgewood
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E. St. Louis
Baldwin
Sparta
Eldorado
Paducah
Cairo
Fulton
Union City
MEMPHIS
Greenwood
Canton
Yazoo City
Jackson
Taylorsville
Hattiesburg
Wanilla
Brookhaven
Beaumont
Mobile
Hammond
Zee
Baton Rouge
Bogalusa
NEW ORLEANS
Kalamazoo
Port Huron
Durand
Sarnia
St. Thomas
Dearborn
Detroit
Toledo
Windsor
Chatham
Fargo
Conneaut
Wallace Jct.
Albion
North Bessemer
Valleyfield
QUEBEC RAILWAY CORP. To CN 2008
Ottawa Central orig. CN, to QRC 1998; Matapédia & Gulf orig. CN, to QRC 1997; New Brunswick East Coast orig. CN, to QRC 1997
GREAT LAKES TRANSPORTATION To CN 2004
Bessemer & Lake Erie, Pittsburgh & Conneaut Dock orig. owned by U.S. Steel, to Transtar 1988, to Great Lakes Transportation 2001
GRAND TRUNK WESTERN
U.S. properties of Grand Trunk incorporated by CN 1928 as Grand Trunk Western; to Grand Trunk Corp. 1971; U.S. operations integrated into CN 1996
Detroit & Toledo Shore Line jointly owned by GTW & Nickel Plate Road; NKP to Norfolk & Western 1964; GTW bought N&W interest 1981
Detroit, Toledo & Ironton sold by Henry Ford to Pennroad Corp 1929; Wabash and Pennsylvania Railroad bought out Pennroad 1951; sold to GTW 1980, merged into GTW 1983
U.S. STEEL To CN 2009
Elgin, Joliet & Eastern owned by U.S. Steel, to Transtar 1988, to U.S. Steel 2001
CHICAGO, CENTRAL & PACIFIC To CN 1999
Orig. Illinois Central; to Chicago, Central & Pacific 1985, to Illinois Central 1996 (Ex-IC lines not labeled)
ILLINOIS CENTRAL To CN 1999
Illinois Central merged with Gulf, Mobile & Ohio 1972, became Illinois Central Gulf; to Illinois Central 1988 (Ex-IC lines not labeled)
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Map research assistance provided by Greg McDonnell, Charles W. Bohi, Leslie S. Kozma, and Canadian National's Mark Hallman
0 100 200 300 400 kilometers
0 100 200 300 400 miles

Whatever happened to the Milwaukee Road?

This Chicago-Pacific Coast trunk line slimmed down to a Midwestern "core" run by a collection of railroads

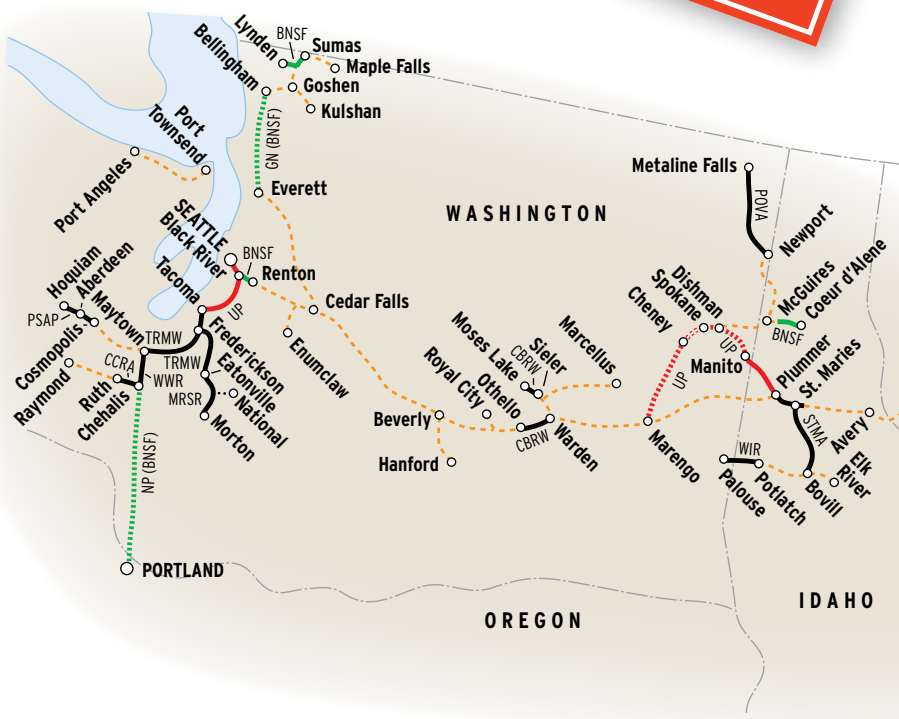
WHAT CAME TO BE KNOWN AS "the Milwaukee Road" had it right the first time, as its 1873 name — Chicago, Milwaukee & St. Paul — stated. It finished building its Pacific Extension in 1909 and, after a 1925 bankruptcy, added "& Pacific" to its name. Meantime, the popular nickname for the railroad whose reporting marks became "MILW" moved east from Minnesota's capital to Wisconsin's largest city, Milwaukee, home to the road's massive locomotive and car shops.

The Pacific Extension, from South Dakota to Puget Sound, has been called "the railroad that shouldn't have been built," as it was never competitive with its two parallel rivals, Great Northern and Northern Pacific. Neither, probably, should many of the Milwaukee's granger branch lines, but a good portion of them helped settle their regions if not add too much rail capacity.

Regardless, all this expansion put the Milwaukee in rare five-figure mileage company with Santa Fe, Southern Pacific, Missouri Pacific, Chicago & North Western, and the Burlington family. Milwaukee Road's Dec. 31, 1946, map bannered 10,733 route-miles.

Branchline abandonments during the 1950s and '60s were somewhat balanced by early 1970s market extensions to Portland, Ore., and Louisville, Ky., gained in others' mergers — and shown on this map, which otherwise is based on the system in 1969, when mileage was 10,512. Revealing is that just 28 percent was classified as "main line," versus 64 percent "branch line" (the remaining 8 percent was on trackage rights). Eight years later, when Milwaukee Road filed for bankruptcy (for the last time) on Dec. 19, 1977, the system was down to 9,841 miles, and its 1980 reduction to a Midwest "core" trimmed that by 61 percent to 3,850 miles.

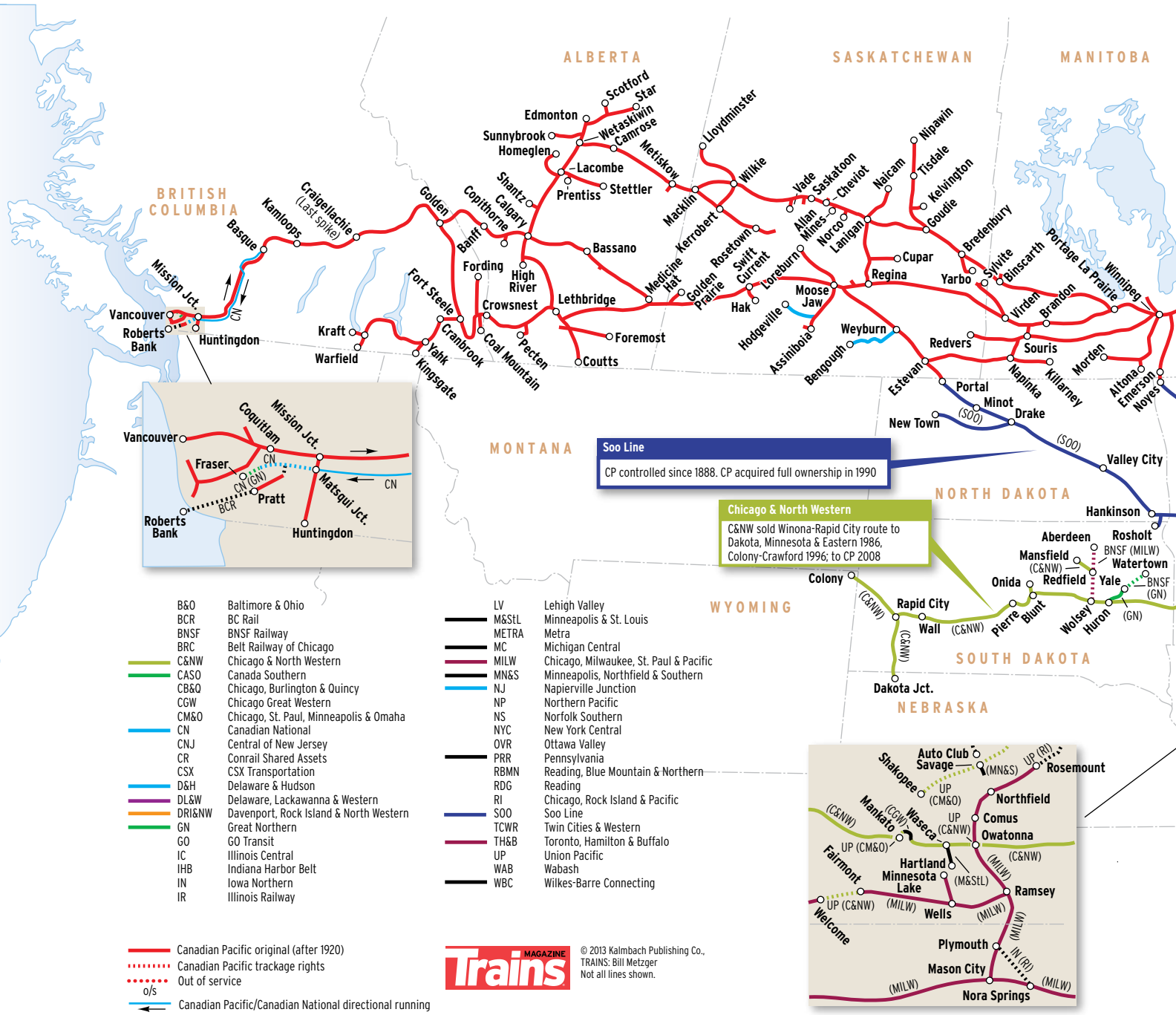
Soo Line was the surprising second-highest-bid winner of Milwaukee Road in 1985. Today, many of those 3,850 miles remain in use, some by Class I railroads, notably Canadian Pacific (which owns Soo Line) and BNSF Railway. In another symbol of the changing times, a significant amount of Milwaukee Road trackage was bought by states to ensure continued rail service. South Dakota bought more than 800 miles, most of which was contracted to Burlington Northern for operation. The Wisconsin & Southern is another example, operating largely on ex-Milwaukee trackage that, for all practical purposes, was acquired by the Badger State. It's been quite a metamorphosis. — *J. David Ingles, senior editor of* Classic Trains *magazine*



Trains MAGAZINE

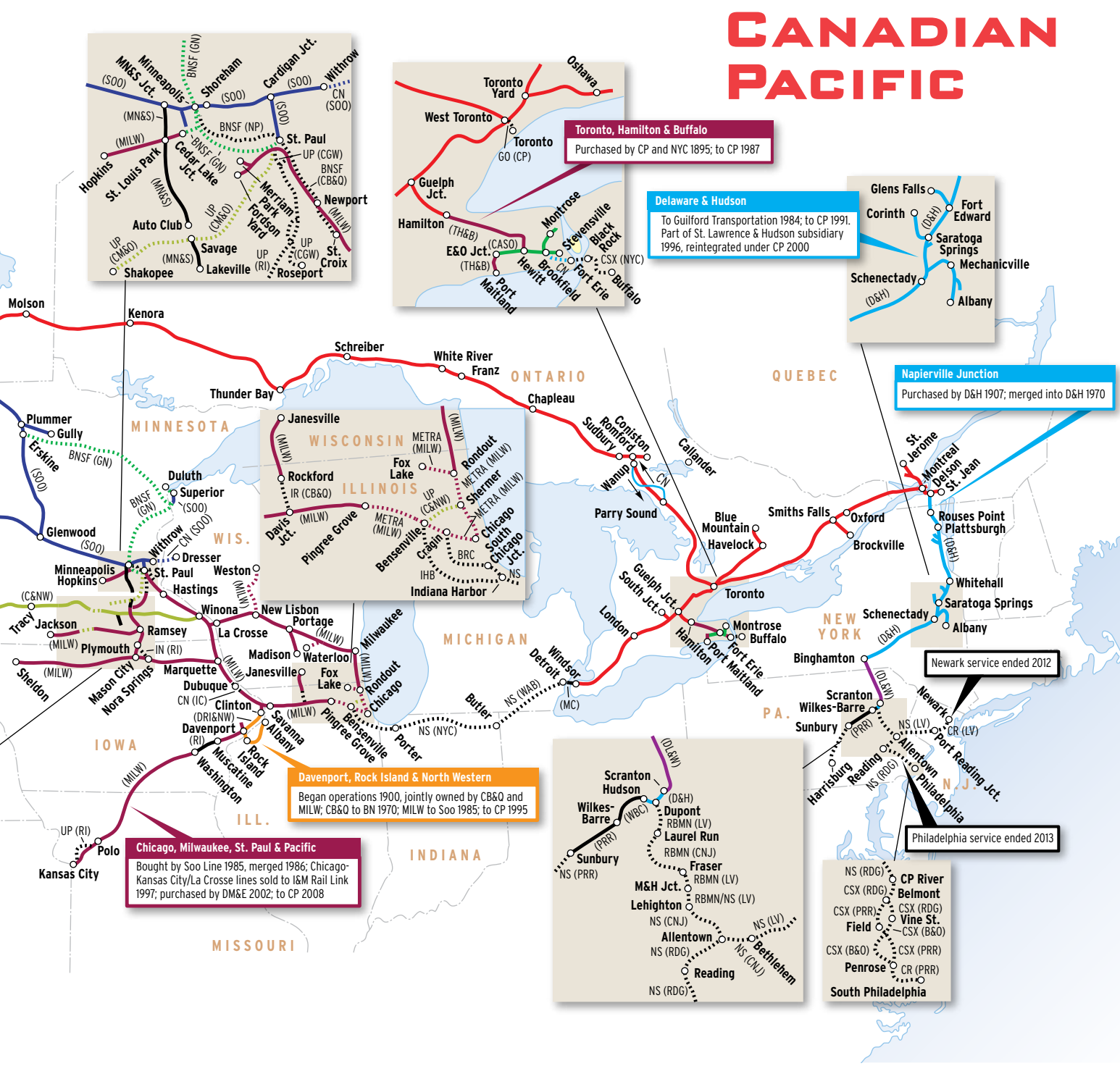
Milwaukee system ca. 1969
Not to scale

Canadian Pacific's predecessors



THE DRIVING OF CANADIAN PACIFIC'S final spike at Craigellachie, B.C., in 1885 marked a defining moment in Canada's transformation from a vast swath of land into a true nation: a political and economic engine able to shape a way of life for its people. While CP's builders launched a full-strength assault across prairies, tundra, and mountains, the company also assembled a network of smaller lines to connect cities and ports in eastern Canada with CP's transcontinental railhead at Callander, Ont. (located east of Sudbury on a line to Smiths Falls that was later spun off and partly abandoned). By 1915, CP had fashioned a network that would remain in place until the late 20th century.

Canadian Pacific's United States trackage has a more convoluted history, although its Soo Line subsidiary has functioned since the 1880s as a traffic source for manufactured products and later an outlet for raw materials from Canada. Soo Line's 1985 purchase of the Milwaukee



Road not only garnered it a superior Twin Cities-Chicago route, but also a 49 percent share in Chicago's Indiana Harbor Belt.

On the heels of CP's 1991 Delaware & Hudson purchase came a mid-1990s purge of 3,800 miles that included all lines east of Montreal. The company even moved its headquarters in 1996 from Montreal west to Calgary, closer to major traffic sources. More changes may be coming under the management team assembled after a 2012 proxy fight. Within a year, CP had ended scheduled service to Newark, N.J., and was looking to sell its former Dakota, Minnesota & Eastern trackage west of Tracy, Minn.

CP's 14,657-mile network in place in 2012 (which includes 4,000 miles of trackage rights) moves raw materials from North America's interior to ports and population centers in the East and West. Canadian Pacific's heaviest tonnage is found between Regina and Vancouver, where unit trains of coal, grain, sulfur, and containers predominate. — *Matt Van Hattem*

CSX Transportation's predecessors

GEOGRAPHIC GROWTH BY ACQUISITION or merger, and the elimination of redundant routes by sale or abandonment, are two factors that have been with American railroading from the outset … and are not about to go away.

Consider this map of CSX Transportation's principal ancestors. Shown here are 22 former Class I railroads — in post-World War II terms — plus a handful of short lines. (In 1950, the Interstate Commerce Commission considered a railroad with $1 million or more a year in revenue to be a Class I.)

There are actually several more Class I railroads that contribute to the current CSX system in small segments around big cities. And if one counts all the Class I railroads created in post-World War II mergers, such as Seaboard Coast Line, Chessie System, and Conrail, the total would increase yet again.

Note that many of CSX's direct routes consist of combinations of railroads that while present historically were often not used as such, because each individual railroad sought the long haul. Also note that many once-sprawling systems, such as Seaboard Air Line, have been chopped into pieces and no longer function as through railroads in the historic sense.

The route-mileage of all the component railroads of today's CSX in 1956 totaled almost 30,000 miles, whereas CSX in 2012 had a system of 20,740 miles (with 3,786 of those miles on trackage rights), a 30 percent reduction. — *Mark W. Hemphill and Curtis W. Richards*

What happened to the Pennsylvania Railroad?

What became of the late, great Pennsylvania? Nearly half survives, and our foldout map shows you where

MENTION THE PENNSYLVANIA RAILROAD and iconic images immediately come to mind: passenger trains rocketing down a four-track electrified main line; limiteds scooping water on the fly from track pans; impossibly long coal drags; and mammoth engineering projects, from Horseshoe Curve in the Alleghenies to Louisville's Ohio River drawbridge, to a maze of elevated freight cutoffs and bypasses.

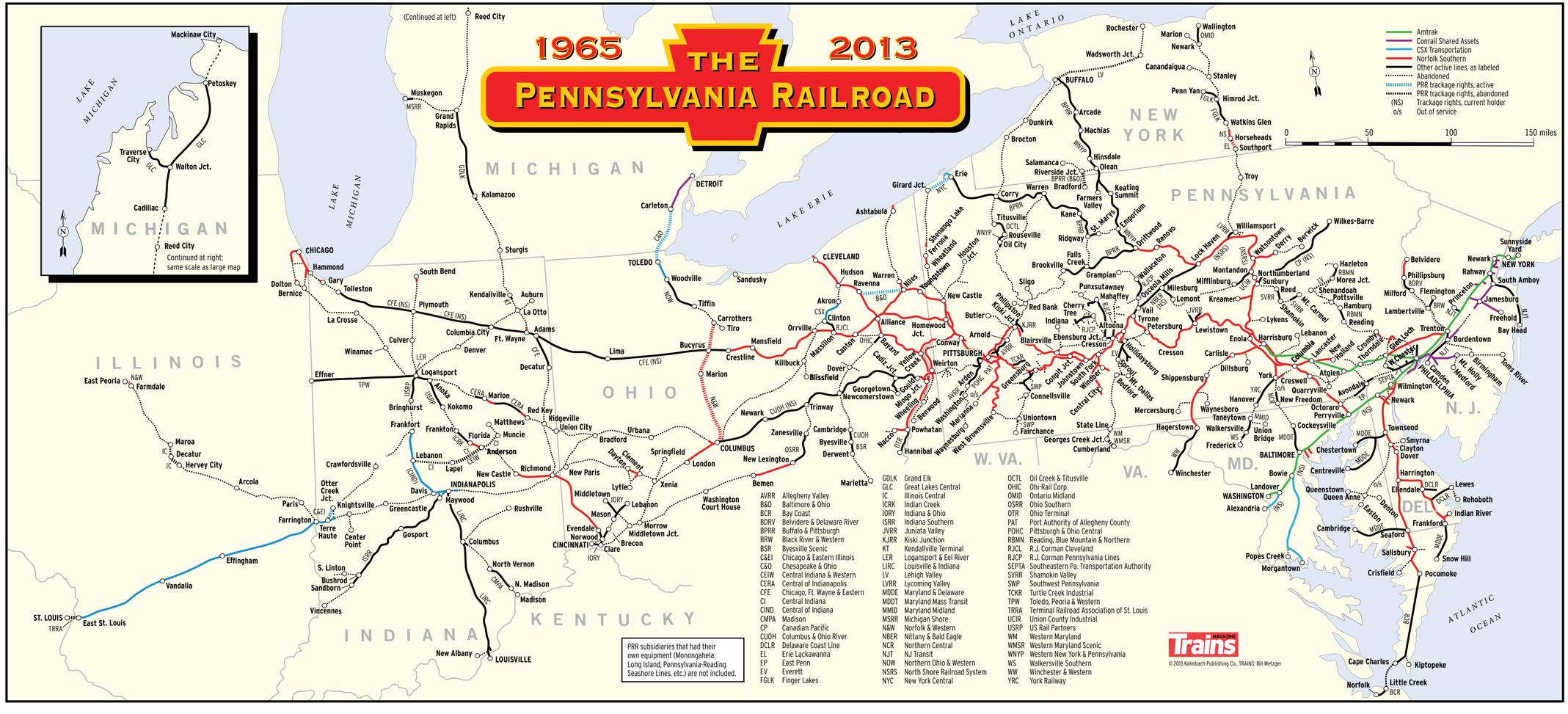
This map shows what remains of the Pennsylvania Railroad in 2013 compared with the system of 48 years before. In 1965, the base year of this map, the PRR operated 9,600 miles of railroad and stretched to its historic geographic limits: New York to St. Louis; Mackinaw City, Mich., to Norfolk, Va.

About 4,200 route-miles survive today — nearly 44 percent of the '65 system, and roughly one-third of the 11,709 miles operated in 1925, on the eve of the Pennsy's 80th birthday.

In October 1964, Norfolk & Western acquired PRR's line from Columbus to Sandusky, Ohio, to connect with N&W's new merger partner, the Nickel Plate; although the PRR received trackage rights from Carrothers south, it was the largest loss to the system to date. More line sales and abandonments followed in the wake of Penn Central, Conrail, and the Norfolk Southern-CSX takeover. Coal branches by the dozens disappeared, as did miles of Midwestern main line. Routes west of Pittsburgh once trod by Pennsy's Blue Ribbon Fleet of passenger trains were either downgraded or torn up.

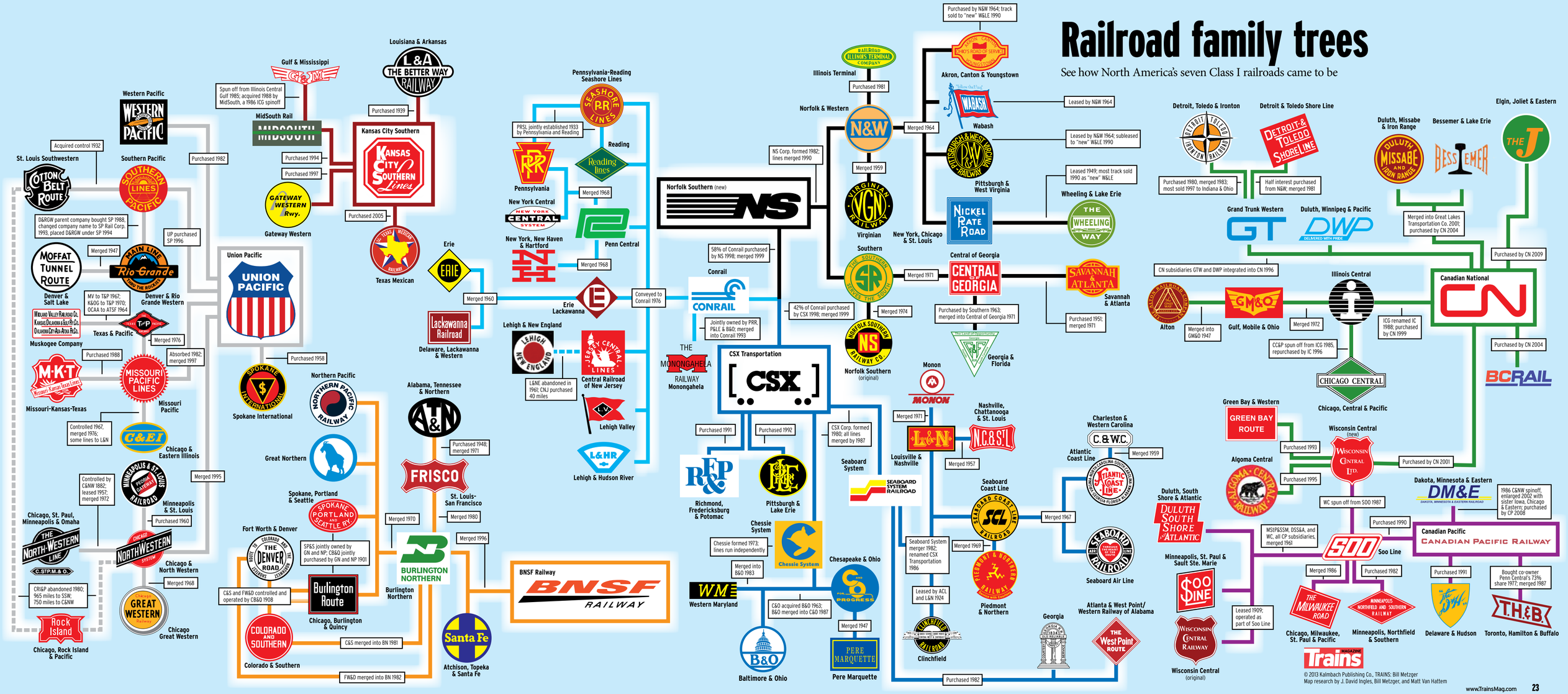
Today, 60 different entities use former Pennsylvania Railroad lines. Norfolk Southern operates about half of the surviving route-miles, while fellow Class I railroads CSX Transportation and Canadian Pacific also lay claim to a few lines. Amtrak owns the passenger-heavy Northeast Corridor and Harrisburg Line. Shortline conglomerates account for 20 operations, including Genesee & Wyoming (with 13), R.J. Corman (2), Anacostia & Pacific (1), Watco (1), OmniTRAX (1), Pioneer Railcorp (1), and US Rail Partners (1). Regional operators add another 12, courtesy of the North Shore Railroad Co. (5), Carload Express (3), Black River & Western (2), and Regional Rail LLC (1). Rounding out the picture are four transit agencies, three excursion lines (not counting tourist operations crewed by freight railroads), and 18 individual short lines.

Other parts of the Pennsylvania Railroad have been reconstituted as busways, trails, and in a few cases, roads. But it's a testament to the importance of PRR's transportation empire that the core of the railroad (the main line over the Alleghenies and the Northeast Corridor) lives on. — *Bill Metzger*



Railroad family trees

See how North America's seven Class I railroads came to be

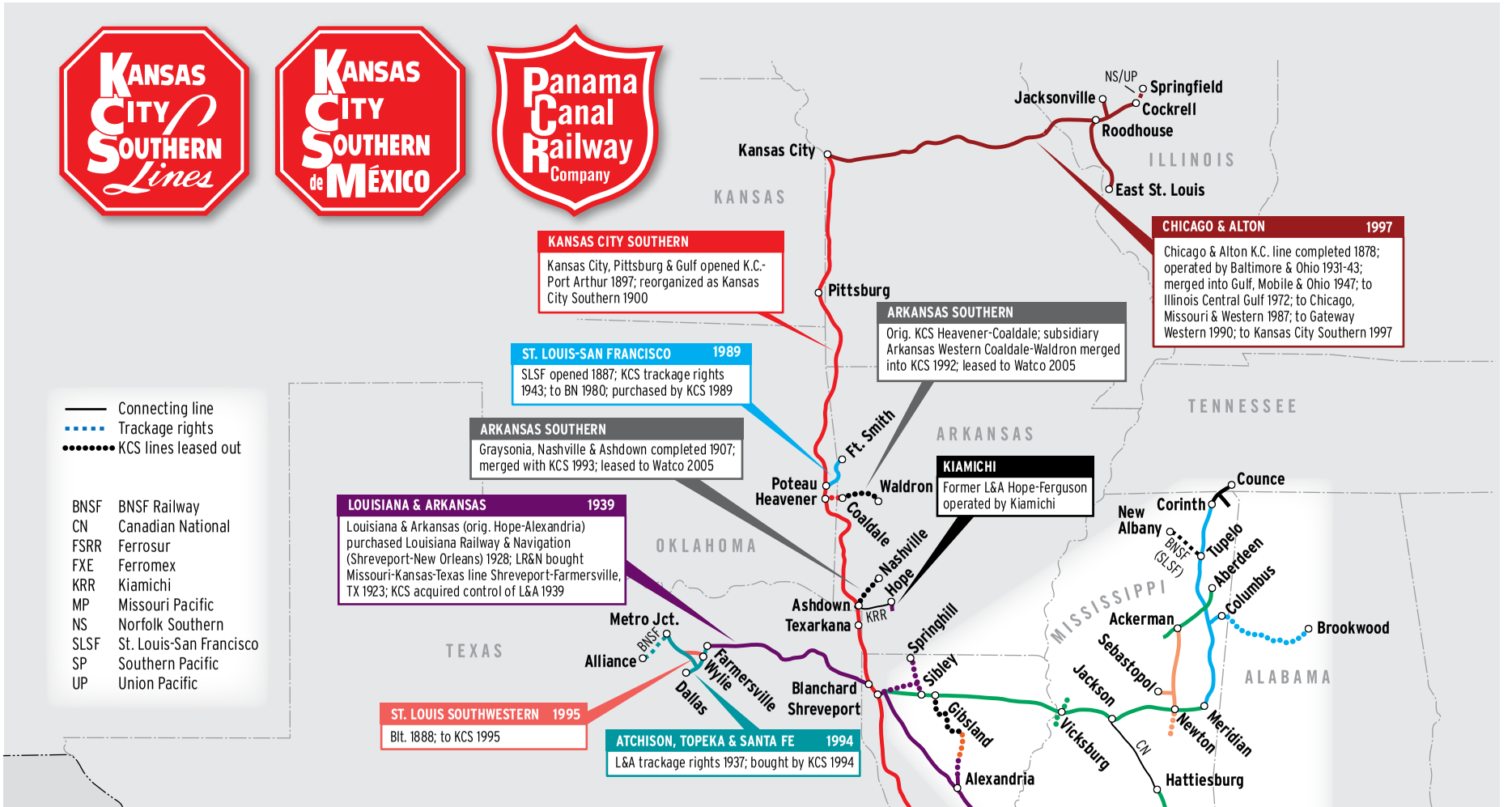


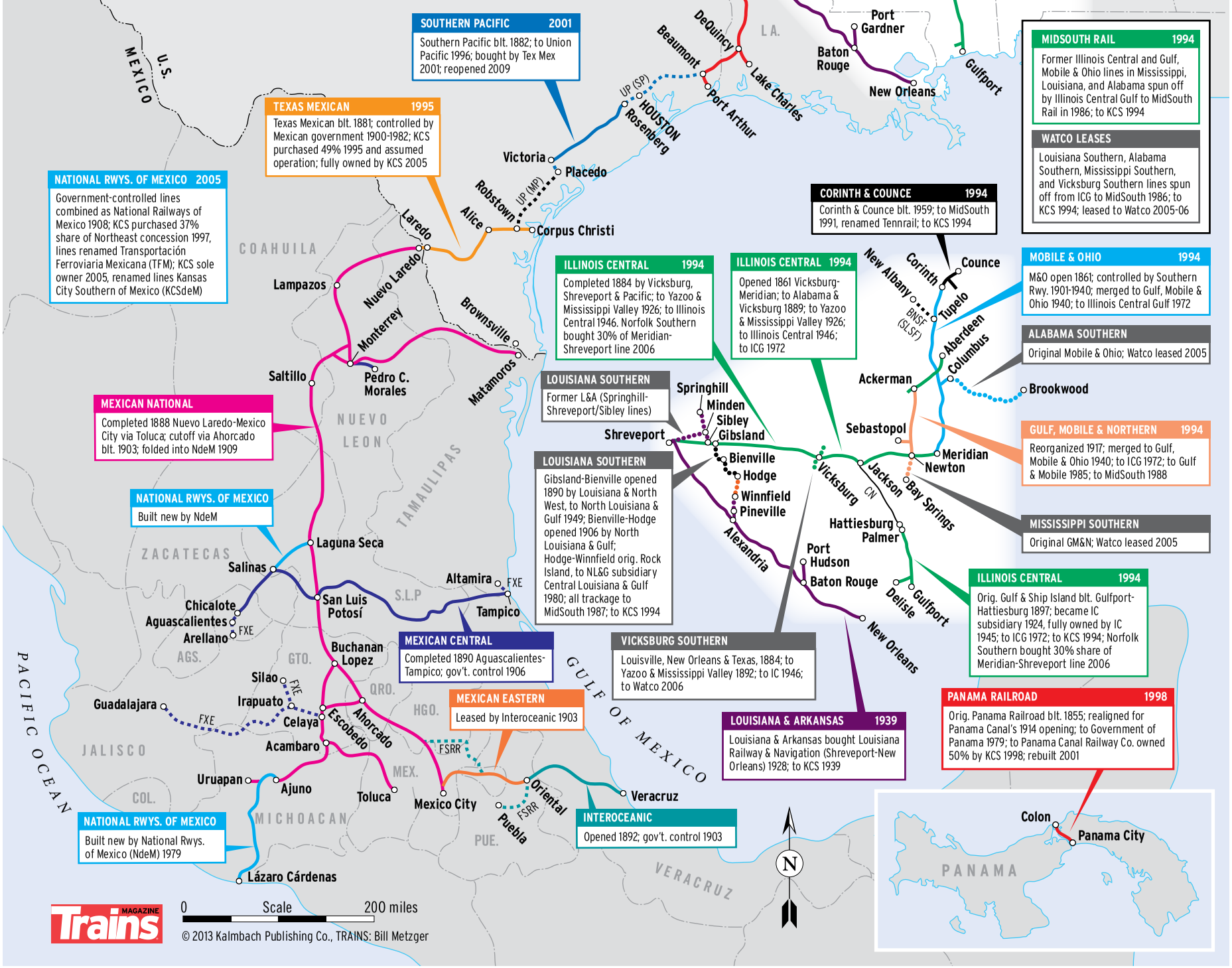
Kansas City Southern's predecessors

The only Class I railroad with operations in three different countries is a melting pot of historic names

LIKE A HEARTY STEW, today's Kansas City Southern was made with an abundance of ingredients. The X-shaped, 1,700-mile network that emerged when KCS combined with Louisiana & Arkansas in 1939 became a steady hauler of chemicals, grain, lumber, and coal. When larger railroads began partnering up in the 1990s, Kansas City Southern did as well, to diversify its traffic base and strategically expand its franchise amid the megasystems surrounding its territory.

The company looked east (buying 1,200-mile MidSouth Rail, whose healthy local business funneled over an east-west trunk that KCS has nurtured into a cross-country traffic lane), north (scooping up the 400-mile Gateway Western, but losing a bid for Canadian Pacific's lines north of Kansas City), south (where the 157-mile Texas Mexican and 3,000-mile KCS de Mexico are generating longer hauls and new sources of traffic), and way south (entering a partnership to rebuild the 48-mile Panama Canal Railway). The result is a system that totaled 6,200 miles in 2012, of which 3,238 miles are in the United States. (That U.S. count includes 486 miles of trackage rights, but not 371 miles of branch lines leased out to other operators.) Chemicals, grain, forest products, and coal still predominate, but the larger network offers more places to see KCS's snazzy "Southern Belle"-styled locomotives. — *Matt Van Hattem and Bill Metzger*




SOUTHERN PACIFIC 2001
Southern Pacific blt. 1882; to Union Pacific 1996; bought by Tex Mex 2001; reopened 2009
TEXAS MEXICAN 1995
Texas Mexican blt. 1881; controlled by Mexican government 1900-1982; KCS purchased 49% 1995 and assumed operation; fully owned by KCS 2005
NATIONAL RWYS. OF MEXICO 2005
Government-controlled lines combined as National Railways of Mexico 1908; KCS purchased 37% share of Northeast concession 1997, lines renamed Transportación Ferroviaria Mexicana (TFM); KCS sole owner 2005, renamed lines Kansas City Southern of Mexico (KCSdeM)
MEXICAN NATIONAL
Completed 1888 Nuevo Laredo-Mexico City via Toluca; cutoff via Ahorcado blt. 1903; folded into NdeM 1909
NATIONAL RWYS. OF MEXICO
Built new by NdeM
NATIONAL RWYS. OF MEXICO
Built new by National Rwys. of Mexico (NdeM) 1979
MEXICAN CENTRAL
Completed 1890 Aguascalientes-Tampico; gov't. control 1906
MEXICAN EASTERN
Leased by Interoceanic 1903
INTEROCEANIC
Opened 1892; gov't. control 1903
ILLINOIS CENTRAL 1994
Completed 1884 by Vicksburg, Shreveport & Pacific; to Yazoo & Mississippi Valley 1926; to Illinois Central 1946. Norfolk Southern bought 30% of Meridian-Shreveport line 2006
ILLINOIS CENTRAL 1994
Opened 1861 Vicksburg-Meridian; to Alabama & Vicksburg 1889; to Yazoo & Mississippi Valley 1926; to Illinois Central 1946; to ICG 1972
LOUISIANA SOUTHERN
Former L&A (Springhill-Shreveport/Sibley lines)
LOUISIANA SOUTHERN
Gibsland-Bienville opened 1890 by Louisiana & North West, to North Louisiana & Gulf 1949; Bienville-Hodge opened 1906 by North Louisiana & Gulf; Hodge-Winnfield orig. Rock Island, to NL&G subsidiary Central Louisiana & Gulf 1980; all trackage to MidSouth 1987; to KCS 1994
VICKSBURG SOUTHERN
Louisville, New Orleans & Texas, 1884; to Yazoo & Mississippi Valley 1892; to IC 1946; to Watco 2006
LOUISIANA & ARKANSAS 1939
Louisiana & Arkansas bought Louisiana Railway & Navigation (Shreveport-New Orleans) 1928; to KCS 1939
CORINTH & COUNCE 1994
Corinth & Counce blt. 1959; to MidSouth 1991, renamed Tennrail; to KCS 1994
MIDSOUTH RAIL 1994
Former Illinois Central and Gulf, Mobile & Ohio lines in Mississippi, Louisiana, and Alabama spun off by Illinois Central Gulf to MidSouth Rail in 1986; to KCS 1994
WATCO LEASES
Louisiana Southern, Alabama Southern, Mississippi Southern, and Vicksburg Southern lines spun off from ICG to MidSouth 1986; to KCS 1994; leased to Watco 2005-06
MOBILE & OHIO 1994
M&O open 1861; controlled by Southern Rwy. 1901-1940; merged to Gulf, Mobile & Ohio 1940; to Illinois Central Gulf 1972
ALABAMA SOUTHERN
Original Mobile & Ohio; Watco leased 2005
GULF, MOBILE & NORTHERN 1994
Reorganized 1917; merged to Gulf, Mobile & Ohio 1940; to ICG 1972; to Gulf & Mobile 1985; to MidSouth 1988
MISSISSIPPI SOUTHERN
Original GM&N; Watco leased 2005
ILLINOIS CENTRAL 1994
Orig. Gulf & Ship Island blt. Gulfport-Hattiesburg 1897; became IC subsidiary 1924, fully owned by IC 1945; to ICG 1972; to KCS 1994; Norfolk Southern bought 30% share of Meridian-Shreveport line 2006
PANAMA RAILROAD 1998
Orig. Panama Railroad blt. 1855; realigned for Panama Canal's 1914 opening; to Government of Panama 1979; to Panama Canal Railway Co. owned 50% by KCS 1998; rebuilt 2001
U.S.
MEXICO
COAHUILA
NUEVO LEON
TAMAULIPAS
ZACATECAS
S.L.P
AGS.
GTO.
QRO.
HGO.
MEX.
COL.
MICHOACAN
PUE.
VERACRUZ
JALISCO
PACIFIC OCEAN
GULF OF MEXICO
L.A.
PANAMA
Victoria
Placedo
Corpus Christi
Robstown
Alice
Laredo
Nuevo Laredo
Lampazos
Monterrey
Saltillo
Pedro C. Morales
Brownsville
Matamoros
Laguna Seca
Salinas
Chicalote
Aguascalientes
Arellano
San Luis Potosí
Altamira
Tampico
Buchanan Lopez
Silao
Irapuato
Guadalajara
Celaya
Acambaro
Escobedo
Ahorcado
Uruapan
Ajuno
Toluca
Mexico City
Puebla
Oriental
Veracruz
Lázaro Cárdenas
Beaumont
DeQuincy
Lake Charles
Port Arthur
HOUSTON
Rosenberg
UP (SP)
UP (MP)
Baton Rouge
Port Gardner
New Orleans
Gulfport
Springhill
Minden
Sibley
Gibsland
Shreveport
Bienville
Hodge
Winnfield
Pineville
Alexandria
Port Hudson
Baton Rouge
New Orleans
Vicksburg
Jackson
CN
Hattiesburg
Palmer
Delisle
Gulfport
Bay Springs
Meridian
Newton
Sebastopol
Ackerman
Columbus
Aberdeen
Tupelo
Corinth
New Albany
BNSF (SLSF)
Counce
Brookwood
Colon
Panama City
0
Scale
200 miles
N
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Trains MAGAZINE

Norfolk Southern's predecessors

HISTORIANS HAVE ARGUED that one key to the success of Norfolk & Western's 1982 consolidation with Southern Railway was that the railroads shared a similar culture: determined, forward-looking, and committed to success. This served to douse the fires of early rivalries with a single-minded focus on making the unified system work, and work well.

It didn't hurt that each railroad also had a solid franchise — not always the shortest or fastest route, but track that was productive and well-maintained nonetheless.

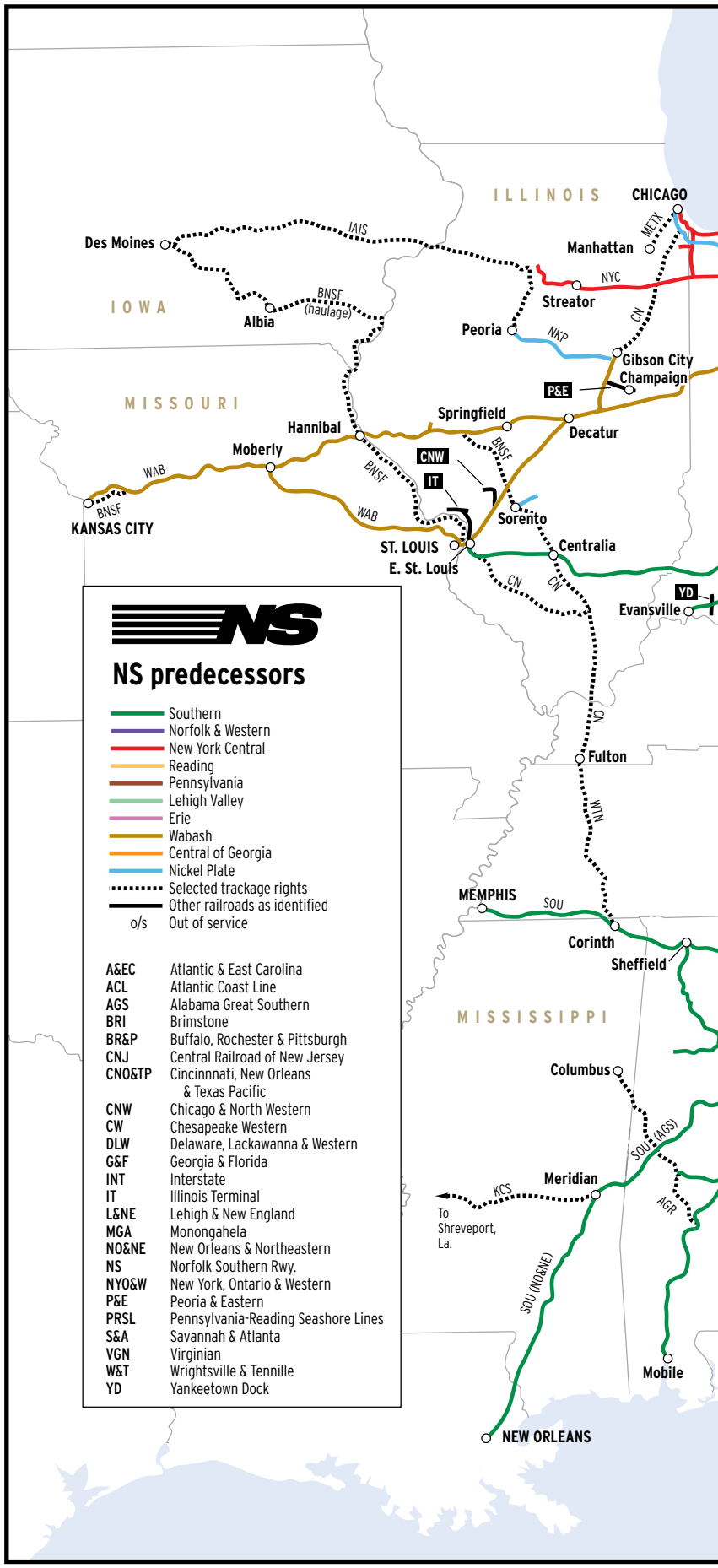
In the 1960s, when most railroads were merging to eliminate parallel lines, including the giant Penn Central, N&W by force looked outward, acquiring the Nickel Plate, leasing the Wabash, and tying all three together with a Pennsylvania Railroad line from Columbus, Ohio, to Lake Erie. N&W's strategic play got it more than just track: It gained access to western gateways and new traffic sources, such as Wabash's Detroit-area auto business, that would reduce its dependence on coal.

Southern and N&W might not have been prominent on each other's radar screens before the CSX accretion of 1980 (Southern had explored mergers with Illinois Central Gulf and Missouri Pacific and petitioned unsuccessfully for Monon's route to Chicago). But each recognized the benefits of combining two strong Eastern railroads that shared common endpoints yet served different regions.

Buying 58 percent of Conrail in 1998 was an equally critical move that strategically positioned Norfolk Southern for handling today's growth commodity, intermodal traffic, which polished the rails of Conrail's high-volume traffic lanes between Chicago and the Eastern Seaboard.

Until recently, Norfolk Southern's component franchises had remained essentially independent operations: Coal moving on former N&W lines had nothing to do with the land-bridge containers rolling across the former Pennsylvania main line. Where the benefits of today's 20,023-mile system (which includes 4,271 miles of trackage rights) were seen most clearly were on key routes no other U.S. railroad either had or served nearly so well: Detroit to Kansas City on the Wabash, and the CNO&TP funnel between the Great Lakes and the Sunbelt.

However, 30 years into the NS era, that historic traffic separation has begun to dissolve, driven first by the Heartland Corridor project, which cleared the former N&W main line to handle double-stacked containers coming out of Virginia's ports. Now, NS is focused on the Crescent Corridor, a project to add intermodal yards and capacity on its main routes from New Jersey and Pennsylvania south to Memphis and Mississippi, paving the way for double-stacked containers to flow north and south in the eastern United States. — *Matt Van Hattem*



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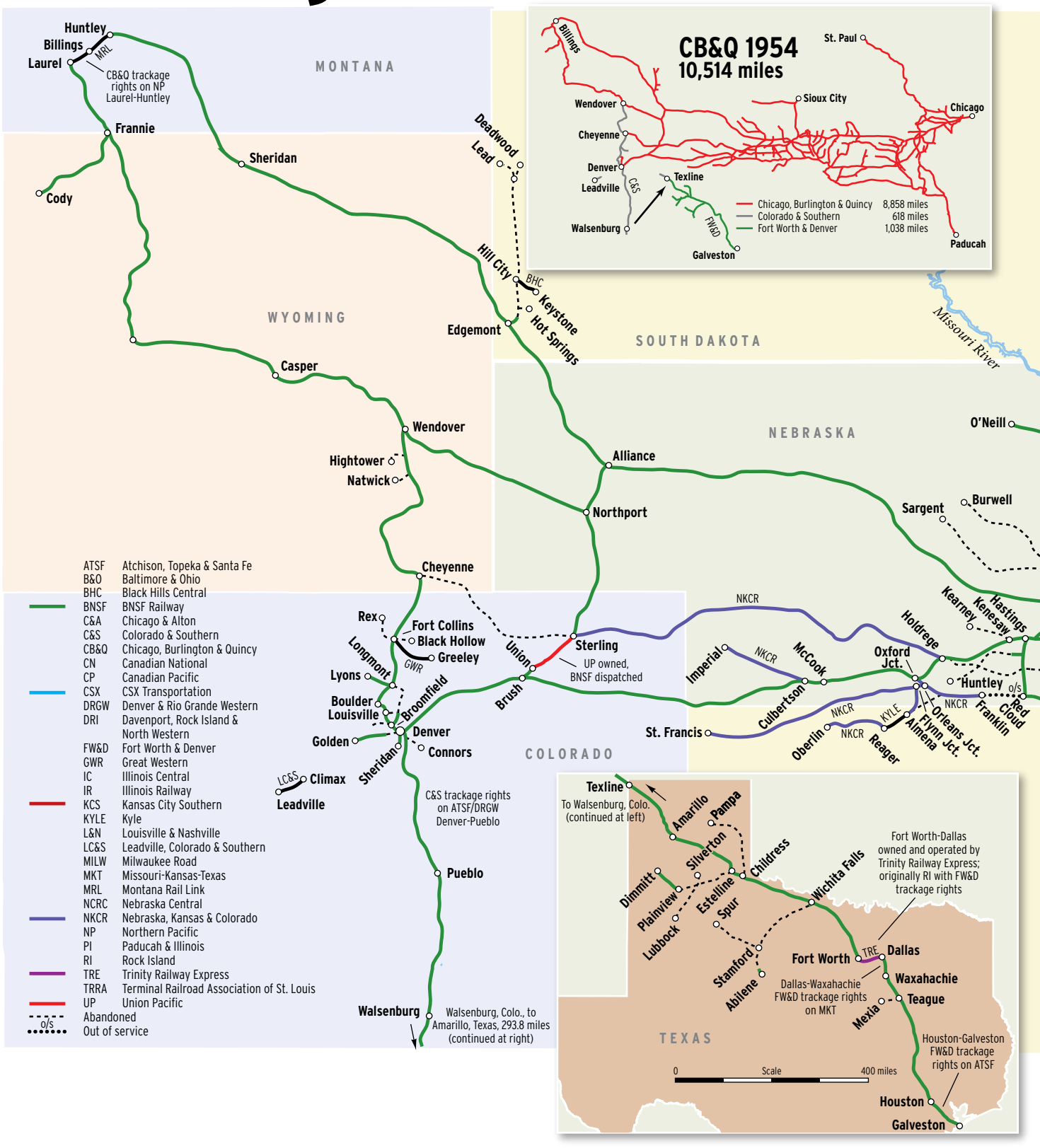
Not all lines shown

Trackage rights, 2013

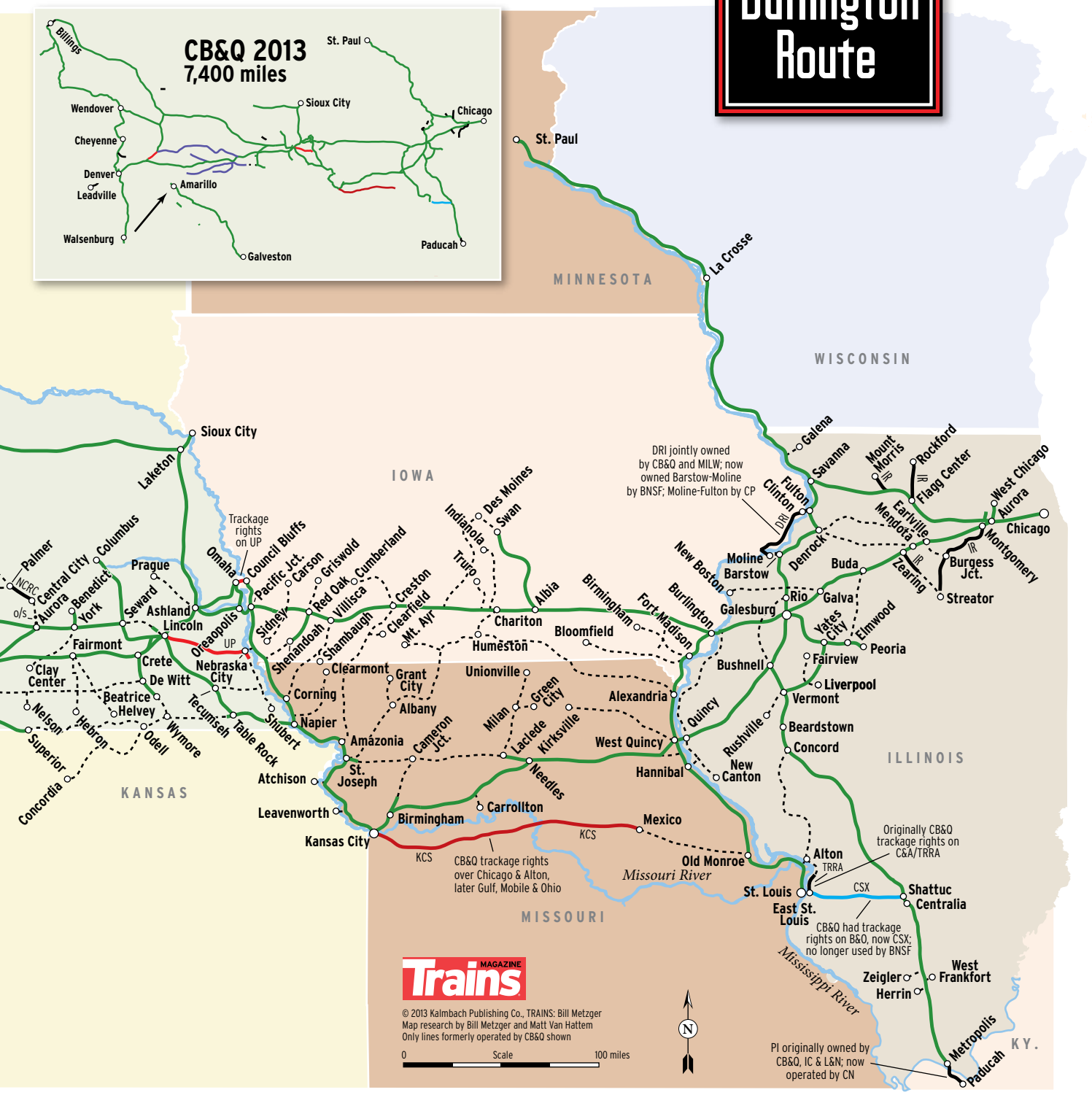
AGR	Alabama & Gulf Coast
AMTK	Amtrak
BNSF	BNSF Railway
CF&E	Chicago, Fort Wayne & Eastern
CN	Canadian National
CNYK	Central New York
CP	Canadian Pacific
CSX	CSX Transportation
CUOH	Columbus & Ohio River
IAIS	Iowa Interstate
KCS	Kansas City Southern
METX	Metra
NBER	Nittany & Bald Eagle
NJT	NJ Transit
OHCR	Ohio Central
OSRR	Ohio Southern
PAS	Pan Am Southern
WTN	West Tennessee

Whatever happened to the Burlington Route?



Seventy percent of the lines run by the Chicago, Burlington & Quincy and its two subsidiaries in 1954 survives to this day. We show you who's running the Q

Burlington Route



Union Pacific's predecessors

IT'S FITTING THAT THE LARGEST U.S. railroad today, the Union Pacific, was born as part of a grandiose plan: to build the nation's first transcontinental railroad. From that not-so-humble beginning, UP has grown into a massive system. In 2012, Union Pacific owned or controlled 26,356 miles, more than any other U.S. railroad. The addition of 5,512 miles of trackage rights nets UP a system total of 31,868 miles, which is sightly less than BNSF Railway's 32,514-mile network, thanks to BNSF's 9,266 miles of trackage rights.

Chartered by Congress in 1862 as the eastern part of the historic first transcontinental rail line that would unite the East with California, UP began building west from Omaha, Neb., in 1865. On May 10, 1869, it met Central Pacific at Promontory, Utah. CP west of Ogden would become part of Southern Pacific. (This map shows UP's predecessors as they were in the immediate post-World War II years.)

Edward H. Harriman bought Union Pacific in 1897 and eventually amassed a network that included Southern Pacific, Illinois Central, and Chicago & Alton. Harriman double-tracked UP from Omaha to Granger, Wyo., and built an alternate line over Sherman Hill west of Cheyenne, Wyo., but he soon would have to divest of his empire. By 1910, UP had grown to the basic configuration it would keep through the 1970s: the main transcontinental line from Council Bluffs, Iowa (next to Omaha), to Ogden; subsidiaries Los Angeles & Salt Lake to Southern California and Oregon Short Line to the Pacific Northwest; and the former Kansas Pacific and Denver Pacific from Kansas City to Cheyenne.

Mergers defined Union Pacific's subsequent growth. UP tried to acquire the Rock Island in 1963, but after 12 years of procedural wrangling, the parties gave up. In 1980, rival Burlington Northern acquired the St. Louis-San Francisco, and the post-regulation merger game was on. In 1982 UP added Missouri Pacific and Western Pacific, which doubled its size, advanced it to northern California and Chicago, and gave it access to lucrative Gulf Coast oil and petrochemical industries. UP finally took over its coal partner and favored Chicago connection, Chicago & Northern Western, in 1995, but that same year BN bought Santa Fe, forcing UP to, in effect, retrace Harriman's steps in 1996 by taking an ailing Southern Pacific, which by then included the Rio Grande and the old Alton.

Through all of this growth, Union Pacific has kept its historic, original name and its identity, shield emblem (introduced in 1886), Armour yellow diesels, and all. — *Jeff Wilson, author of books on railroad history and model railroading*


UNION PACIFIC
CANADA
MONTANA
NORTH DAKOTA
MINNESOTA
SOUTH DAKOTA
WYOMING
NEBRASKA
IOWA
WISCONSIN
ILLINOIS
COLORADO
KANSAS
MISSOURI
NEW MEXICO
OKLAHOMA
ARKANSAS
TENNESSEE
MISSISSIPPI
LOUISIANA
TEXAS
MEXICO
Superior
Rights on BNSF
Rights on CN
Minneapolis-St. Paul
Rights on CP
Eau Claire
Winona
Wyeville
Sheboygan
Milwaukee
Caballo Jct.
Joint with BNSF
Shawnee Jct.
Rights on IANR
Janesville
Beloit
Cedar Rapids
Rockford
Chicago
Sioux City
South Morrill
Green River
Clinton
Chicago-Joliet is rights on CN
Joliet
Cheyenne
North Platte
Des Moines
Omaha
Craig
Lincoln
Gibbon
Union
Rights on BNSF
Springfield
Springfield-Barr is rights on Illinois & Midland
Denver
Superior
Fairbury
St. Joseph
Findlay
Grand Jct.
Colby
Rights on BNSF
Pana
Out of service
Abilene
Topeka
Kansas City
St. Louis
MI – Missouri-Illinois
Pueblo
Herington
Paola
Jefferson City
Mt. Vernon
Benton
Walsenburg
Hutchinson
Wichita
Winfield
Rights on SKOL
MI – Missouri-Illinois
Rights on BNSF
Poplar Bluff
Rights on BNSF
Tulsa
Wagoner
Muskogee
Memphis
Tucumcari
Amarillo
Chickasha
Oklahoma City
Little Rock
Lexa
Pine Bluff
Lubbock
Texarkana
Fort Worth
Dallas
Shreveport
El Paso
Corsicana
Sierra Blanca
Waco
Palestine
Alexandria
Hearne
Baton Rouge
Austin
Lake Charles
New Orleans
Houston
Del Rio
San Antonio
Galveston
Eagle Pass
Port Lavaca
Corpus Christi
Laredo
Brownsville
Rights on TRE
Rights on KCS
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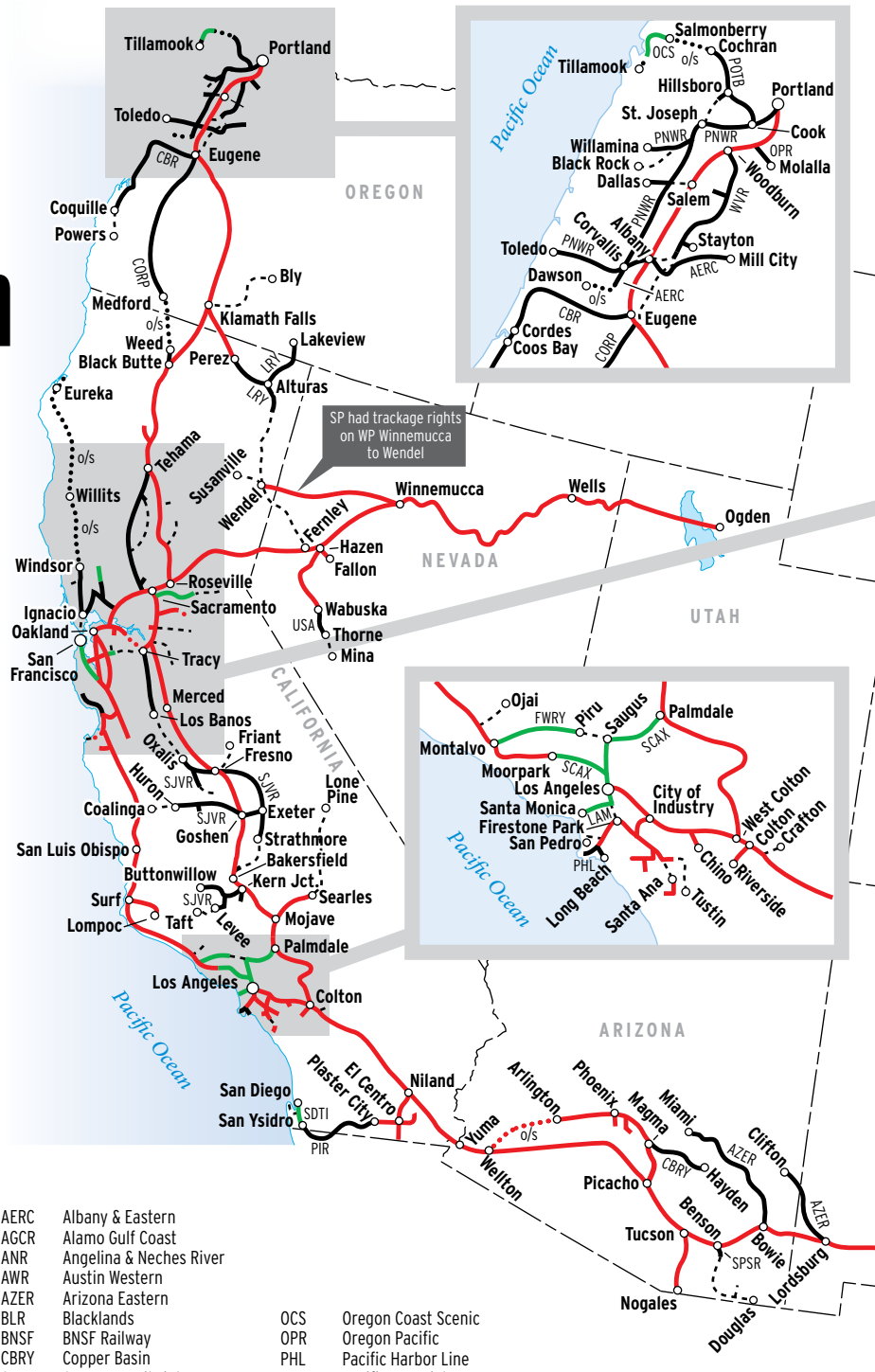
TRAINS: Jeff Wilson and Robert Wegner
Not all lines shown

Whatever happened to the Southern Pacific?

ONE HUNDRED YEARS AFTER the Golden Spike was driven, the promise of America's first transcontinental railroad had been amply fulfilled. West Coast lumber, paper, fruits and vegetables, and manufactured goods were rolling east across the Sierras, while auto parts flowed west to fuel a U.S. postwar boom. California's ballooning prosperity could be tied directly to that of the first transcontinental rail line's Western operator: Southern Pacific Railroad.

By 1969, Southern Pacific controlled a bowl-shaped 13,839-mile network that included not only the pioneering transcontinental route west of Ogden, Utah, but also encompassed half the trackage in California, nearly all the north-south routes along the West Coast, and a 1,566-mile subsidiary, the St. Louis Southwestern, that funneled growing volumes of traffic between Texas and the Midwest. The network of 1969 looked much like it did in 1932 (when SP took control of SSW, popularly called the "Cotton Belt"). The major losses had been SP's Mexico trackage, sold in 1951, portions of the El Paso & Southwestern (a Sunset Route competitor acquired in 1924), and a narrow-gauge operation that quit in 1960.

Southern Pacific generated 10 percent of U.S. railroading's ton-miles in 1969, and took 10 percent of its operating revenues. Even so, railroading's capital needs, shifting traffic patterns, and regulatory constraints pushed SP to diversify. A 1969 reorganization funneled the company's transportation, real estate, pipeline, and other operations into separate subsidiaries. But not all of the new ventures panned out; meanwhile, the capital-starved railroad began to crumble. Traffic fell off, and potential merger partners walked away. Abandonments and line sales began in the 1970s. What remained ultimately went to Union Pacific in 1996, an endgame that might have occurred in 1901 under UP Chairman E.H. Harriman, if not for President Theodore Roosevelt's trust-busting fervor. — *Matt Van Hattem*



AERC	Albany & Eastern
AGCR	Alamo Gulf Coast
ANR	Angelina & Neches River
AWR	Austin Western
AZER	Arizona Eastern
BLR	Blacklands
BNSF	BNSF Railway
CBRY	Copper Basin
CBR	Coos Bay Rail Link
CFNR	California Northern
CMR	Capitol Metro Rail
CORP	Central Oregon & Pacific
DART	Dallas Area Rapid Transit
DGNO	Dallas, Garland & Northeastern
FWRY	Fillmore & Western
FWWR	Fort Worth & Western
JPBX	Caltrain
KCS	Kansas City Southern
LAM	Los Angeles Metrorail
LDRR	Louisiana & Delta
LRY	Lake
MP	Missouri Pacific
NCRY	Niles Canyon
NVRR	Napa Valley Wine Train
NWP	Northwestern Pacific
OCS	Oregon Coast Scenic
OPR	Oregon Pacific
PHL	Pacific Harbor Line
PIR	Pacific Imperial
PNWR	Portland & Western
POTB	Port of Tillamook Bay
SCAX	Metrolink
SCMB	Santa Cruz & Monterey Bay
SDTI	San Diego Trolley
SHEL	Shell Oil
SJVR	San Joaquin Valley
SPSR	San Pedro & Southwestern
SRT	Sacramento Rapid Transit
SS	Sacramento Southern
SSW	St. Louis Southwestern
RI	Rock Island
TXGN	Texas, Gonzales & Northern
USA	U.S. Army
WP	Western Pacific
WVR	Willamette Valley


SOUTHERN PACIFIC LINES
Pacific Ocean
Willits
o/s
Tehama
Wyo
Chico
Stirling City
Oroville
Marysville
Roseville
Harrington
Calistoga
Windsor
Rocktram
Schellville
Sebastopol
Krug
NVRR
NWP
CFNR
Davis
Sacramento
SS
SRT
Folsom
Placerville
Ione
Ignacio
Sausalito
Oakland
San Francisco
Isleton
Lodi
Stockton
Oakdale
Lathrop
Tracy
Redwood City
NCRY
JPBX
San Jose
Santa Cruz
SCMB
Watsonville Jct.
Pacific Grove
Castroville
Hollister
Los Banos
Merced
BNSF owns route from Iowa Jct. to West Bridge Jct. (Avondale)
De Ridder
Lake Charles
Iowa Jct.
Eunice
Lafayette
LDRR
New Iberia
BNSF
Lake Arthur
Abbeville
Baldwin
Bayou Sale
New Orleans
Algiers
Davids
Cypremort
Schriever
Houma
Jay
Avondale
Gulf of Mexico
MISSOURI
ILLINOIS
East St. Louis
SSW had trackage rights on MP Thebes to East St. Louis
SSW/MP jointly owned Illmo to Thebes
Thebes
Illmo
Wyatt
New Madrid
Malden
Paragould
Caruthersville
Blytheville
Trumann
TENN.
Memphis
Brinkley
Little Rock
Altheimer
Pine Bluff
Stuttgart
Gillett
SSW had trackage rights on RI Brinkley to Memphis
Hempstead
Eureka
Dayton
Baytown
Eagle Lake
Helms
Altair
Wharton
KCS
Rosenberg
Houston
Guy
Galveston
ARKANSAS
RI owned Santa Rosa to Tucumcari, but the SP/RI interchange was Tucumcari
NEW MEXICO
Tucumcari
Santa Rosa
Carrizozo
El Paso
Sierra Blanca
Alpine
Denison
BNSF
Sherman
DGNO
McKinney
Carrollton
Plano
KCS
Wylie
FWWR
DART
Dallas
Briggs
Greenville
Paris
Sulphur Springs
Mt. Pleasant
BLR
Lewisville
Fort Worth
SHEL
Shreveport
Ennis
Corsicana
Athens
Tyler
Jacksonville
LOUISIANA
Alexandria
Cheneyville
Lafayette
Waco
Gatesville
Bremond
Nacogdoches
ANR
Lufkin
De Ridder
Dunagan
Eunice
Hearne
Llano
AWR
AWR/CMR
Kerrville
Leander
Austin
Hempstead
Giddings
Beckman
Camp Stanley
AGCR
Flatonia
San Antonio
Spofford
TXGN
Beaumont
Port Arthur
Lake Arthur
Lake Charles
New Orleans
BNSF owns trackage from Iowa Jct. to West Bridge Jct. (Avondale)
Elmendorf
Cuero
Rosenberg
Houston
Galveston
Eagle Pass
Victoria
Palacios
Port Lavaca
Beeville
Coleto Creek
Sinton
Rockport
Alice
Corpus Christi
Edinburg
McAllen
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Gulf of Mexico
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RAILROAD ENGINEERING

Operations, infrastructure, and tonnage

EVERY TRAIN THAT ARRIVES AT ITS DESTINATION is a victory in the daily battles railroads wage against topography, weather conditions, train weights, and the constraints of their own infrastructure. These are the struggles that form the drama of railroading, witnessed in the surge of a throttling locomotive, the groan of a freight car wheel coaxing a heavy load forward, or a train slowed but not stopped by a tough mountain grade. The idea of using a wheel on a rail for transportation has been around for centuries, yet new advances in technology, engineering, and operations keep making that good idea even better. The result, for the United States, is a railroad network that's more robust and efficient than ever.

Powder River Basin loaded and empty coal trains meet at Melbeta, Neb., on Union Pacific's South Morrill Subdivision in June 2000. TRAINS: **Matt Van Hattem**

US ton-miles: 1978-2008

The volume of work Class I railroads handle has doubled in 30 years, albeit with fewer names

THE UNDENIABLE TRIUMPH OF U.S. RAILROADING can be seen in this graph of revenue ton-miles: the most basic unit of measurement (hauling one ton of freight one mile) for the work railroads perform. The data for this illustration came from the Association of American Railroads, and are confined to Class I railroads, the largest group of railroads by revenue and mileage.

(The Surface Transportation Board and its predecessor, the Interstate Commerce Commission, established thresholds for what constitutes a Class I railroad based on operating revenues. The threshold is adjusted each year for inflation.)

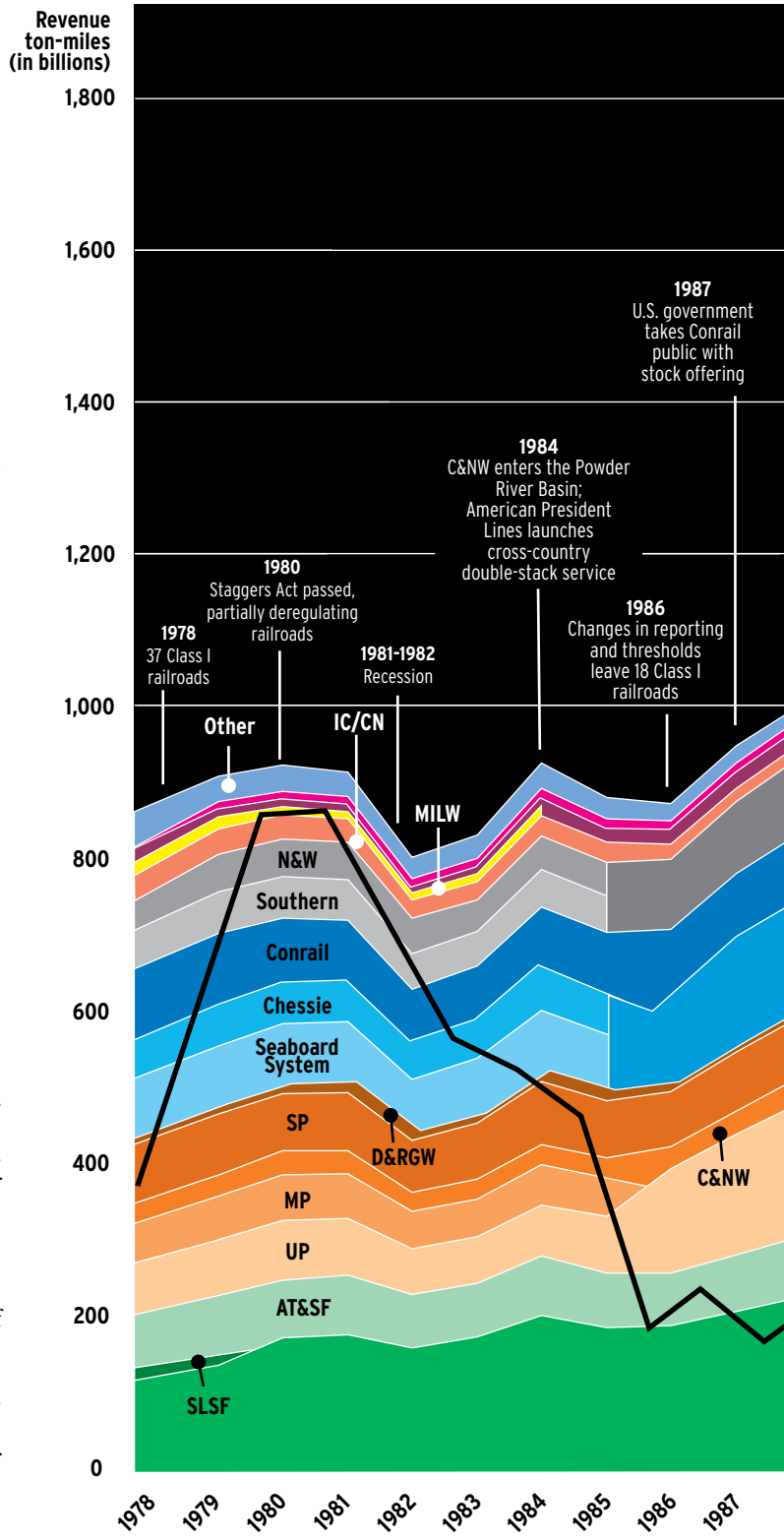
It took 24 years (1944-1968) for railroads to regain the volume of ton-miles they moved at the height of World War II. Yet in that same span, rail's share of U.S. intercity freight traffic fell from 69 percent to 41 percent, as new highways and suburbs created a demand for shorter-haul moves that trucks easily captured. Between 1968 and 1978, as railroad ton-miles grew another 15 percent, their share of freight fell to 36 percent.

Given what preceded it, the 1978-2008 period shown here represents something remarkable. Deregulation gave railroads the ability to price traffic competitively, while mergers helped railroads economize, and enabled them to rationalize and upgrade the mainline network to handle volumes that would have been unthinkable years earlier. The boom in traffic came primarily from two sources: cross-country intermodal shipments and demand for low-sulfur coal from Wyoming's Powder River Basin. (Intermodal loadings grew by a factor of four between 1980 and 2006.) Both commodities exploited what American railroads do best: carry huge volumes long distances. (The average length of haul for a train in 1980 was 616 miles; in 2008, it was 919 miles.)

In those three decades, the actual tons originated by Class I railroads grew about 30 percent, while ton-miles jumped a whopping 105 percent, reaching 1.8 trillion in 2008. All of this occurred even as the number of Class I route-miles shrunk 43 percent. (Today's Class I railroads control two-thirds of the total U.S. rail network.) Where each Class I route-mile in 1980 carried 5.6 million revenue tons on average, in 2006 each route-mile handled 18.66 million tons. This growth enabled railroads to turn a corner in the mid-1990s and begin capturing more of the total U.S. freight ton-miles, after decades of losing market share to trucks.

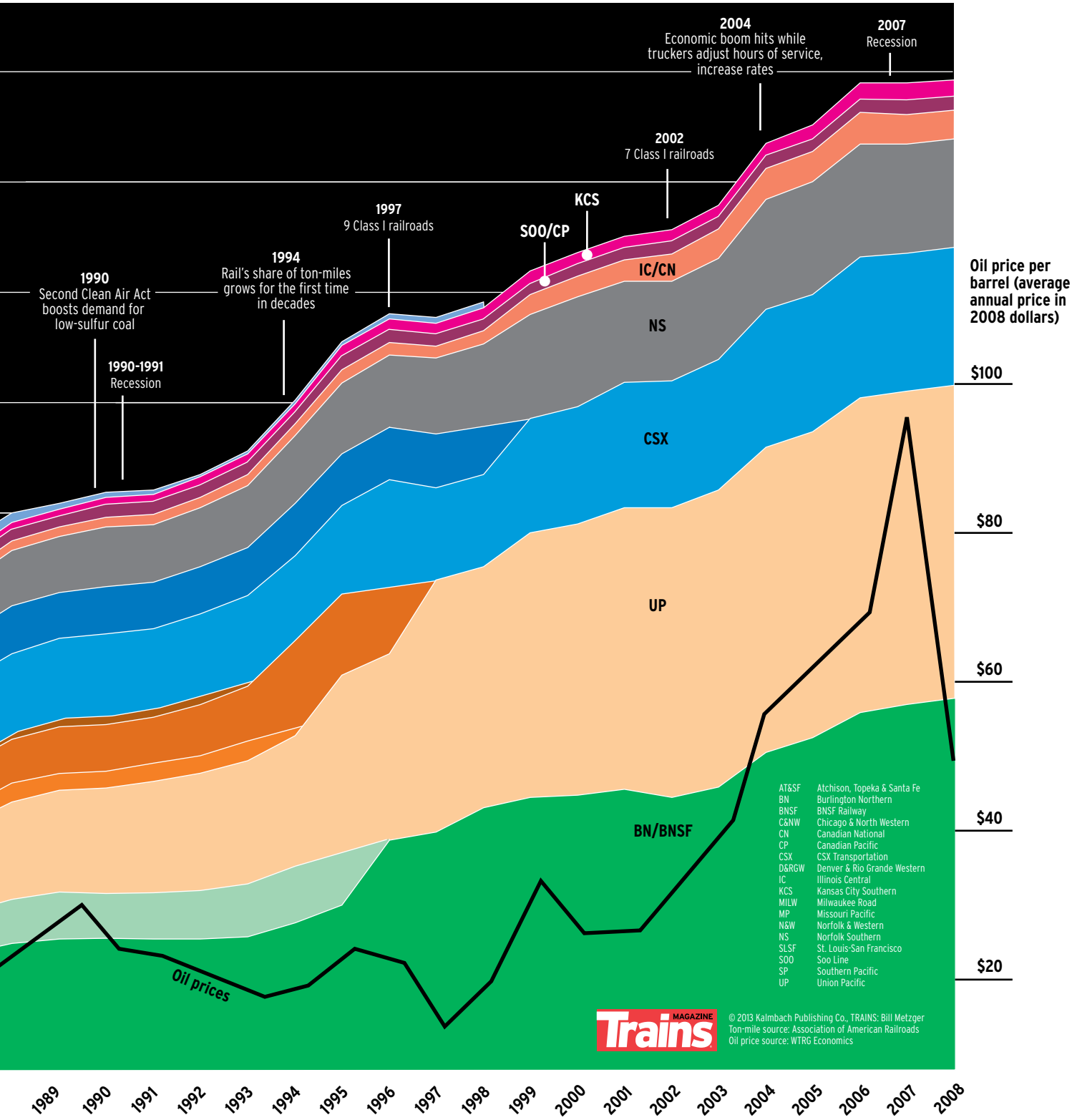
Of course, the names have changed since 1978, and the number of Class I railroads has dropped from 37 to seven. That decline is a product both of mergers and reporting requirements. "If the definition of a Class I railroad in 1980 had been the same as it was in 2007, there would have been 26 Class I railroads in 1980," the AAR notes. Recent acquisitions have actually brought the volumes from routes of smaller railroads like Delaware & Hudson and Bessemer & Lake Erie back into the Class I fold, decades after changing thresholds had dropped them from the list.

BNSF Railway is the ton-mile king, with 37 percent of the 2008 total. (BNSF's ton-miles from coal alone exceed the total ton-miles moved by either CSX or Norfolk Southern.) Union Pacific is close behind, at 32 percent. CSX captured 14 percent, Norfolk Southern 11, Canadian National 3, Kansas City Southern 2, and Canadian Pacific 1 percent. — *Curtis W. Richards*



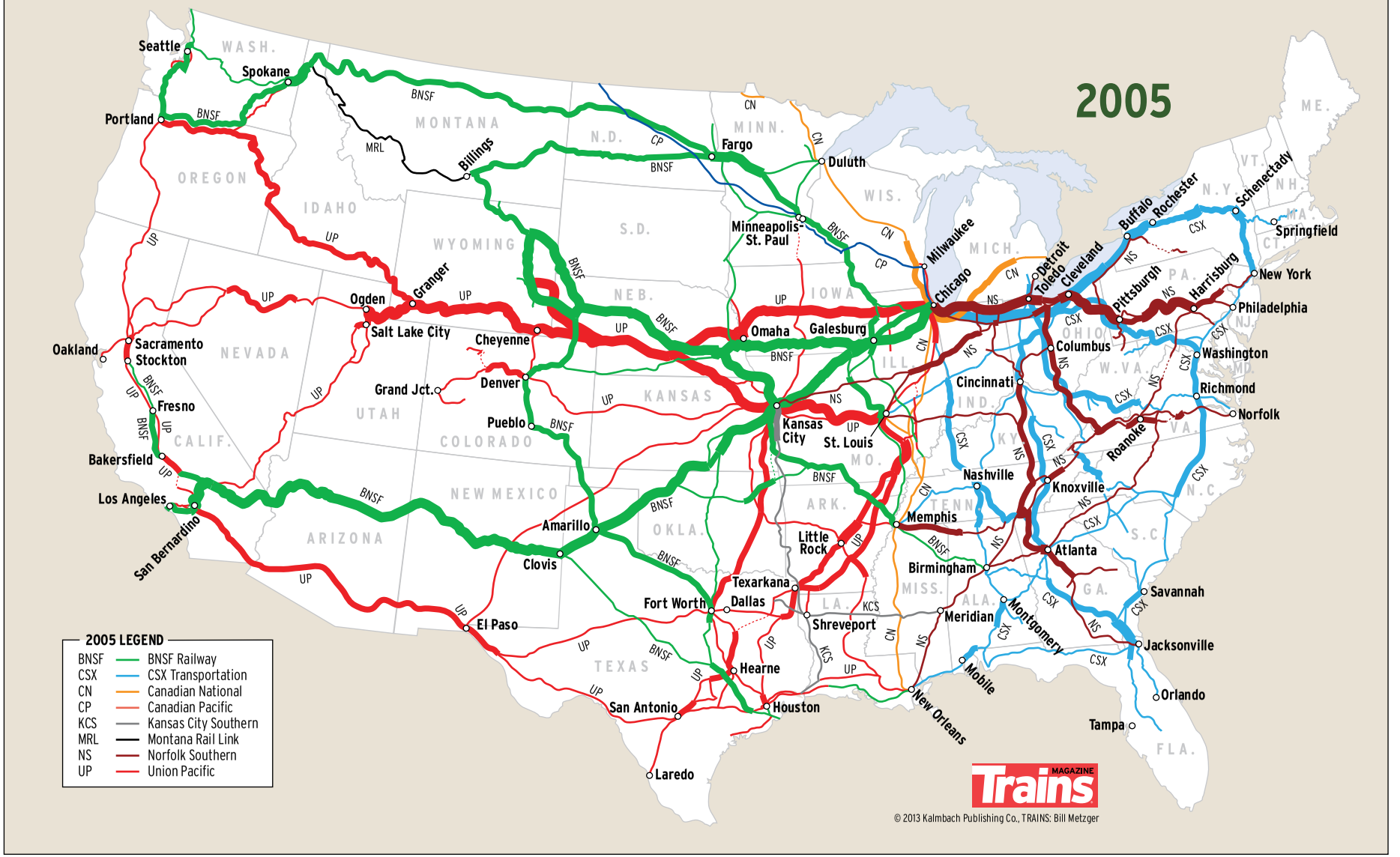
Clarifying the ton-miles

- **"Other"** category comprises: Bessemer & Lake Erie (before 1985), Boston & Maine (before 1989), Delaware & Hudson (before 1988), Detroit, Toledo & Ironton (before 1984), Duluth, Missabe & Iron Range (before 1985), Elgin, Joliet & Eastern (before 1986), Florida East Coast (before 1992), Grand Trunk Western (before 1999), Long Island (before 1983), Missouri-Kansas-Texas (before 1989), Pittsburgh & Lake Erie (before 1985), Rock Island (1978 only), and Western Pacific (before 1986)



- Burlington Northern changes to BNSF Railway in 1996. BN figures include Colorado & Southern and Fort Worth & Denver (1978 through 1981)
- Chessie System figures include Baltimore & Ohio and Chesapeake & Ohio (1978 through 1985), and Western Maryland (1978 through 1983)
- Illinois Central changes to Canadian National in 1999, and includes Grand Trunk Western (1999 through 2001, when separate GTW reporting ended)
- Seaboard System figures include Clinchfield and Louisville & Nashville (1978 through 1982)
- Southern Pacific figures include St. Louis Southwestern (1978 through 1989)

Mainline tonnage: 1980/2005



We map the changes in tonnage on America's busiest railroad lines across one landmark quarter-century

TWENTY-FIVE YEARS SEPARATE THESE TWO MAPS showing the busiest freight railroad lines in the United States.

The 1980 map depicts American railroads at the end of regulation — the Staggers Rail Act of 1980 was signed into law on Oct. 14. With merger provisions streamlined, railroads combined into successively larger systems, cementing their claims on key routes and markets. Meanwhile, rate-making freedom enabled railroads to begin earning better rates of return, which in turn prompted investments in physical plant and equipment to meet surging traffic levels, notably low-sulfur coal from Wyoming's Powder River Basin and imported goods from Asia arriving at port cities.

Perhaps most remarkable is that by 2005 American railroads were carrying nearly twice as much as they had 25 years before. Revenue ton-miles skyrocketed from 918 billion in 1980 to 1.7 trillion in 2005. Two routes experienced a threefold increase in tonnage: Union Pacific's Overland Route and BNSF's Transcon. — *Curtis W. Richards*

Tonnage by state: 2010

See where your state ranks in tons originated and terminated

WYOMING MAY RANK LAST in population, but this sparsely settled state produced 1 out of every 4 tons of freight originated on U.S. railroads in 2010.

That's an impressive step up even from the 1 in 5 tons originated by Wyoming in 2004 (as TRAINS mapped in its March 2006 issue). The 476.8 million tons that moved by rail out of Wyoming in 2010 was four times the amount of the next highest state, Illinois. And almost all of Wyoming's tonnage came from one busy line that slices through the Powder River Basin coal fields. The Association of American Railroads amassed the data shown here, using the Surface Transportation Board's 2010 waybill samples.

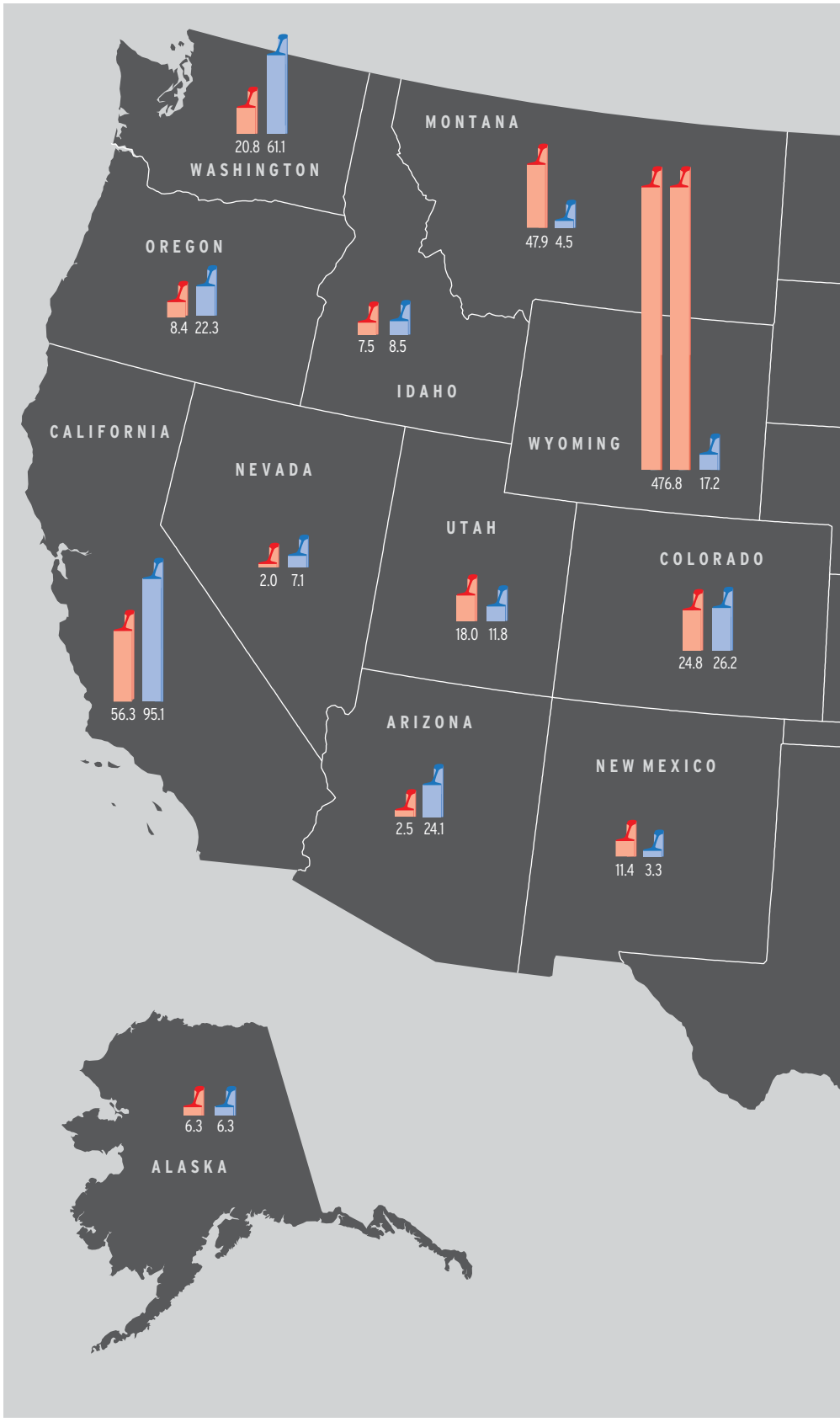
States with abundant natural resources were the top tonnage generators for U.S. railroads. In fact, half the rail tons originated in 2010 came from just six states — Wyoming, Illinois, West Virginia, Minnesota, Texas, and Kentucky — all large producers of coal, oil, natural gas, grain, and iron ore.

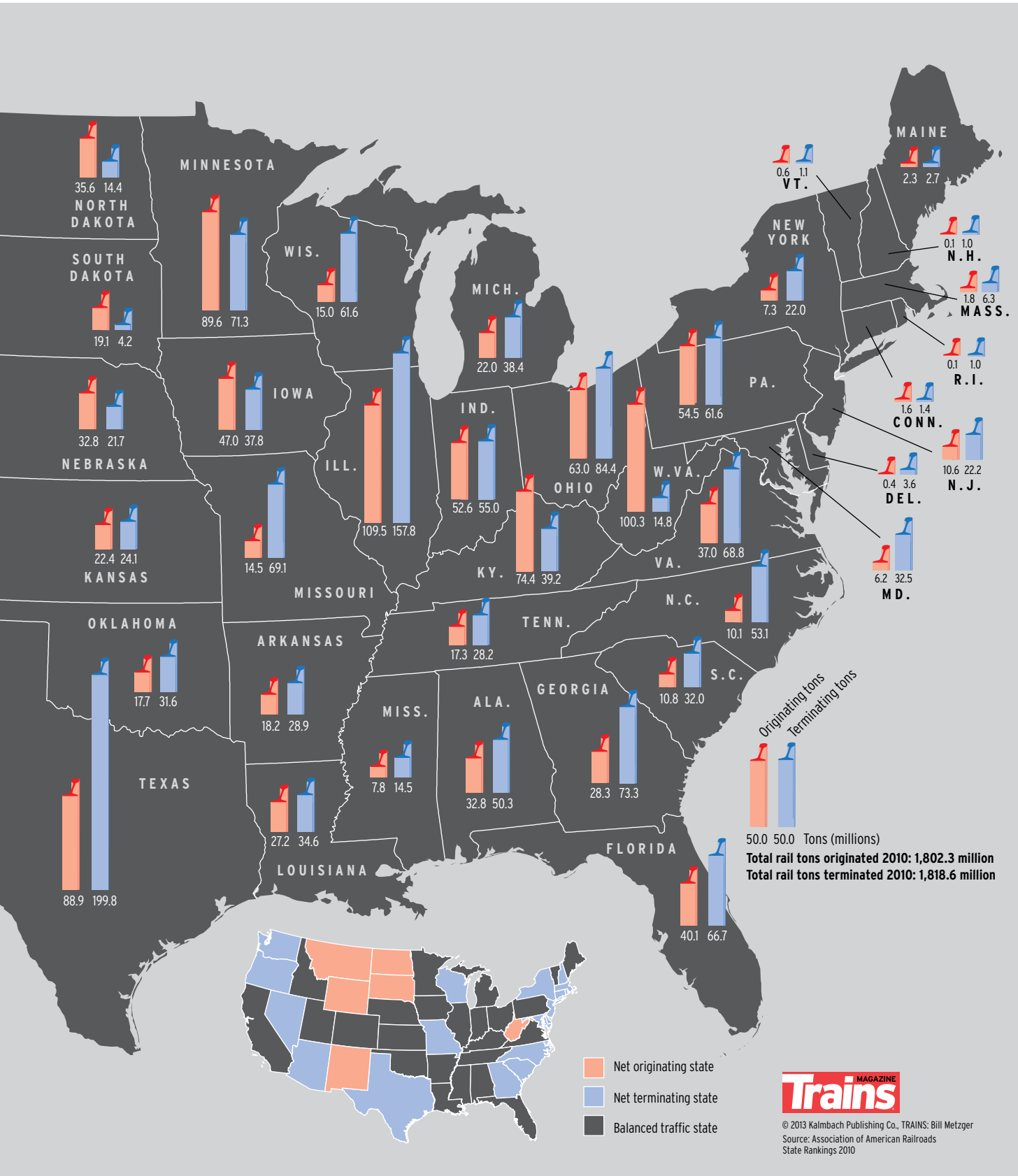
Coal accounted for 46 percent of all rail tons originated in 2010, with 55 percent of that coal coming from Wyoming, 11 percent from West Virginia, and 8 percent from Kentucky. Grain (the second largest tonnage generator, and 9 percent of all rail tons originated) and iron ore helped put Minnesota and Illinois in the top five.

States that led in terminating tonnage are, in order: Texas, Illinois, California, Ohio, Georgia, Minnesota, Missouri, Virginia, Florida, and Wisconsin. The top five of these states combined took 1 of every 3 rail tons terminated, and all 10 states together terminated half of all U.S. rail tons. This correlates somewhat to consumer demand, since six of the top receivers are among the top 10 most populated states, but busy ports also helped make states like Minnesota a top receiver.

The inset map depicts states as originators (at least twice as much tonnage originated than terminated), terminators, or balanced regions.

Total rail tons originated in the U.S. in 2010 was nearly identical to the volume of 2004, although Wyoming, Minnesota, North Dakota, and Nebraska saw major increases. — *Matt Van Hattem*

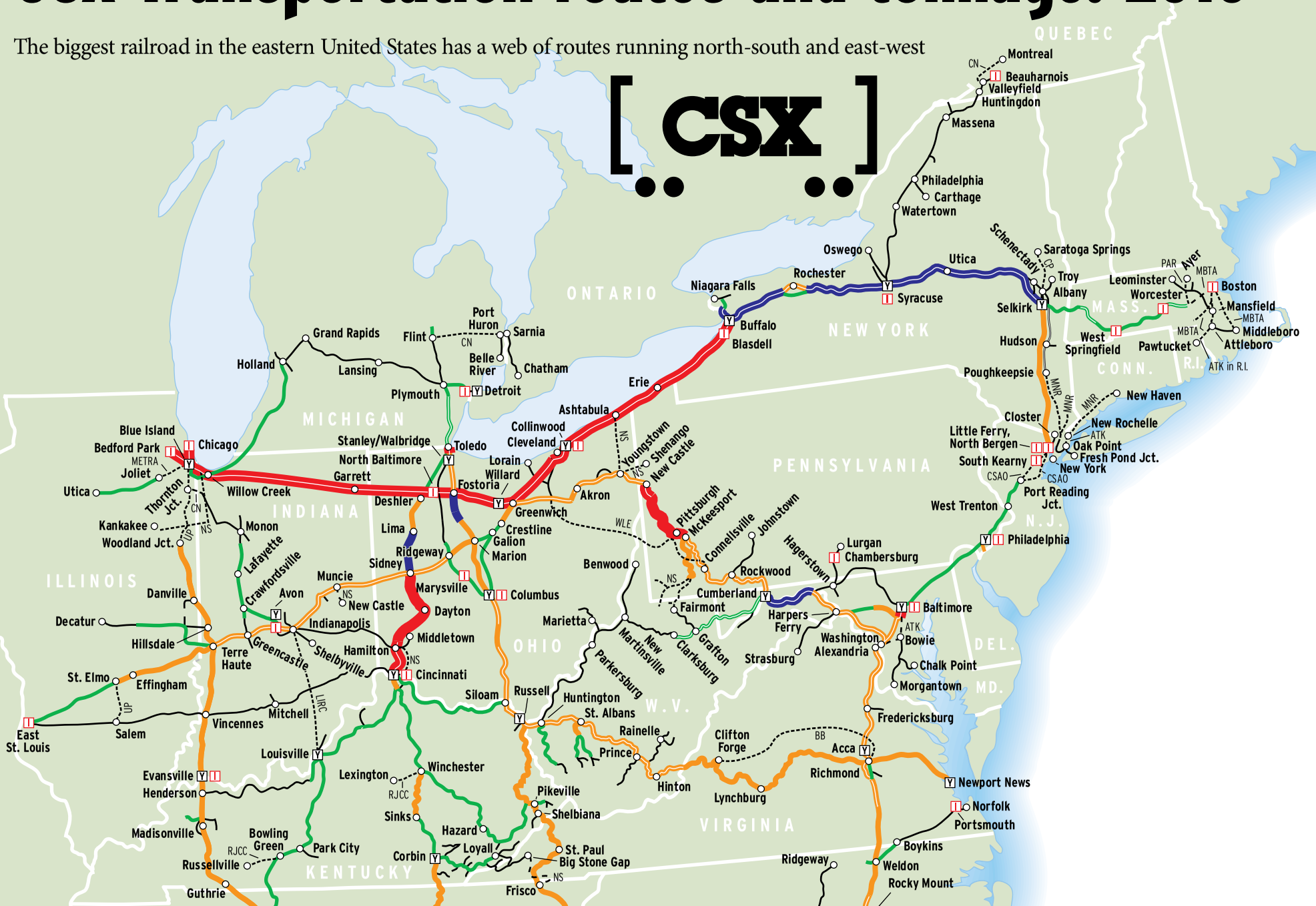


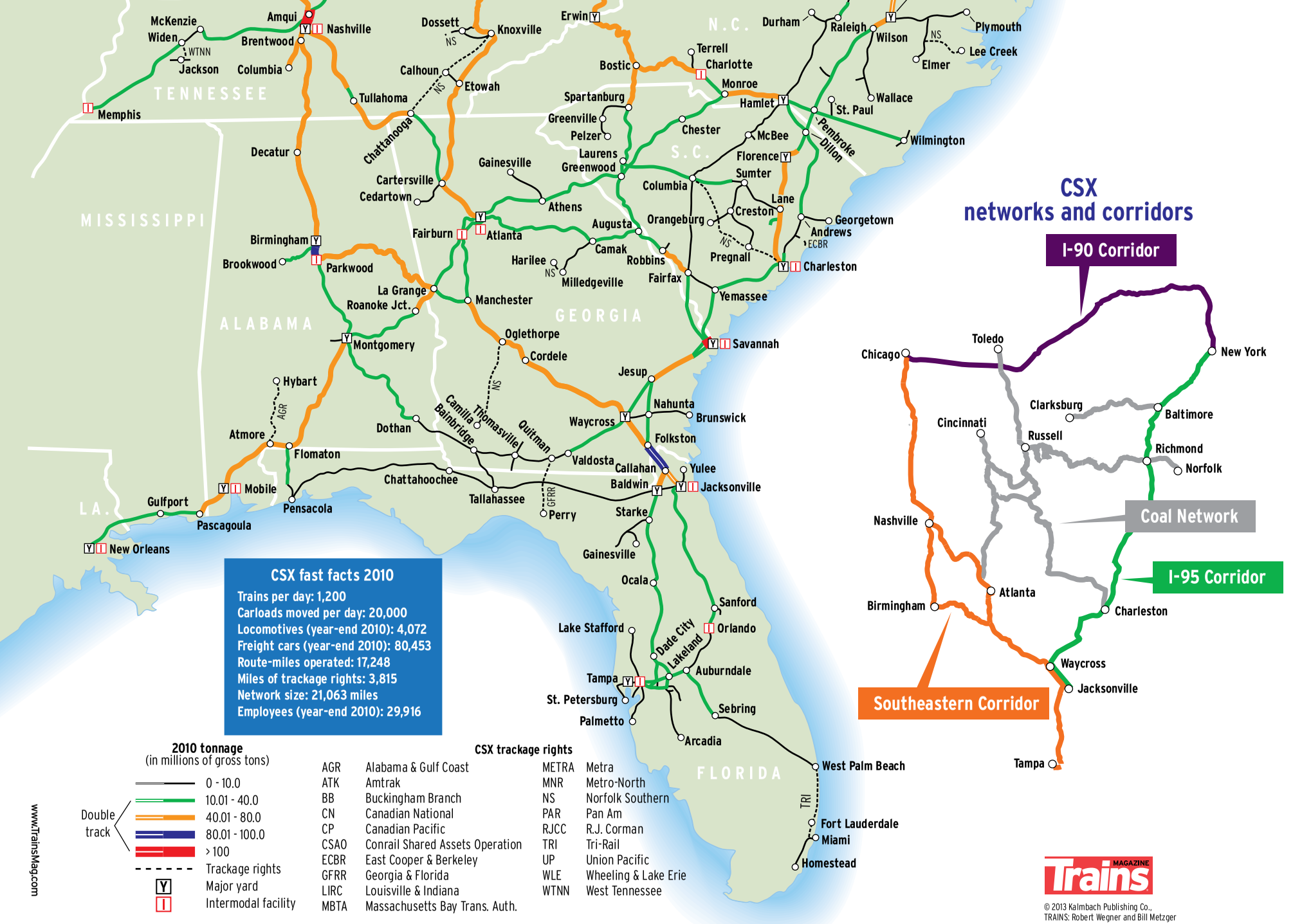


Source: Association of American Railroads
State Rankings 2010

CSX Transportation routes and tonnage: 2010

The biggest railroad in the eastern United States has a web of routes running north-south and east-west





CSX fast facts 2010

Trains per day: 1,200
Carloads moved per day: 20,000
Locomotives (year-end 2010): 4,072
Freight cars (year-end 2010): 80,453
Route-miles operated: 17,248
Miles of trackage rights: 3,815
Network size: 21,063 miles
Employees (year-end 2010): 29,916

2010 tonnage
(in millions of gross tons)

Double track:
- 0 - 10.0
- 10.01 - 40.0
- 40.01 - 80.0
- 80.01 - 100.0
- > 100

Trackage rights
Major yard
Intermodal facility

CSX trackage rights

AGR	Alabama & Gulf Coast
ATK	Amtrak
BB	Buckingham Branch
CN	Canadian National
CP	Canadian Pacific
CSAO	Conrail Shared Assets Operation
ECBR	East Cooper & Berkeley
GFRR	Georgia & Florida
LIRC	Louisville & Indiana
MBTA	Massachusetts Bay Trans. Auth.
METRA	Metra
MNR	Metro-North
NS	Norfolk Southern
PAR	Pan Am
RJCC	R.J. Corman
TRI	Tri-Rail
UP	Union Pacific
WLE	Wheeling & Lake Erie
WTNN	West Tennessee

CSX networks and corridors

Union Pacific trains per day: 2003

We map the average daily train volumes and tons per train on America's largest railroad

THIS MAP REFLECTS AN AVERAGE DAY for the Union Pacific Railroad in late 2003. The average number of trains per day is indicated above each major line segment except where data is not available. These numbers have changed little from the UP trains-per-day map published in the November 2001 issue of TRAINS, except for the Sunset Route between West Colton, Calif., and El Paso, Texas, where train counts grew by about eight per day across the territory.

Traffic-density maps typically show gross ton-miles averaged over a year, rather than the number of trains that run on an average day. In the regulated era before 1980, trains-per-day maps were rare. Traffic patterns evolved slowly and railroads were small enough that everyone knew the patterns and the trends. Traffic varied seasonally, depending on whether a line was dominated by harvest moving to market in the fall, heating coal moving to cities in the winter, lumber moving for the summer construction season, or perishables moving in packing season.

Trains-per-day maps today are useful for planners and confirm what a chief dispatcher already knows. But such maps don't readily indicate the type of train. A light helper running downhill after helping a 17,500-ton coal train to the top of a grade counts the same as the train it just helped. When tonnage and train counts are considered together, as they are on this map, some nature of the type of train appears. Lines with very light tonnages surrounded by lines with heavy tonnages indicates the presence of light helpers, such as Beaumont to West Colton, Calif.; or empty moves only, such as Hiawatha to Marysville, Kan., where the traffic is predominately empty coal trains returning from the Kansas City gateway to Wyoming's Powder River Basin. Heavy tonnage lines show the presence of bulk moves in both directions, or a highly advantageous load-empty ratio. The latter is characteristic of the Chemical Coast of Louisiana and Texas, where intermediate feedstocks move between petrochemical plants and product flows outward.

Line segments showing 5,000 to 6,999-ton trains might seem unimpressive, but it's worth recalling that in the steam era any line that regularly ran trains of more than 5,000 tons was unusual.

— *Mark W. Hemphill*


UNION PACIFIC
MINNESOTA
WISCONSIN
MINNEAPOLIS-ST. PAUL
Valley Park
St. James
Adams
Sheboygan
Milwaukee
Caballo Jct.
WYOMING
Bill
Shawnee Jct.
IOWA
Mason City
California Jct.
Janesville
Sioux City
Missouri Valley
South Morrill
NEBRASKA
Nelson
CHICAGO
Green River
Egbert
Fremont
KC Jct.
Clinton
West Chicago
Joliet
Cheyenne
North Platte
Gibbon Jct.
OMAHA
Council Bluffs
Des Moines
Axial
O'Fallons
Hiawatha
ILL.
Woodland Jct.
DENVER
KANSAS CITY
Ridgely
Findlay Jct.
Bond
Marysville
Topeka
Oakley
Salina
ST. LOUIS
Grand Jct.
KANSAS
Herington
Paola
Jefferson City
Salem
Arco
Pueblo
Hutchinson
Mt. Vernon
COLORADO
Wichita
Parsons
Gorham
MISSOURI
Coffeyville
Poplar Bluff
Stratford
Dexter Jct.
Dalhart
OKLA.
ARKANSAS
Jonesboro
NEW MEXICO
Wagoner
Muskogee
Bald Knob
Wynne
TENN.
Vaughn
Chickasha
Van Buren
MEMPHIS
Brinkley
North Little Rock
Pine Bluff
TEXAS
Chico
Texarkana
Lewisville
Lordsburg
FORT WORTH
Big Sandy
LA.
Shreveport
Sweetwater
Longview
Marshall
EL PASO
Corsicana
Alexandria
Waco
Palestine
Sierra Blanca
Taylor
Hearne
Kinder
Livonia
Round Rock
Sanderson
San Marcos
SAN ANTONIO
Lake Charles
Iowa Jct.
Lafayette
NEW ORLEANS (Avondale)
Spofford
Eagle Pass
Flatonia
HOUSTON
Beaumont
Angleton
Bloomington
Odem
Corpus Christi
Robstown
Laredo
Brownsville

Traffic over the divide: 1980/2000

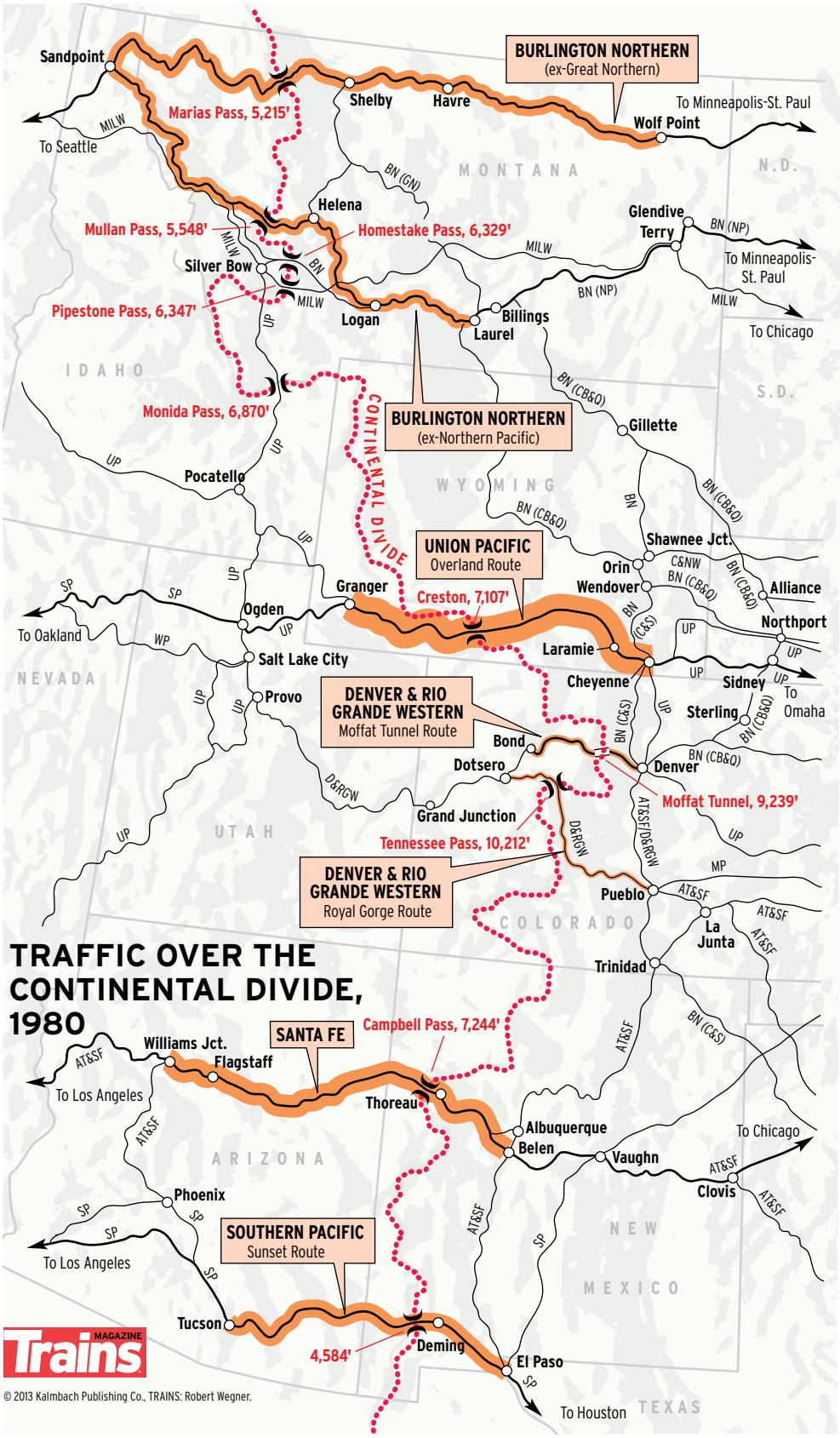
Not all transcontinental routes are created equal. Comparing 1980 to 2000, here's why some lines have won and others lost

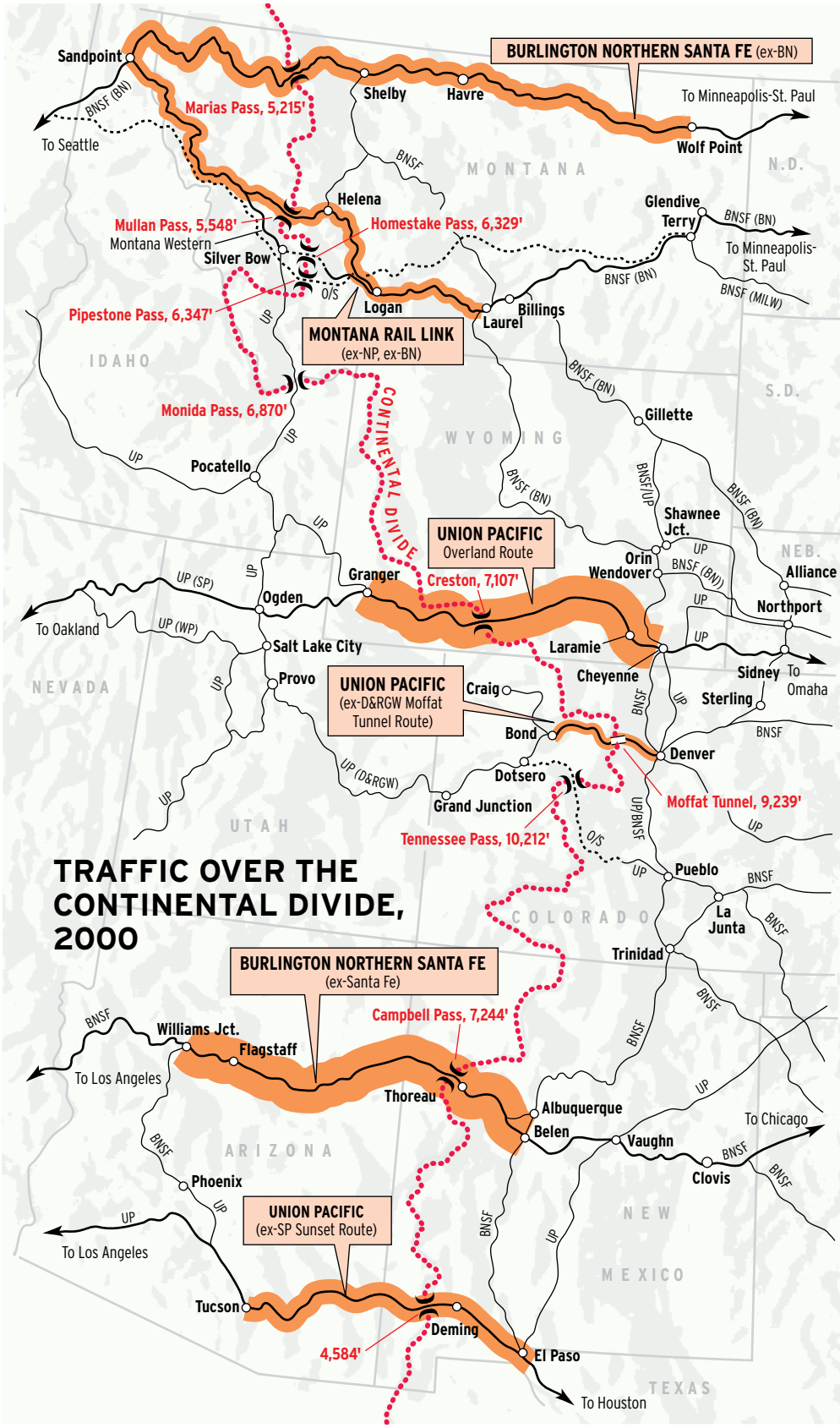
THIS IS A SNAPSHOT OF TRAFFIC across the Continental Divide in 1980 and 2000 on U.S. transcontinental routes. It's inherent in mapmaking that accuracy gets sacrificed on the altar of clarity. Traffic density is by no means uniform across the shaded line segments, and a slightly different picture would emerge were the snapshots taken in the years preceding or following.

Traffic has increased unequally, proving that as railroading entered its third century in North America, topographic features, political boundaries, and strategic position could not be written off as historical conditions. But these conditions do not always affect routes in impartial measure.

Consider the Sunset Route. It has the lowest and easiest rail crossing of the divide in the U.S., occurring at an unnamed point about 3 miles west of Wilna, N.M. Traffic growth on the Sunset, mostly containers moving from and to the ports of Los Angeles and Long Beach, Calif., has been less than half the growth enjoyed by its close competitor, the former Santa Fe — a route which has so completely dominated transcontinental traffic it's become known as "the Transcon." The difference is strategic position: the Santa Fe shoots straight to Chicago while the Sunset does not, making irrelevant the higher elevation of Santa Fe's crossing at Campbell Pass (also Campbell's; either way, a name fallen into disuse).

Elevation and difficulty of approach matter greatly for the two Colorado crossings. It makes them disproportionately expensive to operate. Paradoxically the Rio Grande, with the two worst crossings of the divide, was helpless to consolidate its traffic to one line because of its strategic need to maintain connections at both Denver and Pueblo, and deliver coal to Denver. Union Pacific, acquiring these routes with its 1996 merger with Southern Pacific, in effect moved the connection





points from Denver and Pueblo all the way east to Chicago and Kansas City, and, by consolidating coal traffic to the Moffat Tunnel Route, accomplished what had flummoxed the Rio Grande for half a century.

Union Pacific's Overland Route, the transcontinental tonnage champion throughout the 20th century, by now may be surpassed by the Santa Fe. The Overland already has fewer trains, but has a higher proportion of heavy commodities, notably grain and soda ash. Capacity constraints that dog the Sunset Route aren't a big issue on the Overland, which is all multiple-main-track.

Nor is capacity lacking in Montana despite the loss of two of four mainline crossings of the divide since 1980. Neither the Great Northern nor the Northern Pacific routes, lacking a huge population center at their western end and constrained in their natural territory by the Canadian border, has the same prospects for traffic growth as do the southern routes.

Engineering only gets you so far (as the Milwaukee Road discovered to its chagrin) — ultimately the railroad has to take you where you want to go. For the foreseeable future, that's Southern California. — *Mark W. Hemphill and Curtis W. Richards*

Rail tonnage across the Continental Divide: 1980 and 2000
(millions of gross tons)

Route	1980	2000	Net change	Percent change
Great Northern (BNSF)	34 MGT	63 MGT	+29	+85%
Northern Pacific (MRL)	24 MGT	30 MGT	+6	+24%
Union Pacific Overland Route	107 MGT	146 MGT	+39	+36%
D&RGW Moffat Tunnel Route (UP)	27 MGT	43 MGT	+16	+59%
D&RGW Royal Gorge Route (UP)	18 MGT	0 MGT	-18	-100%
Santa Fe (BNSF)	63 MGT	145 MGT	+82	+130%
Southern Pacific Sunset Route (UP)	46 MGT	79 MGT	+33	+78%

Snowsheds on BNSF's Marias Pass

BNSF Railway uses 11 snowsheds to protect its Rocky Mountain crossing

GREAT NORTHERN RAILWAY'S St. Paul, Minn.-Seattle transcontinental main line, now part of BNSF Railway, was built in the early 1890s as the northernmost such route in the United States, crossing the Continental Divide in the Lewis Range at Marias Pass, 5,215 feet above sea level. The Flathead National Forest and Lewis and Clark National Forest are south of the pass and Glacier National Park is to the north.

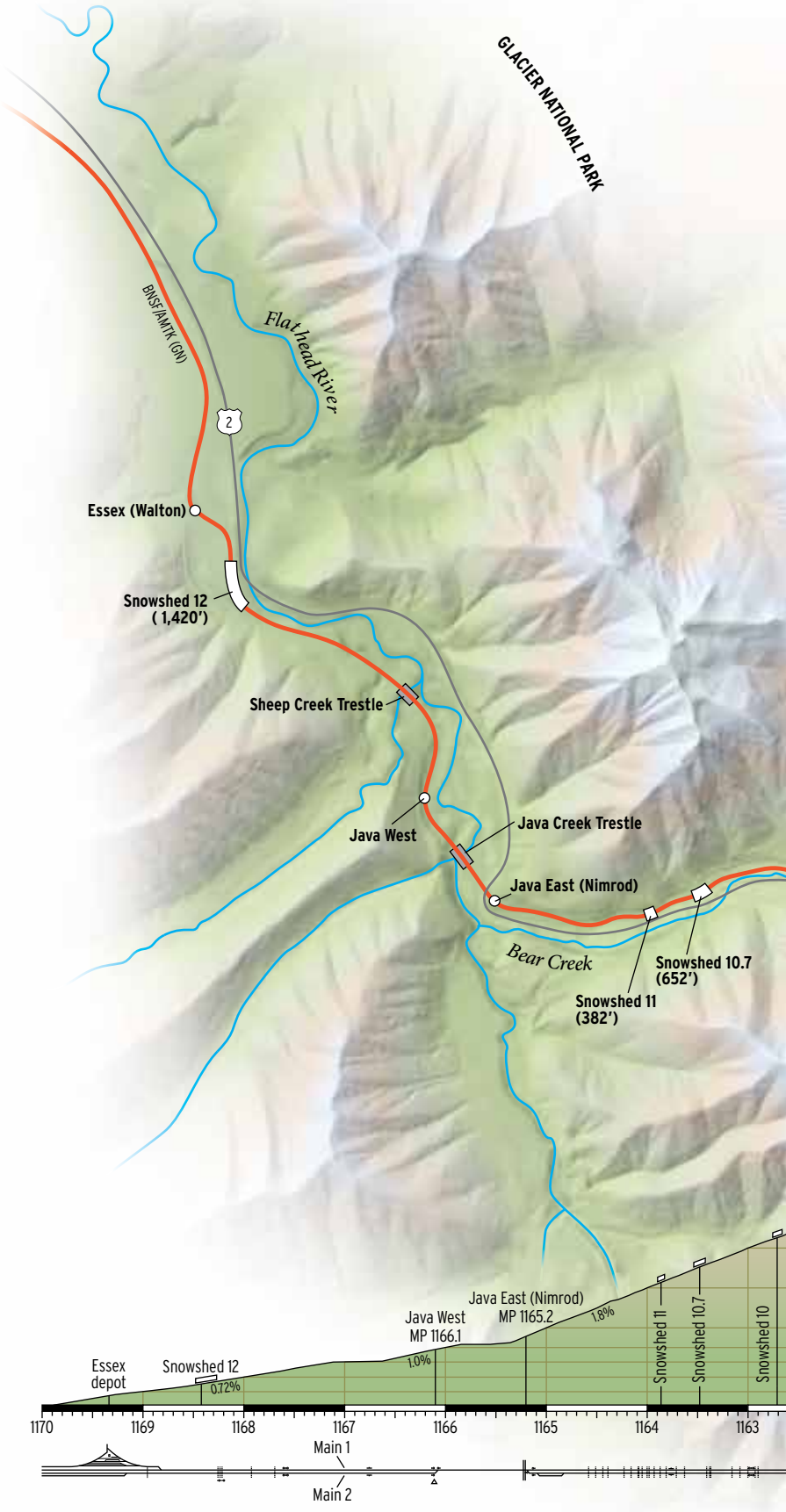
To aid operations, the railroad built snowsheds to protect the right-of-way, placing them at strategic spots throughout Marias Pass. Today, 11 sheds of various lengths are still used daily by BNSF, the shortest measuring 344 feet, and the longest 1,420 feet — placed end to end they stretch 1.3 miles. Found only on the west side of the pass, the sheds are spaced from just west of Blacktail, Mont., on the east to just east of Essex, Mont., on the west. One shed, 4C, burned down and was never rebuilt. Others have suffered non-critical fire damage of one form or another over the years and have been repaired.

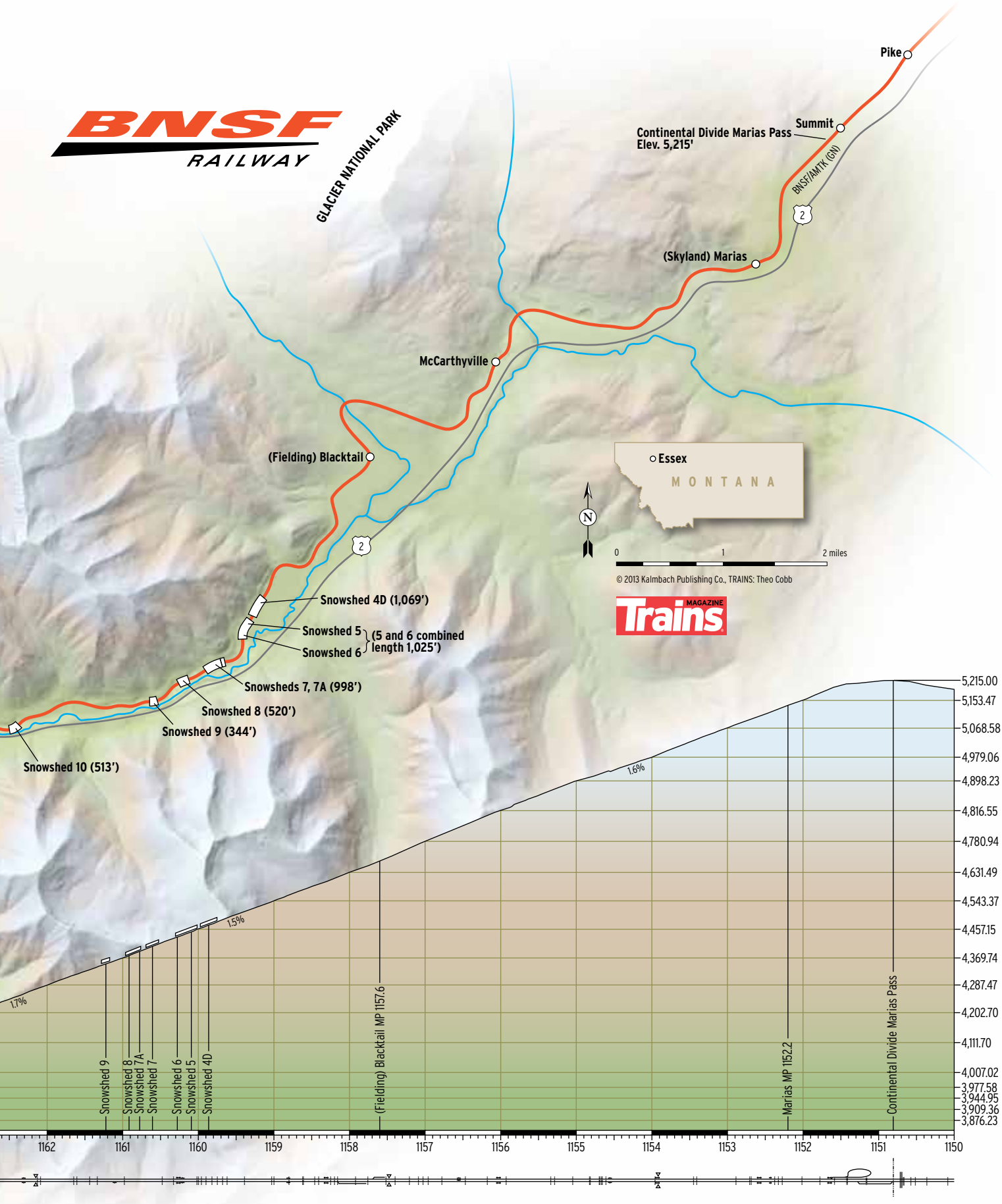
The Great Northern chose Douglas fir with which to construct the snowsheds. Some designs are fully enclosed, while others have an open side supported by vertical timbers. All are made using 1-foot-by-1-foot and 1-foot-by-1⅓-foot post timbers with cap timbers made from 20-foot-long 1-foot-by-1½-foot timbers. The roof timbers are 40-foot-long 1 by 1s. Many are reinforced with concrete, or have a concrete foundation. Workers regularly use shims to keep the sheds square, and Shed 9 even had concrete ties installed. Railroad workers are continuously engaged in an ongoing ground stabilization process by reinforcing the pillar foundations.

Great Northern records now kept by BNSF indicate that the snowsheds were originally covered with creosote. Today they are inspected on a regular basis by the Structures team of the Engineering Department, based at the railroad's headquarters in Fort Worth, Texas. BNSF inspectors regularly look at the snowsheds and notify Bridge and Building gangs whenever repairs are necessary. The timbers are completely retreated on a 15-year cycle. In 2007, BNSF said it had no plans for replacing or removing any of the remaining sheds. They're still doing their jobs — keeping trains safe from snowdrifts and avalanches in one of the most rugged parts of the North American railroad system.

Best of all, the sheds are visible from public places. Amtrak's *Empire Builder* crosses the pass, and many of the most spectacular sheds can be seen from adjacent U.S. 2. At Sheep Creek Trestle, also known as Goat Lick Trestle for the many mountain goats that flock to nearby salt deposits, an observation area provides a look at the railroad action as well as the living descendants of Great Northern's trademark.

— David Lustig, a Trains *correspondent*




BNSF RAILWAY
GLACIER NATIONAL PARK
Pike
Summit
Continental Divide Marias Pass
Elev. 5,215'
BNSF/AMTK (GN)
2
(Skyland) Marias
McCarthyville
(Fielding) Blacktail
Essex
MONTANA
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1
2 miles
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Trains MAGAZINE
Snowshed 4D (1,069')
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(5 and 6 combined length 1,025')
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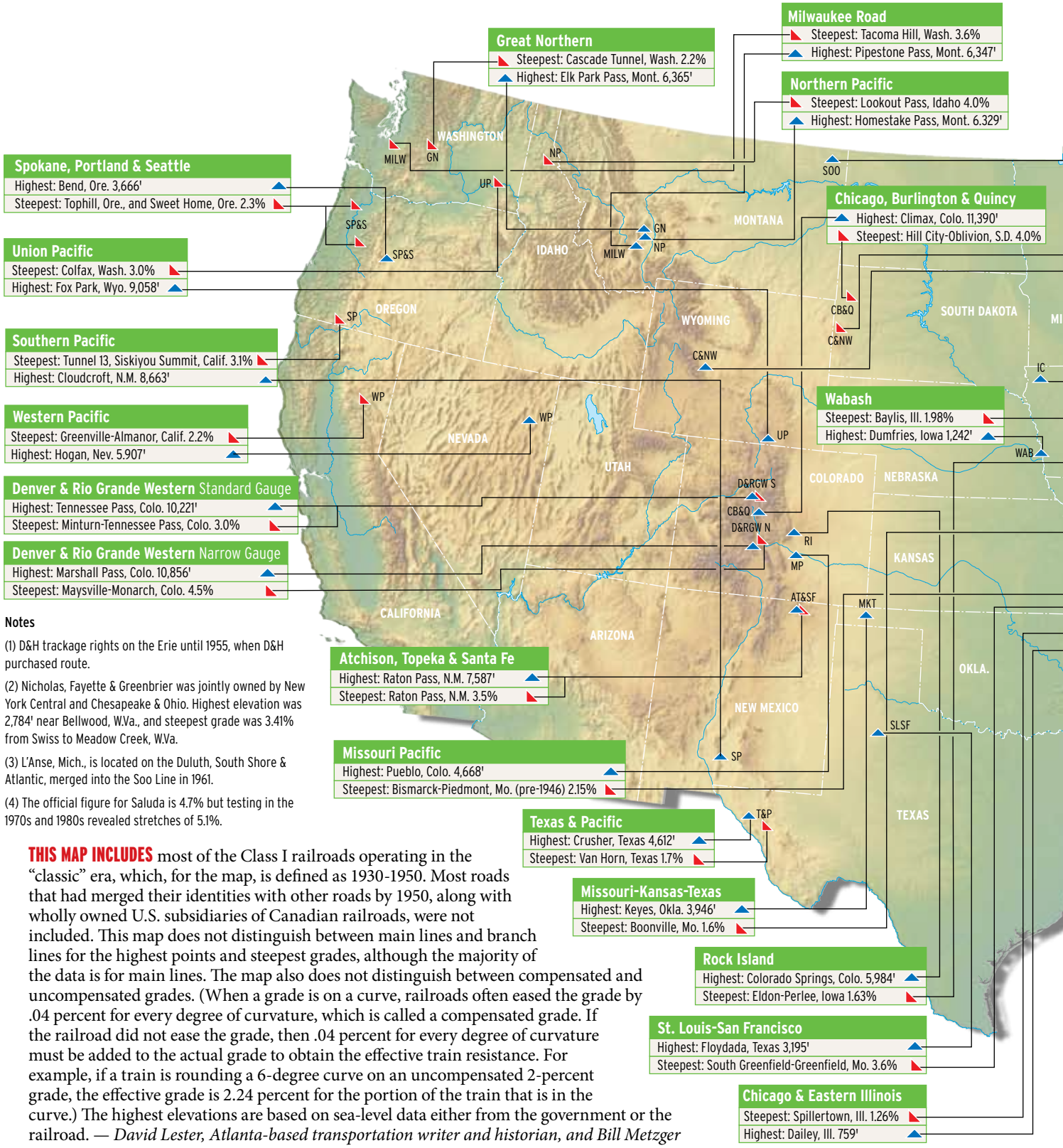
Highest and steepest

We map the steepest climb and highest point on 56 historic American railroads



Notes

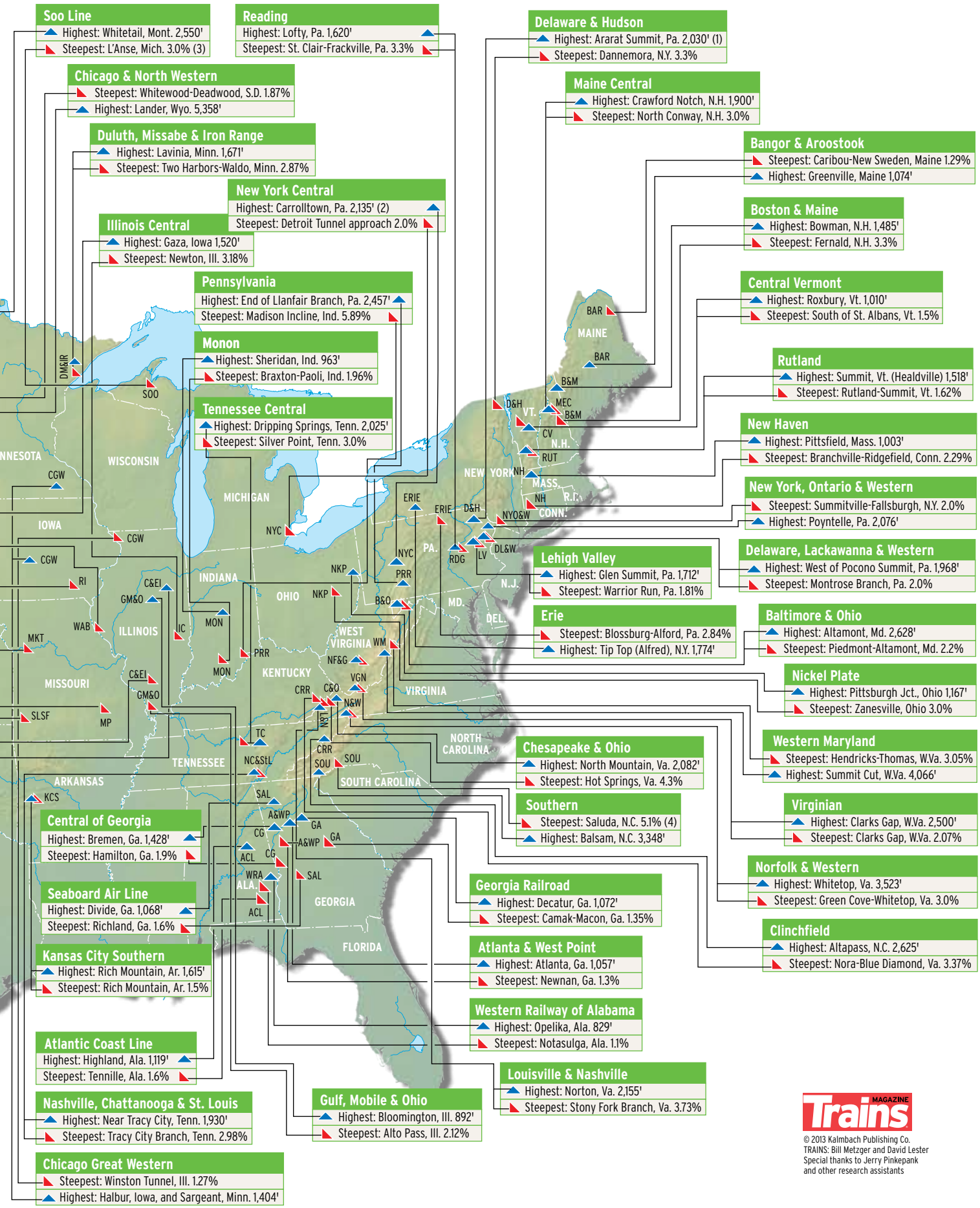
(1) D&H trackage rights on the Erie until 1955, when D&H purchased route.

(2) Nicholas, Fayette & Greenbrier was jointly owned by New York Central and Chesapeake & Ohio. Highest elevation was 2,784' near Bellwood, W.Va., and steepest grade was 3.41% from Swiss to Meadow Creek, W.Va.

(3) L'Anse, Mich., is located on the Duluth, South Shore & Atlantic, merged into the Soo Line in 1961.

(4) The official figure for Saluda is 4.7% but testing in the 1970s and 1980s revealed stretches of 5.1%.

THIS MAP INCLUDES most of the Class I railroads operating in the "classic" era, which, for the map, is defined as 1930-1950. Most roads that had merged their identities with other roads by 1950, along with wholly owned U.S. subsidiaries of Canadian railroads, were not included. This map does not distinguish between main lines and branch lines for the highest points and steepest grades, although the majority of the data is for main lines. The map also does not distinguish between compensated and uncompensated grades. (When a grade is on a curve, railroads often eased the grade by .04 percent for every degree of curvature, which is called a compensated grade. If the railroad did not ease the grade, then .04 percent for every degree of curvature must be added to the actual grade to obtain the effective train resistance. For example, if a train is rounding a 6-degree curve on an uncompensated 2-percent grade, the effective grade is 2.24 percent for the portion of the train that is in the curve.) The highest elevations are based on sea-level data either from the government or the railroad. — *David Lester, Atlanta-based transportation writer and historian, and Bill Metzger*



Multiple-track main lines: 2012

There is a dearth of multiple-track lines in the United States today

PICK UP ANY STATE HIGHWAY MAP and the multi-lane roads are shown prominently. Most railroad maps don't distinguish between single and double track, however, so to compile this map of U.S. multiple-track main lines, a variety of other sources had to be consulted, from railroad engineering and division maps to employee timetables.

Given the map's national scope, we purposely did not highlight segments of multiple track less than 20 miles in length (which would appear on the page as little more than a speck), or routes where sections of single and double track alternate closely. Conversely, some multiple-track lines have brief sections of single track, such as BNSF Railway's crossing of the Missouri River at Sibley, Mo.; for clarity, those routes are shown as continuous multiple track.

All of the lines represented here are what can be considered the main lines of the United States — those routes carrying more than 10 million gross tons a year, plus Amtrak's Northeast Corridor; they encompass a combined 52,223 route-miles, or about 38 percent of the entire 138,500-mile U.S. rail network. Data filed with the Surface Transportation Board indicates that in 2012 Class I railroads owned 16,292 miles of road with two or more main tracks.

During the past 50 years, double-track mileage in the U.S. has shrunk, while the number of ton-miles has more than doubled. In the early 20th century, the location of multiple-track rail lines matched market demands, proliferating between the East Coast and Chicago, on Appalachian coal roads, passenger-heavy routes to the South, and the transcontinental lines of the Santa Fe and Union Pacific. Traffic declines after Word War II prompted railroads in the overbuilt East to rid themselves of multiple track, while a shift in traffic generation pushed more freight onto single-track lines in the West, creating a wider discrepancy between U.S. traffic flows and the capacity of its physical plant.

In more recent times, Union Pacific and BNSF have financed giant track expansion projects on routes leading from Wyoming's Powder River Basin and main lines between Chicago and Los Angeles, while relying on directional running across parallel routes gained from mergers to thread their traffic through other busy, single-track regions, such as Texas.
— Curtis W. Richards and Matt Van Hattem


Williston
BNSF
MINNESOTA
Fargo
NORTH DAKOTA
Staples
BNSF
WISCONSIN
Minneapolis
St. Paul
CP
St. Croix
SOUTH DAKOTA
BNSF
Fond du Lac
CN
Milwaukee
CP
Watertown
CP
Battle Creek
MICH.
Flint
CN
Detroit
Buffalo
Binghamton
NS
CSX
Albany
Worcester
Boston
MAINE
VT.
N.H.
NEW YORK
Pittsfield
MA.
CT.
R.I.
ATK
IOWA
Alliance
BNSF
NEBRASKA
UP
Savanna
Chicago
NS
Toledo
Cleveland
CSX
PA.
Pittsburgh
NS
Easton
New York
N.J.
Philadelphia
Harrisburg
O'Fallons
UP
Omaha
Creston
Galesburg
BNSF
CN
CSX
NS
Woodland Jct.
Indianapolis
Ridgeway
Dayton
Columbus
Grafton
Baltimore
Washington
DE.
MD.
Gibbon
Lincoln
UP
Marysville
Kansas City
UP/CP
Polo
BNSF
ILL.
Decatur
NS
Terre Haute
Cincinnati
CSX
OHIO
W.VA.
Charleston
Clifton Forge
VA.
Richmond
Kenova
Petersburg
Norfolk
Topeka
UP
Jefferson City
UP
St. Louis
Ellinor
KANSAS
Bardstown
Danville
Roanoke
Bluefield
Rocky Mount
MISSOURI
Illmo
KY.
Salisbury
N.C.
Avard
BNSF
Nashville
Knoxville
Harriman
Greenville
Florence
ARKANSAS
Chattanooga
TENN.
Bald Knob
Little Rock
Memphis
CN
Amarillo
OKLAHOMA
Atlanta
S.C.
Birmingham
Yemassee
Savannah
GA.
Fort Worth
Dallas
LA.
ALABAMA
MISSISSIPPI
Folkston
Baldwin
Jacksonville
TEXAS
San Marcos
San Antonio
Houston
New Orleans
FLORIDA
Miami
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Scale
200 miles
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Multiple-track main lines: 1950

IT'S REMARKABLE HOW RAILROADING is bound by its past. Decisions made a century or more ago still matter, from the choice of a coat of paint to the fundamental question of where the track ought to be laid.

Compare the map on pages 52 and 53 showing today's double-track rail lines with this map of multiple-track lines in 1950, which also shows single-track routes protected by centralized traffic control or automatic block signaling. We owe a debt of gratitude to the late geographer Edward L. Ullman, whose analysis of railroad routes, commodities, and traffic in the "Geographical Review" of April 1949 provided critical information for this map. (Amtrak named a Superliner I sleeper after Ullman, who served on the passenger railroad's board in the 1970s.)

"In northwestern Europe double track is the rule. In the United States it is the exception in most areas," Ullman wrote, and then explained why: U.S. railroads built into areas less intensely developed than in Europe, and tended to run lighter passenger trains and heavier freights. Thus on many routes, neither the demand nor operating practices warranted multiple track. Furthermore, competition in the private U.S. rail system produced several routes between markets, functioning in effect as multiple track. Under this system, U.S. roads invested in operating methods and signaling technology — notably CTC — to wring the maximum capacity from their single-track routes.

In 1945, 41,000 route-miles were multiple track (18 percent of the 227,000-mile U.S. network), while 6,495 route-miles had CTC. By 1950, CTC protected 13,275 route-miles.

Only the highest-density lines had multiple track, such as routes between the East Coast and Chicago, the Appalachian coal roads, passenger-heavy routes to the South, and the transcontinental lines of the Santa Fe and Union Pacific. Products of mines (coal, iron ore, phosphate) accounted for more than half of originated freight tonnage in 1950, which helps explain the clusters of double track around Duluth, Minn., and Pittsburgh. From Chicago, the multiple-track routes of several Midwest grangers radiated outward to an L-shaped line of demarcation stretching from Minneapolis to Omaha, Neb., to Kansas City, Mo., and St. Louis, beyond which double track dropped to almost nothing.

Ullman marveled at three- and four-track lines (see inset): "the railroad facility corresponding to American mass production for a home market." A similar principle applies to double track today.

— Matt Van Hattem

Legend for railroads on map

Multiple track
Signaled single track

ACL	Atlantic Coast Line
ATSF	Atchison, Topeka & Santa Fe
AWP	Atlanta & West Point
B&M	Boston & Maine
B&O	Baltimore & Ohio
BAR	Bangor & Aroostook
BLE	Bessemer & Lake Erie
C&O	Chesapeake & Ohio
CBQ	Chicago, Burlington & Quincy
CEI	Chicago & Eastern Illinois
CG	Central of Georgia
CNJ	Central of New Jersey
CNW	Chicago & North Western
D&H	Delaware & Hudson
DLW	Delaware, Lackawanna & Western
DMIR	Duluth, Missabe & Iron Range
DRGW	Denver & Rio Grande Western
DTSL	Detroit & Toledo Shore Line
ERIE	Erie
FEC	Florida East Coast
GMO	Gulf, Mobile & Ohio
GN	Great Northern
GTW	Grand Trunk Western
IC	Illinois Central
LIRR	Long Island Rail Road
L&N	Louisville & Nashville
LV	Lehigh Valley
MEC	Maine Central
MILW	Milwaukee Road
MKT	Missouri-Kansas-Texas
MP	Missouri Pacific
NCSL	Nashville, Chattanooga & St. Louis
NH	New Haven
NKP	Nickel Plate
NP	Northern Pacific
NYC	New York Central
NYOW	New York, Ontario & Western
N&W	Norfolk & Western
PLE	Pittsburgh & Lake Erie
PRR	Pennsylvania
PRSL	Pennsylvania-Reading Seashore Lines
RDG	Reading
RFP	Richmond, Fredericksburg & Potomac
RI	Rock Island
SAL	Seaboard Air Line
SLSF	St. Louis-San Francisco
SP	Southern Pacific
SR	Southern Railway
T&P	Texas & Pacific
UP	Union Pacific
VGN	Virginian
WAB	Wabash
WM	Western Maryland
WP	Western Pacific

America's signaled railroad lines

We map the lines protected by CTC, ABS, cab signaling, and train control systems

ABS
Automatic Block Signals
Signals are controlled by the trains themselves. The track is divided into a series of electronic blocks (track circuits) that determine the presence or absence of a train in the block and relay that information to the signal. Trains in ABS territory still need permission from a dispatcher to occupy the track. In the event of a power or connection failure or if a rail is broken, a stop signal is automatically displayed.

ACS
Automatic Cab Signals
Signals in the cab of a locomotive used in conjunction with, or instead of, block signals to provide continuous data on track conditions ahead. Cab signals have the advantage of being visible to the train crew when weather conditions might obscure the visibility of lineside signals. Further, when a signal changes, the engineer knows immediately and can respond right away, rather than having to wait until the appearance of the next lineside signal before taking action.

ATC
Automatic Train Control
A form of speed control based on a cab signaling system. If the train speed exceeds the maximum allowed, an overspeed alarm sounds in the cab. Failure to reduce speed results in an automatic penalty brake application. ATC is almost exclusively applied to passenger locomotives in both intercity and commuter service.

ATS
Automatic Train Stop
A magnetic device on the locomotive is contacted by a trackside inductor, which is only activated if the signal is clear. Failure to acknowledge a stop signal within a given time will set the brakes. ATC and ATS are similar in function.

CTC
Centralized Traffic Control
A dispatcher in a central location controls switches at interlockings, signal displays to convey movement authority, and traffic flows over a specific territory. The main characteristic of CTC is a control panel or computer screen with a graphic depiction of the railroad.

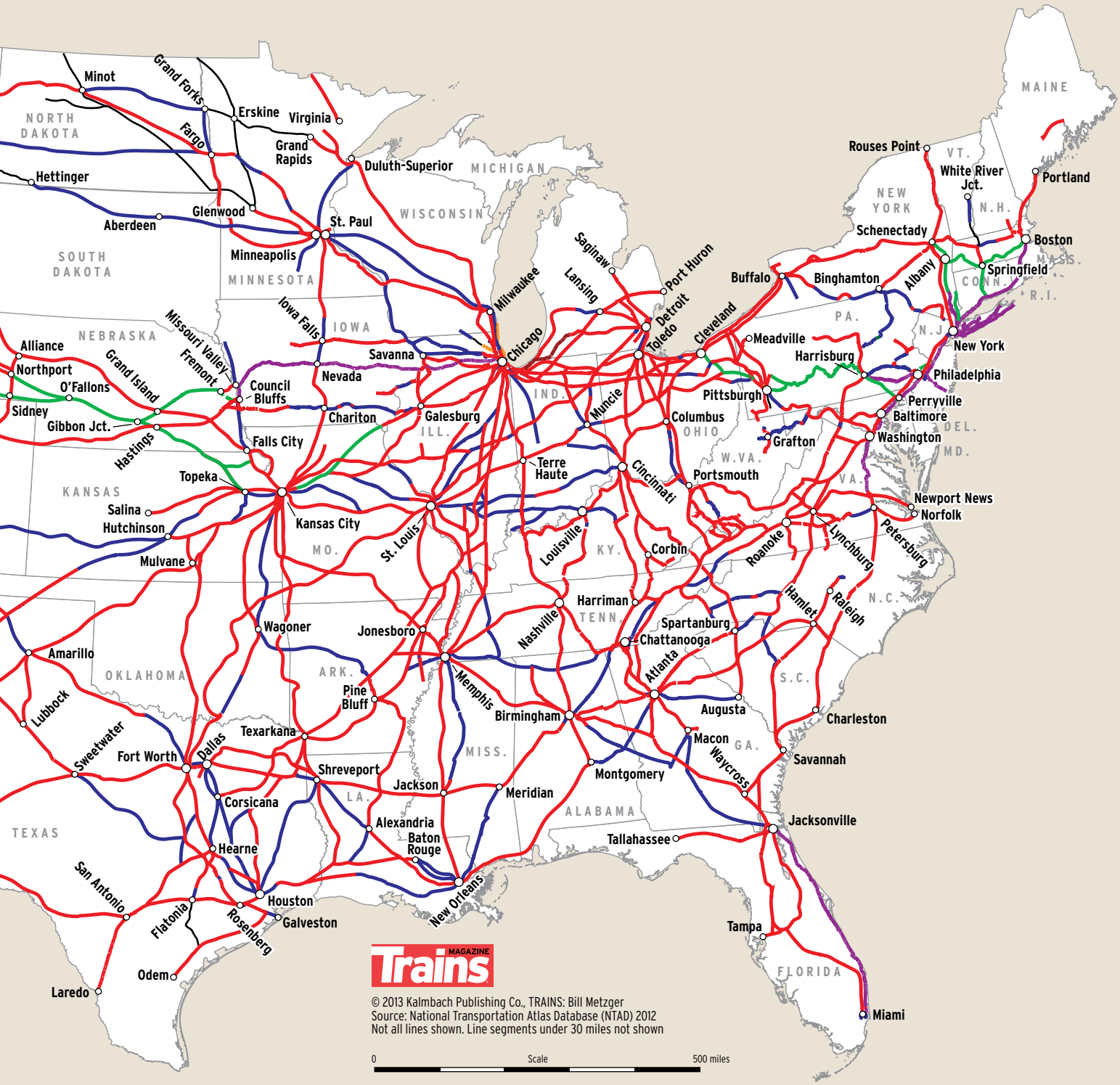
ITC
Incremental Train Control
A form of positive train control that monitors grade crossing conditions and enforces speed limits and indications communicated by an existing signal system if the engineer fails to act. Used on a portion of Amtrak's Michigan Line.

TWC
Track Warrant Control (not all TWC lines shown)
The dispatcher, usually with the aid of a computer, selects the stations or mileposts in unsignaled territory between which a train may move. The dispatcher issues a verbal track warrant, usually by radio, to the train crew. The crew then copies the warrant and repeats it to the dispatcher for verification. Also used to communicate track conditions.

Early CTC installation

	Track-miles	Route-miles
1927	40	40
1930	554	554
1935	1,755	1,329
1940	2,407	1,891
1945	7,384	6,495
1950	14,893	13,275
1955	28,248	23,591
1960	35,997	30,697
1965	44,025	37,035
1970	47,433	39,676

From AAR's Railroad Facts


Minot
Grand Forks
Erskine
Virginia
Fargo
Grand Rapids
Duluth-Superior
MICHIGAN
NORTH DAKOTA
Hettinger
Aberdeen
Glenwood
St. Paul
WISCONSIN
SOUTH DAKOTA
Minneapolis
MINNESOTA
Milwaukee
Saginaw
Lansing
Port Huron
Detroit
Toledo
Cleveland
Buffalo
Rouses Point
VT.
White River Jct.
Portland
MAINE
NEW YORK
N.H.
Schenectady
Boston
Springfield
Albany
Binghamton
CONN.
R.I.
MASS.
Iowa Falls
IOWA
Missouri Valley
Fremont
NEBRASKA
Alliance
Northport
Grand Island
O'Fallons
Council Bluffs
Sidney
Gibbon Jct.
Hastings
Nevada
Savanna
Chicago
Chariton
Galesburg
ILL.
IND.
Muncie
Columbus
OHIO
Pittsburgh
Meadville
Harrisburg
PA.
N.J.
New York
Philadelphia
Perryville
Baltimore
Washington
DEL.
MD.
Grafton
Terre Haute
Cincinnati
Portsmouth
W.VA.
VA.
Falls City
Topeka
KANSAS
Salina
Hutchinson
Mulvane
Kansas City
St. Louis
MO.
Louisville
KY.
Corbin
Roanoke
Lynchburg
Petersburg
Newport News
Norfolk
N.C.
Raleigh
Hamlet
Harriman
TENN.
Nashville
Spartanburg
Chattanooga
Atlanta
Wagoner
Jonesboro
Amarillo
OKLAHOMA
ARK.
Memphis
Pine Bluff
Lubbock
Sweetwater
Fort Worth
Dallas
Texarkana
Birmingham
Augusta
Charleston
S.C.
Macon
GA.
Savannah
Waycross
MISS.
Shreveport
Jackson
Meridian
Montgomery
LA.
Corsicana
ALABAMA
Alexandria
Baton Rouge
Jacksonville
Tallahassee
TEXAS
Hearne
San Antonio
Houston
Galveston
Flatonia
Rosenberg
New Orleans
Tampa
FLORIDA
Odem
Laredo
Miami
Trains MAGAZINE
© 2013 Kalmbach Publishing Co., TRAINS: Bill Metzger
Source: National Transportation Atlas Database (NTAD) 2012
Not all lines shown. Line segments under 30 miles not shown
0
Scale
500 miles

Extreme weather railroading

These rail lines are subject to the worst weather in the United States of America

RAILROADING HAS BEEN DUBBED "all-weather transportation." Back in the early days of commercial aviation, railroads even boasted of their reliability in bad weather when planes would sit grounded.

The United States has the most variable weather of any nation in the world, and America's railroads must cope with the vagaries of that weather week in and week out. But where is the weather the worst? Meteorologists at AccuWeather Enterprise Solutions, which provides route-specific storm warnings to the railroad industry, assembled this ranking of rail lines that see the fiercest winds, most tornadoes, hottest temperatures, and highest rain and snow accumulations. They based the rankings on long-term weather averages calculated from 30 years of data from the National Oceanic and Atmospheric Administration.

That data came from weather stations, which in the mountains are placed at or near the top of the range, whereas the associated rail line might be in a tunnel or cut below and thus may receive different snow or rain amounts. (For example, at Washington state's Cascade Tunnel, where the weather station is 1,800 feet higher than the railroad, the difference in snowfall could be as much as 200 inches a year.) However, heavy snows recorded above mountain railroads can create avalanche and flood hazards at track level, so there is a correlation.

Among the surprises here are the relatively high frequency of tornadoes along CSX Transportation's route in Florida. Florida ranks fourth in number of tornadoes, but its tornadoes are generally weaker than those in the central United States. High winds in the moisture-laden Sierras, combined with the high frequency of snow, make winters there especially miserable for railroad operating and maintenance crews.

Extreme temperatures, both warm and cold, are the invisible hazard. Especially with today's continuous welded rail, expansion during extreme heat can cause it to buckle, and contraction during extreme cold can cause pull-aparts, derailing trains.

Fortunately, the science of meteorology has advanced rapidly in the past 20 years, and railroads can now take action before dangerous weather strikes, halting trains or moving equipment out of harm's way.
— Mike Smith, senior vice president of AccuWeather Enterprise Solutions, and Steve Pryor, a certified consulting meteorologist at AccuWeather

SNOWIEST LINES

Rank	Railroad	Line segment	Miles	Average annual snowfall
1	BNSF	Cascade Tunnel-Scenic, Wash.	7.9	470 inches at Stevens Pass, Wash.
2	BNSF	Stampede Tunnel-Lester, Wash.	12.6	439 inches at Stampede Pass, Wash.
3	UP	Donner Summit (East Norden)-Emigrant Gap, Calif.	21.0	408 inches at Donner Summit, Calif.
4	UP	Crescent Lake-McCredie Springs, Ore.	37.9	281 inches at Cascade Summit, Ore.
5	BNSF	Glacier Park-Belton (West Glacier), Mont.	53.6	249 inches at Summit, Mont.
6	UP	West Portal (Moffat Tunnel)-Fraser, Colo.	5.9	226 inches at Winter Park, Colo.
7	UP	Boca-Donner State Park (West Truckee), Calif.	11.4	201 inches at Truckee, Calif.
8	CN	White Pine, Mich.-Gurney, Wis.	60.4	180 inches at Ironwood, Mich.
9	CSX	Fulton-Oswego, N.Y.	10.5	145 inches at Oswego, N.Y.
10	UP	Crescent-East Portal (Moffat Tunnel), Colo.	17.1	140 inches at Nederland, Colo.

WETTEST LINES

Rank	Railroad	Line segment	Miles	Average annual rainfall
1	BNSF	Scenic-Index, Wash.	32.2	109 inches at Baring, Wash.
2	BNSF	Lester-Palmer, Wash.	22.4	90 inches at Palmer, Wash.
3	UP	Lakehead-Lamoine, Calif.	7.4	71 inches at Vollmers (Delta), Calif.
4	BNSF	New Orleans-Morgan City, La.	67.5	69 inches at Thibodaux, La.
5	UP	Rich Bar-Poe (Concow), Calif.	27.4	69 inches at Storrie, Calif.
6	UP	Soda Springs-Blue Canon, Calif.	29.4	67 inches at Blue Canon, Calif.
7	CSX	New Orleans, La.-Bay Minette, Ala.	157.6	67 inches at Pascagoula, Miss.
8	CN	New Orleans, La.-McComb, Miss.	90.3	66 inches at Amite, La.
9	UP	New Orleans-Bunkie, La.	145.9	65 inches at Baton Rouge, La.
10	NS	New Orleans, La.-Poplarville, Miss.	67.6	64 inches at Picayune, Miss.

HOTTEST LINES

Rank	Railroad	Line segment	Miles	Average July maximum temperature
1	UP	Mobile-Wellton, Ariz.	110.8	109 at Gila Bend, Ariz.
2	BNSF	Yucca, Ariz.-Cadiz, Calif.	103.4	109 at Needles, Calif.
3	ARZC	Rice-Ripley, Calif.	48.0	109 at Blythe, Calif.
4	ARZC	Bouse, Ariz.-Cadiz, Calif.	109.8	108 at Parker, Ariz.
5	UP	Niland-Palm Springs, Calif.	77.5	108 at Palm Springs, Calif.
6	UP	Phoenix-Arlington/ Growler-Wellton, Ariz.	52.0/ 32.0	108 at Buckeye, Ariz.
7	UP	Wellton, Ariz.-Niland, Calif.	99.5	107 at Yuma, Ariz.
8	UP	Niland-Calexico, Calif.	41.3	107 at El Centro, Calif.
9	BNSF	Cadiz-Barstow, Calif.	94.7	106 at Daggett, Calif.
10	UP	Dry Lake-Sloan, Nev.	46.6	105 at Las Vegas, Nev.

Abbreviations

ARZC	Arizona & California
BNSF	BNSF Railway
CN	Canadian National
CSX	CSX Transportation
NS	Norfolk Southern
UP	Union Pacific

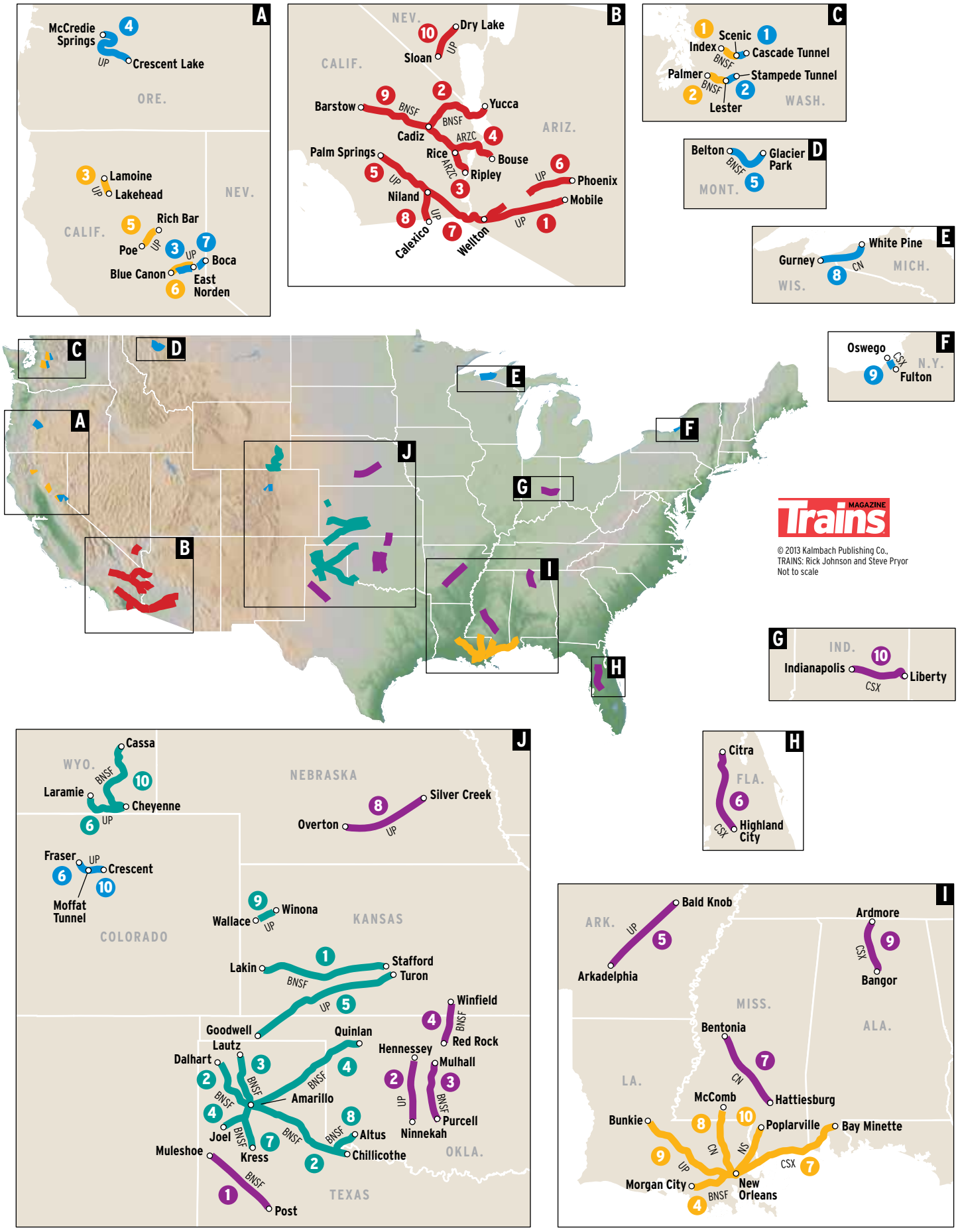
MOST TORNADO-PRONE LINES

Rank	Railroad	Line segment	Miles	Tornado density*
1	BNSF	Post-Lubbock-Muleshoe, Texas	106.0	Greater than 9 per year
2	UP	Hennessey-Ninnekah, Okla.	81.0	Greater than 9 per year
3	BNSF	Mulhall-Oklahoma City-Purcell, Okla.	78.5	Greater than 9 per year
4	BNSF	Winfield, Kan.-Red Rock, Okla.	55.7	Greater than 9 per year
5	UP	Bald Knob-Little Rock-Arkadelphia, Ark.	122.9	Greater than 7 per year
6	CSX	Citra-Ocala-Lakeland-Highland City, Fla.	115.6	Greater than 7 per year
7	CN	Bentonia-Hattiesburg, Miss.	112.3	Greater than 7 per year
8	UP	Silver Creek-Grand Island-Overton, Neb.	109.6	Greater than 7 per year
9	CSX	Ardmore-Decatur-Bangor, Ala.	75.1	Greater than 7 per year
10	CSX	Liberty-Indianapolis, Ind.	68.1	Greater than 7 per year

*Tornadoes per 10,000 square miles

WINDIEST LINES

Rank	Railroad	Line segment	Miles	Average maximum gust	Gusts greater than
1	BNSF	Stafford-Lakin, Kan.	167	14 mph at Dodge City, Kan.	13 mph
2	BNSF	Chillicothe-Amarillo-Dalhart, Texas	231.1	13.5 mph at Amarillo, Texas	13 mph
3	BNSF	Amarillo-Lautz, Texas	71.2	13.5 mph at Amarillo, Texas	13 mph
4	BNSF	Quinlan, Okla.-Amarillo-Joel, Texas	223.3	13.5 mph at Amarillo, Texas	13 mph
5	UP	Turon, Kan.-Goodwell, Okla.	201.9	Unknown	12 mph
6	UP	Cheyenne-Laramie, Wyo.	55.0	Unknown	12 mph
7	BNSF	Canyon-Kress, Texas	43.3	Unknown	12 mph
8	BNSF	Altus, Okla.-Quanah, Texas	35.2	Unknown	12 mph
9	UP	Winona-Wallace, Kan.	21.5	Unknown	12 mph
10	BNSF	Cheyenne-Cassa, Wyo.	110.8	Unknown	12 mph


A
McCredie Springs
4
UP
Crescent Lake
ORE.
3
Lamoine
UP
Lakehead
NEV.
CALIF.
5
Rich Bar
Poe
UP
3
UP
7
Boca
Blue Canon
East Norden
6
B
NEV.
Dry Lake
10
UP
Sloan
CALIF.
9
BNSF
2
Barstow
Yucca
BNSF
Cadiz
ARZC
4
ARIZ.
Palm Springs
Rice
ARZC
Bouse
5
UP
Ripley
3
6
UP
Phoenix
Niland
Mobile
8
UP
UP
1
Calexico
7
Wellton
C
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Scenic
1
Index
Cascade Tunnel
BNSF
Palmer
Stampede Tunnel
BNSF
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2
Lester
WASH.
D
Belton
Glacier Park
BNSF
5
MONT.
E
White Pine
Gurney
CN
8
MICH.
WIS.
F
Oswego
CSX
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Trains
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Not to scale
G
IND.
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Indianapolis
Liberty
CSX
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Cassa
WYO.
BNSF
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Laramie
Cheyenne
6
UP
NEBRASKA
8
Silver Creek
Overton
UP
Fraser
UP
6
Crescent
10
Moffat Tunnel
COLORADO
9
Winona
Wallace
UP
KANSAS
1
Stafford
Lakin
BNSF
Turon
UP
5
Winfield
4
BNSF
Red Rock
Goodwell
Quinlan
Hennessey
Mulhall
Lautz
Dalhart
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BNSF
BNSF
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BNSF
Amarillo
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UP
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BNSF
Purcell
4
BNSF
Joel
BNSF
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Kress
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Altus
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Chillicothe
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LA.
McComb
Hattiesburg
Bunkie
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Poplarville
Bay Minette
CN
NS
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UP
CSX
7
Morgan City
BNSF
New Orleans
4

RAILROAD PLACES
CITIES, STATES, AND REGIONS

BEFORE THE GIANT MERGERS of the late 20th century, most railroads were closely tied to specific regions of the United States, as their names often proclaimed: Florida East Coast; Boston & Maine; Monongahela. Cities and regions, in turn, prospered from the railroads that bore those names. Even today's big systems can claim places as uniquely theirs. Norfolk Southern looks right at home on Pennsylvania's Horseshoe Curve. Think of Cheyenne, Wyo., and images of long Union Pacific trains charging up Sherman Hill immediately come to mind (sorry, BNSF Railway). And how many towns still use the likeness of a steam locomotive for their community logo? (I haven't come across any with a semitruck.) Across North America, freight branch lines have been saved and commuter operations launched because a city, state, or public agency stepped up and said, "we need this train." To look at a railroad map is to see the story of communities, of statehood, of economic development. After all, if a railroad didn't go there, how important could it really have been?

With Chicago's skyline rising above, Canadian National train M337 threads its way through the Windy City — America's railroad capital — on its journey from Champaign, Ill., to Waterloo, Iowa, on March 6, 2005.
Brian Buchanan

Wisconsin's railroads: 1940/2013

WHEN AL KALMBACH PUBLISHED the first issue of TRAINS magazine in November 1940, the company's home state of Wisconsin boasted 6,675 railroad route-miles, a total that had peaked at 7,500 two decades earlier. Lingering effects from the Great Depression kept the state's three largest railroads in bankruptcy — Chicago & North Western, Milwaukee Road, and Soo Line.

North Western was the state's dominant railroad. With affiliate Omaha Road, C&NW served every corner of Wisconsin, often with duplicate routes. Competition came from the Milwaukee, which blanketed the southern half of the state, and Soo Line in the north. Despite extensive branches, all three roads carried their heaviest traffic between Chicago and Minneapolis-St. Paul on routes that survive to this day. (The branches and secondary lines have mostly disappeared, however.)

Since 1940, when TRAINS magazine was founded, our home state's rail network has shrunk in half

Milwaukee Road's 1977 bankruptcy triggered some surprising shifts in rail ownership. Soo Line acquired the Milwaukee in 1985, then spun off its historic Wisconsin trackage to the newly formed Wisconsin Central in 1987. Canadian National purchased WC in 2001 and by 2011 could claim 40 percent of Wisconsin's total rail mileage of 3,385 — half the 1940 total — while the former Milwaukee Road main line between Chicago and St. Paul became a key link in Soo Line parent Canadian Pacific's international network. Onetime mileage king Chicago & North Western gutted its 2,500-mile network of 1940 down to a 597-mile core now run by successor Union Pacific. Meanwhile, the Burlington's line along the Mississippi River, a passenger-heavy route in 1940, today under BNSF is the state's most heavily used main line, and is all-freight. — *Curtis W. Richards*

Iowa's rail evolution

At one time, no point in Iowa was more than 12 miles from a railroad, until deregulation and mergers changed it all

IOWA HAS BEEN THE POSTER-CHILD STATE for the overbuilding of railways in the era before paved roads. In the April 1986 issue of TRAINS, author Charles W. Bohi said Hawkeye State children were taught "there is no point in Iowa that is more than 12 miles from a railroad" (a day's drive by horse and wagon). Not so anymore. From 1911 to 1985, the state's rail mileage fell from 10,000 to 5,000. By 2011, Iowa had 3,893 miles, used by 19 different railroads.

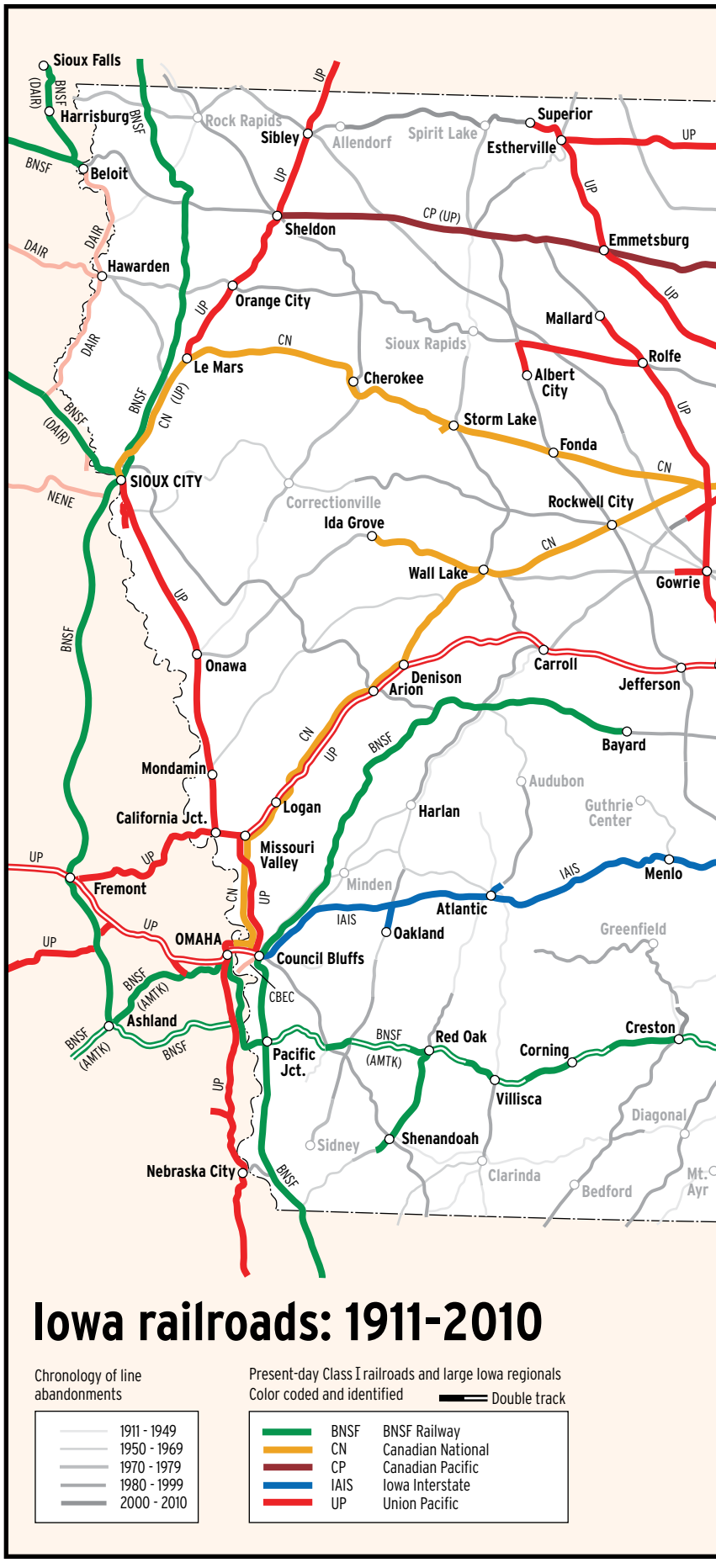
All of Iowa's 99 counties (each about the same size, in nine "tiers") once had railroads. Today, 90 do; five of the nine without them are in the southernmost tier. The interior rivers of Iowa, and the Missouri and Mississippi that frame it, generally flow northwest to southeast. The railroad trunk lines, on the other hand, followed the east-west commerce of the developing nation.

For most of the 20th century, six Class I railroads vied for traffic between the Union Pacific at Council Bluffs/Omaha and Chicago: Illinois Central, Chicago Great Western, Chicago & North Western, Milwaukee Road, Rock Island, and Burlington. A seventh, Wabash, had a line to St. Louis. Examining the abandoned lines on this map (using information from the Iowa Department of Transportation), differentiated by time period, reveals a correlation between the relative status quo of the regulated era and post-1980 deregulation. With "de-reg" came the big-merger movement and related Class I sell-offs to big regionals, of which Iowa had three with significant mileage:

- Iowa Interstate, which operates the cross-state Rock Island main, was formed by shippers (led by Maytag in Newton) and the state.
- Today's Canadian National lines were sold in 1985 by Illinois Central to the new Chicago, Central & Pacific, which IC repurchased in 1996 (CN acquired IC in 1999).
- Iowa, Chicago & Eastern ran the ex-Milwaukee Road trackage sold off in 1997 by MILW successor Soo Line, only to be repurchased in 2008 by Soo Line parent Canadian Pacific.

Chicago Great Western was absorbed by Chicago & North Western in 1968 and largely abandoned, as was much of Milwaukee's main line across central Iowa. Union Pacific absorbed C&NW in 1995. Wabash successor Norfolk Southern has a token Iowa presence, to Des Moines.

An exception to the branchline-abandonment habit has been C&NW's, and now UP's, continued success with the old Rock Island "Bow & Arrow Country" branch network, based at Eagle Grove. — *J. David Ingles*



Other railroads — Color coded, and identified (parentheses indicate trackage or haulage rights tenant)

AMTK	Amtrak
APNC	Appanoose County Community
BJRY	Burlington Junction
BSV	Boone & Scenic Valley (tourist)
CBEC	CBEC Railway
CEDR	Cedar River
CIC	Cedar Rapids & Iowa City
DAIR	D & I Railroad
IANR	Iowa Northern
IARR	Iowa River (filed for abandonment 2012)
IATR	Iowa Traction
KJRY	Keokuk Junction
NCRA	North Central Railway Association
NENE	Nebraska Northeastern
NS	Norfolk Southern

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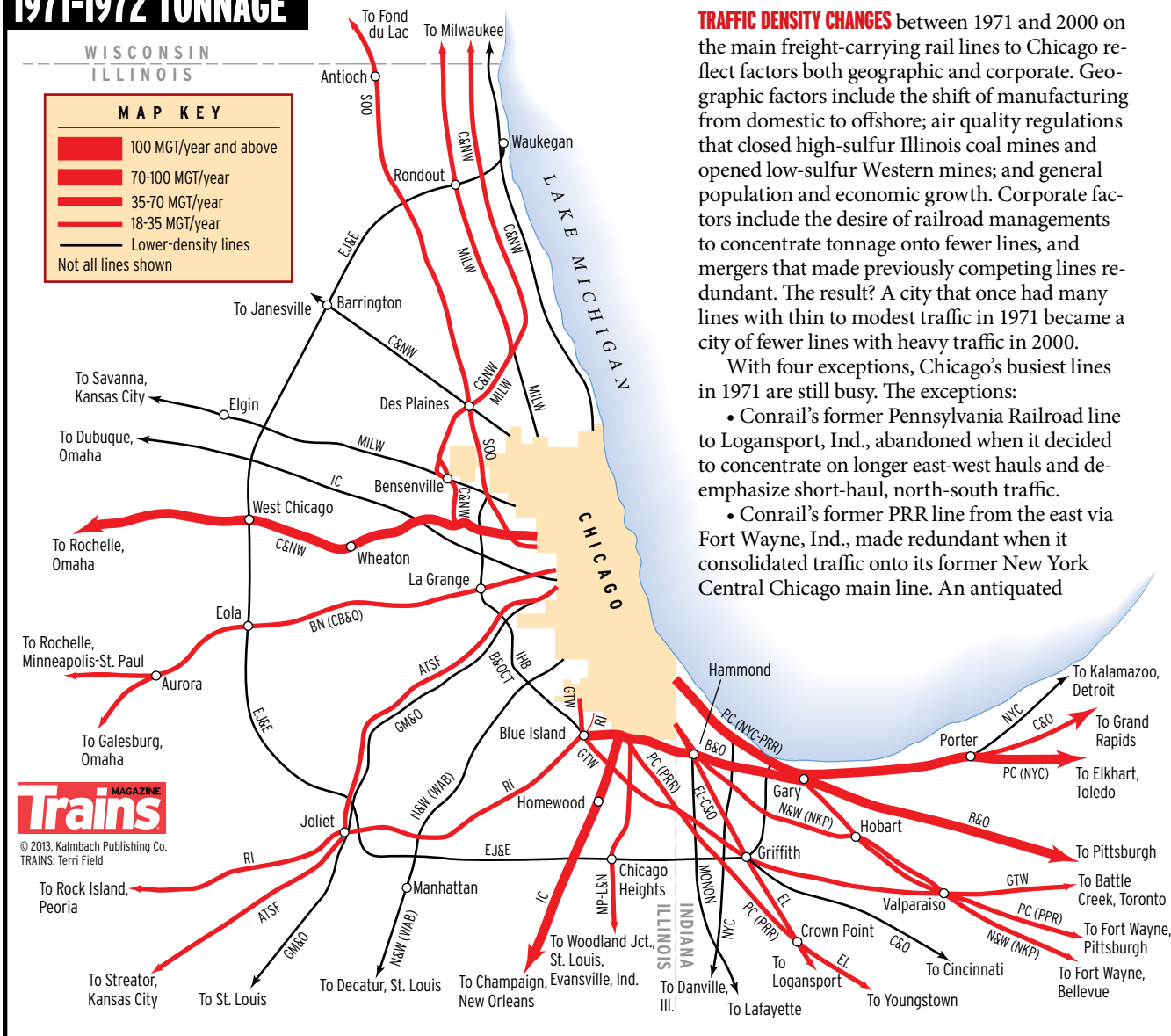
0 Scale 50 miles

During the liquidation of the Rock Island and reorganization of the Milwaukee Road, many lines were abandoned and later acquired by other railroads. These abandonments are not indicated on the map.

Tonnage changes at Chicago: 1971-

1971-1972 TONNAGE



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TRAINS: Terri Field

TRAFFIC DENSITY CHANGES between 1971 and 2000 on the main freight-carrying rail lines to Chicago reflect factors both geographic and corporate. Geographic factors include the shift of manufacturing from domestic to offshore; air quality regulations that closed high-sulfur Illinois coal mines and opened low-sulfur Western mines; and general population and economic growth. Corporate factors include the desire of railroad managements to concentrate tonnage onto fewer lines, and mergers that made previously competing lines redundant. The result? A city that once had many lines with thin to modest traffic in 1971 became a city of fewer lines with heavy traffic in 2000.

With four exceptions, Chicago's busiest lines in 1971 are still busy. The exceptions:

- Conrail's former Pennsylvania Railroad line to Logansport, Ind., abandoned when it decided to concentrate on longer east-west hauls and de-emphasize short-haul, north-south traffic.
- Conrail's former PRR line from the east via Fort Wayne, Ind., made redundant when it consolidated traffic onto its former New York Central Chicago main line. An antiquated

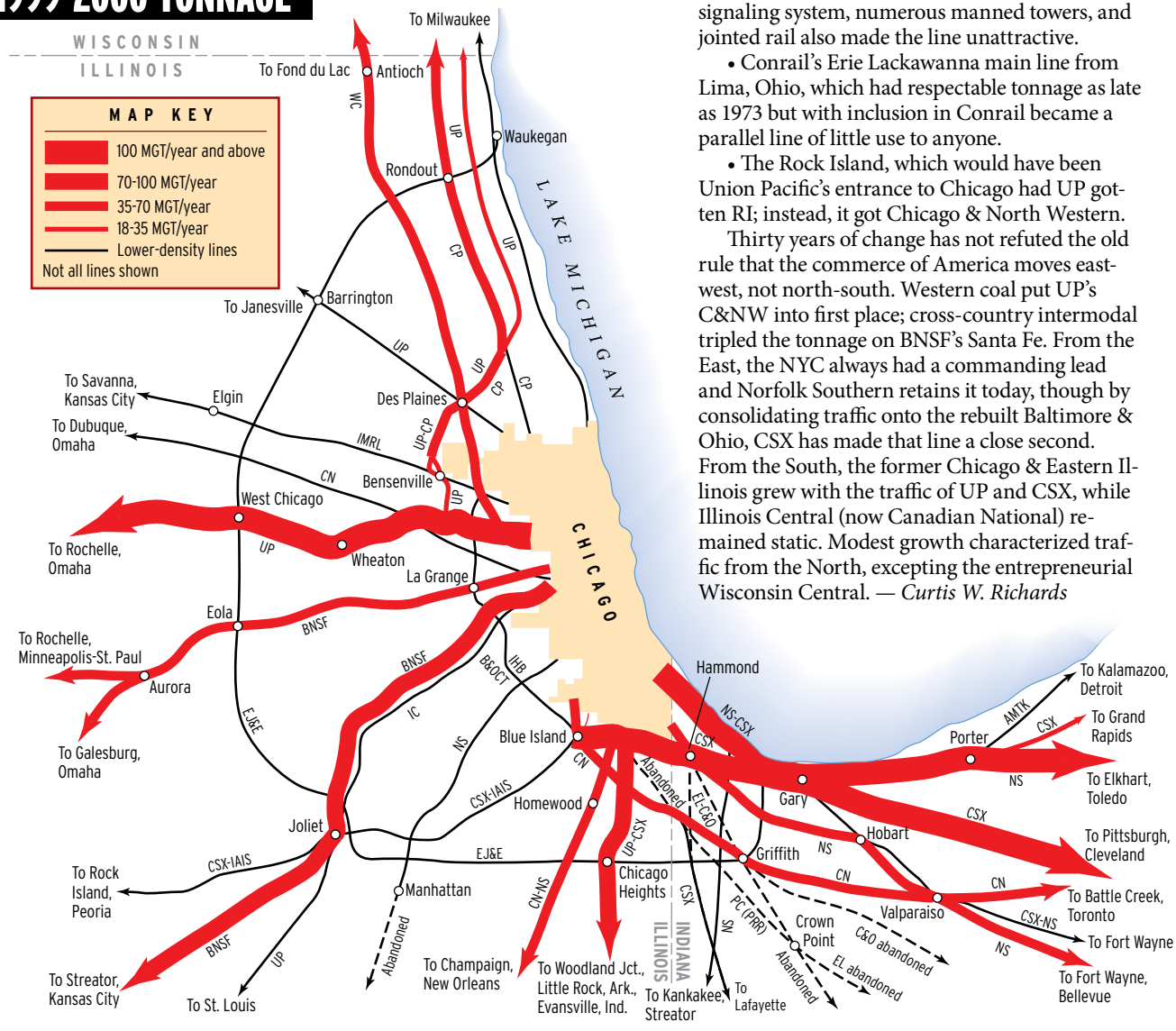
FREIGHT DENSITIES ON MAJOR RAIL LINES SERVING CHICAGO [expressed in millions

	LINE	1971 RAILROAD	1971-72 TON-MILES	2000 RAILROAD	1999-2000 TON-MILES
NORTH LINES	Milwaukee (2 lines combined)	Chicago & North Western	34	Union Pacific	34
	Rondout-Milwaukee	Milwaukee Road	25	Canadian Pacific	36
	Antioch-Fond du Lac	Soo Line	19	Wisconsin Central	42
WEST LINES	Wheaton-Rochelle	Chicago & North Western	47	Union Pacific	123
	Aurora-Rochelle	Burlington Northern (CB&Q)	21	BNSF	39
	Aurora-Galesburg	Burlington Northern (CB&Q)	27	BNSF	40
	Joliet-Rock Island	Rock Island	31	CSX/Iowa Interstate	unknown
	Joliet-Kansas City	Santa Fe	26	BNSF	88

*Only 1971 density **1973 density Ton-miles are from selected line segments immediately beyond Chicago interchanges and junctions.

2000

1999-2000 TONNAGE



signaling system, numerous manned towers, and jointed rail also made the line unattractive.

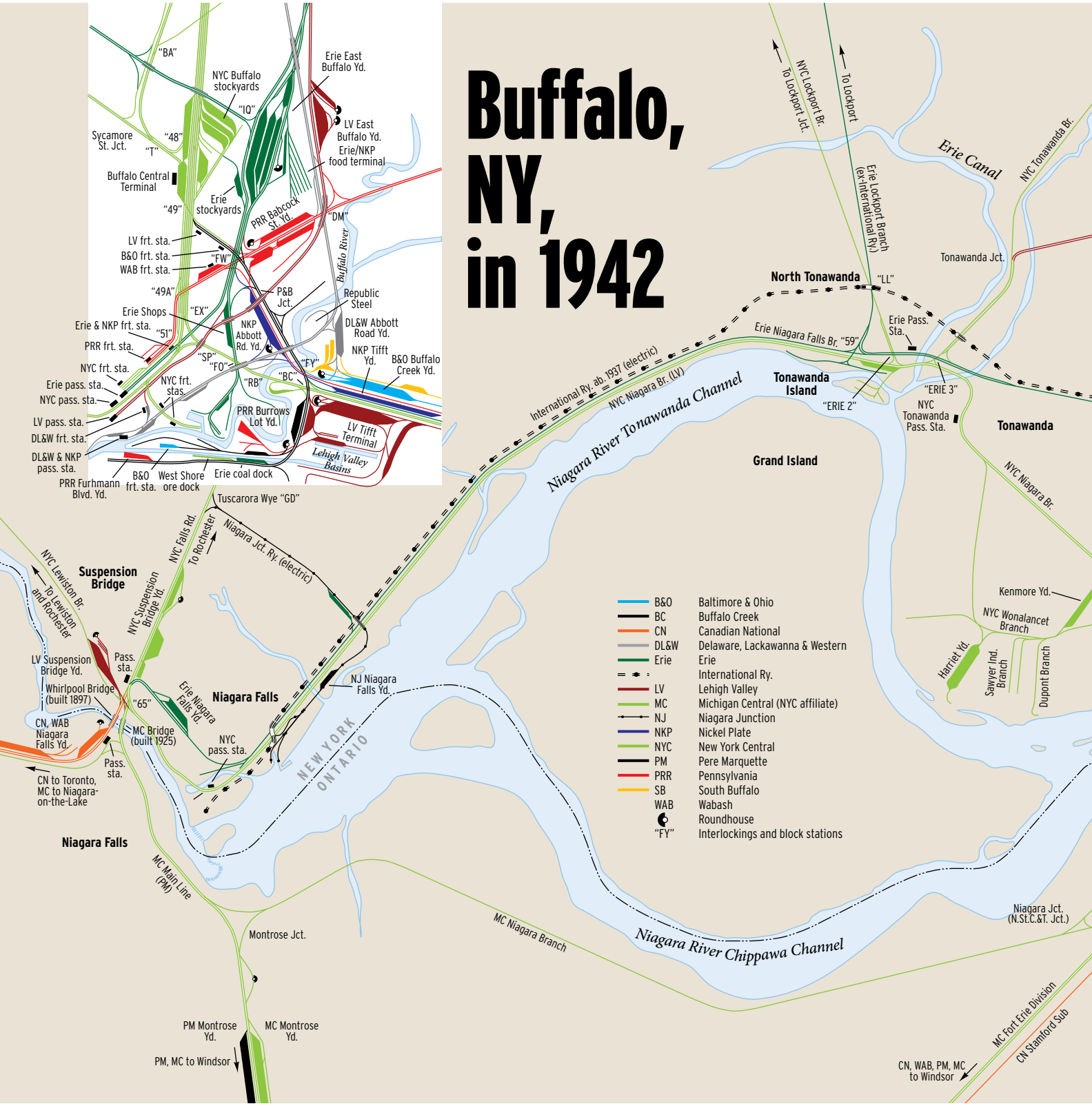
• Conrail's Erie Lackawanna main line from Lima, Ohio, which had respectable tonnage as late as 1973 but with inclusion in Conrail became a parallel line of little use to anyone.

• The Rock Island, which would have been Union Pacific's entrance to Chicago had UP gotten RI; instead, it got Chicago & North Western.

Thirty years of change has not refuted the old rule that the commerce of America moves east-west, not north-south. Western coal put UP's C&NW into first place; cross-country intermodal tripled the tonnage on BNSF's Santa Fe. From the East, the NYC always had a commanding lead and Norfolk Southern retains it today, though by consolidating traffic onto the rebuilt Baltimore & Ohio, CSX has made that line a close second. From the South, the former Chicago & Eastern Illinois grew with the traffic of UP and CSX, while Illinois Central (now Canadian National) remained static. Modest growth characterized traffic from the North, excepting the entrepreneurial Wisconsin Central. — *Curtis W. Richards*

of gross ton-miles per year]

	LINE	1971 RAILROAD	1971-72 TON-MILES	2000 RAILROAD	1999-2000 TON-MILES
SOUTH LINES	Homewood-Champaign	Illinois Central	51	CN/NS	49
	Chicago Heights-Woodland Jct.	Missouri Pacific/L&N (C&EI)	34	UP/CSX/CP	73
	Crown Point-Logansport	Penn Central (PRR)	24*	Abandoned	–
EAST LINES	Crown Point-Lima	Erie Lackawanna (Erie)	25**	Abandoned	–
	Hobart-Fort Wayne	Norfolk & Western (NKP)	23	Norfolk Southern	45
	Valparaiso-Fort Wayne	Penn Central (PRR)	29*	CSX/NS	Less than 5
	Valparaiso-Battle Creek	Grand Trunk Western	22	Canadian National	48
	Gary-Pittsburgh	Baltimore & Ohio	46	CSX	105
	Porter-Elkhart	Penn Central (NYC)	52*	Norfolk Southern	115
	Porter-Grand Rapids	Chesapeake & Ohio	18	CSX/CP	27



BUFFALO'S RAILROADS owe their early development to water transport. It was no accident that the Erie Canal delivered Hudson River vessels to the Niagara River *above* Niagara Falls. Long before the falls were a honeymoon destination, they were a giant obstacle to Great Lakes navigation. The canal's 1825 opening tapped the prairie's vast grain fields and the iron and copper mines of the Upper Midwest. Immigrants flowed west and grain flowed east. Buffalo prospered from both.

Harsh winters were another impediment to navigation, making the emerging technology of rail transportation an attractive alternative. By the early 1840s a string of 10 short lines formed a parallel route to the canal. They merged as the New York Central in 1853. By 1904, the Central would boast it "surrounded and permeated" the Buffalo area.

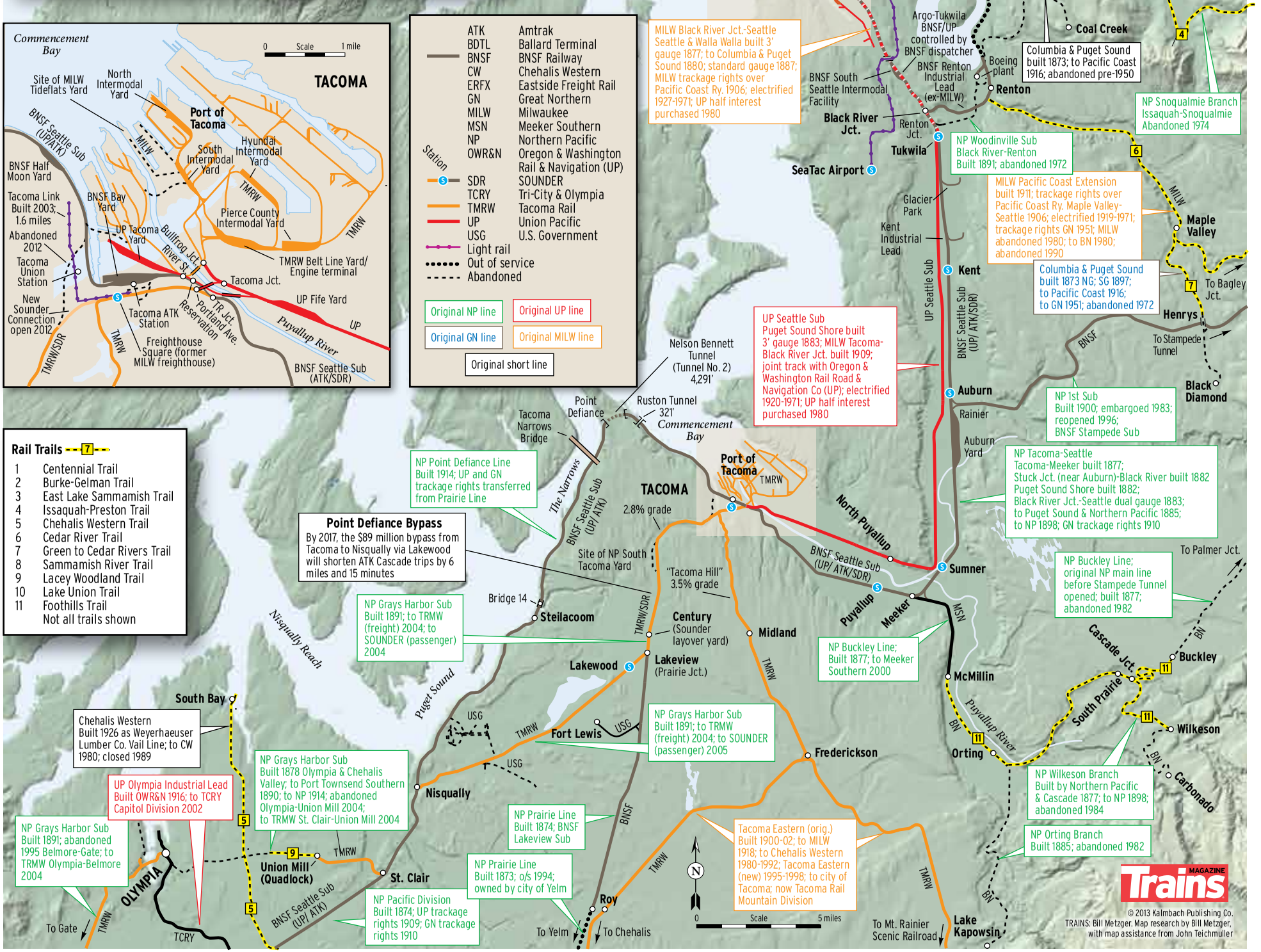
Other railroads tied their fortunes to Buffalo's booming port and rail center. Four carriers — New York Central, Erie,

Lackawanna, and Lehigh Valley — had main lines direct to the New York City area. Most railroads arrived (or departed) in the final decades of the 19th century.

Buffalo became a flour milling center. More than 20 grain elevators lined the wharves. Steel mills clouded up the sky by day and brightened it by night.

This map shows Buffalo in 1942, at its most tangled: 11 trunkline railroads coming together, one on a four-track main line; three short lines, one powered by cheap electricity from Niagara Falls; lake boats bringing in grain and iron ore and hauling out Pennsylvania coal delivered by rail; thousands of cars interchanged daily between Canada, the Midwest, and the Northeast; hot metal, slag, and finished steel moving in giant mills; trainloads of passengers coming to visit, connect, or (yes) honeymoon in the falls; and junctions that made dispatchers old before their time. It must have been quite a sight. — *Bill Metzger*

Railroads of Seattle-Tacoma


Commencement Bay
0 Scale 1 mile
TACOMA
Site of MILW Tideflats Yard
North Intermodal Yard
Port of Tacoma
BNSF Seattle Sub (UP/ATK)
MILW
South Intermodal Yard
Hyundai Intermodal Yard
TMRW
BNSF Half Moon Yard
BNSF Bay Yard
Pierce County Intermodal Yard
Tacoma Link Built 2003; 1.6 miles
Abandoned 2012
UP Tacoma Yard
Bullfrog Jct.
River St.
TMRW Belt Line Yard/ Engine terminal
Tacoma Union Station
Tacoma Jct.
New Sounder Connection open 2012
Tacoma ATK Station
Reservation
Portland Ave.
TR Jct
UP Fife Yard
Puyallup River
UP
TMRW/SDR
Freighthouse Square (former MILW freighthouse)
BNSF Seattle Sub (ATK/SDR)
ATK Amtrak
BDTL Ballard Terminal
BNSF BNSF Railway
CW Chehalis Western
ERFX Eastside Freight Rail
GN Great Northern
MILW Milwaukee
MSN Meeker Southern
NP Northern Pacific
OWR&N Oregon & Washington Rail & Navigation (UP)
Station
SDR SOUNDER
TCRY Tri-City & Olympia
TMRW Tacoma Rail
UP Union Pacific
USG U.S. Government
Light rail
Out of service
Abandoned
Original NP line
Original UP line
Original GN line
Original MILW line
Original short line
MILW Black River Jct.-Seattle Seattle & Walla Walla built 3' gauge 1877; to Columbia & Puget Sound 1880; standard gauge 1887; MILW trackage rights over Pacific Coast Ry. 1906; electrified 1927-1971; UP half interest purchased 1980
Argo-Tukwila BNSF/UP controlled by BNSF dispatcher
Coal Creek
Columbia & Puget Sound built 1873; to Pacific Coast 1916; abandoned pre-1950
BNSF South Seattle Intermodal Facility
BNSF Renton Industrial Lead (ex-MILW)
Boeing plant
Renton
NP Snoqualmie Branch Issaquah-Snoqualmie Abandoned 1974
Black River Jct.
Renton Jct.
Tukwila
NP Woodinville Sub Black River-Renton Built 1891; abandoned 1972
SeaTac Airport
MILW Pacific Coast Extension built 1911; trackage rights over Pacific Coast Ry. Maple Valley-Seattle 1906; electrified 1919-1971; trackage rights GN 1951; MILW abandoned 1980; to BN 1980; abandoned 1990
Glacier Park
Kent Industrial Lead
Maple Valley
Columbia & Puget Sound built 1873 NG; SG 1897; to Pacific Coast 1916; to GN 1951; abandoned 1972
Kent
UP Seattle Sub
BNSF Seattle Sub (UP/ ATK/SDR)
To Bagley Jct.
Henrys
To Stampede Tunnel
BNSF
Black Diamond
UP Seattle Sub Puget Sound Shore built 3' gauge 1883; MILW Tacoma-Black River Jct. built 1909; joint track with Oregon & Washington Rail Road & Navigation Co (UP); electrified 1920-1971; UP half interest purchased 1980
Auburn
Rainier
NP 1st Sub Built 1900; embargoed 1983; reopened 1996; BNSF Stampede Sub
Auburn Yard
NP Tacoma-Seattle Tacoma-Meeker built 1877; Stuck Jct. (near Auburn)-Black River built 1882 Puget Sound Shore built 1882; Black River Jct.-Seattle dual gauge 1883; to Puget Sound & Northern Pacific 1885; to NP 1898; GN trackage rights 1910
Nelson Bennett Tunnel (Tunnel No. 2) 4,291'
Point Defiance
Ruston Tunnel 321'
Commencement Bay
Tacoma Narrows Bridge
NP Point Defiance Line Built 1914; UP and GN trackage rights transferred from Prairie Line
The Narrows
BNSF Seattle Sub (UP/ ATK)
Port of Tacoma
TMRW
TACOMA
2.8% grade
North Puyallup
BNSF Seattle Sub (UP/ ATK/SDR)
Sumner
To Palmer Jct.
NP Buckley Line; original NP main line before Stampede Tunnel opened; built 1877; abandoned 1982
Point Defiance Bypass
By 2017, the $89 million bypass from Tacoma to Nisqually via Lakewood will shorten ATK Cascade trips by 6 miles and 15 minutes
Site of NP South Tacoma Yard
"Tacoma Hill" 3.5% grade
Bridge 14
Steilacoom
NP Grays Harbor Sub Built 1891; to TRMW (freight) 2004; to SOUNDER (passenger) 2004
TMRW/SDR
Century (Sounder layover yard)
Midland
Puyallup
Meeker
MSN
NP Buckley Line; Built 1877; to Meeker Southern 2000
Cascade Jct.
Buckley
Nisqually Reach
Lakewood
Lakeview (Prairie Jct.)
McMillin
Puget Sound
South Bay
Chehalis Western Built 1926 as Weyerhaeuser Lumber Co. Vail Line; to CW 1980; closed 1989
USG
TMRW
Fort Lewis
USG
NP Grays Harbor Sub Built 1891; to TRMW (freight) 2004; to SOUNDER (passenger) 2005
Frederickson
South Prairie
Wilkeson
Puyallup River
Orting
BN
Carbonado
NP Wilkeson Branch Built by Northern Pacific & Cascade 1877; to NP 1898; abandoned 1984
NP Grays Harbor Sub Built 1878 Olympia & Chehalis Valley; to Port Townsend Southern 1890; to NP 1914; abandoned Olympia-Union Mill 2004; to TRMW St. Clair-Union Mill 2004
Nisqually
UP Olympia Industrial Lead Built OWR&N 1916; to TCRY Capitol Division 2002
NP Prairie Line Built 1874; BNSF Lakeview Sub
BNSF
Tacoma Eastern (orig.) Built 1900-02; to MILW 1918; to Chehalis Western 1980-1992; Tacoma Eastern (new) 1995-1998; to city of Tacoma; now Tacoma Rail Mountain Division
NP Orting Branch Built 1885; abandoned 1982
NP Grays Harbor Sub Built 1891; abandoned 1995 Belmore-Gate; to TRMW Olympia-Belmore 2004
OLYMPIA
Union Mill (Quadlock)
St. Clair
NP Prairie Line Built 1873; o/s 1994; owned by city of Yelm
NP Pacific Division Built 1874; UP trackage rights 1909; GN trackage rights 1910
BNSF Seattle Sub (UP/ ATK)
Roy
To Yelm
To Chehalis
To Gate
TCRY
To Mt. Rainier Scenic Railroad
Lake Kapowsin
N
0 Scale 5 miles
Rail Trails 7
1 Centennial Trail
2 Burke-Gelman Trail
3 East Lake Sammamish Trail
4 Issaquah-Preston Trail
5 Chehalis Western Trail
6 Cedar River Trail
7 Green to Cedar Rivers Trail
8 Sammamish River Trail
9 Lacey Woodland Trail
10 Lake Union Trail
11 Foothills Trail
Not all trails shown
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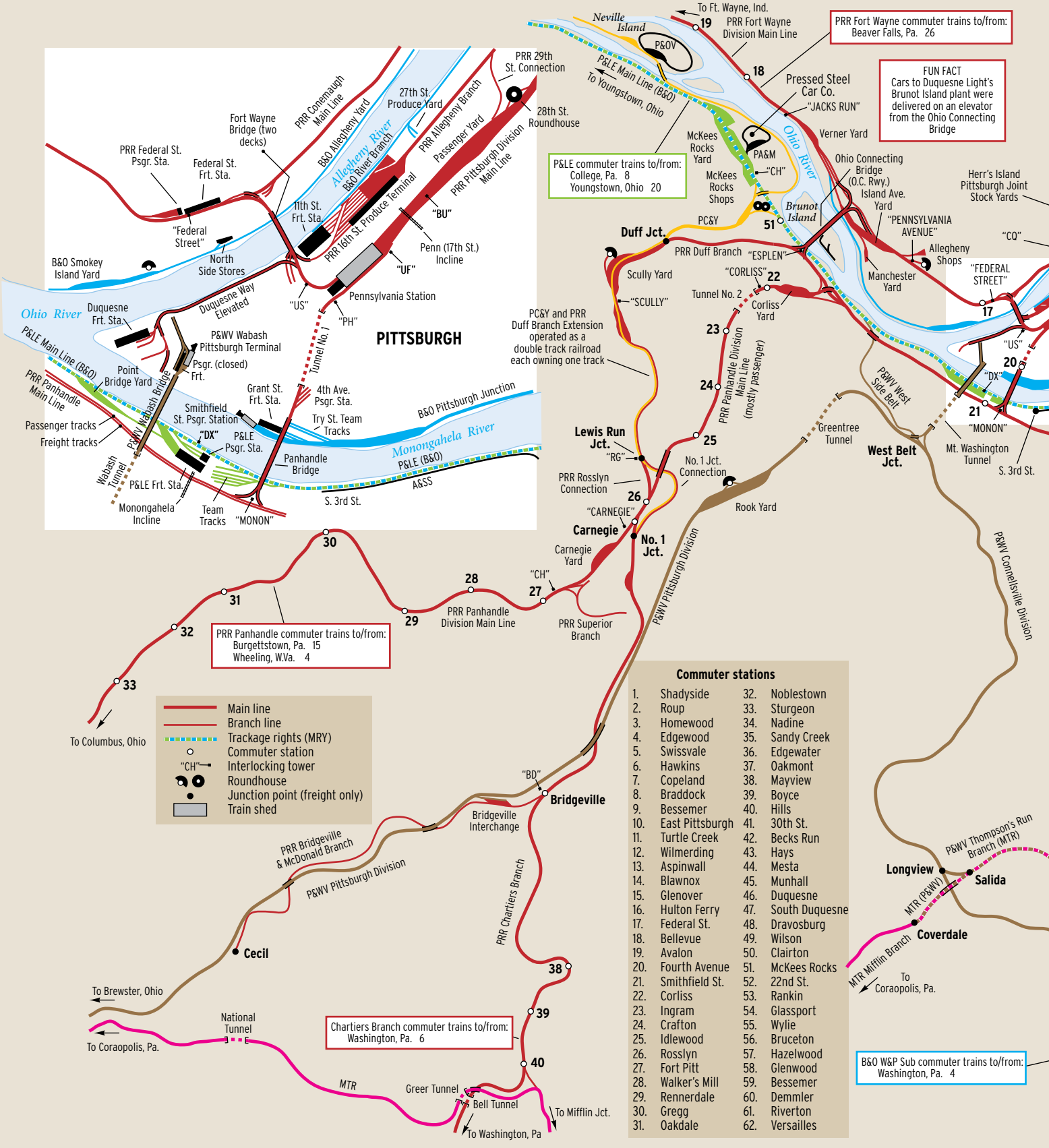
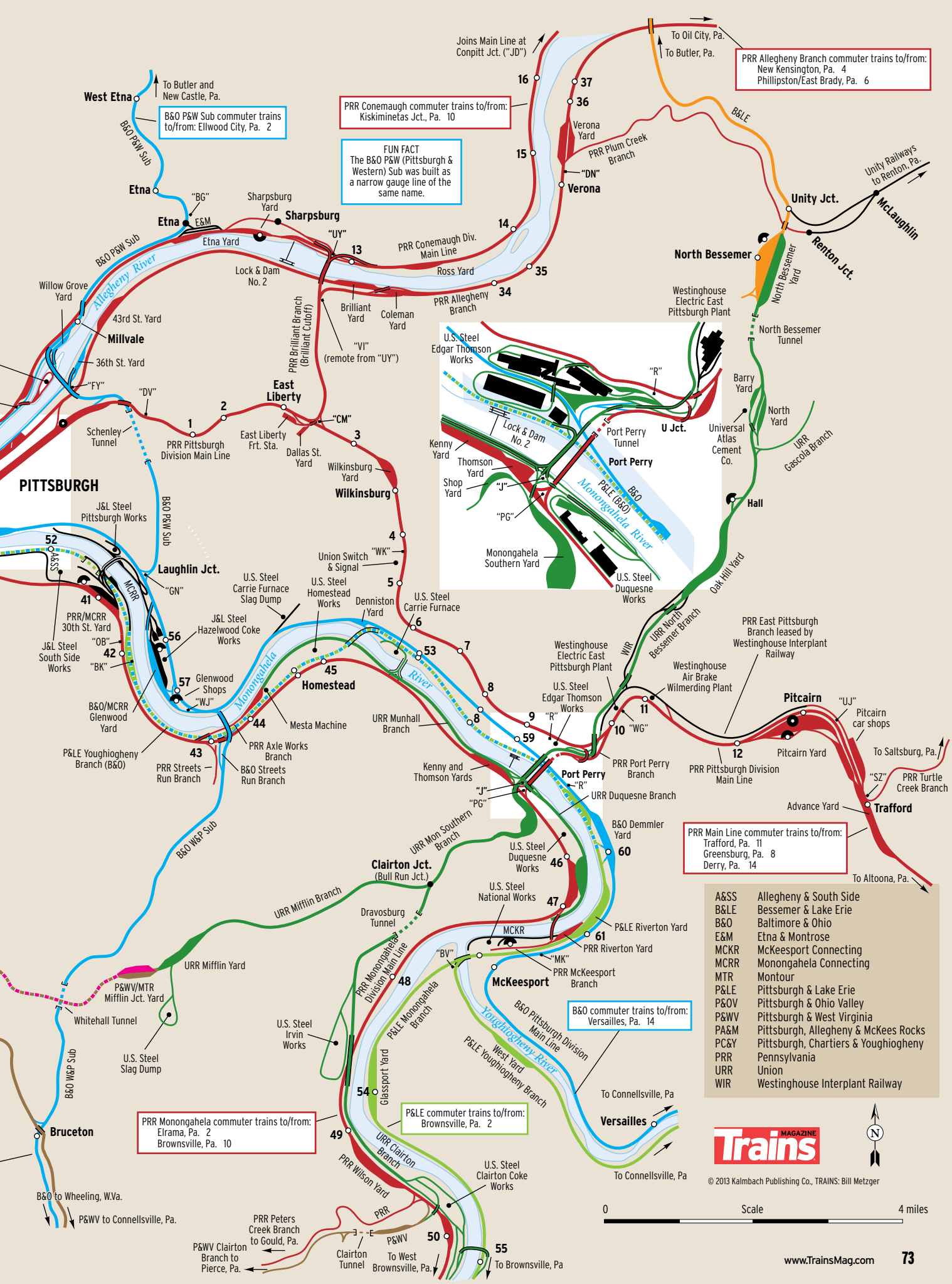
TRAINS: Bill Metzger. Map research by Bill Metzger, with map assistance from John Teichmüller

Pittsburgh's railroads in 1946




West Etna
To Butler and New Castle, Pa.
B&O P&W Sub commuter trains to/from: Ellwood City, Pa. 2
B&O P&W Sub
Etna
"BG"
Etna
E&M
Etna Yard
Sharpsburg Yard
Sharpsburg
"UY"
Lock & Dam No. 2
Allegheny River
Willow Grove Yard
43rd St. Yard
Millvale
36th St. Yard
"FY"
"DV"
Schenley Tunnel
PITTSBURGH
East Liberty
East Liberty Frt. Sta.
Dallas St. Yard
"CM"
PRR Pittsburgh Division Main Line
PRR Brilliant Branch (Brilliant Cutoff)
Brilliant Yard
Coleman Yard
"VI" (remote from "UY")
PRR Allegheny Branch
Ross Yard
PRR Conemaugh Div. Main Line
Joins Main Line at Conpitt Jct. ("JD")
PRR Conemaugh commuter trains to/from: Kiskiminetas Jct., Pa. 10
FUN FACT
The B&O P&W (Pittsburgh & Western) Sub was built as a narrow gauge line of the same name.
Verona Yard
PRR Plum Creek Branch
"DN"
Verona
To Oil City, Pa.
To Butler, Pa.
PRR Allegheny Branch commuter trains to/from:
New Kensington, Pa. 4
Phillipston/East Brady, Pa. 6
B&LE
Unity Railways to Renton, Pa.
Unity Jct.
McLaughlin
Renton Jct.
North Bessemer
North Bessemer Yard
Westinghouse Electric East Pittsburgh Plant
North Bessemer Tunnel
U.S. Steel Edgar Thomson Works
"R"
U Jct.
Barry Yard
North Yard
Universal Atlas Cement Co.
URR Gascola Branch
Lock & Dam No. 2
Port Perry Tunnel
Port Perry
Kenny Yard
Thomson Yard
Shop Yard
"J"
"PG"
B&O P&LE (B&O)
Monongahela River
Monongahela Southern Yard
U.S. Steel Duquesne Works
Hall
Oak Hill Yard
Wilkinsburg Yard
Wilkinsburg
Union Switch & Signal
"WK"
J&L Steel Pittsburgh Works
B&O P&W Sub
Laughlin Jct.
"GN"
A&SS
MCRR
PRR/MCRR 30th St. Yard
J&L Steel South Side Works
"OB"
"BK"
U.S. Steel Carrie Furnace Slag Dump
J&L Steel Hazelwood Coke Works
U.S. Steel Homestead Works
Denniston Yard
U.S. Steel Carrie Furnace
Glenwood Shops
"WJ"
B&O/MCRR Glenwood Yard
Monongahela River
Homestead
Mesta Machine
PRR Axle Works Branch
P&LE Youghiogheny Branch (B&O)
PRR Streets Run Branch
B&O Streets Run Branch
URR Munhall Branch
Kenny and Thomson Yards
"J"
"PG"
Port Perry
"R"
URR Duquesne Branch
PRR Port Perry Branch
Westinghouse Electric East Pittsburgh Plant
WIR
URR North Bessemer Branch
U.S. Steel Edgar Thomson Works
"R"
"WG"
Westinghouse Air Brake Wilmerding Plant
PRR East Pittsburgh Branch leased by Westinghouse Interplant Railway
Pitcairn
"UJ"
Pitcairn car shops
Pitcairn Yard
To Saltsburg, Pa.
"SZ"
PRR Turtle Creek Branch
Advance Yard
Trafford
PRR Pittsburgh Division Main Line
PRR Main Line commuter trains to/from:
Trafford, Pa. 11
Greensburg, Pa. 8
Derry, Pa. 14
To Altoona, Pa.
B&O W&P Sub
Clairton Jct. (Bull Run Jct.)
URR Mon Southern Branch
B&O Demmler Yard
U.S. Steel Duquesne Works
U.S. Steel National Works
URR Mifflin Branch
Dravosburg Tunnel
MCKR
P&LE Riverton Yard
PRR Riverton Yard
"MK"
PRR McKeesport Branch
McKeesport
"BV"
URR Mifflin Yard
P&WV/MTR Mifflin Jct. Yard
Whitehall Tunnel
U.S. Steel Slag Dump
U.S. Steel Irvin Works
PRR Monongahela Division Main Line
P&LE Monongahela Branch
Glassport Yard
B&O Pittsburgh Division Main Line
Youghiogheny River
West Yard
P&LE Youghiogheny Branch
B&O commuter trains to/from: Versailles, Pa. 14
To Connellsville, Pa
Versailles
To Connellsville, Pa
PRR Monongahela commuter trains to/from:
Elrama, Pa. 2
Brownsville, Pa. 10
P&LE commuter trains to/from: Brownsville, Pa. 2
Bruceton
B&O W&P Sub
URR Clairton Branch
PRR Wilson Yard
U.S. Steel Clairton Coke Works
B&O to Wheeling, W.Va.
P&WV to Connellsville, Pa.
PRR Peters Creek Branch to Gould, Pa.
P&WV Clairton Branch to Pierce, Pa.
PRR
P&WV
Clairton Tunnel
To West Brownsville, Pa.
To Brownsville, Pa
A&SS Allegheny & South Side
B&LE Bessemer & Lake Erie
B&O Baltimore & Ohio
E&M Etna & Montrose
MCKR McKeesport Connecting
MCRR Monongahela Connecting
MTR Montour
P&LE Pittsburgh & Lake Erie
P&OV Pittsburgh & Ohio Valley
P&WV Pittsburgh & West Virginia
PA&M Pittsburgh, Allegheny & McKees Rocks
PC&Y Pittsburgh, Chartiers & Youghiogheny
PRR Pennsylvania
URR Union
WIR Westinghouse Interplant Railway
Trains MAGAZINE
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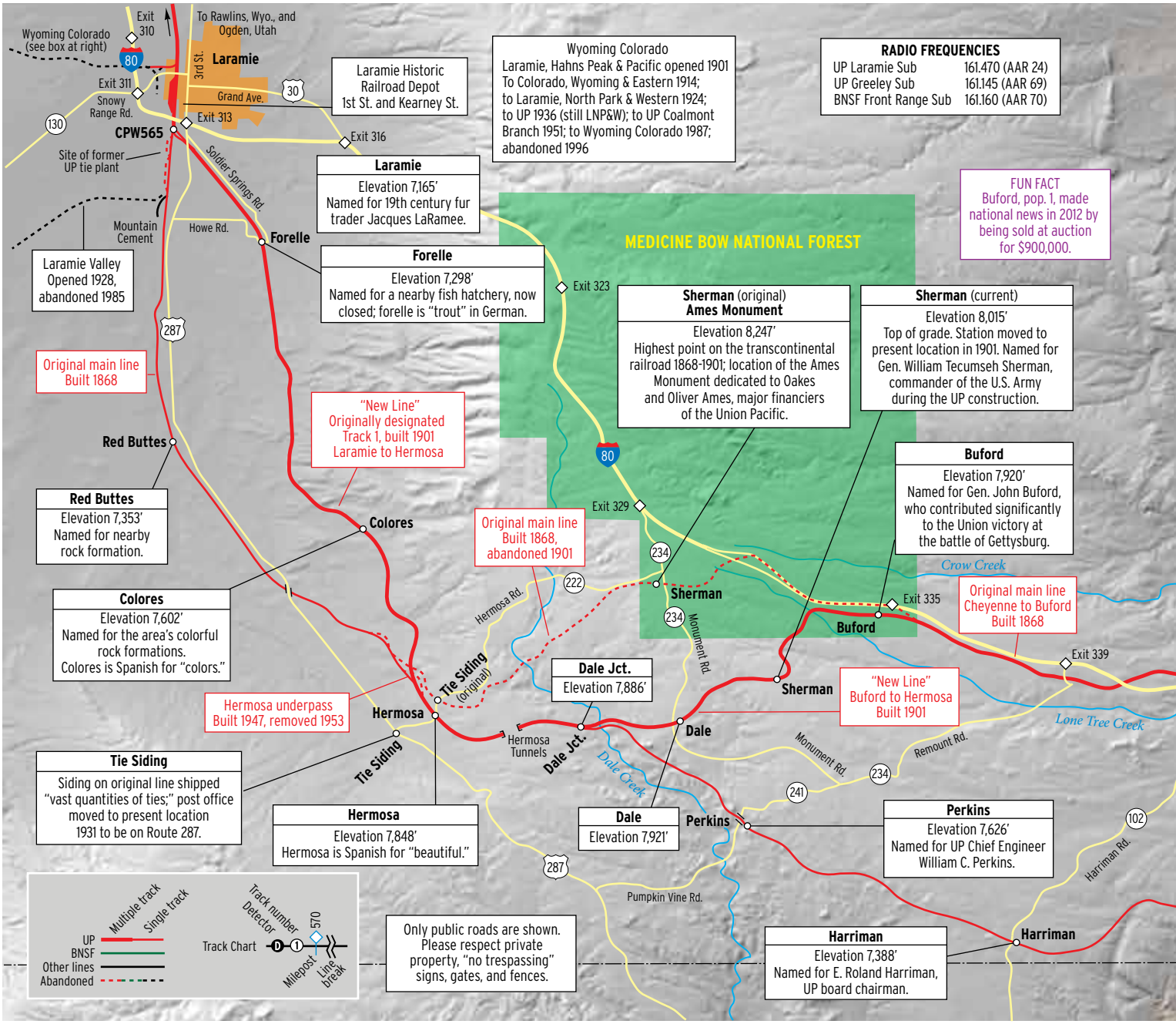
N
0
Scale
4 miles

All-time guide to Sherman Hill

See how Union Pacific's first mountain railroad crests the Rocky Mountains



Wyoming Colorado
Laramie, Hahns Peak & Pacific opened 1901
To Colorado, Wyoming & Eastern 1914;
to Laramie, North Park & Western 1924;
to UP 1936 (still LNP&W); to UP Coalmont Branch 1951; to Wyoming Colorado 1987; abandoned 1996

RADIO FREQUENCIES

UP Laramie Sub	161.470 (AAR 24)
UP Greeley Sub	161.145 (AAR 69)
BNSF Front Range Sub	161.160 (AAR 70)

Laramie Historic Railroad Depot
1st St. and Kearney St.

Laramie
Elevation 7,165'
Named for 19th century fur trader Jacques LaRamee.

Forelle
Elevation 7,298'
Named for a nearby fish hatchery, now closed; forelle is "trout" in German.

FUN FACT
Buford, pop. 1, made national news in 2012 by being sold at auction for $900,000.

Sherman (original)
Ames Monument
Elevation 8,247'
Highest point on the transcontinental railroad 1868-1901; location of the Ames Monument dedicated to Oakes and Oliver Ames, major financiers of the Union Pacific.

Sherman (current)
Elevation 8,015'
Top of grade. Station moved to present location in 1901. Named for Gen. William Tecumseh Sherman, commander of the U.S. Army during the UP construction.

Buford
Elevation 7,920'
Named for Gen. John Buford, who contributed significantly to the Union victory at the battle of Gettysburg.

Red Buttes
Elevation 7,353'
Named for nearby rock formation.

Colores
Elevation 7,602'
Named for the area's colorful rock formations.
Colores is Spanish for "colors."

Dale Jct.
Elevation 7,886'

Tie Siding
Siding on original line shipped "vast quantities of ties;" post office moved to present location 1931 to be on Route 287.

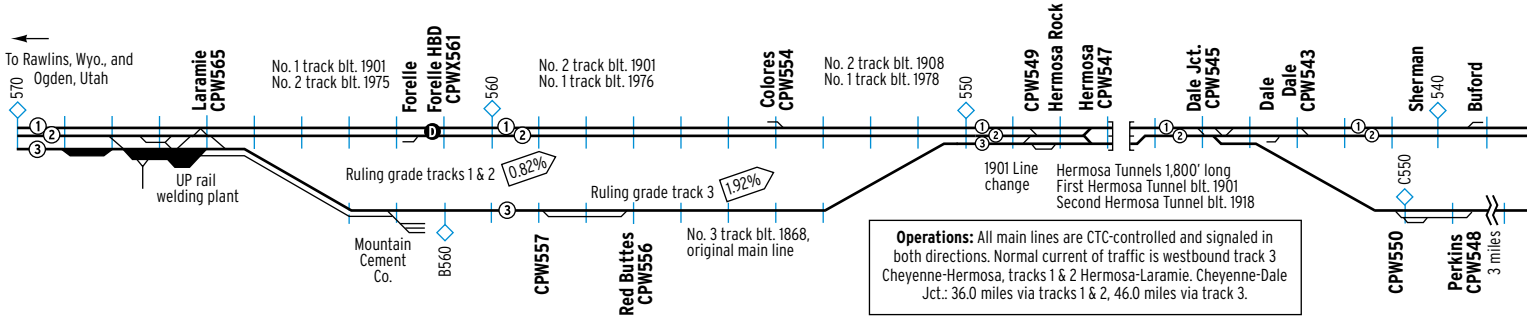
Hermosa
Elevation 7,848'
Hermosa is Spanish for "beautiful."

Dale
Elevation 7,921'

Perkins
Elevation 7,626'
Named for UP Chief Engineer William C. Perkins.

Harriman
Elevation 7,388'
Named for E. Roland Harriman, UP board chairman.

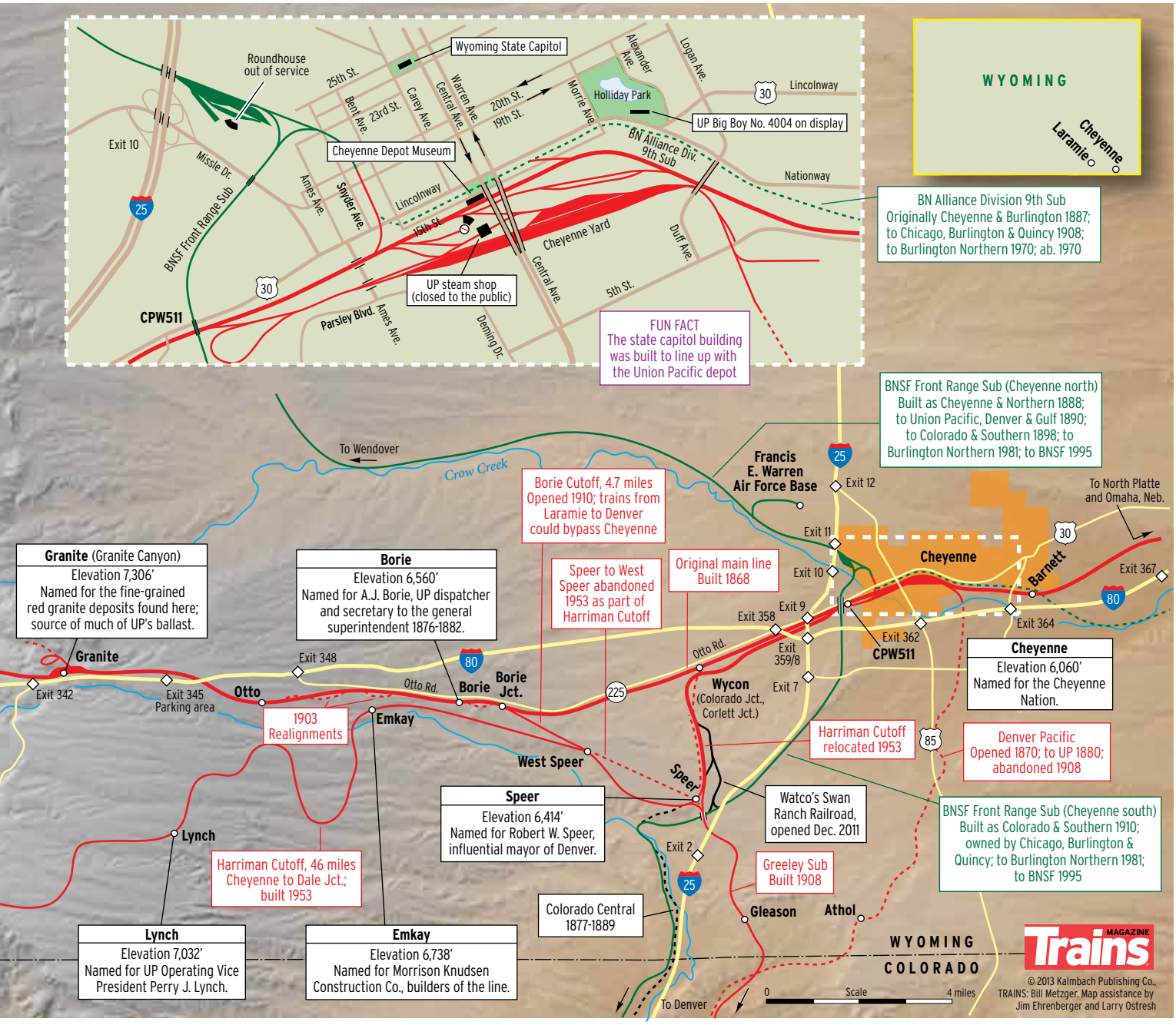
Only public roads are shown. Please respect private property, "no trespassing" signs, gates, and fences.

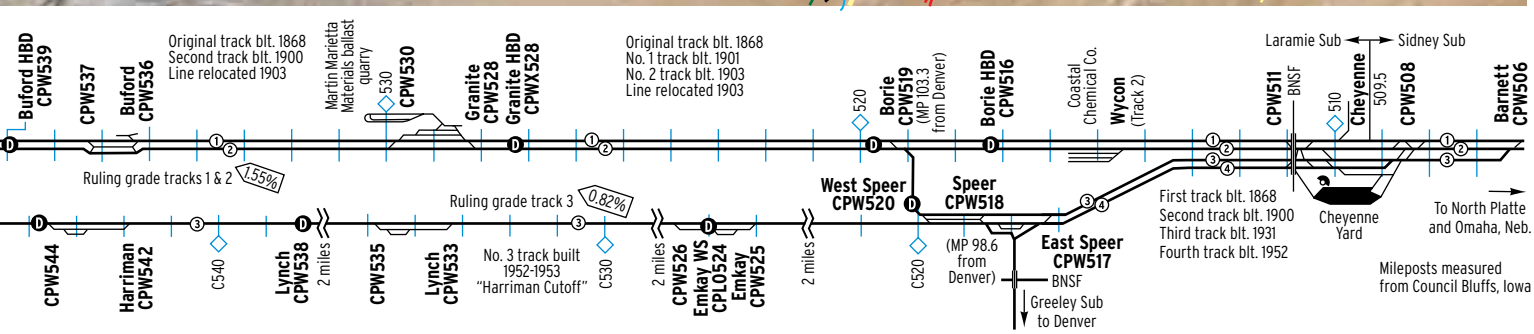


Operations: All main lines are CTC-controlled and signaled in both directions. Normal current of traffic is westbound track 3 Cheyenne-Hermosa, tracks 1 & 2 Hermosa-Laramie. Cheyenne-Dale Jct.: 36.0 miles via tracks 1 & 2, 46.0 miles via track 3.

AMERICA'S FIRST TRANSCONTINENTAL RAILROAD crossed the Rocky Mountains on Sherman Hill, a gently sloping natural pass through the mountain chain. "Any engineer who failed to take advantage … would not have been fit to belong to the profession," observed Grenville Dodge, Union Pacific's chief engineer. Geologists called the narrow east-west ridge that UP followed "the gangplank."

Although the railroad improved its mountain crossing multiple times, the area's favorable geography gave UP a singular advantage from the start. "This is the only place in the entire Rocky Mountain front where you can go from the Great Plains to the summit of the mountains without snaking up a mountain face or going through a tunnel," said geologist David Love. — *Bill Metzger*





America's regional railroads

These 21 carriers operate 12,369 rail miles and play a key role in moving America's freight

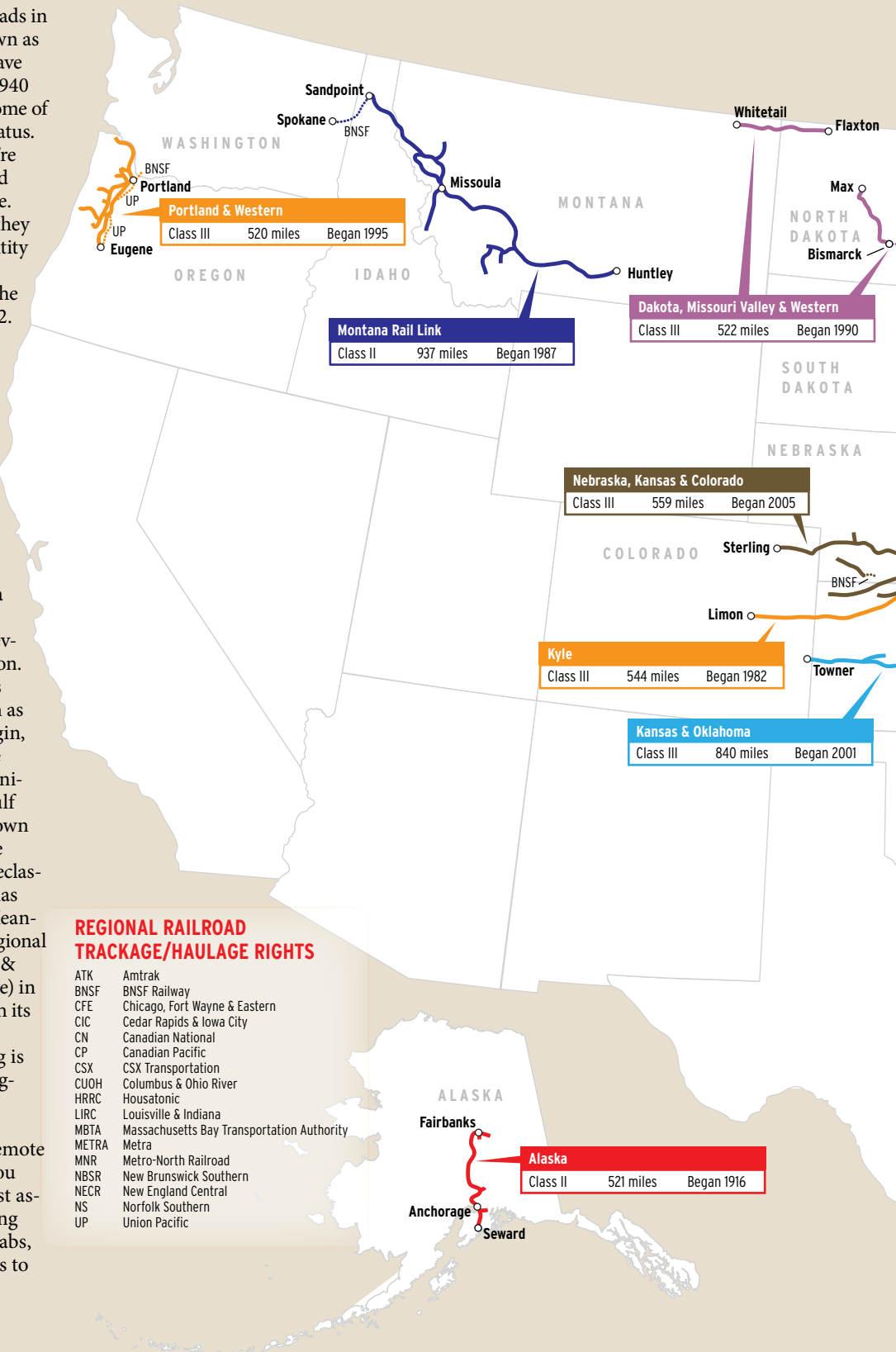
MEET THE MOST ECLECTIC GROUP of railroads in the United States: the 21 carriers known as regional railroads. Their size would have made them Class I railroads back in 1940 when TRAINS magazine began, and some of the lines shown here once held that status. But in today's super-sized world, they're smaller than any Class I, yet larger and more complex than a typical short line. Like television's Jan and Peter Brady, they fall in the middle, carving out an identity and purpose uniquely their own.

Regionals controlled 9 percent of the 138,500-mile U.S. rail network in 2012. The Association of American Railroads is responsible for defining what a regional is: line-haul railroads that operate at least 350 miles of road and earn at least $20 million in revenue, or earn revenue between $40 million and the Class I threshold (currently $432.2 million, as set by the Surface Transportation Board) regardless of mileage. The STB, meanwhile, has its own railroad classification system, which includes a Class II category that most regionals fall under: railroads with operating revenues of $34.7 million to $432.2 million.

At the start of the 21st century, this map would have included names such as Dakota, Minnesota & Eastern and Elgin, Joliet & Eastern — railroads that have since been absorbed into the Class I universe. Yet in that time, Alabama & Gulf Coast and Indiana Rail Road have grown enough to join the regional fold. Since 2010, 10 former regionals have been reclassified as short lines, while one name has been added: New England Central. Meanwhile, RailAmerica's shortline and regional railroads became part of the Genesee & Wyoming family (lines colored orange) in 2012, and Watco (blue) expanded with its purchase of Wisconsin & Southern.

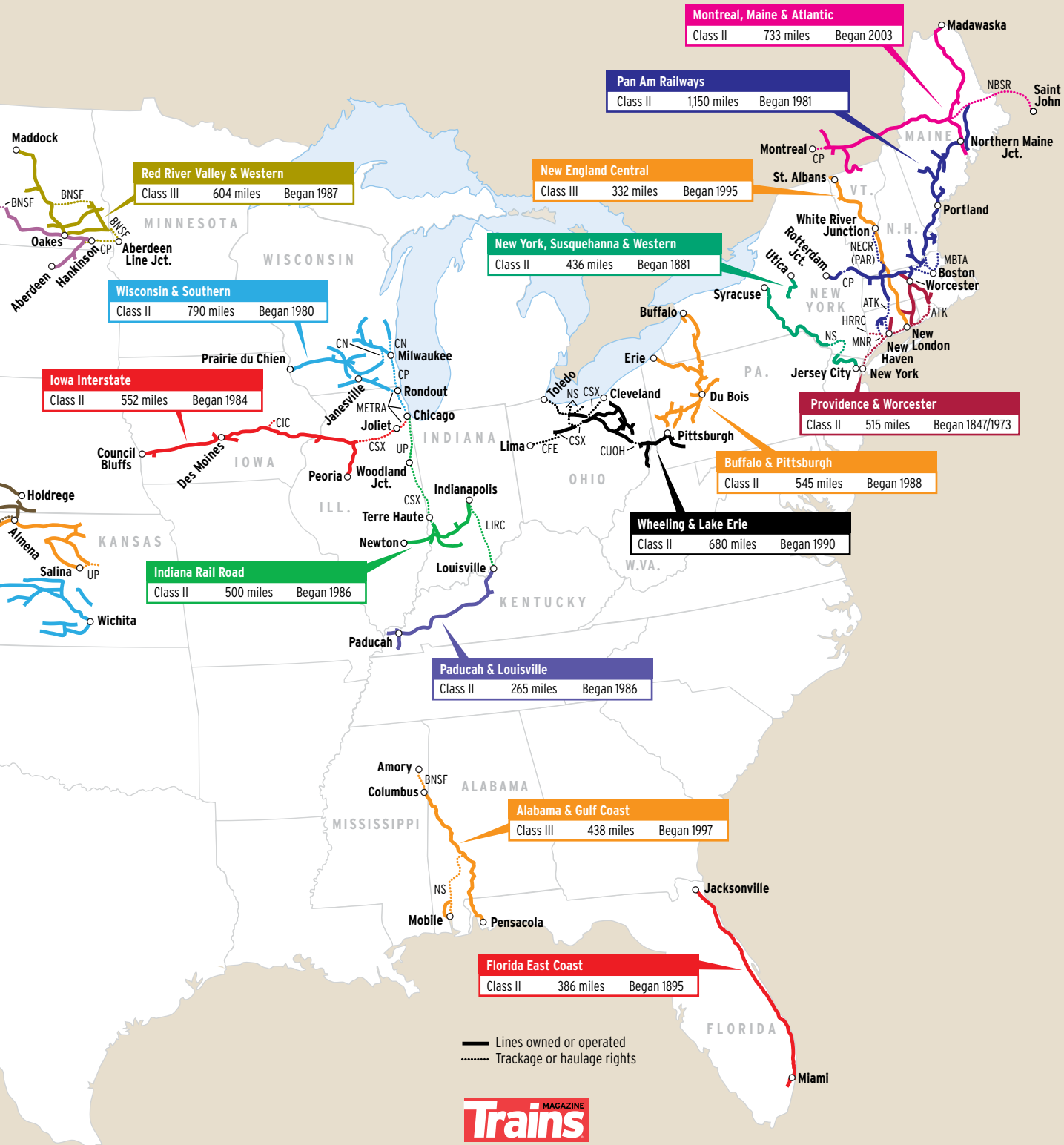
What makes regionals fascinating is the way they combine elements of big-time railroading with down-home shortline appeal, aided by targeted investments in technology such as remote control locomotives and switches. You might see long unit trains rolling past as-needed locals, or aging Geeps working side by side with big, six-axle wide-cabs, all adorned in colorful paint schemes to match their owners' colorful names.

— Matt Van Hattem



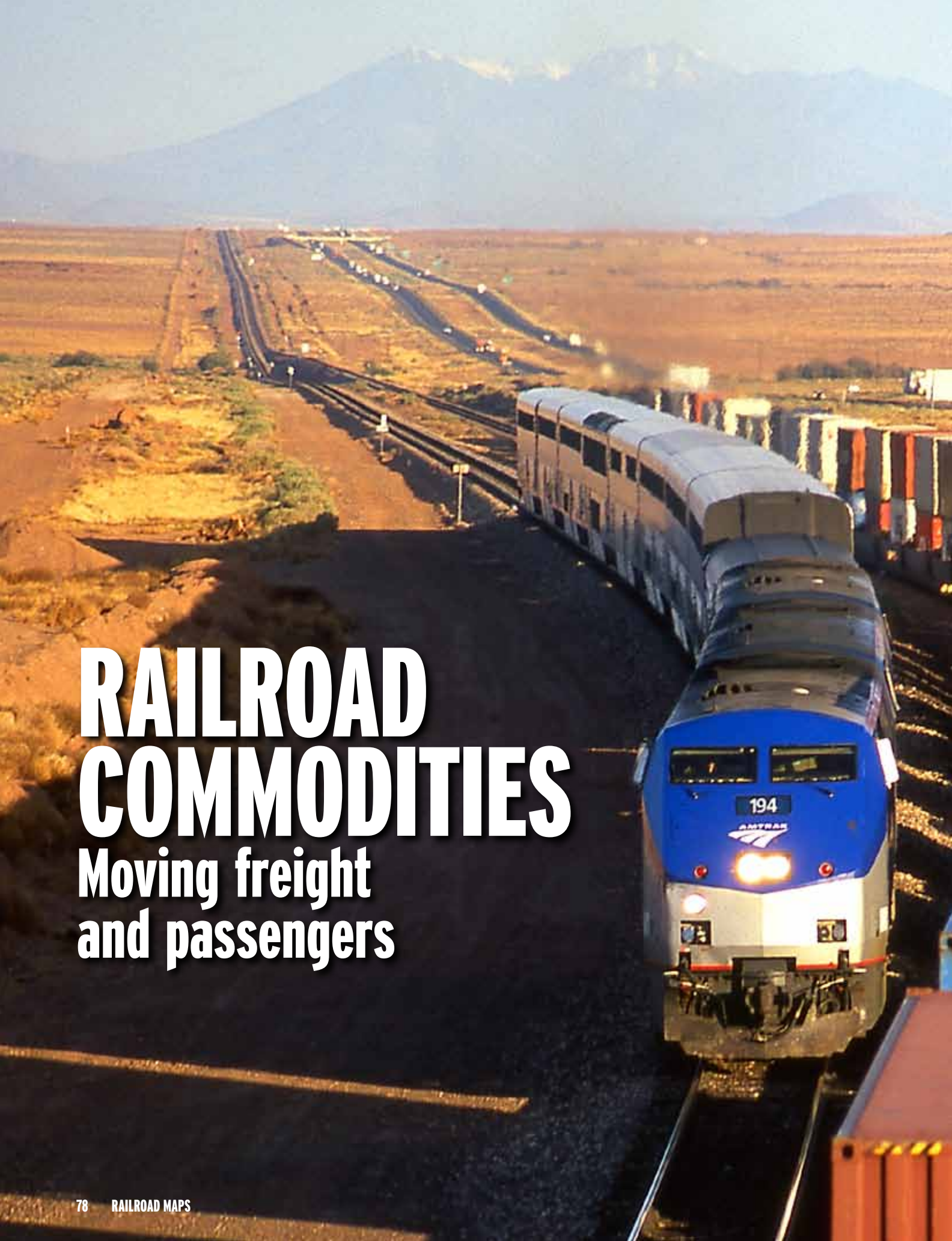
REGIONAL RAILROAD TRACKAGE/HAULAGE RIGHTS

ATK	Amtrak
BNSF	BNSF Railway
CFE	Chicago, Fort Wayne & Eastern
CIC	Cedar Rapids & Iowa City
CN	Canadian National
CP	Canadian Pacific
CSX	CSX Transportation
CUOH	Columbus & Ohio River
HRRC	Housatonic
LIRC	Louisville & Indiana
MBTA	Massachusetts Bay Transportation Authority
METRA	Metra
MNR	Metro-North Railroad
NBSR	New Brunswick Southern
NECR	New England Central
NS	Norfolk Southern
UP	Union Pacific



Trains MAGAZINE

Note: Miles include trackage rights; year indicates year operations began



RAILROAD COMMODITIES

Moving freight and passengers

UNDERLYING RAILROADING'S GEOGRAPHY is the fundamental need to move people and freight. The mix of commodities, and the routes they take, may change over time, but the mission remains the same. That freight train you saw the other day could be carrying the items on your next shopping list. Your upcoming business trip or vacation might include a ride on a passenger train. The economic might of the entire continent rides on North America's railroads, and every whistle blast from a passing train is an urgent reminder of all that is at stake.

Amtrak's eastbound *Southwest Chief*, en route from Los Angeles to Chicago, passes a long BNSF Railway double-stacked container train headed west at Winslow, Ariz., in May 2006. TRAINS: Matt Van Hattem

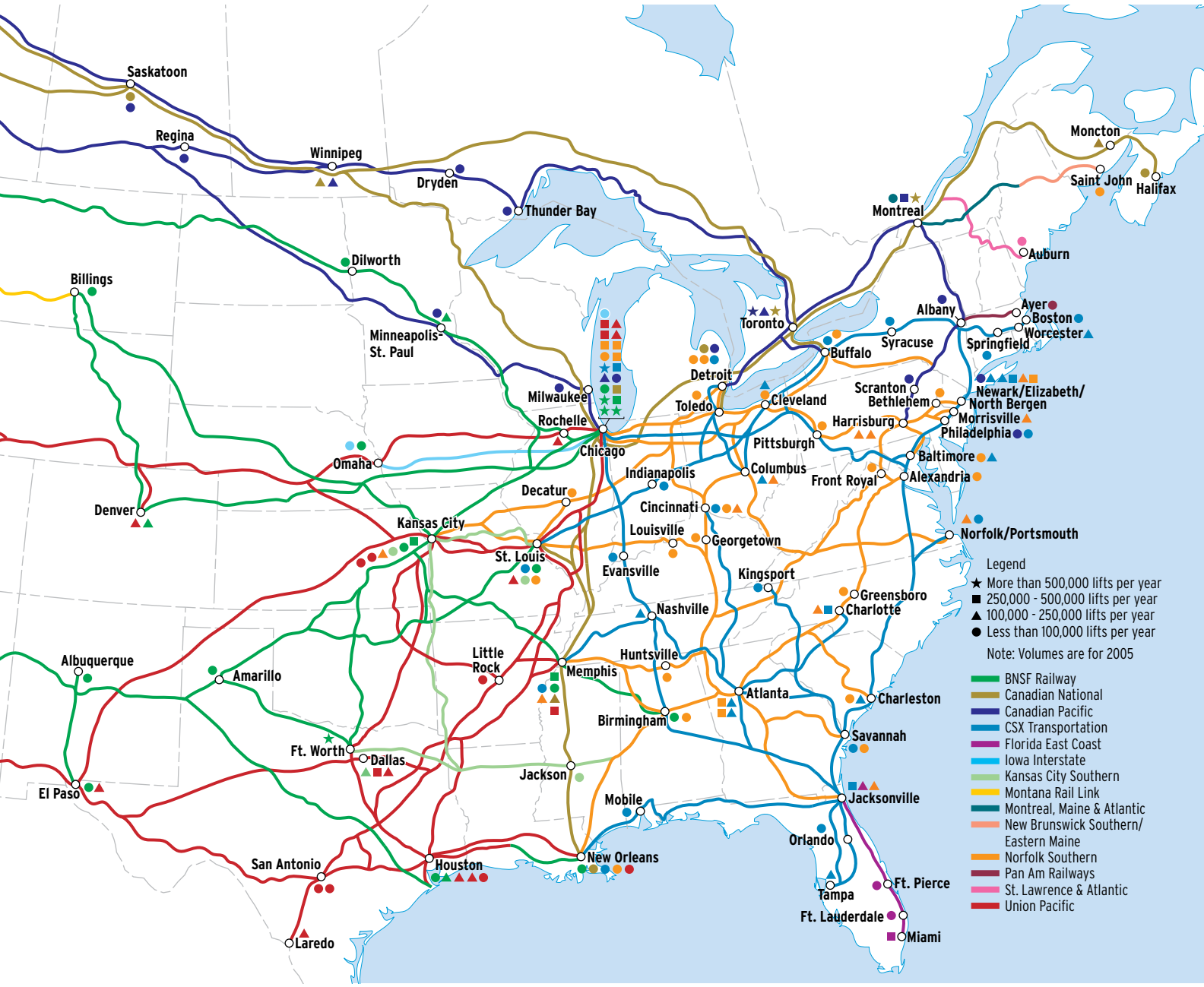
Intermodal yard volumes: 2005

Major railroad intermodal terminals of the U.S. and Canada

★ = More than 500,000 lifts per year ■ = 250,000 - 500,000 lifts per year
▲ = 100,000-250,000 lifts per year ● = Less than 100,000 lifts per year

Vol.	Location	Yard
BNSF Railway		
●	Albuquerque, N.M.	Albuquerque
★	Alliance, Texas	Alliance (Fort Worth)
●	Amarillo, Texas	Amarillo
●	Billings, Mont.	Billings
●	Birmingham, Ala.	Birmingham
★	Chicago	Cicero
★	Chicago	Corwith
●	Chicago	Western Ave. (closed 2005)
▲	Denver	Denver
●	Dilworth, Minn.	Dilworth
●	El Paso, Texas	El Paso
■	Elwood, Ill.	Logistics Park Chicago
●	Fresno, Calif.	Fresno
▲	Glendale, Ariz.	Phoenix
★	Hodgkins, Ill.	Willow Springs (Chicago)
●	Houston	Barbours Cut
▲	Houston	Houston
■	Kansas City, Kan.	Argentine
●	Kansas City, Mo.	Murray
■	Long Beach, Calif.	Port of Long Beach
★	Los Angeles	Hobart
★	Los Angeles	LA Harbor
●	Marion, Ark.	Harvard (Memphis)
■	Memphis, Tenn.	Tennessee
▲	Oakland, Calif.	Oakland Int'l. Gateway
●	Omaha, Neb.	Gibson
▲	Portland, Ore.	Portland
●	Portland, Ore.	Port of Portland Terminal 6
●	Richmond, Calif.	Richmond
★	San Bernardino, Calif.	San Bernardino
■	Seattle	Seattle Int'l. Gateway
▲	South Seattle, Wash.	South Seattle
●	Spokane, Wash.	Spokane
■	Stockton, Calif.	Stockton
●	St. Louis, Mo.	St. Louis
▲	St. Paul, Minn.	Midway Hub Center
★	Tacoma, Wash.	Tacoma
●	Westwego, La.	New Orleans
Canadian National		
■	Calgary, Alta.	Sarcee
▲	Edmonton, Alta.	McBain Intermodal Term.
●	Ferndale, Mich.	Moterm (Detroit)
●	Halifax, N.S.	Halifax Intermodal Term.
■	Harvey, Ill.	Gateway IT (Chicago)
▲	Memphis, Tenn.	Gateway IT-Memphis
▲	Moncton, N.B.	Moncton
★	Montreal	Taschereau
●	New Orleans	New Orleans
●	Saskatoon, Sask.	Saskatoon
★	Toronto	Brampton Intermodal Term.
▲	Vancouver, B.C.	Vancouver Intermodal Term.
▲	Winnipeg, Man.	Winnipeg Intermodal Term.
Canadian Pacific		
●	Albany, N.Y.	Albany (run for NS)
▲	Calgary, Alta.	Calgary
●	Detroit, Mich.	Detroit
●	Dryden, Ont.	Dryden
▲	Edmonton, Alta.	Edmonton
▲	Etobicoke, Ont.	Obico (Toronto)
●	Franklin Park, Ill.	Bensenville (Chicago)
★	Kleinburg, Ont.	Vaughan (Toronto)
■	Lachine, Que.	Lachine (Montreal)
●	Milwaukee	Milwaukee
●	Minneapolis	Minneapolis
●	Newark, N.J.	Oak Island (closed 2006)
●	Philadelphia	Ameriport
▲	Pitt Meadows, B.C.	Vancouver
●	Regina, Sask.	Regina
●	Saskatoon, Sask.	Saskatoon
▲	Schiller Park, Ill.	Schiller Park (Chicago)
●	Taylor, Pa.	Taylor (Scranton; run for NS)
●	Thunder Bay, Ont.	Thunder Bay
▲	Winnipeg, Man.	Winnipeg
CSX Transportation		
▲	Atlanta	Fairburn
▲	Atlanta	Hulsey
●	Avon, Ind.	Indianapolis
▲	Baltimore	Penn Mary
●	Boston	Beacon Park
●	Buffalo, N.Y.	Buffalo
▲	Charleston, S.C.	Charleston
■	Charlotte, N.C.	Pinoca
■	Chicago	59th St.
★	Chicago	Bedford Park
●	Cincinnati	Cincinnati
▲	Cleveland	Cleveland
▲	Columbus, Ohio	Buckeye
●	Detroit	Livernois (run by Conrail)
●	East St. Louis, Ill.	Rose Lake
●	Evansville, Ill.	Evansville
■	Jacksonville, Fla.	Jacksonville
●	Kingsport, Tenn.	Kingsport
▲	Little Ferry, N.J.	Little Ferry
●	Memphis, Tenn.	Leewood
●	Mobile, Ala.	Mobile
▲	Nashville, Tenn.	Nashville
●	New Orleans	New Orleans
▲	North Bergen, N.J.	North Bergen
●	Orlando, Fla.	Orlando
●	Philadelphia	Greenwich
●	Portsmouth, Va.	Portsmouth
●	Savannah, Ga.	Savannah
■	South Kearny, N.J.	South Kearny
●	Springfield, Mass.	West Springfield
●	Syracuse, N.Y.	Syracuse
▲	Tampa, Fla.	Tampa
▲	Worcester, Mass.	Worcester
Florida East Coast		
●	Fort Lauderdale, Fla.	Fort Lauderdale
●	Fort Pierce, Fla.	Fort Pierce
▲	Jacksonville, Fla.	Jacksonville
■	Miami	Miami
Iowa Interstate		
●	Chicago	Burr Oak
●	Council Bluffs, Iowa	Council Bluffs Railport (UP/IAIS)
Kansas City Southern		
▲	Dallas	Dallas
●	Jackson, Miss.	Jackson
●	Kansas City, Mo.	Knoche (Kansas City)
●	Venice, Ill.	East St. Louis
Montreal, Maine & Atlantic		
●	Farnham, Que.	Farnham (Montreal)
New Brunswick Southern		
●	Saint John, N.B.	Saint John
Norfolk Southern		
●	Alexandria, Va.	Alexandria (closed 2005)
■	Atlanta	Inman
■	Austell, Ga.	Whitaker
●	Baltimore	Bayview
●	Bethlehem, Pa.	BethIntermodal
●	Birmingham, Ala.	Birmingham
●	Buffalo, N.Y.	Buffalo
●	Charleston, S.C.	Charleston
▲	Charlotte, N.C.	Charlotte
■	Chicago	47th St.
■	Chicago	63rd St.
●	Chicago	Calumet
■	Chicago	Landers
▲	Cincinnati	Gest St.
●	Cincinnati	Sharonville (opened 2005)
▲	Columbus, Ohio	Columbus
●	Decatur, Ill.	Decatur
●	Detroit	Delray
●	Detroit	Livernois (run by Conrail)
▲	Elizabeth, N.J.	E-Rail
●	Front Royal, Va.	Virginia Inland Port
●	Georgetown, Ky.	Georgetown
●	Greensboro, N.C.	Greensboro
▲	Harrisburg, Pa.	Harrisburg
●	Huntsville, Ala.	Huntsville
▲	Jacksonville, Fla.	Jacksonville
■	Jersey City, N.J.	Croxton
▲	Kansas City, Mo.	Kansas City

TRAINS: Rick Johnson
Map research by Curtis W. Richards
and Matt Van Hattem

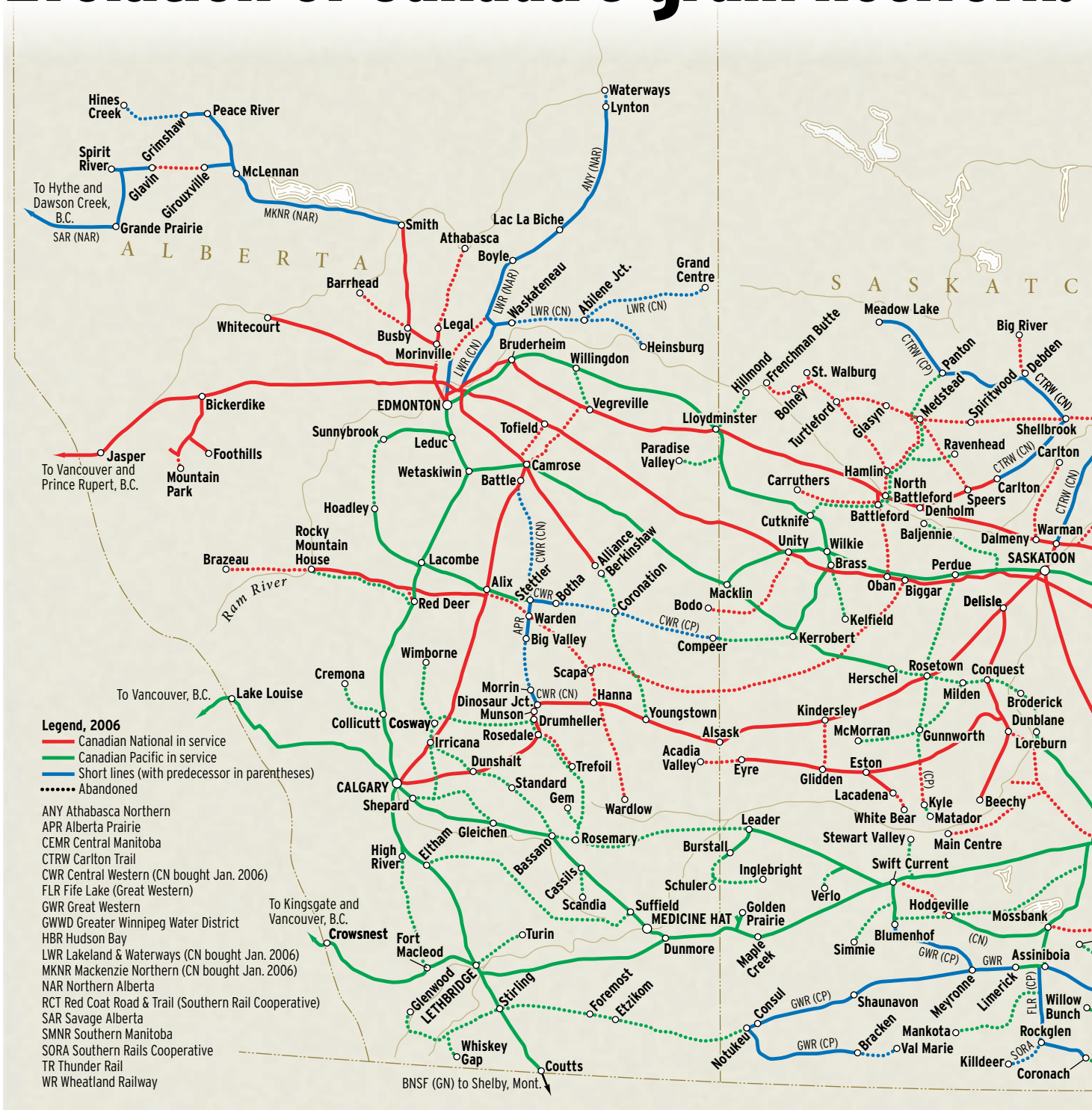


● Louisville, Ky.	Louisville
● Maple Heights, Ohio	Cleveland
▲ Memphis, Tenn.	Forrest
▲ Morrisville, Pa.	Morrisville
● New Orleans	New Orleans
▲ Norfolk, Va.	Norfolk
▲ Rutherford, Pa.	Rutherford (Harrisburg)
● Savannah, Ga.	Savannah ICTF
● St. Louis, Mo.	St. Louis
● Toledo, Ohio	Toledo
● Pittsburgh	Pitcairn
*Triple Crown RoadRailer terminals not included	
Pan Am Railways	
● Ayer, Mass.	Ayer
St. Lawrence & Atlantic	
● Auburn, Maine	Maine Intermodal Terminal
Union Pacific	
● Avondale, La.	New Orleans

▲ Chicago	Canal St.
■ Chicago	Global 1
▲ Chicago	Yard Center
▲ City of Industry, Calif.	City of Industry (LA)
■ Dallas	DIT
▲ Denver	Denver
▲ Dupo, Ill.	Dupo (St. Louis)
▲ El Paso, Texas	El Paso
● Houston	Barbours Cut
▲ Houston	Englewood
▲ Houston	Houston
● Kansas City, Kan.	Armourdale
● Kansas City, Mo.	Kansas City
▲ Laredo, Texas	Laredo
● Las Vegas	Las Vegas
▲ Lathrop, Calif.	Lathrop
■ Los Angeles	East Los Angeles
★ Los Angeles	ICTF

▲ Los Angeles	LATC
■ Marion, Ark.	Marion Railport (Memphis)
▲ Mesquite, Texas	Mesquite (Dallas)
■ Northlake, Ill.	Global 2 (Chicago)
● North Little Rock, Ark.	North Little Rock
■ Oakland, Calif.	Oakland
● Portland, Ore.	Brooklyn
● Portland, Ore.	Portland
● Reno, Nev.	Reno (closed 2005)
▲ Rochelle, Ill.	Global 3
▲ Salt Lake City	SLCIT
● San Antonio	San Antonio
● San Antonio	San Antonio TOFC
▲ Seattle	Seattle
● Sparks, Nev.	Sparks
● Tucson, Ariz.	Tucson

Evolution of Canada's grain network:

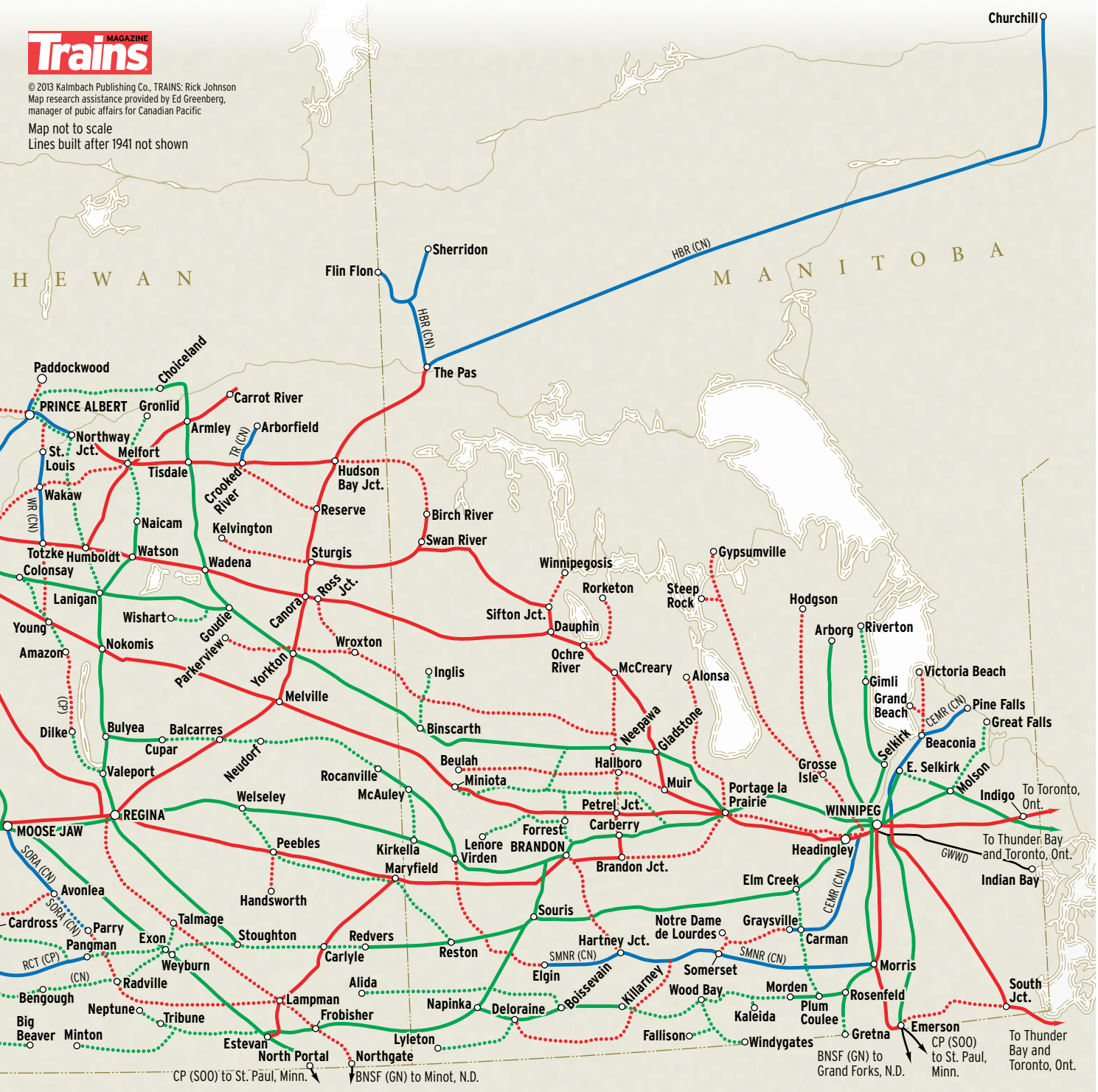


THREE DISTINCT PERIODS of railway construction created the grain-gathering network that serves the farmers of Manitoba, Saskatchewan, and Alberta.

The first 3,000 miles were built between 1881 and the onset of a depression in 1893. Better times returned in 1896, fueling an incredible boom that saw the construction of more than 11,000 route-miles by the Canadian Northern, Grand Trunk Pacific, Canadian Pacific, and others. World War I ended the proliferation of new lines and led to Canadian National's takeover of both the Canadian Northern and Grand Trunk Pacific. Intense rivalry between CN and CP prompted the third boom in grain branches, with 4,500 miles built between 1918 and 1935.

This map shows the evolution of lines in place by 1941, when the rural railway network totaled more than 19,500 miles, serving over 5,000 elevators at more than 2,000 delivery points. (The few lines built after 1941, mainly to serve mines or gas

1941-2005



plants, are not shown.)

Intense political pressure ensured that few miles would be abandoned. Yet by 1975, the region's grain-handling trackage had deteriorated so badly that even organizations usually violently opposed to rail removal conceded that some lines had to come up. Two exhaustive studies in the 1970s recommended the removal of 3,129 miles of branch lines. The 1983 abolition of the "Crow Rate," which pegged grain-shipping charges at 1897 levels, led to more rail abandonment.

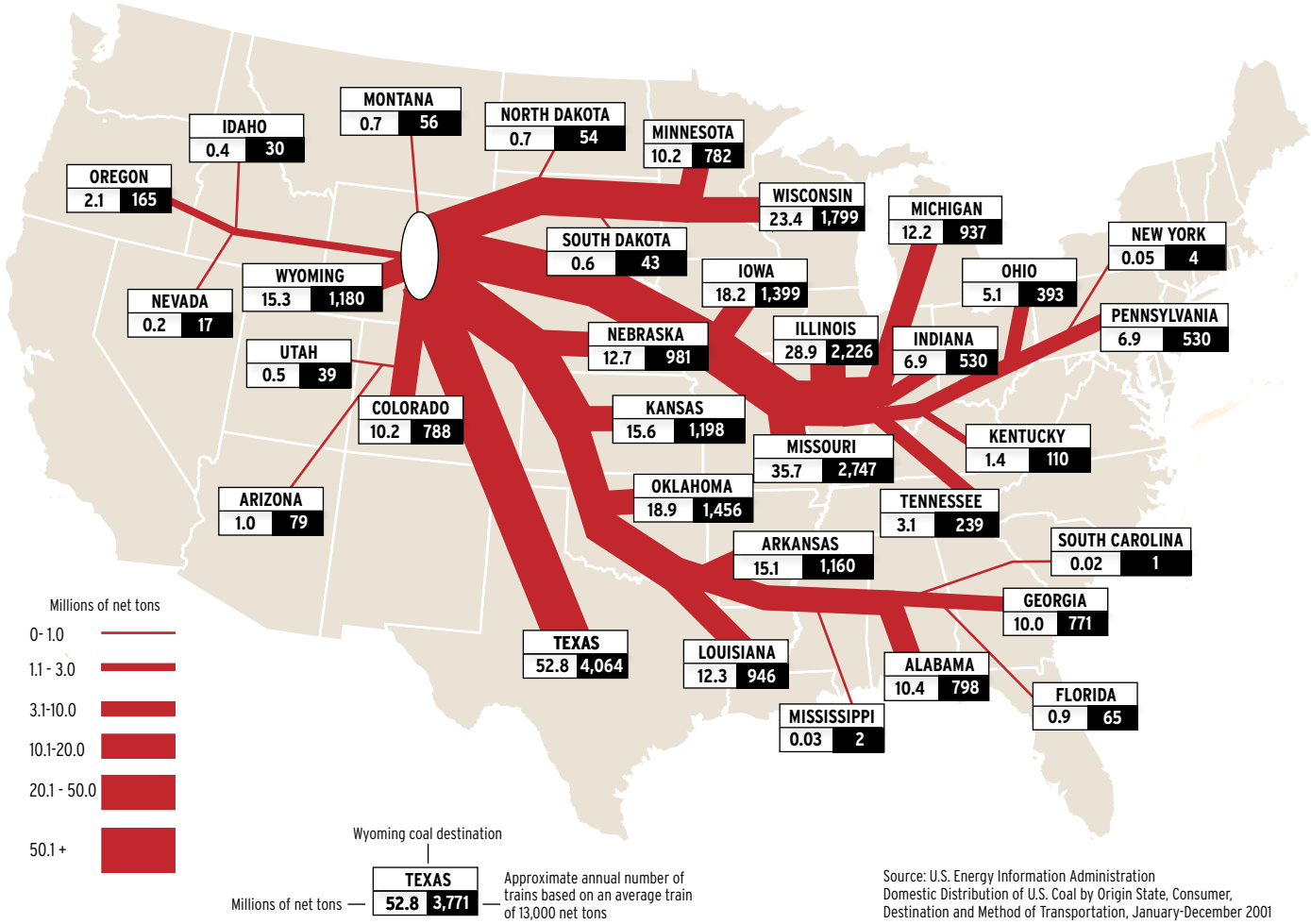
By 2005, some 6,600 miles — 35 percent of the region's peak mileage — had been abandoned. Another 2,500 miles (13 percent) had been spun off into regional railroads. Other lines have not seen the passage of a train for months or even years; for some, abandonment has already begun. — *Charles W. Bohi, an author and retired schoolteacher in White River Junction, Vt., and Leslie S. Kozma, an author and Canadian railway historian*

Moving Wyoming's coal by rail

We map the tons of Wyoming coal hauled by rail across North America in 2001 and 2011

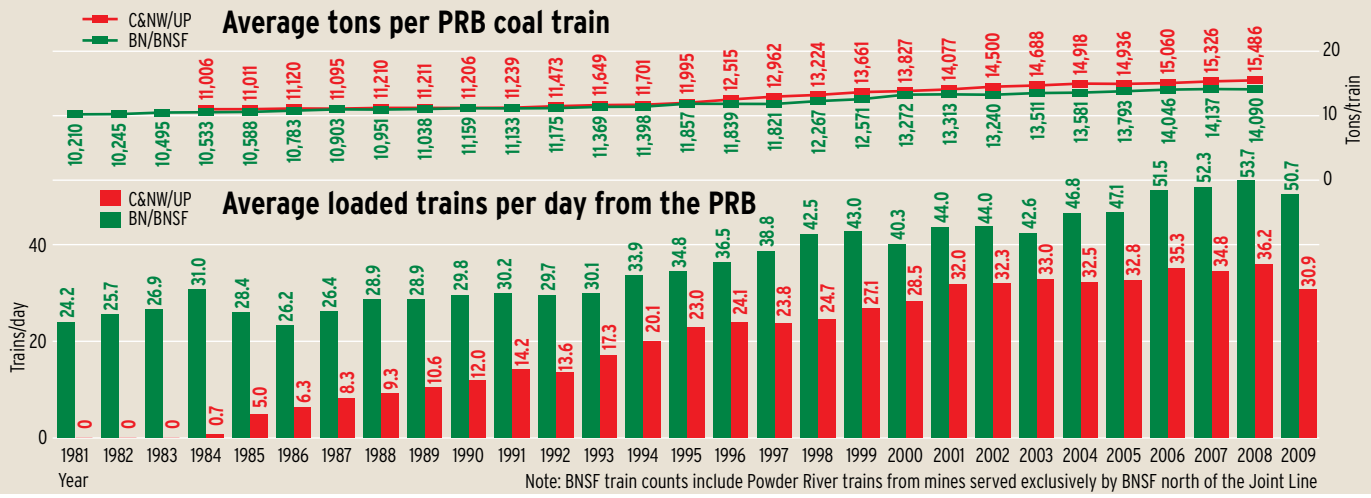
THE NEED TO HAUL COAL has fueled railway construction since the beginning. But that mission may have reached its apotheosis on the windswept plains of Wyoming in the 2000s, where a growing number of long hopper trains crept through towering mine loadouts to be filled with coal. Most of those trains left the state on a single route, jointly owned by BNSF Railway and Union Pacific, that has grown to four tracks wide in places. This map shows the growth in railroad-hauled coal out of Wyoming from 2001 to 2011, a decade when the state's coal production jumped more than 25 percent. By 2011, Wyoming was producing 40 percent of all the coal mined in America, according to the U.S. Energy Administration, and its reach had spread across the country, as power plants favored Wyoming's low-sulfur coal over higher-sulfur and higher-priced reserves elsewhere. In 2008, the average rail haul for Powder River coal was 1,200 miles. However, by 2011, overall coal production in the U.S. had begun to fall, as utilities closed older plants and switched others to lower-priced natural gas. (Although more than 90 percent of American coal still goes to making electricity, coal's share of total U.S. electric generation dropped from 49 percent in 2007 to 42 percent in 2011.) Nevertheless, Wyoming will continue to be America's coal king for the foreseeable future, and there's still no better place to see heavy-haul freight railroading at its best than the coal lines radiating from it. — *Bill Metzger and Matt Van Hattem*

Distribution of Wyoming coal by rail, 2001
Total tons: 332.7 million



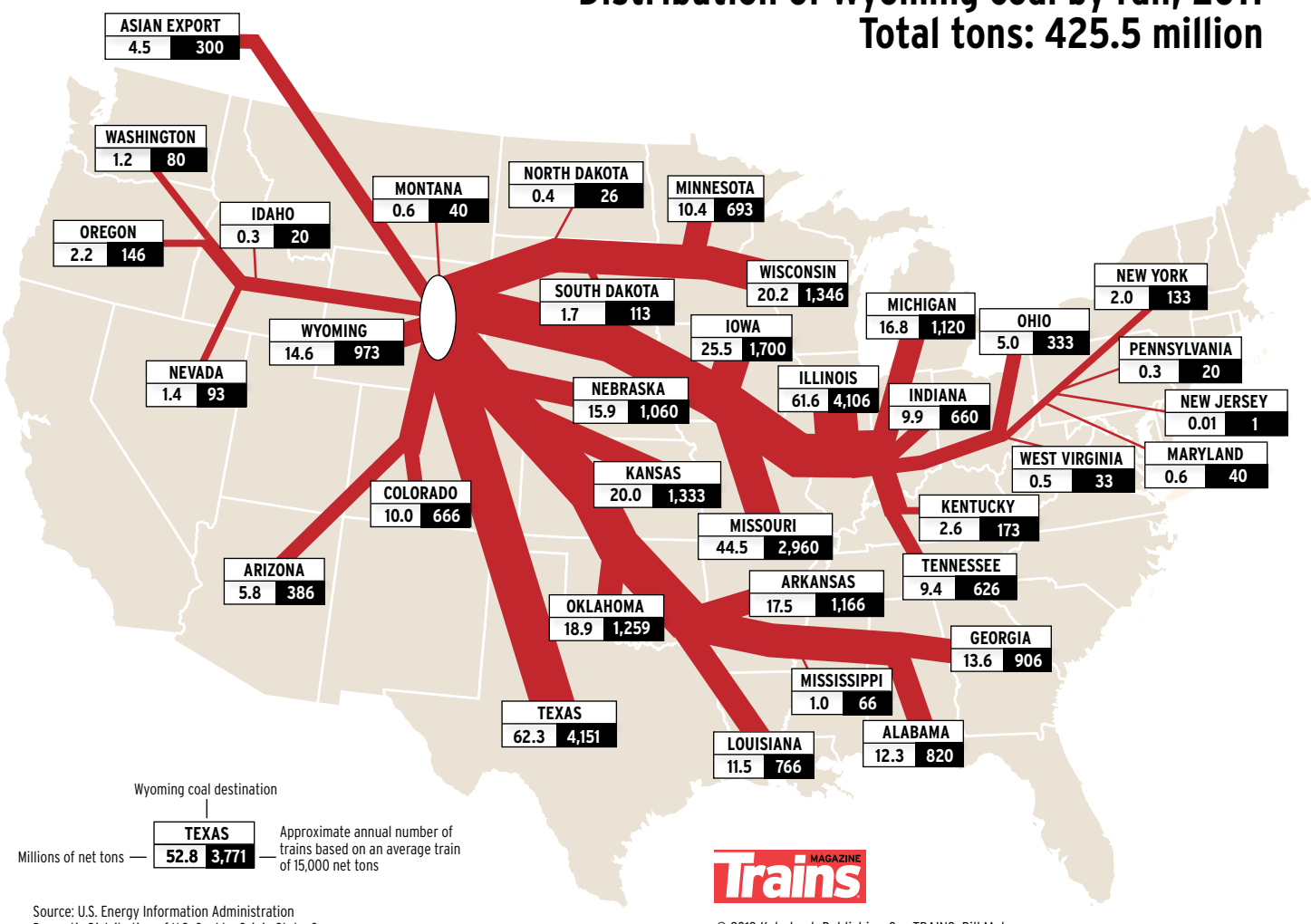
Source: U.S. Energy Information Administration
Domestic Distribution of U.S. Coal by Origin State, Consumer, Destination and Method of Transportation, January-December 2001

Rail operations in the Powder River Basin: 1981-2009



Note: BNSF train counts include Powder River trains from mines served exclusively by BNSF north of the Joint Line

Distribution of Wyoming coal by rail, 2011
Total tons: 425.5 million



Source: U.S. Energy Information Administration
Domestic Distribution of U.S. Coal by Origin State, Consumer, Destination and Method of Transportation, January-December 2011

Notes: Routes shown are schematic. Only rail-originated coal is shown. Some coal (e.g. Illinois, Wisconsin, Michigan) moves partially by river or Great Lakes vessels.

Coal: From mine to plant

See how coal moves between the 51 biggest mines and the top 25 coal-burning power plants in the United States

Which power plants use the most coal?

These top 25 plants consumed one-fifth of all U.S. coal in 2008

Rank	Facility	Owner	Location	Types of coal used (percentage) Bituminous	Lignite	Subbituminous	Major coal source	Coal delivery method	Tons used 2008 (millions)
1	Robert W. Scherer	Southern Co.	Juliette, GA			100%	Various Powder River Basin mines (via BNSF)	Rail (NS)	14.9
2	Martin Lake	Luminant	Tatum, TX		81%	19%	Oak Hill and Beckville mines, TX; Powder River Basin (via BNSF)	Rail (Texas lignite via LE private line; PRB coal via BNSF to Kansas City, to Shreveport, BNSF delivery)	14.1
3	James H. Miller Jr.	Southern Co.	West Jefferson, AL			100%	Various Powder River Basin mines (via BNSF)	Rail (BNSF)	12.3
4	W.A. Parish	NRG Texas	Thompsons, TX			100%	Various Powder River Basin mines (via BNSF)	Rail (BNSF)	12.0
5	Monticello	Luminant	Mount Pleasant, TX		42%	58%	Powder River Basin (via BNSF); Winfield, TX	Rail (Texas lignite via LE private line; PRB coal via BNSF to Kansas City, KCS delivery)	11.3
6	Rockport	American Electric Power	Rockport, IN	14%		86%	Various Powder River Basin mines (via UP to river terminal)	Barge	11.0
7	Colstrip	PPL Montana	Colstrip, MT			100%	Rosebud Mine, MT	Mine-mouth plant	10.3
8	Labadie	Ameren	Labadie, MO			100%	Various PRB mines (via UP)	Rail (UP)	10.2
9	Gibson	Duke Energy Indiana	Owensville, IN	100%			Various Indiana mines (via NS)	Rail (NS)	10.0
10	Limestone	NRG Texas	Jewett, TX		65%	35%	Jewett Mine, TX; Bucksin and Rawhide mines, WY (via BNSF)	Mine-mouth plant; PRB coal via BNSF	9.9
11	Monroe	Detroit Edison Co.	Monroe, MI	48%		52%	Various PRB mines (via BNSF to Chicago for interchange to NS or CSX or to Superior, WI, for transfer to lake vessel); various Kentucky mines (via NS or CSX)	Rail (PRB coal via BNSF-Chicago-NS or BNSF-Chicago-CSX-Toledo-CN; Kentucky coal via NS or via CSX -Toledo-CN); lake vessel	9.1
12	Jeffrey Energy Ctr.	Westar Energy	St. Marys, KS			100%	Eagle Butte Mine, WY (via BNSF)	Rail (BNSF to Northport, NE, UP delivery)	8.8
13	Bowen	Southern Co.	Cartersville, GA	100%			Pine Branch Mine, KY (via CSX)	Rail (CSX)	8.8
14	Jim Bridger	MidAmerican Energy	Point of Rocks, WY			100%	Bridger and Black Butte mines, WY	Mine-mouth plant	8.6
15	Sherburne County	Xcel Energy	Becker, MN			100%	Absaloka Mine, MT (via BNSF)	Rail (BNSF)	8.5
16	Gen. J.M. Gavin	American Electric Power	Cheshire, OH	92%		8%	Powhatan Mine, OH (via NS to river terminal)	Barge	8.5
17	Four Corners	Arizona Public Service	Farmington, NM	100%			Navajo Mine, NM	Rail (NAVM)	8.3
18	Big Cajun II Generating	NRG Louisiana	New Roads, LA			100%	Buckskin Mine, WY (via BNSF to river terminal)	Barge	8.2
19	Navajo	Salt River Project	Page, AZ	100%			Kayenta Mine, AZ	Rail (BM&LP)	8.1
20	Baldwin Energy Complex	Dynegy Midwest Generation	Baldwin, IL			100%	North Antelope Rochelle Mine, WY (via BNSF)	Rail (CN)	7.8
21	Laramie River	Basin Electric Power Co-op.	Wheatland, WY			100%	Various Powder River Basin mines (via BNSF)	Rail (BNSF)	7.6
22	Coal Creek	Great River Energy	Underwood, ND		100%		Falkirk Mine, ND	Mine-mouth plant barge	7.4
23	W.H. Sammis	FirstEnergy	Stratton, OH	93%		7%	Cumberland Mine, PA	Barge	7.3
24	Bruce Mansfield	FirstEnergy	Shippingport, PA	100%			McElroy Mine, WV	Barge	7.2
25	Paradise	Tennessee Valley Auth.	Paradise, KY	100%			Various Kentucky mines (via CSX, plus truck and barge)	Truck; rail (CSX); barge	6.9
	Total (25 facilities)			**29%**	**13%**	**58%**			**236.9 million tons**

Source: EIA Utility, Non-Utility, and Combined Heat & Power Plant Database (2008 December EIA-923 Monthly Time Series File); EIA Monthly Utility and Nonutility Fuel Receipts and Fuel Quality Database, 2008; conversations and correspondence with industry participants and observers; utility websites

Which mines produce the most coal?

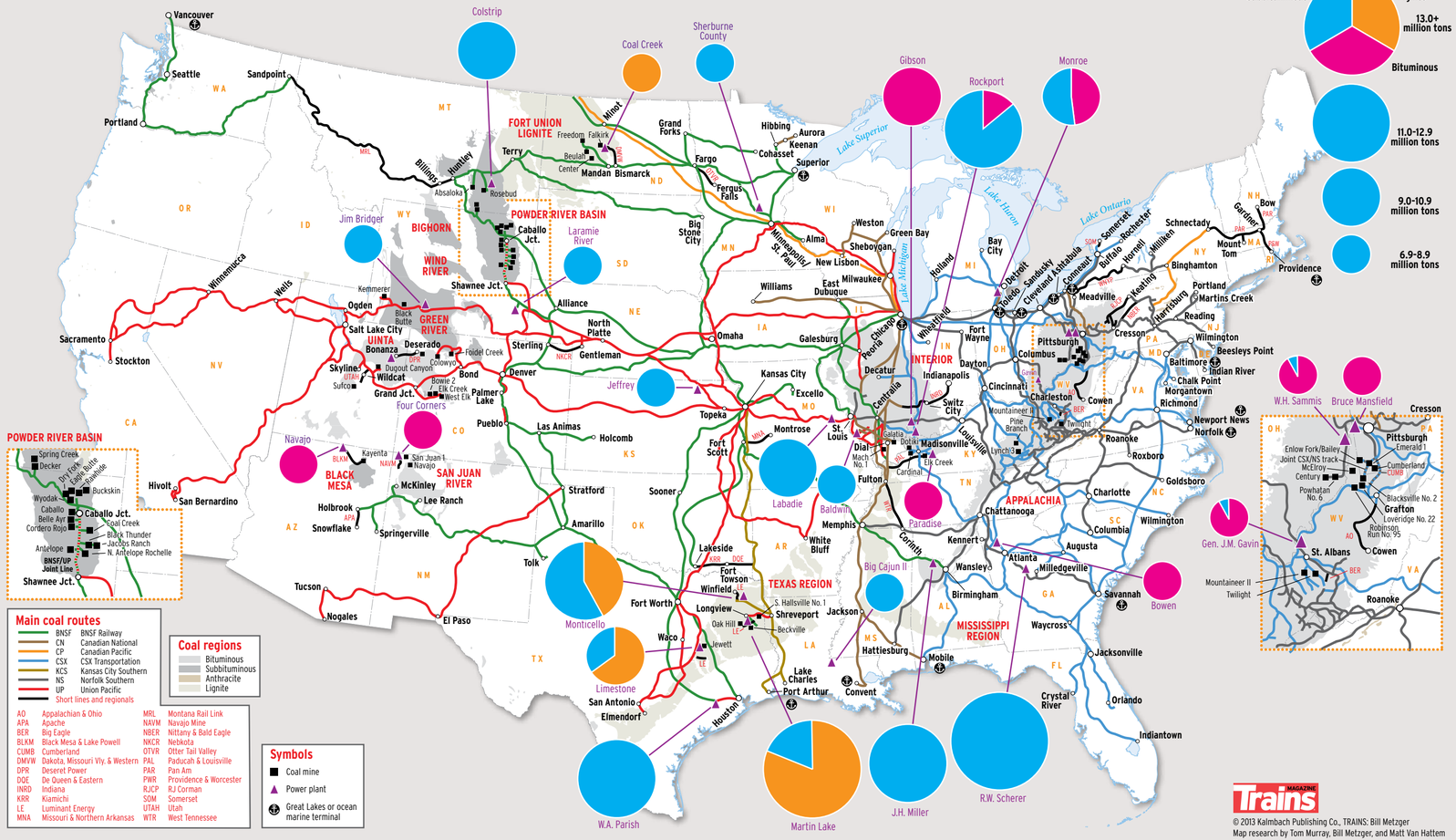
These top 51 mines produced 61% of all U.S. coal in 2008

Rank	Mine	State	Surface or underground	Coal region	Railroad	2008 production (tons)
1	North Antelope Rochelle	WY	S	PRB	BNSF, UP	97,578,499
2	Black Thunder	WY	S	PRB	BNSF, UP	88,584,704
3	Jacobs Ranch	WY	S	PRB	BNSF, UP	42,145,705
4	Cordero Rojo	WY	S	PRB	BNSF, UP	40,033,283
5	Antelope	WY	S	PRB	BNSF, UP	35,777,489
6	Caballo	WY	S	PRB	BNSF, UP	31,205,381
7	Belle Ayr	WY	S	PRB	BNSF, UP	28,707,982
8	Buckskin	WY	S	PRB	BNSF	26,076,355
9	Eagle Butte	WY	S	PRB	BNSF	20,442,963
10	Rawhide	WY	S	PRB	BNSF	18,418,546
11	Spring Creek	MT	S	PRB	BNSF	17,947,506
12	Freedom	ND	S	FUL	BNSF	14,565,631
13	Rosebud	MT	S	PRB	BNSF	13,052,713
14	Coal Creek	WY	S	PRB	BNSF, UP	11,453,546
15	Enlow Fork	PA	U	APP	NS	11,089,475
16	Bailey	PA	U	APP	CSX, NS	9,996,038
17	McElroy	WV	U	APP	Barge	9,636,827
18	Navajo	NM	S	SJR	NAVM	8,905,813
19	Kayenta	AZ	S	BM	BLKM	8,024,973
20	Foidel Creek	CO	U	UIN	UP	8,004,176
21	Falkirk	ND	S	FUL	Mine mouth	7,532,993
22	Cumberland	PA	U	APP	CUMB, Barge	7,321,030
23	San Juan 1	NM	U	SJR	Mine mouth	7,046,199
24	Sufco	UT	U	UIN	UP	6,946,075
25	Decker	MT	S	PRB	BNSF	6,871,671
26	Century	OH	U	APP	NS	6,843,898
27	Jewett	TX	S	TR	None	6,453,799
28	Absaloka	MT	S	PRB	BNSF	6,390,699
29	Emerald No. 1	PA	U	APP	CSX, NS	6,343,350
30	Wyodak	WY	S	PRB	BNSF	6,015,890
31	West Elk	CO	U	UIN	UP	5,858,789
32	Powhatan No. 6	OH	U	APP	NS	5,797,596
33	Robinson Run No. 95	WV	U	APP	CSX	5,627,306
34	Blacksville No. 2	PA	U	APP	CSX, NS	5,584,153
35	Mach No. 1	IL	U	INT	CN	5,503,665
36	Galatia	IL	U	INT	CN	5,263,019
37	Dry Fork	WY	S	PRB	BNSF	5,261,242
38	Loveridge No. 22	WV	U	APP	CSX, NS	5,192,742
39	Twilight MTR Surface	WV	S	APP	CSX	5,167,254
40	Cardinal	KY	U	INT	CSX, PAL	5,108,496
41	Beckville Strip	TX	S	TR	LE	5,093,709
42	Kemmerer	WY	S	GR	UP	4,988,841
43	Colowyo	CO	S	UIN	UP	4,914,363
44	Elk Creek	CO	U	UIN	UP	4,902,633
45	Dotiki	KY	U	INT	CSX, PAL	4,662,442
46	Oak Hill Strip	TX	S	TR	LE	4,655,079
47	Center	ND	S	FUL	BNSF	4,505,263
48	Mountaineer II	WV	U	APP	CSX	4,187,338
49	Dugout Canyon	UT	U	UIN	UP	4,145,406
50	South Hallsville No. 1	TX	S	TR	None	4,054,916
51	Elk Creek	KY	U	INT	CSX, PAL	4,033,847
					Subtotal	**713,921,308**
					All other mines	**457,887,361**
					U.S. 2008 total	**1,171,808,669**

Source: EIA Report No: DOE/EIA 0584 (2008), Major U.S. Coal Mines, 2008; railroad coal mine directories; mine operator websites

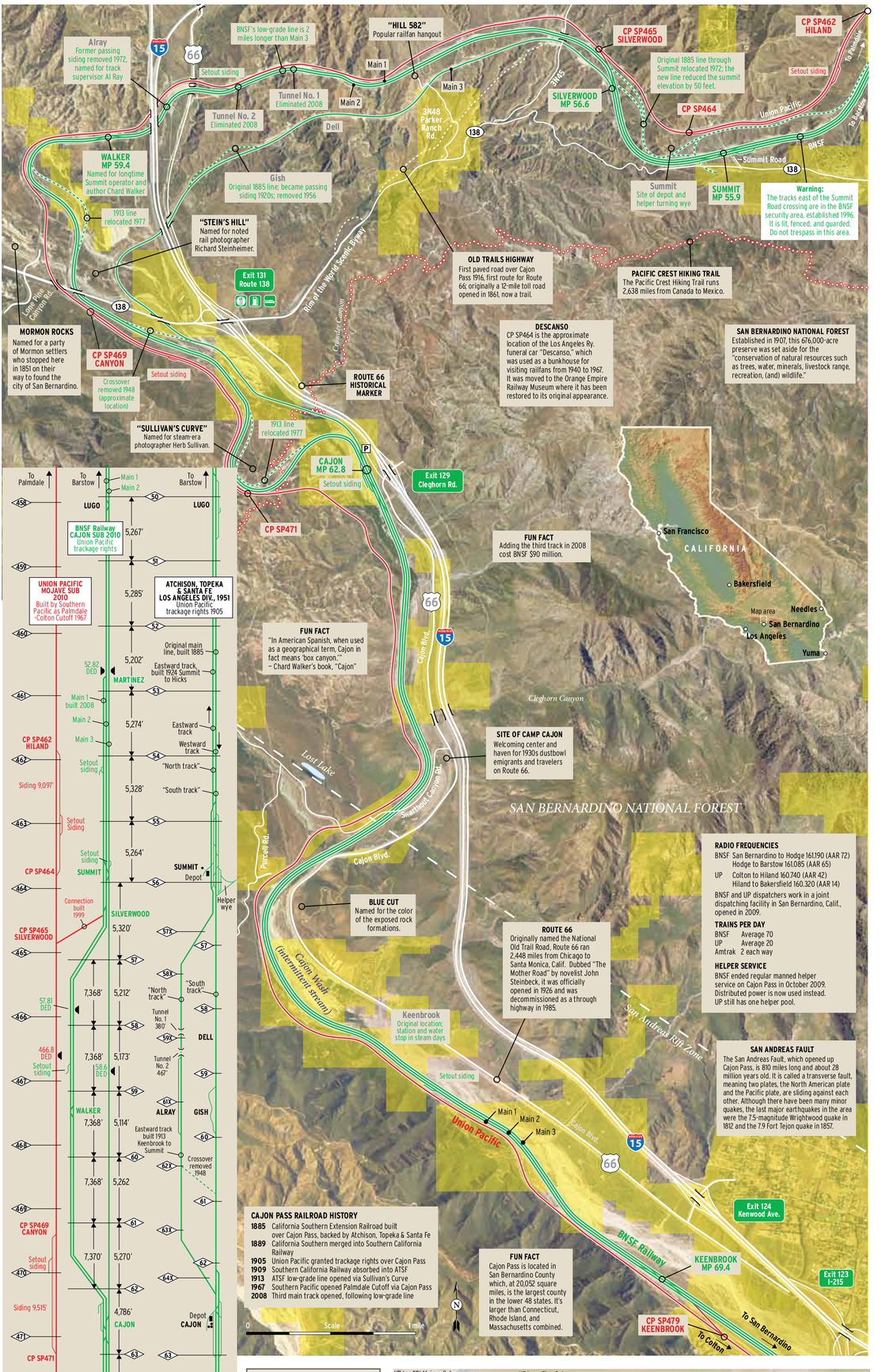
Coal region abbreviations

APP	Appalachia
BM	Black Mesa
FUL	Fort Union Lignite
INT	Interior
PRB	Powder River Basin
SJR	San Juan River
TR	Texas Region
UI	Uinta



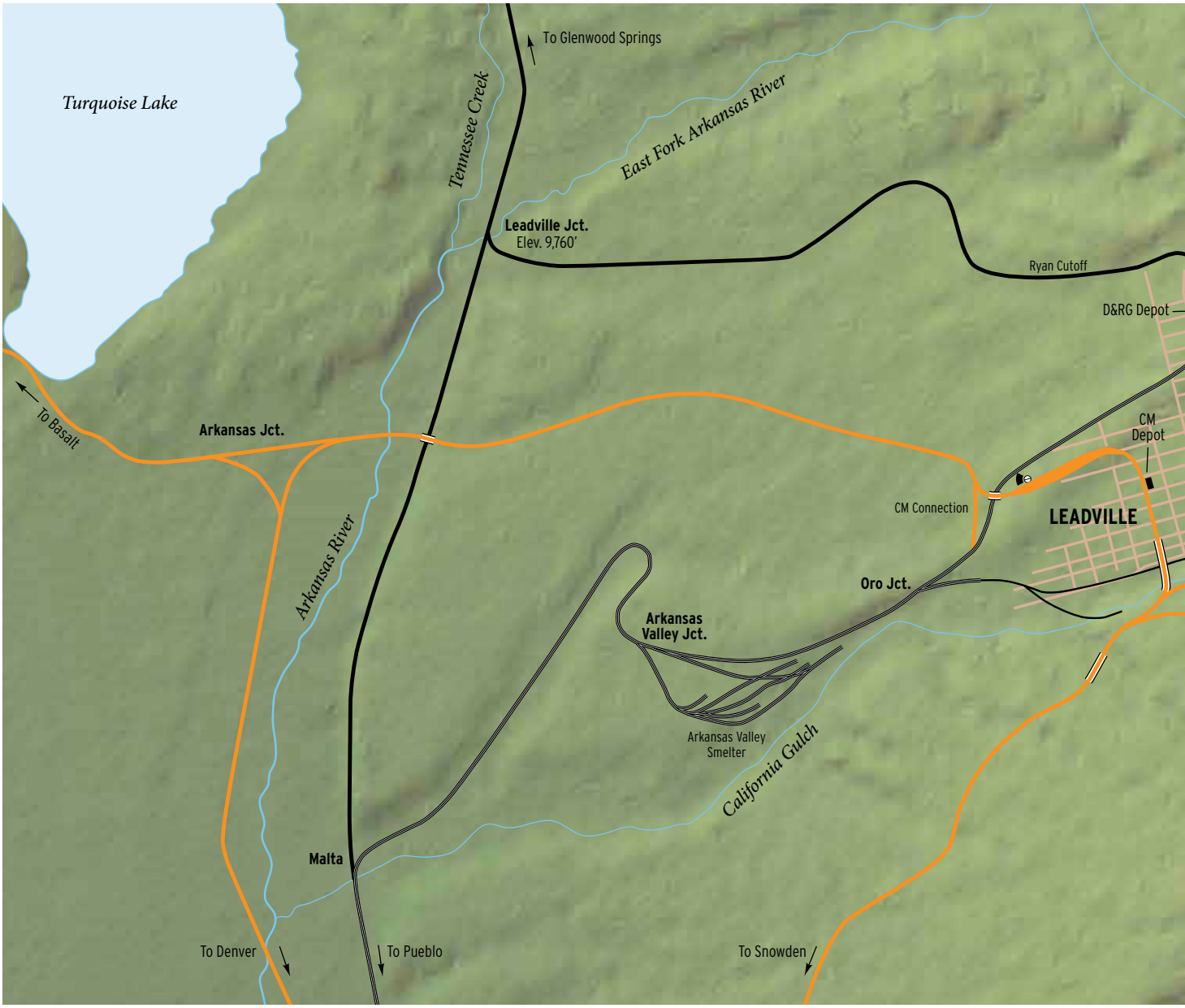
Cajon Pass as you've never seen it

Your all-time guide to the busiest railroad mountain crossing in the United States. We map 128 years of railroad history



Railroads in metal competition

Searching for gold, silver, and a mineral called molybdenum at Leadville, Colo., in 1905



DURING THE LATE 19TH AND EARLY 20TH CENTURIES, Western railroads served many precious metal mining regions, and among the most prominent was Leadville, Colo.

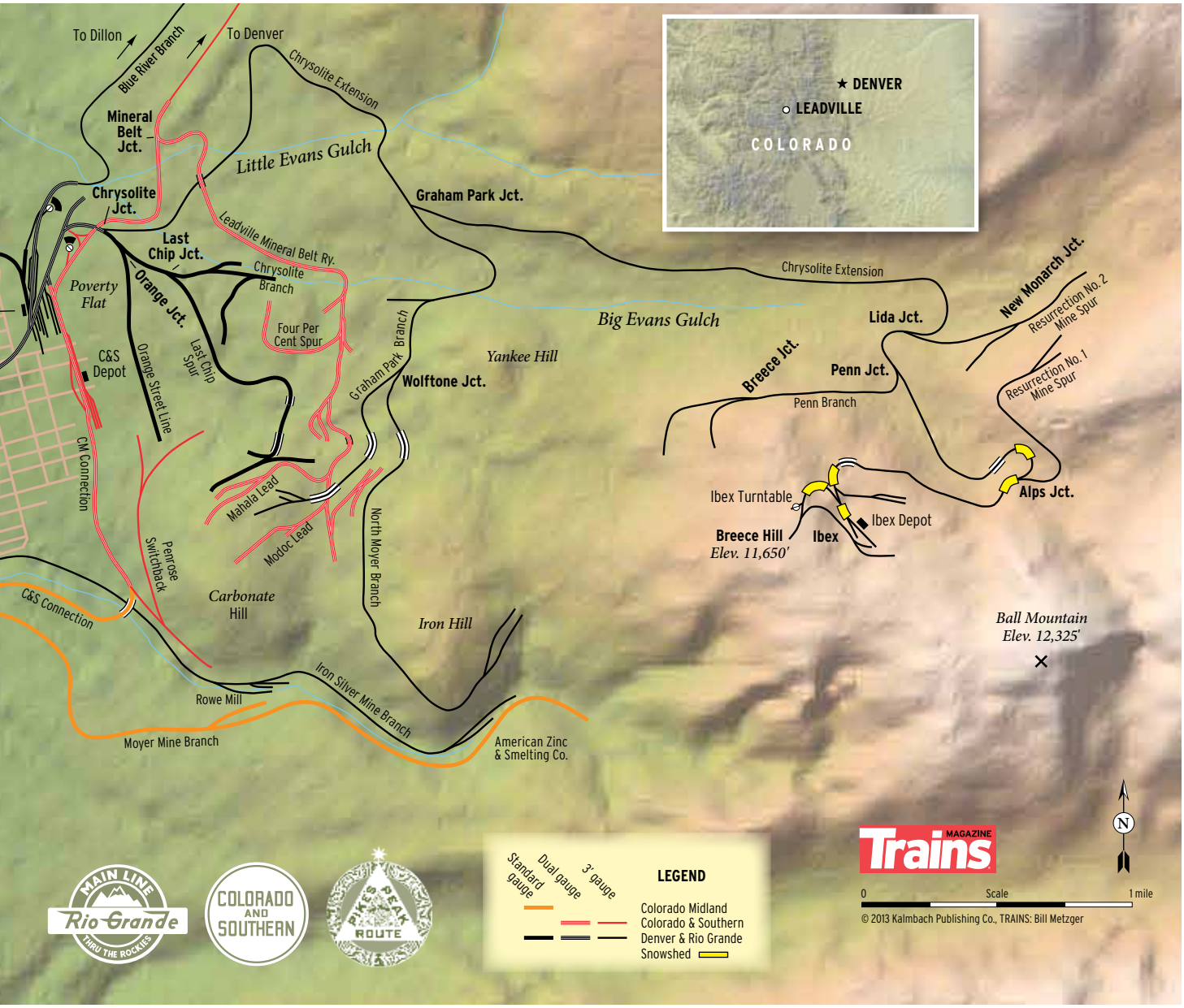
In places with more than one railroad, such as Deadwood, S.D.; Butte, Mont.; and Cripple Creek, Colo., trackage was complex in the scramble to reach the mines. Leadville was among the most interesting. Three railroads of narrow and standard gauge operated a network that included dual-gauge track, switchbacks, and snowsheds, all at an elevation of more than 10,000 feet.

While prospectors in the Leadville area found gold as early as 1860, the first railroad did not reach what native Coloradans call "Cloud City" until 1880 after the discovery of silver ore. The first narrow-gauge Denver & Rio Grande train arrived in July of that year.

The people of Leadville had long sought a railroad, and the inauguration of this line included a visit from one of the biggest political figures of the day, former U.S. President Ulysses S. Grant. In the coming years, the Denver & Rio Grande changed its line to dual gauge and ultimately settled on standard gauge.

The narrow-gauge Denver South Park & Pacific came in at the same time as the Denver & Rio Grande, via trackage rights over that road. In 1884, the South Park finished its own line, and the standard-gauge Colorado Midland arrived from Colorado Springs in 1887.

In 1900, Colorado & Southern, which had inherited the South Park, completed yet another railroad in the region called the Leadville Mineral Belt.



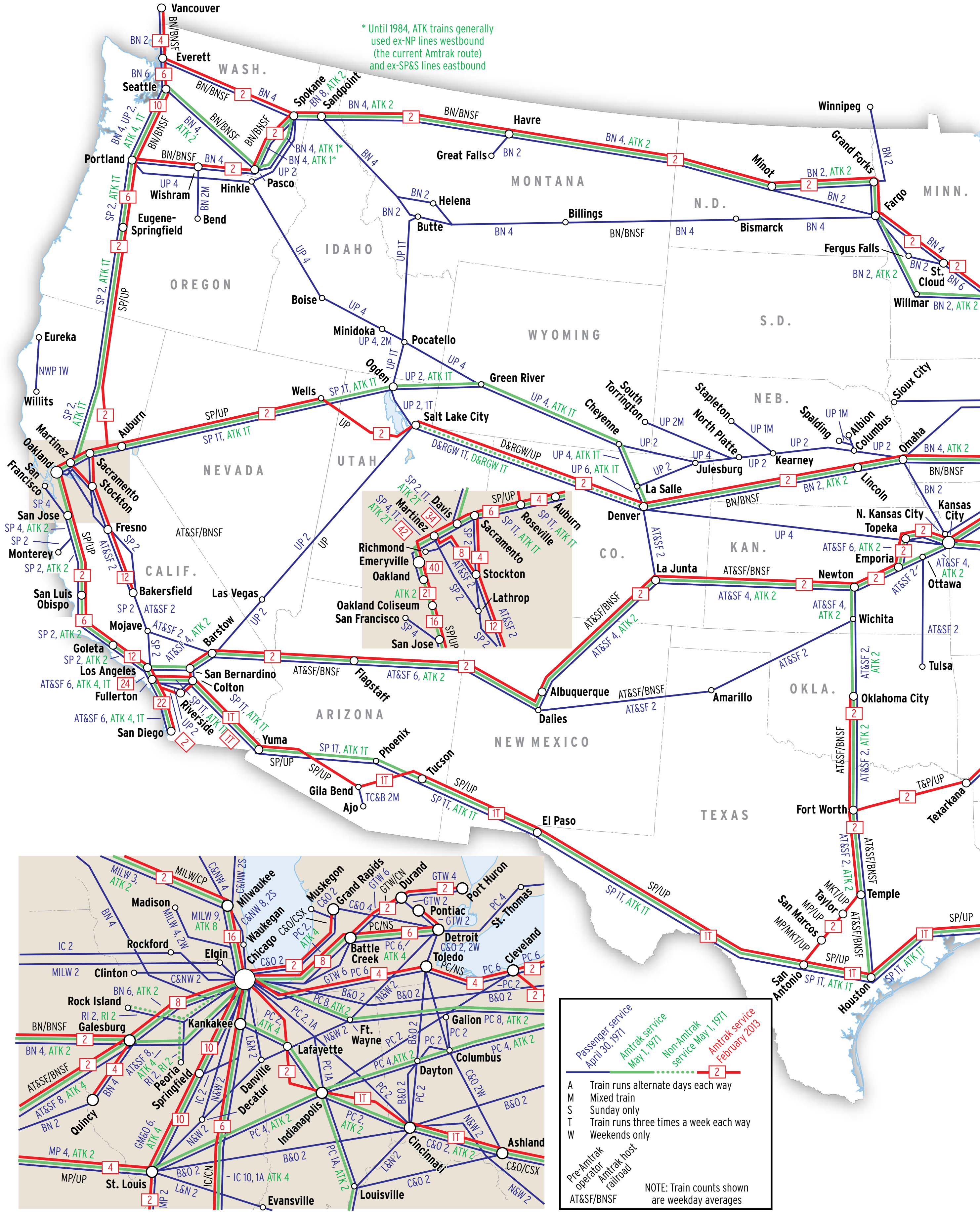
The extent of the network of narrow-, dual-, and standard-gauge tracks varied greatly as the years passed, and this map from 1905 does not show all the changes that were made. Nor does it show the many that would follow.

The Colorado Midland quit running in the Leadville area in 1918, retrenching east as the Midland Terminal. The Colorado & Southern removed its tracks in 1938 except for 13.7 miles between Leadville and Climax. Serving one of the largest deposits of a steel component known as molybdenum (a word whose Greek origins mean "lead-like"), the isolated Climax branch shipped all of its products out to market over the rails of the Denver & Rio Grande Western.

Converted to standard gauge in 1943, the C&S line survived into the Burlington Northern era. Its last run took place in October 1986, and BN sold the line to local investors in December 1987 to become the Leadville, Colorado & Southern tourist train. Today, the rails of the LC&S are the only active ones in Leadville.

In 1997, Union Pacific shut down the famous Rio Grande main line through the twisting Royal Gorge and across the steep grades of Tennessee Pass. The Mineral Belt is a popular biking and hiking trail.

Fortunately, thanks to the work of Ed Haley and the Rocky Mountain Railroad Club (which originally published a similar map in its book "Colorado Midland") based on maps of mining claims, we still know how Leadville's railroads once meandered in search of minerals: just about everywhere in the Rockies. — *Charles Albi, a Colorado rail historian and author*


* Until 1984, ATK trains generally used ex-NP lines westbound (the current Amtrak route) and ex-SP&S lines eastbound
WASH.
OREGON
IDAHO
MONTANA
N.D.
MINN.
S.D.
WYOMING
NEB.
NEVADA
UTAH
CALIF.
CO.
KAN.
ARIZONA
NEW MEXICO
OKLA.
TEXAS
Vancouver
Everett
Seattle
Portland
Wishram
Hinkle
Pasco
Spokane
Sandpoint
Bend
Eugene-Springfield
Havre
Great Falls
Helena
Butte
Billings
Bismarck
Minot
Grand Forks
Fargo
Winnipeg
Fergus Falls
St. Cloud
Willmar
Boise
Minidoka
Pocatello
Ogden
Green River
Salt Lake City
Wells
Eureka
Willits
Auburn
Martinez
Oakland
San Francisco
Sacramento
Stockton
San Jose
Monterey
Fresno
San Luis Obispo
Bakersfield
Mojave
Barstow
Las Vegas
Goleta
Los Angeles
Fullerton
San Bernardino
Colton
Riverside
San Diego
Yuma
Phoenix
Tucson
Gila Bend
Ajo
El Paso
Flagstaff
Albuquerque
Dalies
Amarillo
Cheyenne
South Torrington
Stapleton
North Platte
Julesburg
La Salle
Denver
Kearney
Spalding
Albion
Columbus
Omaha
Lincoln
Sioux City
La Junta
Newton
Wichita
Emporia
Topeka
N. Kansas City
Kansas City
Ottawa
Tulsa
Oklahoma City
Fort Worth
Texarkana
Temple
Taylor
San Marcos
San Antonio
Houston
Richmond
Emeryville
Oakland
Oakland Coliseum
San Francisco
San Jose
Davis
Roseville
Sacramento
Stockton
Lathrop
Madison
Milwaukee
Rockford
Elgin
Waukegan
Chicago
Clinton
Rock Island
Galesburg
Kankakee
Peoria
Springfield
Quincy
St. Louis
Muskegon
Grand Rapids
Durand
Port Huron
Pontiac
Detroit
St. Thomas
Battle Creek
Toledo
Cleveland
Galion
Ft. Wayne
Lafayette
Danville
Decatur
Columbus
Dayton
Indianapolis
Cincinnati
Ashland
Louisville
Evansville
Passenger service April 30, 1971
Amtrak service May 1, 1971
Non-Amtrak service May 1, 1971
Amtrak service February 2013
A Train runs alternate days each way
M Mixed train
S Sunday only
T Train runs three times a week each way
W Weekends only
Pre-Amtrak operator
Amtrak host railroad
AT&SF/BNSF
NOTE: Train counts shown are weekday averages

Amtrak: Now, then, and before

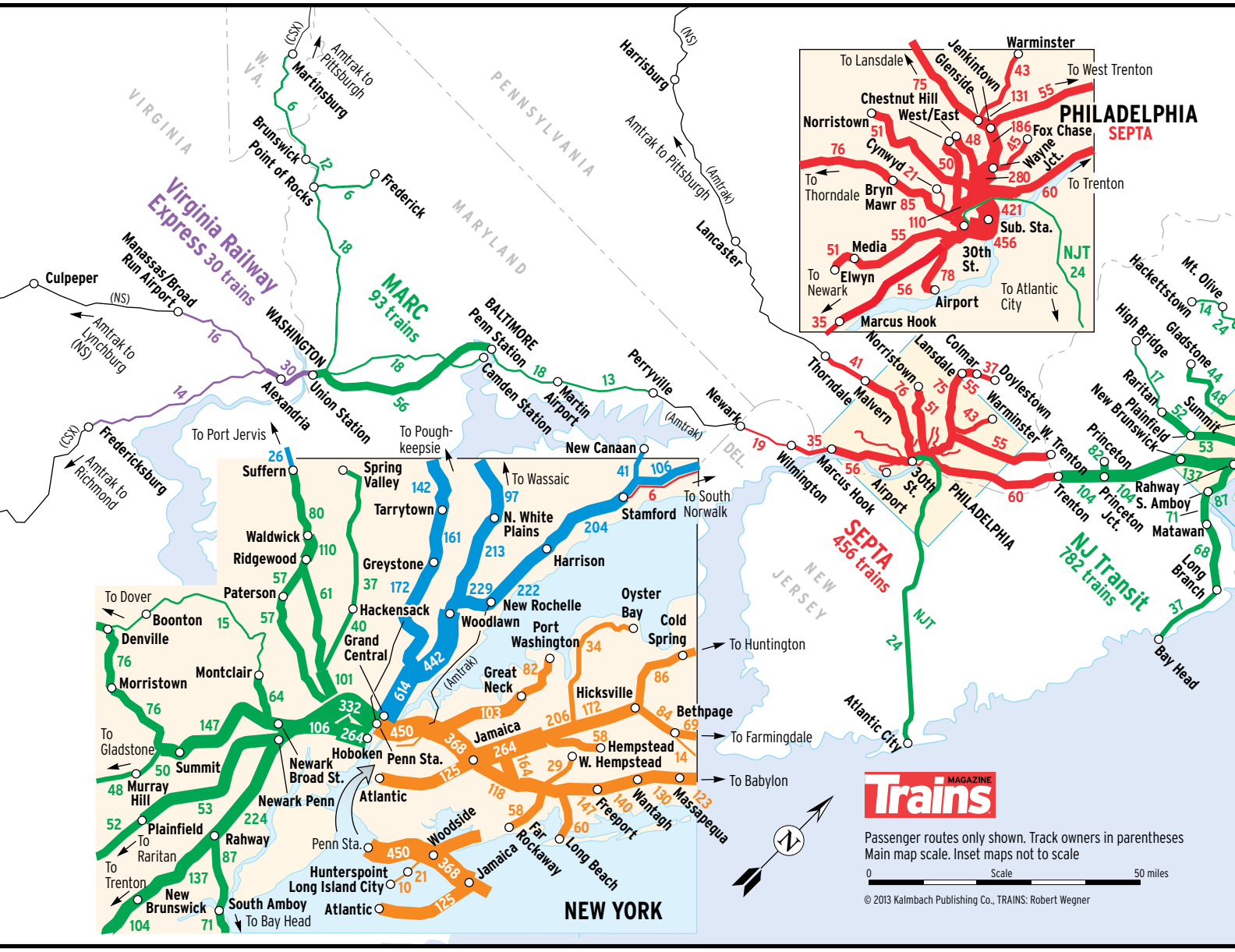
We chart the average passenger trains per day run by Amtrak in early 2013 and on May 1, 1971 (Amtrak's first day of operation), plus what was running on April 30, 1971, the day before Amtrak

AT&SF	Atchison, Topeka & Santa Fe
B&O	Baltimore & Ohio
BN	Burlington Northern
BNSF	BNSF Railway
C&NW	Chicago & North Western
C&O	Chesapeake & Ohio
CG	Central of Georgia
CN	Canadian National
CP	Canadian Pacific
CSX	CSX Transportation
D&H	Delaware & Hudson
D&RGW	Denver & Rio Grande Western
GA	Georgia
GM&O	Gulf, Mobile & Ohio
GTW	Grand Trunk Western
IC	Illinois Central
L&N	Louisville & Nashville
MILW	Milwaukee Road
MKT	Missouri-Kansas-Texas
MP	Missouri Pacific
N&W	Norfolk & Western
NECR	New England Central
NP	Northern Pacific
NS	Norfolk Southern
NWP	Northwestern Pacific
PAR	Pan Am
PC	Penn Central
RDG	Reading
RI	Rock Island
SCL	Seaboard Coast Line
SOO	Soo Line
SOU	Southern
SP	Southern Pacific
SP&S	Spokane, Portland & Seattle
SSW	St. Louis Southwestern
T&P	Texas & Pacific
TC&B	Tucson, Cornelia & Gila Bend
UP	Union Pacific
VTR	Vermont

Map research by Matt Van Hattem, Bill Metzger, and Curtis W. Richards

Northeast commuter trains

Every weekday, 3,288 trains of eight commuter railroads hustle people to destinations in the Northeast

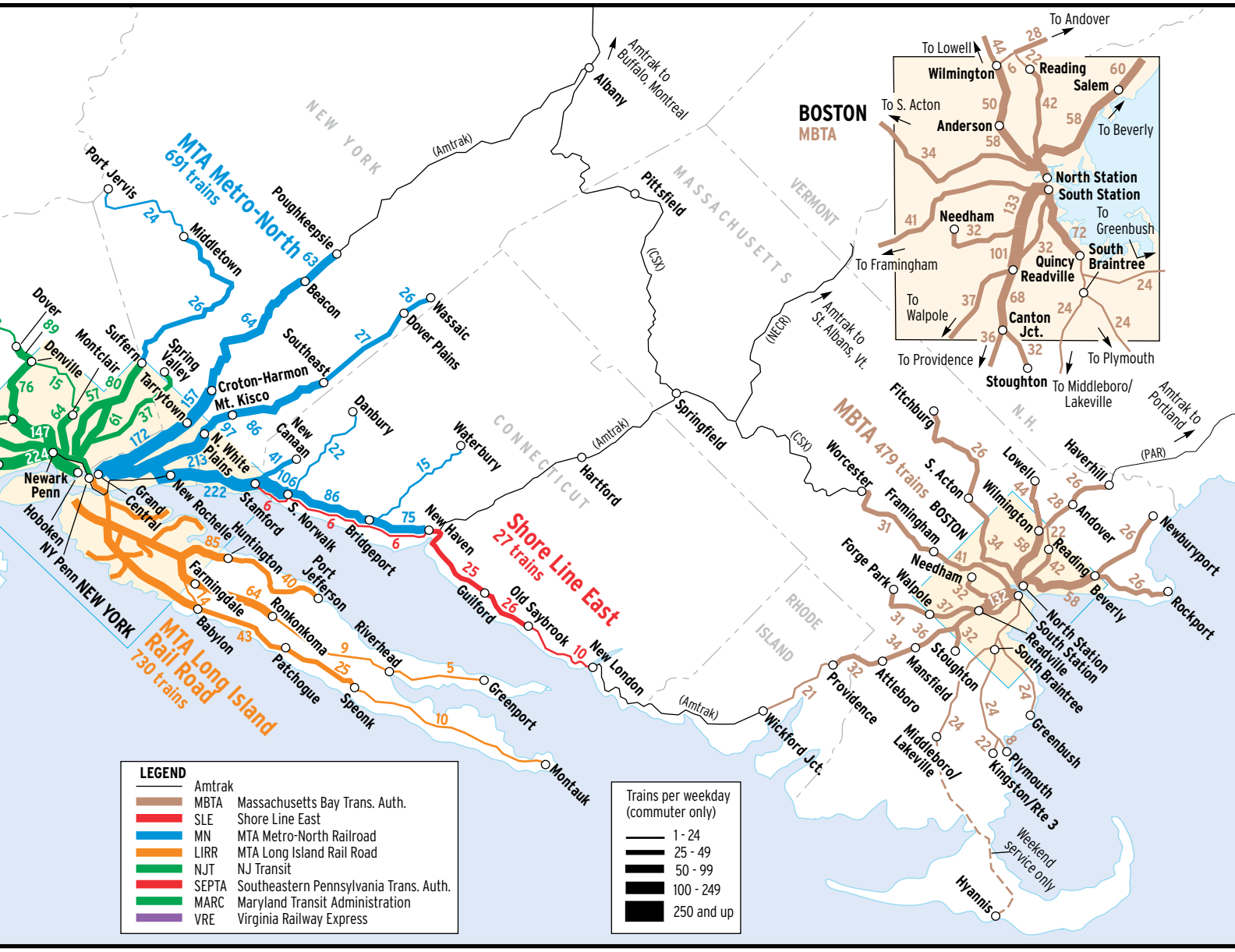


THINK YOU'RE IN A HURRY to get to work? The 3,288 trains on this map make it their business to hustle, with a purposefulness matched only by the riders packed aboard their coaches. This is a snapshot of the commuter trains that run every weekday in the Northeast. Without them, some of the biggest cities in the U.S. would grind to a halt. The tabulations come from public timetables in effect during spring 2013. Only revenue moves are shown, meaning that some lines see even more trains, like non-scheduled "flip back" moves to reposition equipment for the next rush.

With apologies to Union Pacific's triple-track in Nebraska and BNSF's Transcon, putting 100 trains a day on a main line is child's play in the East! Granted, commuter trains all behave identically, and pretty much look the same. They need to, if they're to race against time twice a day. But the sheer numbers are staggering. SEPTA squeezes all 456 of its weekday trains through a four-track tunnel between Philadelphia's Suburban and 30th Street stations, while Metro-North keeps Grand Central Terminal humming with 614 trains.

Perhaps the biggest surprise? NJ Transit now surpasses the Long Island Rail Road in weekday train volumes. Getting the most out of big-ticket projects like the Secaucus Junction transfer station and Montclair Line electrification, NJ Transit now fields 782 weekday trains — 52 more than LIRR (known since forever as the nation's busiest railroad). That NJT figure is a little disingenuous, though, since it includes 82 trips made by a one-car "dinky" on the 2.7-mile Princeton branch. Take out those runs, and the Long Island Rail Road is comfortably back on top.

Some of the busiest lines are tenants on



Amtrak's Northeast Corridor (except New Rochelle, N.Y.-New Haven, Conn., where Amtrak is the tenant). In the 457 miles between Boston and Washington, only three segments lack commuter trains: Wickford Jct., R.I.-New London, Conn. (43 miles), New Rochelle-New York Penn Station (19 miles), and Newark, Del.-Perryville, Md. (20 miles). Conversely, some Amtrak trains function as commuter services, notably the 28 weekday *Keystone Service* trains between Philadelphia and Harrisburg, Pa.

The Northeast's commuter lines are an industry success story. Thirty years ago, Virginia Railway Express and Shore Line East did not even exist, and NJ Transit was running less than half the 332 trains it now sends through the 1910-built Hudson River tunnels. As suburbs have pushed farther out, commuter agencies have added routes and services to keep pace with their customer base. MARC entered Frederick, Md., in 2001; Metro-North extended to Wassaic in 2000; and the MBTA added 93 miles in the 1990s, then 37 more miles in the 2000s, reintroducing service on some lines that hadn't seen a passenger train since 1959.

Commuter services require an intense capital investment: equipment to handle crowds; track and signaling to move trains safely on mercilessly tight headways; big-city terminals and suburban park-and-rides; and enough employees to keep the system running like a well-oiled machine. Public commuter agencies can see beyond the trains' red ink — to the financial benefits that accrue from having a healthy business district, flourishing residential areas, and convenient tourist access.

There are 8 million stories in the naked city, after all, and some of them begin with a train ride. — *Matt Van Hattem*

Brand-name passenger fleets

From the *Chiefs* to the *Rockets*, branded trains promised consistent service. We map America's brand-name passenger fleets

ALTHOUGH THE IDEA OF BRANDING passenger-train fleets did not begin with the streamliner, it flourished in that era. Innovations such as stainless steel found widespread use in an age captivated by design. Suddenly, appearance mattered. Trains with colorful paint schemes and exterior finishes projected an image far removed from the past.

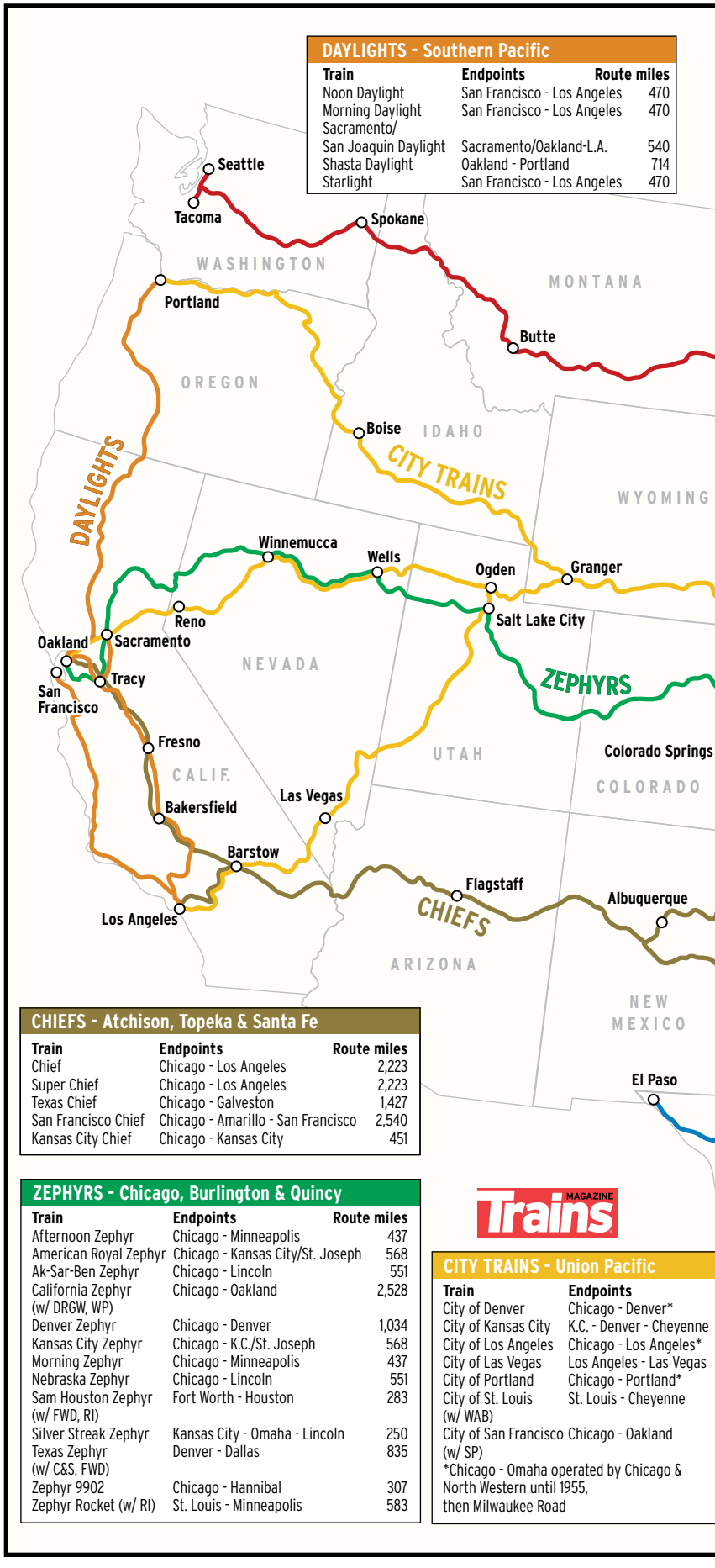
The first branded streamliner was Burlington's *Zephyr*, which became a fleet name in late 1934 with the placement of an order for the Chicago-Twin Cities *Twin Zephyrs* (the trains began in 1936). Union Pacific arrived at its brand circuitously: It first promoted the awkward, numeric designations of its early trains such as M-10000; this gave way to a named fleet with the introduction of the *City of Portland* in 1935. Streamlining's third early brand, Rock Island's *Rockets*, which entered service in 1937, were planned as a fleet from the outset.

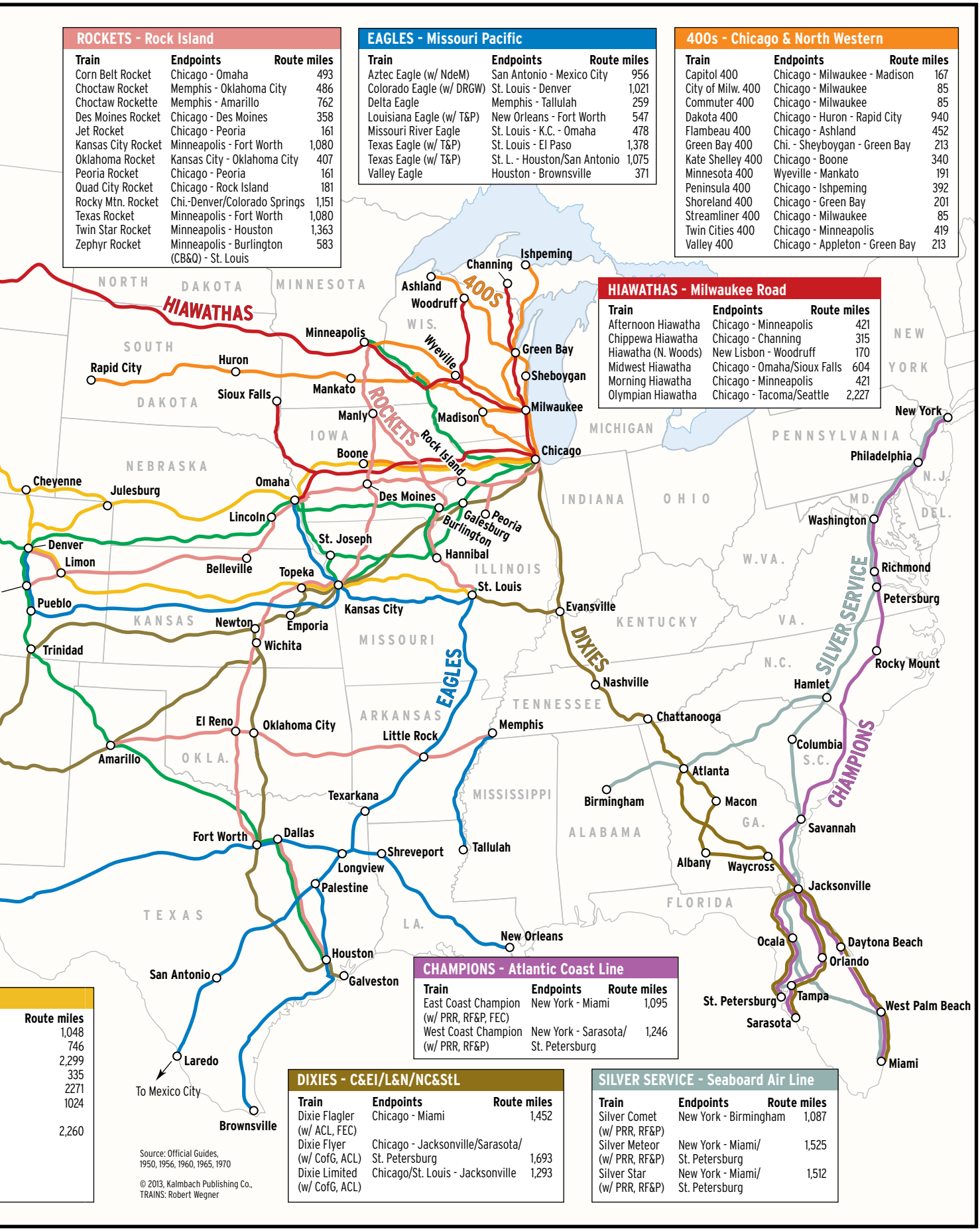
In considering what fleets to include on this map, many proved to be too small, while others were not well defined. Seaboard's *Silver* service and Coast Line's *Champions* appear, while Florida East Coast's *Flaglers* were but a pair of names. (The mileages depict the post-World War II period when the fleets were at their height, not a single year.)

By and large, the service promised under a brand was delivered across a fleet. Exceptions occurred early, when orders for streamlined equipment exceeded production, and after 1950, when some fleets were downgraded as ridership fell.

Some railroads applied branding before streamliners, breaking with a tradition of naming trains to give information (e.g., *Pittsburgh Night Express)*. Pennsylvania set a patriotic theme with the *Congressional Express* of 1882; *Liberty Limited* and *The American* date from 1925. New York Central claimed to invent passenger-train branding with the 1891 *Empire State Express*. Central was at the fore: The 1890s saw the popularization of national brands such as Ivory soap, yet Central's memorable "Great Steel Fleet" appeared in advertising only from 1936 to '38.

Railroading's best known and most effective brand, Santa Fe's *Chief*, dates from 1926. Yet even earlier, the road introduced names drawing on its marketing theme of the great Southwest: *Missionary* and *Navajo* date from 1915, *Hopi* from 1929. — *Michael E. Zega, a historian of railroad advertising and co-author of the book* "Travel by Train"




ROCKETS - Rock Island
Train | Endpoints | Route miles
Corn Belt Rocket | Chicago - Omaha | 493
Choctaw Rocket | Memphis - Oklahoma City | 486
Choctaw Rockette | Memphis - Amarillo | 762
Des Moines Rocket | Chicago - Des Moines | 358
Jet Rocket | Chicago - Peoria | 161
Kansas City Rocket | Minneapolis - Fort Worth | 1,080
Oklahoma Rocket | Kansas City - Oklahoma City | 407
Peoria Rocket | Chicago - Peoria | 161
Quad City Rocket | Chicago - Rock Island | 181
Rocky Mtn. Rocket | Chi.-Denver/Colorado Springs | 1,151
Texas Rocket | Minneapolis - Fort Worth | 1,080
Twin Star Rocket | Minneapolis - Houston | 1,363
Zephyr Rocket | Minneapolis - Burlington (CB&Q) - St. Louis | 583
EAGLES - Missouri Pacific
Train | Endpoints | Route miles
Aztec Eagle (w/ NdeM) | San Antonio - Mexico City | 956
Colorado Eagle (w/ DRGW) | St. Louis - Denver | 1,021
Delta Eagle | Memphis - Tallulah | 259
Louisiana Eagle (w/ T&P) | New Orleans - Fort Worth | 547
Missouri River Eagle | St. Louis - K.C. - Omaha | 478
Texas Eagle (w/ T&P) | St. Louis - El Paso | 1,378
Texas Eagle (w/ T&P) | St. L. - Houston/San Antonio | 1,075
Valley Eagle | Houston - Brownsville | 371
400s - Chicago & North Western
Train | Endpoints | Route miles
Capitol 400 | Chicago - Milwaukee - Madison | 167
City of Milw. 400 | Chicago - Milwaukee | 85
Commuter 400 | Chicago - Milwaukee | 85
Dakota 400 | Chicago - Huron - Rapid City | 940
Flambeau 400 | Chicago - Ashland | 452
Green Bay 400 | Chi. - Sheyboygan - Green Bay | 213
Kate Shelley 400 | Chicago - Boone | 340
Minnesota 400 | Wyeville - Mankato | 191
Peninsula 400 | Chicago - Ishpeming | 392
Shoreland 400 | Chicago - Green Bay | 201
Streamliner 400 | Chicago - Milwaukee | 85
Twin Cities 400 | Chicago - Minneapolis | 419
Valley 400 | Chicago - Appleton - Green Bay | 213
HIAWATHAS - Milwaukee Road
Train | Endpoints | Route miles
Afternoon Hiawatha | Chicago - Minneapolis | 421
Chippewa Hiawatha | Chicago - Channing | 315
Hiawatha (N. Woods) | New Lisbon - Woodruff | 170
Midwest Hiawatha | Chicago - Omaha/Sioux Falls | 604
Morning Hiawatha | Chicago - Minneapolis | 421
Olympian Hiawatha | Chicago - Tacoma/Seattle | 2,227
Route miles
1,048
746
2,299
335
2271
1024
2,260
CHAMPIONS - Atlantic Coast Line
Train | Endpoints | Route miles
East Coast Champion (w/ PRR, RF&P, FEC) | New York - Miami | 1,095
West Coast Champion (w/ PRR, RF&P) | New York - Sarasota/ St. Petersburg | 1,246
DIXIES - C&EI/L&N/NC&StL
Train | Endpoints | Route miles
Dixie Flagler (w/ ACL, FEC) | Chicago - Miami | 1,452
Dixie Flyer (w/ CofG, ACL) | Chicago - Jacksonville/Sarasota/ St. Petersburg | 1,693
Dixie Limited (w/ CofG, ACL) | Chicago/St. Louis - Jacksonville | 1,293
SILVER SERVICE - Seaboard Air Line
Train | Endpoints | Route miles
Silver Comet (w/ PRR, RF&P) | New York - Birmingham | 1,087
Silver Meteor (w/ PRR, RF&P) | New York - Miami/ St. Petersburg | 1,525
Silver Star (w/ PRR, RF&P) | New York - Miami/ St. Petersburg | 1,512
HIAWATHAS
400S
ROCKETS
EAGLES
DIXIES
SILVER SERVICE
CHAMPIONS
Rock Island
Wyeville
NORTH DAKOTA
SOUTH DAKOTA
MINNESOTA
WIS.
IOWA
NEBRASKA
KANSAS
OKLA.
TEXAS
MISSOURI
ARKANSAS
LA.
MISSISSIPPI
ILLINOIS
INDIANA
MICHIGAN
OHIO
KENTUCKY
TENNESSEE
ALABAMA
GA.
FLORIDA
S.C.
N.C.
VA.
W.VA.
PENNSYLVANIA
NEW YORK
N.J.
MD.
DEL.
Ishpeming
Channing
Ashland
Woodruff
Minneapolis
Green Bay
Sheboygan
Milwaukee
Madison
Chicago
Rapid City
Huron
Sioux Falls
Mankato
Manly
Boone
Cheyenne
Julesburg
Omaha
Des Moines
Lincoln
Galesburg
Peoria
Burlington
Denver
Limon
Belleville
St. Joseph
Hannibal
Topeka
St. Louis
Pueblo
Kansas City
Newton
Emporia
Wichita
Trinidad
Evansville
Nashville
Chattanooga
Memphis
Little Rock
El Reno
Oklahoma City
Amarillo
Texarkana
Fort Worth
Dallas
Shreveport
Longview
Palestine
Tallulah
Houston
Galveston
San Antonio
New Orleans
Laredo
To Mexico City
Brownsville
Birmingham
Atlanta
Macon
Savannah
Albany
Waycross
Jacksonville
Ocala
Daytona Beach
Orlando
Tampa
St. Petersburg
Sarasota
West Palm Beach
Miami
New York
Philadelphia
Washington
Richmond
Petersburg
Rocky Mount
Hamlet
Columbia
Source: Official Guides, 1950, 1956, 1960, 1965, 1970
© 2013, Kalmbach Publishing Co., TRAINS: Robert Wegner

West Coast passenger trains

From Vancouver to San Diego, a revolution has occurred. Let someone else sit in traffic!

WHAT YOU'RE SEEING HERE is a transformation that's nothing short of remarkable.

In the mid-1980s, a map of West Coast short-haul passenger trains would've been little more than a blank page. Back then, Amtrak provided minimal service between Oakland and Bakersfield, Calif., and between Portland and Seattle, though it did field 14 *San Diegans* a day to and from Los Angeles. The only commuter trains, San Jose to San Francisco, a service dating from 1864, were kept running with state money.

These maps chart the 468 weekday commuter and intercity passenger trains that now serve West Coast cities from San Diego to Vancouver, B.C. The network totals 1,765 route-miles! Train counts (revenue moves only) are from public timetables in effect in January 2013.

Omitted from the tabulations are six overnight trains operated by Amtrak and VIA Rail Canada, although they do extend the network to riders beyond the corridors and in some cases supplement Amtrak's intercity service. (For example, the *Coast Starlight*'s morning departures provide an extra frequency southbound from Seattle to Eugene, Ore., and northbound from Los Angeles to San Luis Obispo, Calif.)

While 468 trains may seem like a drop in the bucket compared with the 3,000 commuter trains that run in the Northeast (see pages 96-97), the rise of the West Coast passenger train has been a success story for a region in love with its cars. Of course, it was intolerable highway congestion that prompted Western states to look to the passenger train as an alternative. It took vision and leadership from politicians and public administrators at the state and county levels to get the trains going — and a commitment from citizens, who voted "yes" to bond issues, gasoline and sales tax hikes, and clean-air legislation that included funding for passenger rail.

Like flowers blooming in the desert, new services appeared: Amtrak's Capitol Corridor in 1991; LA's Metrolink in 1992; San Diego's Coaster and Vancouver's West Coast Express in 1995; San Jose's Altamont Commuter Express in 1998; Seattle's Sounder in 2000; and Oceanside's Sprinter in 2008.

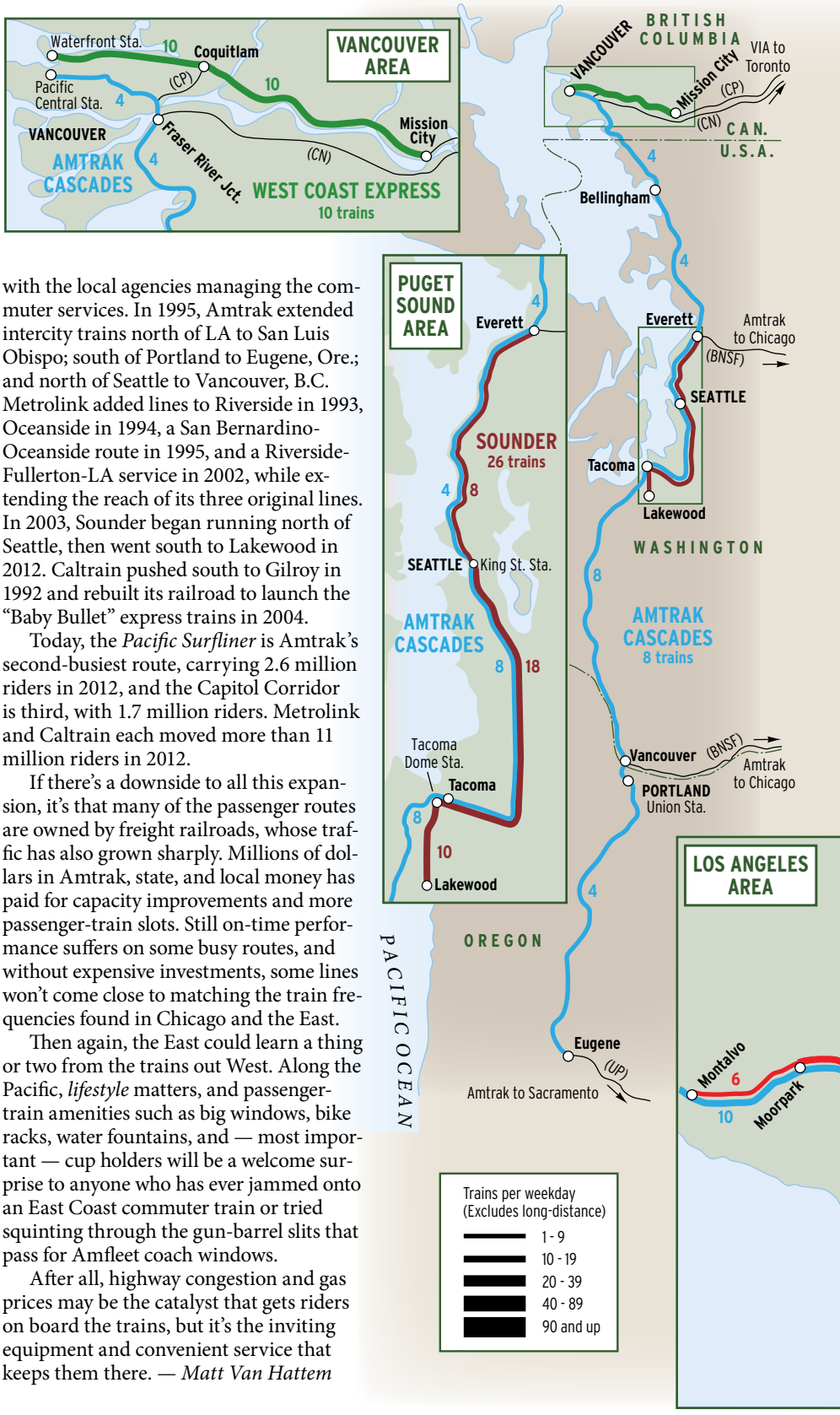
Established services, meanwhile, added departures and introduced sharp-looking new equipment, thanks to a commitment from Amtrak and its state sponsors, along with the local agencies managing the commuter services. In 1995, Amtrak extended intercity trains north of LA to San Luis Obispo; south of Portland to Eugene, Ore.; and north of Seattle to Vancouver, B.C. Metrolink added lines to Riverside in 1993, Oceanside in 1994, a San Bernardino-Oceanside route in 1995, and a Riverside-Fullerton-LA service in 2002, while extending the reach of its three original lines. In 2003, Sounder began running north of Seattle, then went south to Lakewood in 2012. Caltrain pushed south to Gilroy in 1992 and rebuilt its railroad to launch the "Baby Bullet" express trains in 2004.

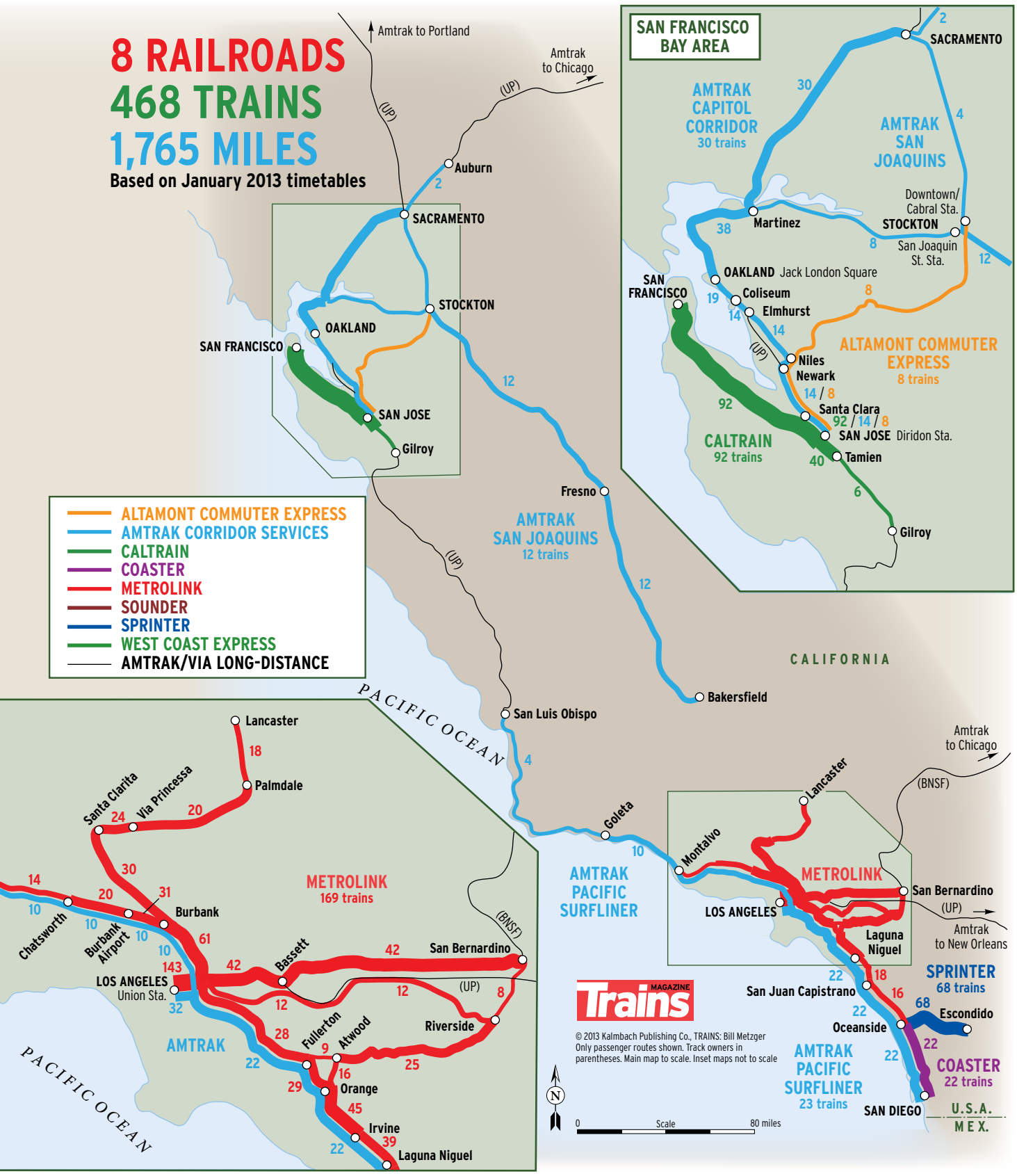
Today, the *Pacific Surfliner* is Amtrak's second-busiest route, carrying 2.6 million riders in 2012, and the Capitol Corridor is third, with 1.7 million riders. Metrolink and Caltrain each moved more than 11 million riders in 2012.

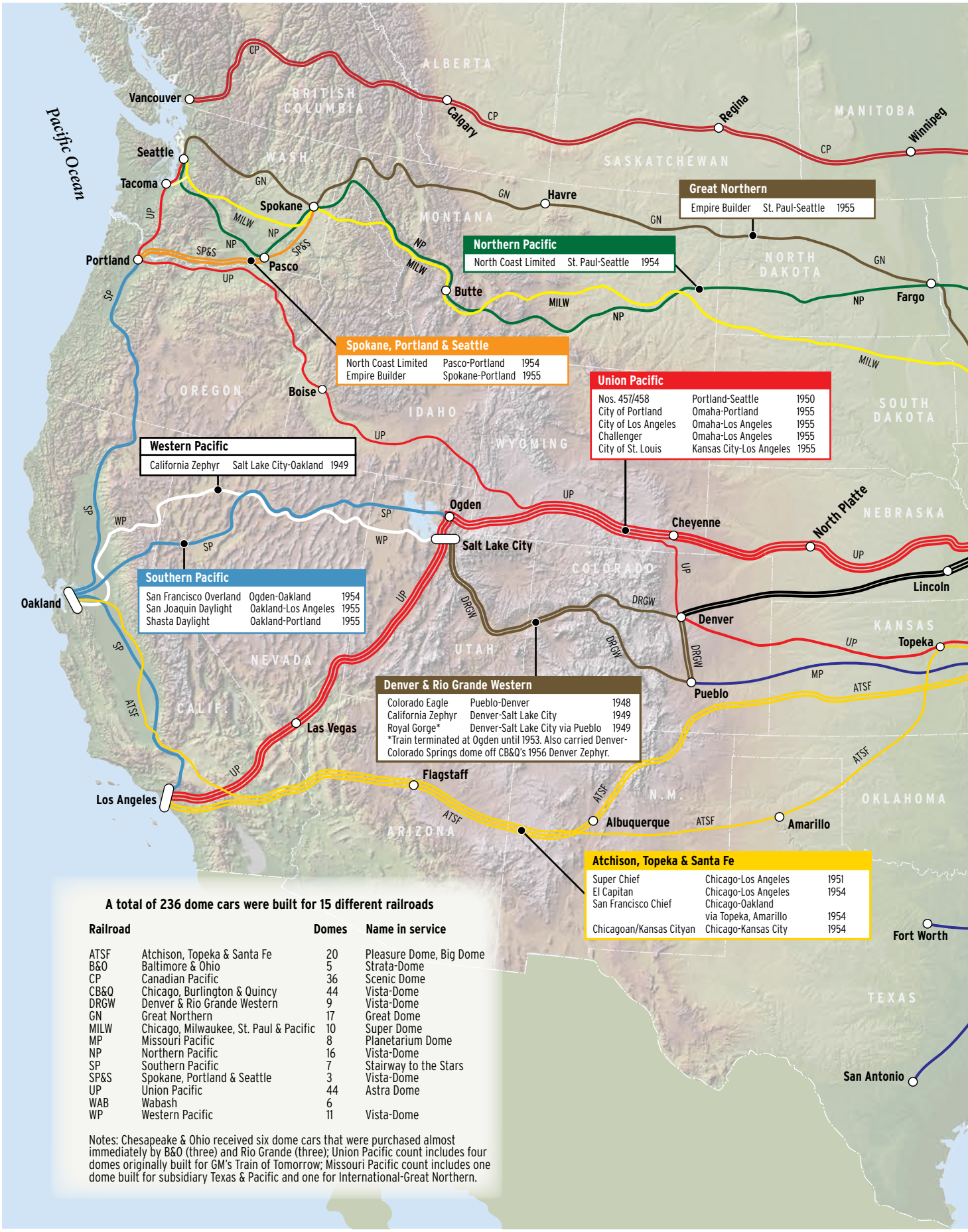
If there's a downside to all this expansion, it's that many of the passenger routes are owned by freight railroads, whose traffic has also grown sharply. Millions of dollars in Amtrak, state, and local money has paid for capacity improvements and more passenger-train slots. Still on-time performance suffers on some busy routes, and without expensive investments, some lines won't come close to matching the train frequencies found in Chicago and the East.

Then again, the East could learn a thing or two from the trains out West. Along the Pacific, *lifestyle* matters, and passenger-train amenities such as big windows, bike racks, water fountains, and — most important — cup holders will be a welcome surprise to anyone who has ever jammed onto an East Coast commuter train or tried squinting through the gun-barrel slits that pass for Amfleet coach windows.

After all, highway congestion and gas prices may be the catalyst that gets riders on board the trains, but it's the inviting equipment and convenient service that keeps them there. — *Matt Van Hattem*



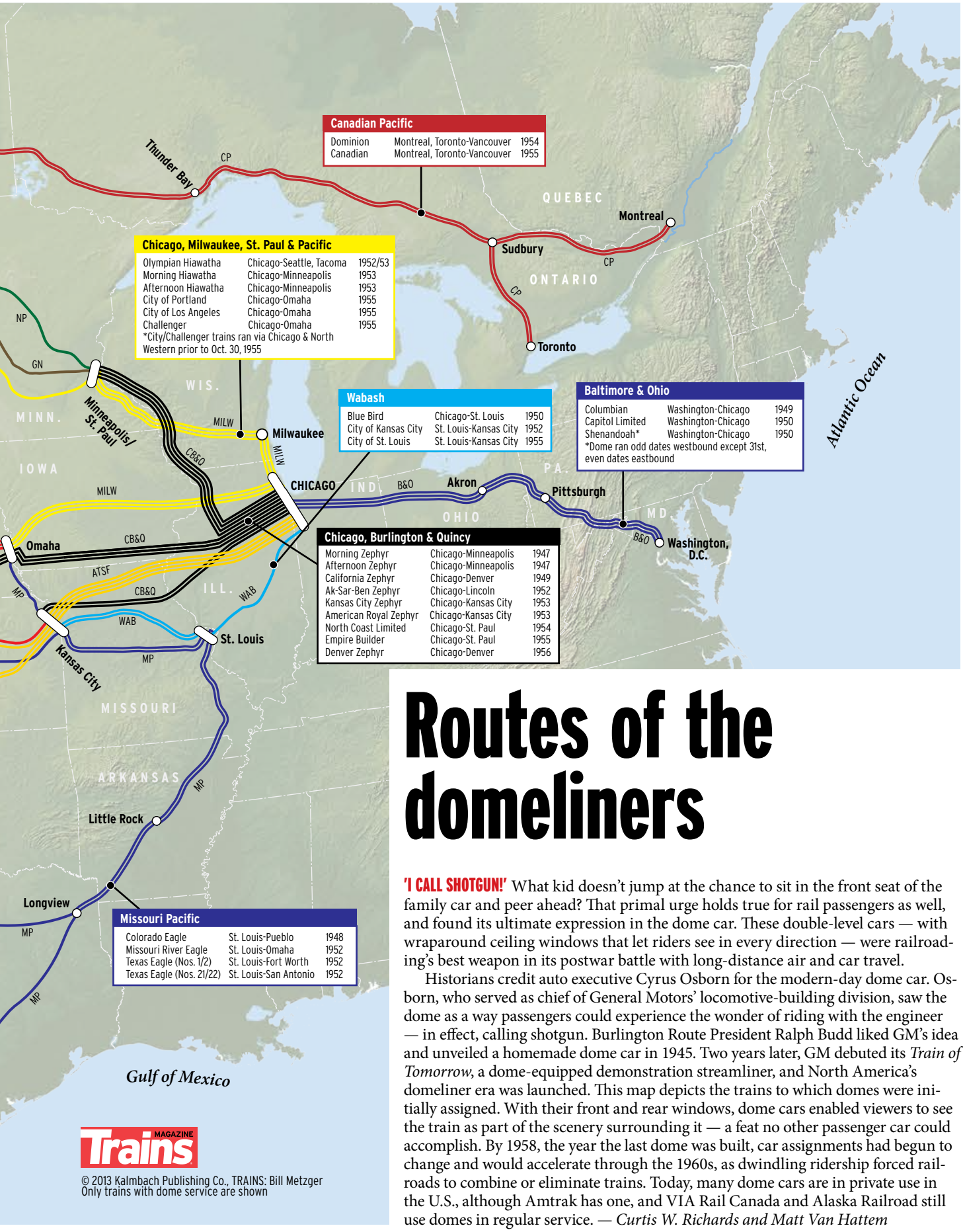

8 RAILROADS
468 TRAINS
1,765 MILES
Based on January 2013 timetables
Amtrak to Portland
Amtrak to Chicago
(UP)
Auburn
2
SACRAMENTO
STOCKTON
OAKLAND
SAN FRANCISCO
SAN JOSE
Gilroy
12
Fresno
AMTRAK SAN JOAQUINS
12 trains
Bakersfield
San Luis Obispo
4
Goleta
10
Montalvo
Lancaster
18
Palmdale
Santa Clarita
24
Via Princessa
20
30
14
10
20
31
Burbank
Chatsworth
10
Burbank Airport
10
10
61
143
42
LOS ANGELES
Union Sta.
32
Bassett
42
San Bernardino
12
(UP)
8
Riverside
28
Fullerton
9
Atwood
16
25
29
Orange
45
Irvine
39
22
Laguna Niguel
AMTRAK
22
METROLINK
169 trains
(BNSF)
AMTRAK PACIFIC SURFLINER
METROLINK
LOS ANGELES
Lancaster
(BNSF)
Amtrak to Chicago
San Bernardino
(UP)
Amtrak to New Orleans
Laguna Niguel
22
18
16
San Juan Capistrano
22
Oceanside
68
Escondido
22
22
SAN DIEGO
SPRINTER
68 trains
COASTER
22 trains
AMTRAK PACIFIC SURFLINER
23 trains
U.S.A.
MEX.
SAN FRANCISCO BAY AREA
2
SACRAMENTO
AMTRAK CAPITOL CORRIDOR
30 trains
30
4
AMTRAK SAN JOAQUINS
Downtown/ Cabral Sta.
STOCKTON
San Joaquin St. Sta.
12
8
38
Martinez
OAKLAND Jack London Square
SAN FRANCISCO
19
Coliseum
14
Elmhurst
14
8
(UP)
Niles
Newark
14 / 8
92
Santa Clara
92 / 14 / 8
SAN JOSE Diridon Sta.
CALTRAIN
92 trains
40
Tamien
6
Gilroy
ALTAMONT COMMUTER EXPRESS
8 trains
ALTAMONT COMMUTER EXPRESS
AMTRAK CORRIDOR SERVICES
CALTRAIN
COASTER
METROLINK
SOUNDER
SPRINTER
WEST COAST EXPRESS
AMTRAK/VIA LONG-DISTANCE
CALIFORNIA
PACIFIC OCEAN
PACIFIC OCEAN
Trains MAGAZINE
© 2013 Kalmbach Publishing Co., TRAINS: Bill Metzger
Only passenger routes shown. Track owners in parentheses. Main map to scale. Inset maps not to scale
N
0
Scale
80 miles



A total of 236 dome cars were built for 15 different railroads

Railroad		Domes	Name in service
ATSF	Atchison, Topeka & Santa Fe	20	Pleasure Dome, Big Dome
B&O	Baltimore & Ohio	5	Strata-Dome
CP	Canadian Pacific	36	Scenic Dome
CB&Q	Chicago, Burlington & Quincy	44	Vista-Dome
DRGW	Denver & Rio Grande Western	9	Vista-Dome
GN	Great Northern	17	Great Dome
MILW	Chicago, Milwaukee, St. Paul & Pacific	10	Super Dome
MP	Missouri Pacific	8	Planetarium Dome
NP	Northern Pacific	16	Vista-Dome
SP	Southern Pacific	7	Stairway to the Stars
SP&S	Spokane, Portland & Seattle	3	Vista-Dome
UP	Union Pacific	44	Astra Dome
WAB	Wabash	6	
WP	Western Pacific	11	Vista-Dome

Notes: Chesapeake & Ohio received six dome cars that were purchased almost immediately by B&O (three) and Rio Grande (three); Union Pacific count includes four domes originally built for GM's Train of Tomorrow; Missouri Pacific count includes one dome built for subsidiary Texas & Pacific and one for International-Great Northern.



Trains MAGAZINE

Only trains with dome service are shown

Routes of the domeliners

'I CALL SHOTGUN!' What kid doesn't jump at the chance to sit in the front seat of the family car and peer ahead? That primal urge holds true for rail passengers as well, and found its ultimate expression in the dome car. These double-level cars — with wraparound ceiling windows that let riders see in every direction — were railroading's best weapon in its postwar battle with long-distance air and car travel.

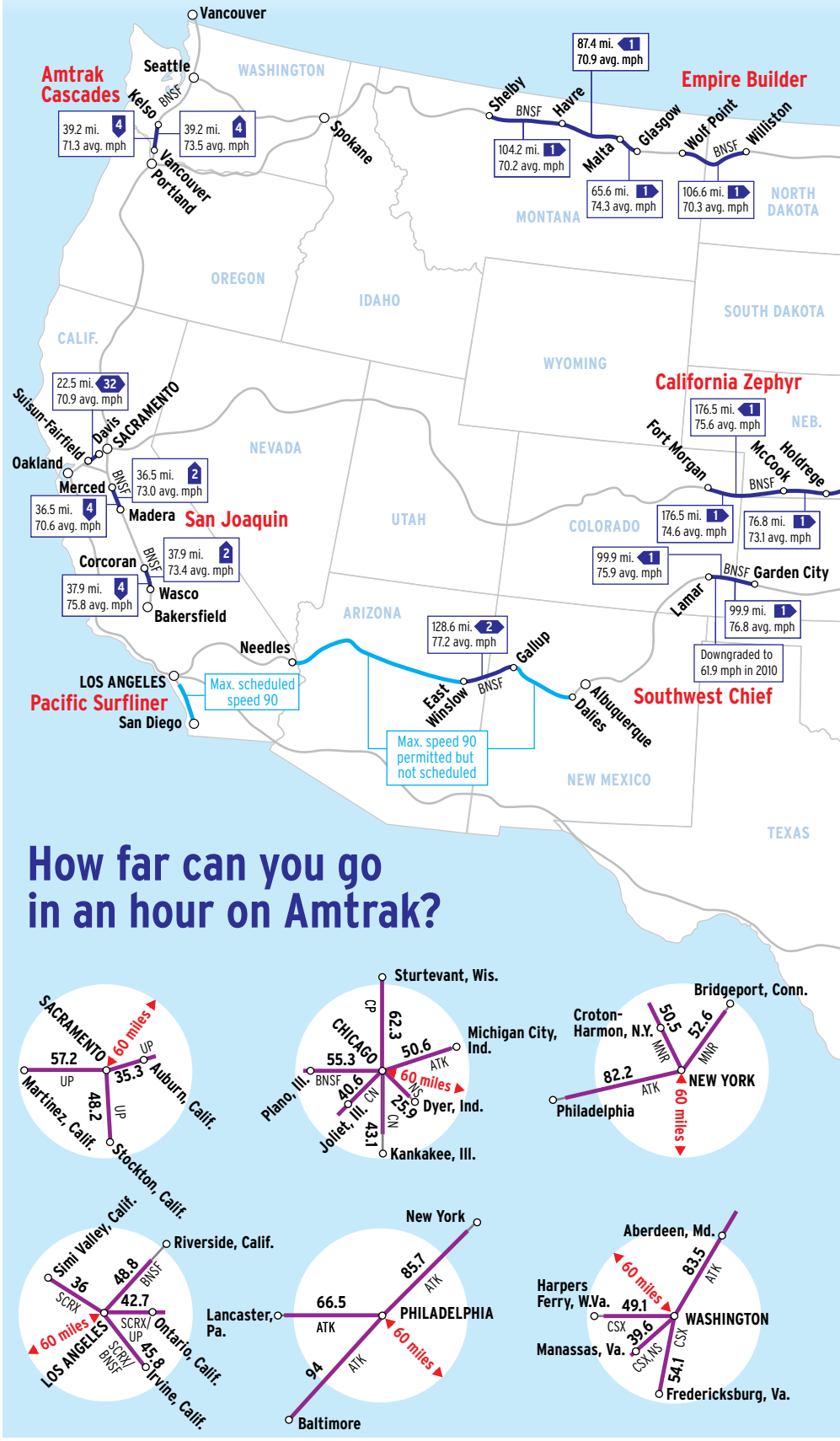
Historians credit auto executive Cyrus Osborn for the modern-day dome car. Osborn, who served as chief of General Motors' locomotive-building division, saw the dome as a way passengers could experience the wonder of riding with the engineer — in effect, calling shotgun. Burlington Route President Ralph Budd liked GM's idea and unveiled a homemade dome car in 1945. Two years later, GM debuted its *Train of Tomorrow*, a dome-equipped demonstration streamliner, and North America's domeliner era was launched. This map depicts the trains to which domes were initially assigned. With their front and rear windows, dome cars enabled viewers to see the train as part of the scenery surrounding it — a feat no other passenger car could accomplish. By 1958, the year the last dome was built, car assignments had begun to change and would accelerate through the 1960s, as dwindling ridership forced railroads to combine or eliminate trains. Today, many dome cars are in private use in the U.S., although Amtrak has one, and VIA Rail Canada and Alaska Railroad still use domes in regular service. — *Curtis W. Richards and Matt Van Hattem*

America's fastest lines

See where US passenger trains average 70 mph or more

HOW MANY PLACES in the United States can a railroad passenger travel more than 70 miles in one hour? This map spotlights those locations, based on the schedules in Amtrak's Fall/Winter 2007 system timetable and its Spring 2008 Northeast Corridor timetable. (Where precise information was not available, the speeds factor in 1 minute of dwell time at stations for short-haul trains and 2 minutes of dwell for long-distance trains.) In July 1973, when Donald M. Steffee published one of his last speed surveys in TRAINS, most of the trackage where U.S. passenger trains achieved point-to-point runs averaging 70 mph or more occurred on freight railroads in the Southeast and Midwest. Today, the lion's share of 70-plus average speeds happens on the Amtrak-operated portions of the Northeast Corridor between Boston and Washington. (MTA Metro-North Railroad limits speeds on the segment it controls between New Haven, Conn., and New Rochelle, N.Y.)

The enabling factor in many of the 70-plus speeds achieved today has been public funding that has paid for bridge and signal upgrades, new rail and ties, straightened curves, reconfigured interlockings, and new or lengthened passing sidings. The Northeast Corridor's success in moving passengers quickly is a direct result of more than $4 billion in public investments made since Amtrak's inception. The funding helped electrify the line between Boston and New Haven and rebuild trackage that had deteriorated under the previous owners — freight railroads unable to risk private money for passenger trains against the enormous public investments being made in parallel highways and regional airports. Elsewhere, state partnerships in places like Illinois, Michigan, and California have boosted frequencies and running times for passenger trains, aided by agreements with freight railroads to help ensure schedules are met. Half of the $10.5 billion announced in 2010 for federal high speed rail funding went to upgrades and additions to the conventional passenger rail network, enabling more passenger trains to average 70 mph and up in more places. *— Andy Kirk, an author who has held operational and administrative positions with several Northeastern railroads*



How far can you go in an hour on Amtrak?


Chicago hub
Hiawatha Service
Wolverine and Blue Water
California Zephyr/ Southwest Chief
Illinois Zephyr/ Carl Sandburg
Lincoln Service
Illini/Saluki/ City of New Orleans
Milwaukee
Sturtevant
Princeton
Mendota
Galesburg
Plano
Glenview
Chicago
Kalamazoo
Dowagiac
Niles
Homewood
Kankakee
Gilman
Rantoul
Champaign-Urbana
Mattoon
Effingham
Centralia
Joliet
Pontiac
Bloomington
Macomb
Quincy
Kewanee
Max. speed 110 as of 02/2012
Max. speed 110 as of 11/2012
Not to scale
Maximum operating speeds for Acela and Amfleet
Maximum average speeds for Acela Express
Northeast Corridor
Inland Route
Empire Service
Keystone Service
Boston South
Back Bay
Route 128
Providence
Kingston
New London
Old Saybrook
New Haven
Stamford
New Rochelle
New York
Newark
Metropark
Trenton
Philadelphia
Wilmington
Baltimore
Washington
Montreal
St. Albans
Rutland
Portland
Springfield
Boston
New Haven
NEW YORK
PHILADELPHIA
WASHINGTON
Albany-Rensselaer
Harrisburg
Buffalo-Depew
Rochester
Port Huron
Pontiac
Detroit
Cleveland
Battle Creek
Bryan
Grand Rapids
Milwaukee
Wisconsin Dells
Tomah
Omaha
Fort Madison
Hastings
La Plata
Carrollton
Kansas City
St. Louis
Galesburg
Princeton
Quincy
Waterloo
Indianapolis
Cincinnati
Pittsburgh
Charlottesville
Richmond
Petersburg
Newport News
Rocky Mount
Greensboro
Selma
Charlotte
Savannah
Jesup
Jacksonville
Tampa
Winter Haven
Sebring
Okeechobee
West Palm Beach
Miami
New Orleans
San Antonio
Fort Worth
Oklahoma City
Springfield
Windsor Locks
Windsor
Hartford
Meriden
Wallingford
Mill River
Hudson
Rhinecliff
Poughkeepsie
Croton-Harmon
Overbrook
Paoli
Parkesburg
Lancaster
Mount Joy
Elizabethtown
Middletown
45.0 mi. 1 73.0 avg. mph
58.2 mi. 1 72.8 avg. mph
58.2 mi. 2 74.3 avg. mph
71.3 avg. mph
54.5 mi. 1 72.7 avg. mph
54.5 mi. 1 71.1 avg. mph
78.4 mi. 1 70.2 avg. mph
25.1 mi. 1 75.3 avg. mph
60.7 mi. 1 70.0 avg. mph
97.6 mi. 2 71.4 avg. mph
27.6 mi. Max. avg. mph 72.0
25.3 mi. (N) max. avg. mph 72.3 (S) max. avg. mph 79.9
15.6 mi. Max. avg. mph 72.0
91.2 mi. 1 70.2 avg. mph
41.1 mi. 2 72.5 avg. mph
41.4 mi. 2 73.1 avg. mph
102.6 mi. 1 72.4 avg. mph*
48.2 mi. Max. avg. mph 80.3
18.2 mi. Max. avg. mph 80.9
7.9 mi. Max. avg. mph 86.2
Max. speed 90 permitted but not scheduled
Except where noted, all highlighted segments on this map have a maximum speed limit of 79 mph.
Work under way for 160 mph
10.3 mi. Max. avg. mph 77.3
32.2 mi. Max. avg. mph 101.7
112.8 mi. Max. avg. mph 83.6
152.2 mi. Max. avg. mph 76.0
33.5 mi. Max. avg. mph 121.8
80.6 mi. Max. avg. mph 94.8
25.8 mi. Max. avg. mph 86.0
68.9 mi. Max. avg. mph 103.4
40.3 mi. Max. avg. mph 83.4
Acela
Amfleet
Amtrak
MNR
ATK Amtrak
BNSF BNSF Railway
CN Canadian National
CP Canadian Pacific
CSX CSX Transportation
MNR MTA Metro-North
NS Norfolk Southern
SCRX Metrolink
UP Union Pacific
1 Number and direction of trains at same average speed
Local speed restrictions not shown
Speeds derived from Amtrak Fall/Winter 2007 System Timetable and Spring 2008 Northeast Corridor Timetable
*Train No. 98, the northbound Silver Meteor, does not stop at Okeechobee. Speed figures are from West Palm Beach to Sebring.
Not to scale
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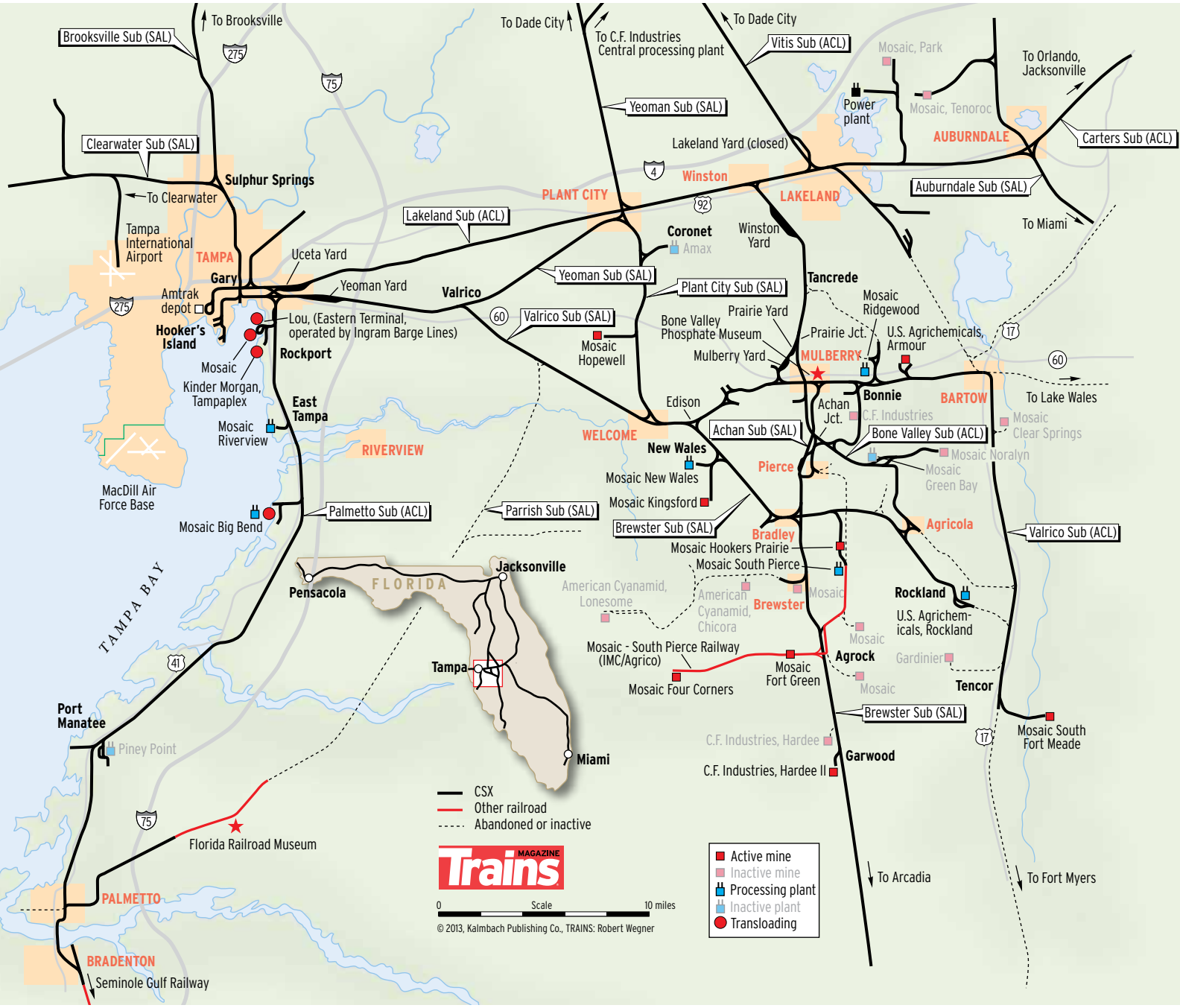
Information supplied by Andy Kirk

CSX in Florida's Bone Valley: 2005

CSX has a web of trackage to support central Florida's phosphate mining industry



BONE VALLEY IS NAMED for the fossilized dinosaur bones found among the region's phosphate rock deposits. Phosphate rock yields phosphorous, an essential ingredient in fertilizer and animal feed, and phosphate has been mined in central Florida since the late 19th century. Florida produces three-quarters of the nation's phosphate supply, and it's the state's third-largest business, after tourism and agriculture. Florida's rich phosphate deposits are among the world's largest, although China, North Africa, and Russia have become competitors in the international marketplace. Much has changed in Bone Valley since the 1980s. Many mines have been depleted or changed ownership and the remaining phosphate reserves are farther south, although most phosphate-processing plants have stayed at their original locations. That means CSX road-switchers are hauling phosphate rock slightly longer distances from mines to processing plants.

— Scott A. Hartley, a TRAINS *correspondent*

The top 30 mountain passes

We compare tonnage over the mountains in 1972 and 2002

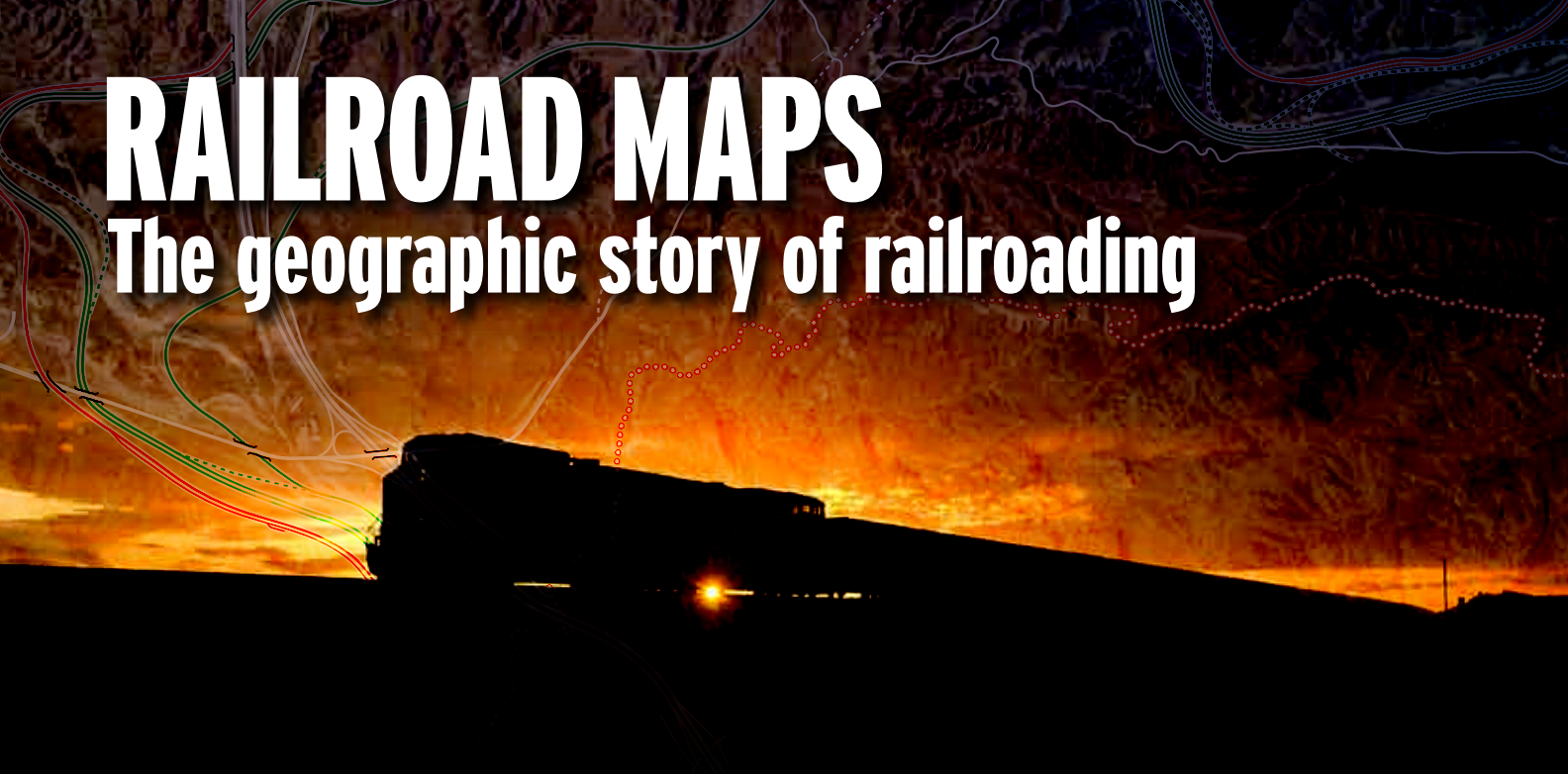
THIS TABLE SHOWS the mountain routes with the most traffic in 1972 vs. 2002. Coal, containers, cost, and concentration drove most of the change. Coal lifted Crawford Hill and Palmer Divide from obscurity to No. 2 and 8 in 2002. Containers doubled Cajon's tonnage, even while it lost almost all of its heavy bulk traffic. Cost and concentration knocked five routes out of the Top 30 since 1972, four of them in the East, which had more duplicate lines to lose. The lone Western pass to fall off the list, Donner, lost out to the parallel Feather River Canyon. Keating Summit's traffic diverted to a longer route to avoid its pusher district. More striking is what hasn't changed: The good routes then are the good routes now — provided they still go places traffic wants to go. Not even the good engineering of the Boston & Maine and Boston & Albany could save them from the disappearance of manufacturing in New England. That traffic? It's on Cajon in a container. — *Curtis W. Richards*

Amtrak's eastbound *Southwest Chief* streaks past Mormon Rocks while climbing California's Cajon Pass on July 24, 2002. Judd Spittler

TONNAGE OVER THE MOUNTAINS, 2002 VS. 1972: THE TOP 30 Million gross tons, annually

2002					1972			
Rank	Tonnage	Mountain pass or crossing	Railroad	% change from '72	Rank	Tonnage	Mountain pass or crossing	Railroad
1	167	Cajon Pass, Calif.	BNSF, UP	120	1	113	Horseshoe Curve, Pa.	PC (PRR)
2	159	Crawford Hill, Neb.	BNSF	1,225	2	82	Sherman Hill, Wyo.	UP
3	144	Sherman Hill, Wyo.	UP	76	3	76	Cajon Pass, Calif.	AT&SF, UP, SP
4	135	Arizona Divide, Ariz.	BNSF	187	4	66	Christiansburg, Va.	N&W
5	109	Horseshoe Curve, Pa.	NS	-4	5	60	Tehachapi, Calif.	SP, AT&SF
6	90	Wahsatch Summit, Utah	UP	73	6	55	Beaumont Hill, Calif.	SP
7	89	Christiansburg, Va.	NS	35	7	52	Wahsatch Summit, Utah	UP
8	80	Palmer Divide, Colo.	BNSF, UP	789	8	50	"the Rat Hole," Burnside, Ky.	SOU (CNO&TP)
9	78	Rogers Pass, B.C.	CP	N/A	9	48	Washington Hill, Mass.	PC (B&A)
10	77	Beaumont Hill, Calif.	UP	40	10	47	Arizona Divide, Ariz.	AT&SF
11	75	Tehachapi, Calif.	BNSF, UP	25	11	42	Alleghany Tunnel, Va.	C&O
12	74	"the Rat Hole," Burnside, Ky.	NS	48	12	40	Cascade Summit, Ore.	SP
13	61	Marias Pass, Mont.	BNSF	177	13	39	Donner Pass, Calif.	SP
14	58	Duff Mountain, Tenn.	CSX	87	14	36	Black Butte, Calif.	SP
15	58	Alleghany Tunnel, Va.	CSX	38	15	35	Sand Patch, Pa.	B&O
16	57	Altapass, N.C. (Blue Ridge)	CSX	128	16	34	Soldier Summit, Utah	D&RGW, UTAH
17	56	Yellowhead Pass, Alta.	CN	N/A	17	31	Duff Mountain, Tenn.	L&N
18	52	Sand Patch, Pa.	CSX	49	18	27	Richmondville Hill, N.Y.	D&H
19	50	Kamela, Ore. (Blue Mountains)	UP	117	19	25	Altapass, N.C. (Blue Ridge)	CRR
20	49	Whetstone, Mo. (Ozark Plateau)	BNSF	123	20	24	Seventeen-Mile Grade, W.Va.	B&O
21	47	Moffat Tunnel, Colo.	UP, BNSF	176	21	23	Kamela, Ore. (Blue Mountains)	UP (OWR&N)
22	43	Crestline, Nev. (LA&SL)	UP	126	22	22	Marias Pass, Mont.	BN (GN)
23	37	McElhany Hill, Mo. (S. of Neosho)	KCS	164	23	22	Whetstone, Mo. (Ozark Plateau)	SLSF
24	36	Cascade Summit, Ore.	UP	-10	24	21	Hoosac Tunnel, Mass.	B&M
25	35	Washington Hill, Mass.	CSX	-27	25	19	Crestline, Nev.	UP (LA&SL)
26	34	Feather River Canyon, Keddie, Calif.	UP, BNSF	89	26	18	Feather River Canyon, Keddie, Calif.	WP
27	31	Black Butte, Calif.	UP	-14	27	17	Moffat Tunnel, Colo.	D&RGW
28	30	Soldier Summit, Utah	UP, BNSF, UTAH	-12	28	16	Mullan Pass, Mont.	BN (NP)
29	29	Mullan Pass, Mont.	MRL	81	29	16	Keating Summit, Pa.	PC (PRR)
30	25	Stevens Pass, Wash.	BNSF	67	30	15	Stevens Pass, Wash.	BN (GN)

NOTES: Tonnages are rounded to nearest million and are averages of 1971-'72 and 2001-'02 to reduce yearly variation. Multiple railroads are listed in order of greatest tonnage. Tonnages are taken at principal summit if available; otherwise, station nearest summit or point of maximum through tonnage is used, whichever is higher. CN and CP data for 1972 were not made available.



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