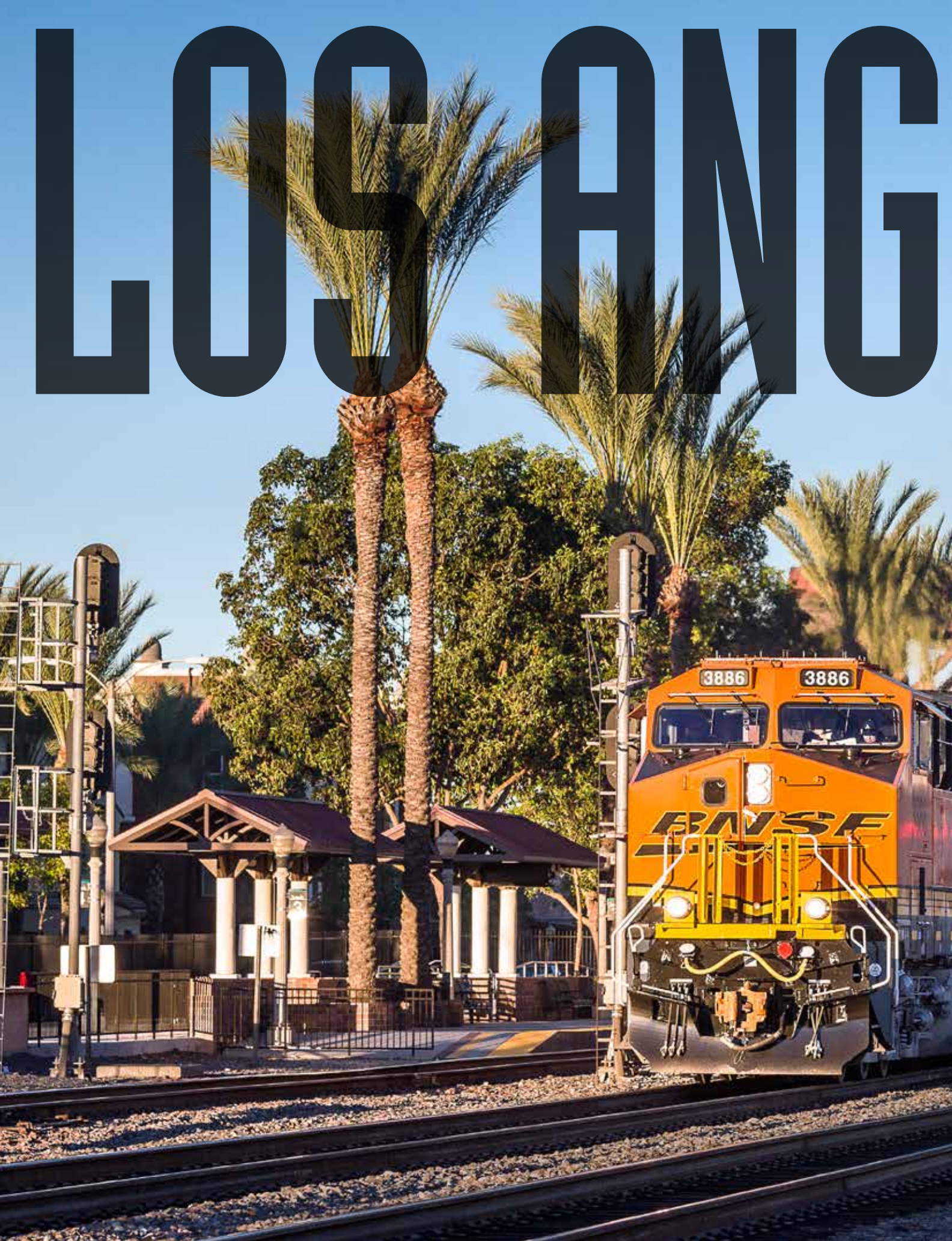


SUNSHINE AND POWER

Locomotives in California, Florida
and everywhere in between



LOS ANGELES



ELES

ONE AMAZING RAILROAD TOWN

by Ted Benson



A trio of brand-new BNSF ET44C4s accelerate an eastbound intermodal past Amtrak's *Southwest Chief*, detrainning passengers at the former Santa Fe station in Fullerton, Calif., at 6:42 a.m., Nov. 7, 2015. David Styffe



Pacific Harbor Line PR30C No. 40 at CP Badger Bridge on the Alameda Sub in the Port of Los Angeles. Greg McDonnell

of them called Los Angeles home. Pacific Electric, California's fourth-largest freight carrier in 1955, was the line that defined LA. Built to sow residential growth across the fertile coastal plain in the first half of the 20th century, Espee's homegrown interurban subsidiary reaped a growing harvest of commercial waybills after World War II. Steadily dropping its trolley poles as the expanding freeway system sent mountains of Big Red Cars to scrapyards on Terminal Island, PE exited passenger service in 1953, handing what little remained to the Los Angeles Metropolitan Transit Authority.

"Operationally, the Los Angeles scene is not confined to a set of city limits," Sims noted in 1959. "The locale insofar as railroads are concerned cuts across a primarily flat basin of countless tracts and mushrooming industry ... metropolis and surrounding communities ... served by a series of branches which radiate in grapevine fashion from the three main carriers." Then as now, LA was best described as "a geographical complex that finds switchers catering to fusee signals along the flat shoreline ... while ... at the same moment, four units of six-axled road-switchers are pulling up enough gradient to hold a train to 20 mph — within the same city limits yet almost 50 miles apart."

At the hub of LA's railroad wheel, carload freight dominated classification yards north and east of downtown, while chair cars and Pullmans catered to first-class customers at Los Angeles Union Passenger Terminal. Two decades after the dawn of the diesel era, the face of Southern California was still defined by streamlined cab units, augmented by growing numbers of utilitarian hoods. Discounting the absence of steam and "the world's greatest electric railway system," Los Angeles 1959 had much in common with Los Angeles 1939.

Fifty-seven years later, the casual observer struggles to find tangible links to the LA of '59. The city has grown to a population of 3.96 million; Los Angeles County is the nation's most populous at 10.1 million. Factor the adjacent counties of Orange, Riverside, San Bernardino, and Ventura into your theory of geographical definition and the region is home to 18.4 million — second largest in the United States, with more residents than the nation of Chile.

For Southland railroaders, the region's overall growth is reflected by the industry's remarkable transformation. LA's "big three" mainline carriers resisted corporate consolidation throughout most of the 20th century, but in an unregulated environment of dynamic evolution, nothing is forever. Santa Fe was the first to go, merging with Burlington Northern in 1995. Southern Pacific and Union Pacific followed suit in 1996. Greater still was the transfiguration in the support-



Set against the LA skyline, Amtrak No. 4, the Chicago-bound Southwest Chief, crosses the LA River at sunset on March 24, 2016. Greg McDonnell

ing cast for Tinseltown's Class I triumvirate.

Fifty-seven years ago, Pacific Electric, Los Angeles Junction Railway, and Harbor Belt Line generously bolstered transcontinental waybills. LAMTA, the public entity that inherited the "unkempt stepchild of a onetime interurban empire teetering on the verge of euthanasia," kept the overhead energized on the final Red Car line to Long Beach. Today, PE is long gone, folded into SP's Los Angeles Division in August 1965. Los Angeles Junction is a paper railroad, with LAJ crews utilizing BNSF power to prowl the steel bowl of "spaghetti in the jungle" south of Hobart yard. Harbor Belt has ceased to exist. In their stead, a quartet of remarkable operations has emerged —

For fans of America's pastime, it's a little piece of heaven — a cool breeze blowing in from the Pacific Ocean, cold beer and nachos on the patio, and Vin Scully welcoming listeners to a Dodger baseball game. Sunday afternoons in Fullerton, Calif., have been like this for the last 58 seasons in the big leagues.

For fans of the railroad persuasion, the scene transcends anything imaginable when Brooklyn's trolley dodgers followed diesel's first generation to the City of Angels in 1958. On this spring afternoon in 2016, the patio is the Fullerton depot platform, the Santa Fe Café serves up snacks and suds, and headlights advancing east and west from Basta and Fullerton Junction guarantee major-league rail action. The only thing that hasn't changed is Scully's invincible baritone inviting everyone to share another "pleasant good afternoon."

Fifty-seven years ago, the Southland railroad story was told in a different voice — one more in tune with the monotone drone of LAPD TV Sgt. Joe Friday — as photojournalist Donald Sims introduced his "L.A. Story" in the July and August 1959 issues of *Trains*. This was the city: Los Angeles, Calif., home to 2.5 million citizens, "give or take a few hundred thousand depending upon your theory of geographical definition," and Sims was inviting readers to "come watch the trains in the place nobody's ever called a railroad town."

Three mainline carriers — Southern Pacific, Santa Fe, and Union Pacific — owned significant Southland terminals, but none



Pacific Harbor Line, Metro Rail, Metrolink, and Amtrak California's *Pacific Surfliners*.

Pacific Harbor Line began in 1998 to provide a privately owned, neutral alternative to the balkanization of the Harbor Belt Line's carrier-controlled layout. The railroad operates 18 route-miles on a 59-mile web of tracks and facilities owned by the ports of Los Angeles and Long Beach, handling nearly 40,000 units of carload freight annually while providing switching service for nine on-dock container terminals.

The first railroad in the Southland to go green, Pacific Harbor Line is powered by Tier 2 and Tier 3 locomotives. Fourteen MP20C-3 units constructed on SD40 and SD45 chassis anchor the roster of 23 locomotives — all of them dressed in a modern version of Santa Fe's classy aluminum and black "zebra stripe" paint scheme. Thanks to former President Andrew Fox, the AT&SF

Continued on page 68



Upholding the grand tradition of Pacific Electric and tracing the route of PE motors and "Big Red Cars," UPY 2705, 2704, and 2707 strut along Vermont Avenue in Gardena with loads for Crenshaw Lumber in April 2016. Greg McDonnell

Train-watcher's guide to LA

- Alameda Corridor Subdivision AC [1]**
 - CP East Redondo to CP West Thenard
 - Trackage rights: BNSF, Union Pacific
 - Built 2002 on former Southern Pacific San Pedro Branch
- Union Pacific Alhambra Subdivision UP [1]**
 - CP Yuma Jct. (SCAX) to SP538 Rancho
 - Former Southern Pacific Pomona Subdivision
- Union Pacific Los Angeles Subdivision UP [2]**
 - CP East Redondo (AC) to West Riverside (BNSF)
 - Former Union Pacific Second Subdivision
- Union Pacific Mojave Subdivision UP [3]**
 - SP538 Rancho to SP311 North Bakersfield
 - Former Southern Pacific Palmdale Cutoff

- Metro Blue Line**
 - Los Angeles to Long Beach
 - Former Pacific Electric Long Beach Line
- Metro Expo Line**
 - Los Angeles to Santa Monica
 - Former Pacific Electric Santa Monica Air Line
- Metro Gold Line**
 - East Los Angeles to Azusa
 - Former Santa Fe Second District (LA to Azusa)
- Metro Green Line**
 - El Segundo to Norwalk
 - Center Divider of I-105 Freeway

Detail of LA Union Station area



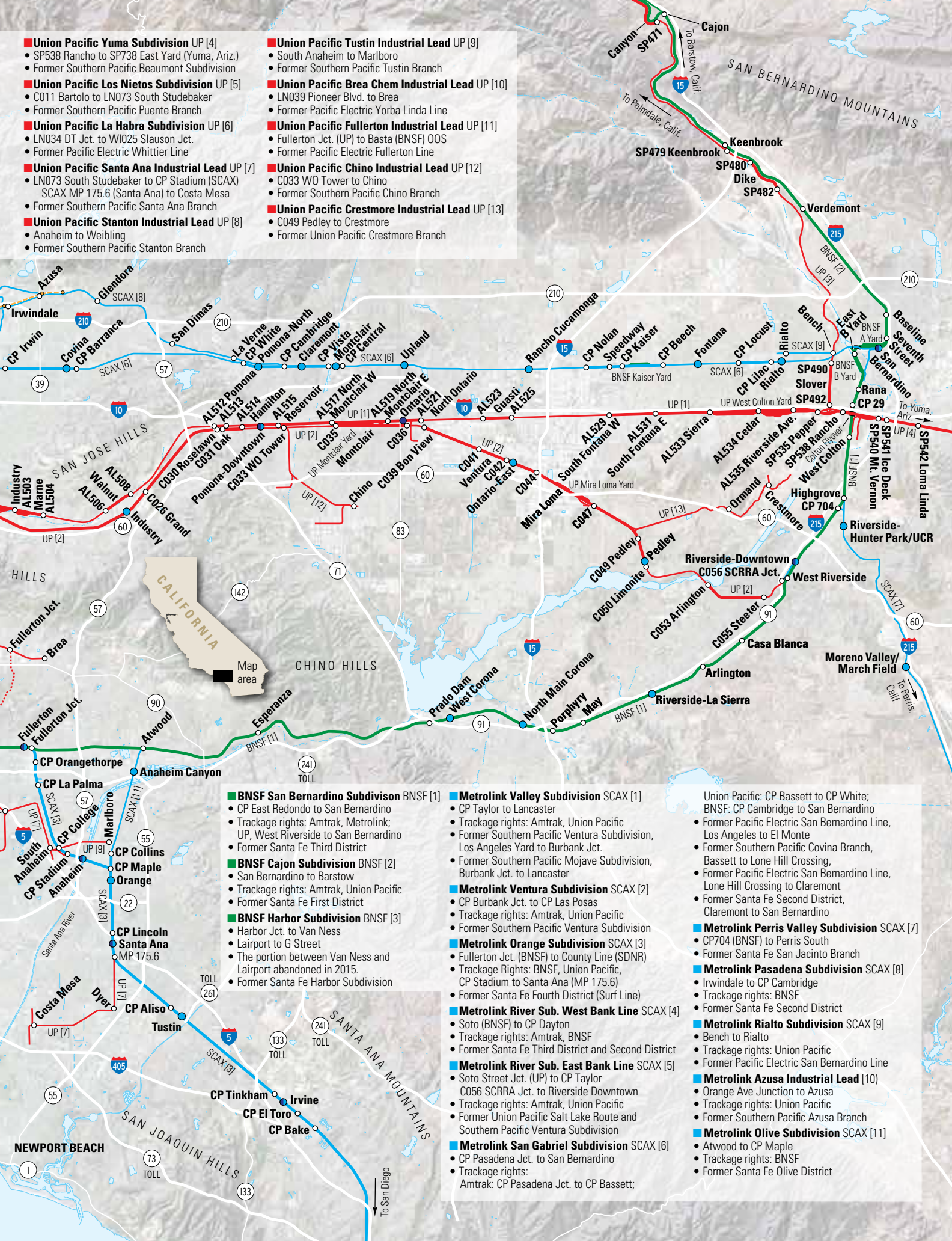
0 Scale 2 miles

- Single Track
- Multiple Track
- AC Alameda Corridor
- AMTK Amtrak
- BNSF BNSF Railway
- LAJ Los Angeles Junction
- PHL Pacific Harbor Line
- SCAX Metrolink
- UP Union Pacific
- Blue Metro Blue Line
- Expo Metro Expo Line
- Gold Metro Gold Line
- Green Metro Green Line
- Purple Metro Purple Line (Subway)
- Red Metro Red Line (Subway)
- P/R Metro Purple/Red (Subway)
- Amtrak Station
- Metrolink Station
- Amtrak/Metrolink Station

0 Scale 5 miles

- Union Pacific Wilmington Subdivision UP [14]**
 - CP West Redondo to CP Alameda (AC)
 - Former Pacific Electric Long Beach Line
- Union Pacific San Pedro Subdivision UP [15]**
 - C003 Downey Road to Manuel Yard (PHL)
 - Former Union Pacific San Pedro Branch
- Union Pacific El Segundo Industrial Lead UP [16]**
 - Watts to El Segundo
 - Former Pacific Electric El Segundo Line
- Union Pacific Torrance Industrial Lead UP [17]**
 - South Los Angeles to Torrance
 - Former Pacific Electric San Pedro via Torrance Line
- Union Pacific Patata Industrial Lead UP [18]**
 - LN073 South Studebaker to CP Compton (AC)
 - Former Southern Pacific Santa Ana Branch, Studebaker to Firestone Park
 - Former Southern Pacific San Pedro Branch, Firestone Park to East Compton
- Union Pacific Dolores Industrial Lead UP [19]**
 - CP Compton to CP West Thenard (AC)
 - Former Pacific Electric Dominguez Line
- Union Pacific Lakewood Industrial Lead UP [20]**
 - Douglas Jct. to Lakewood
 - Former Union Pacific Lakewood Branch
- Union Pacific Paramount Industrial Lead UP [21]**
 - San Pedro Subdivision MP 11.1 to Crutcher
 - Former Pacific Electric Santa Ana Line

- **Union Pacific Yuma Subdivision** UP [4]
 - SP538 Rancho to SP738 East Yard (Yuma, Ariz.)
 - Former Southern Pacific Beaumont Subdivision
- **Union Pacific Los Nietos Subdivision** UP [5]
 - C011 Bartolo to LN073 South Studebaker
 - Former Southern Pacific Puente Branch
- **Union Pacific La Habra Subdivision** UP [6]
 - LN034 DT Jct. to WI025 Slauson Jct.
 - Former Pacific Electric Whittier Line
- **Union Pacific Santa Ana Industrial Lead** UP [7]
 - LN073 South Studebaker to CP Stadium (SCAX) SCAX MP 175.6 (Santa Ana) to Costa Mesa
 - Former Southern Pacific Santa Ana Branch
- **Union Pacific Stanton Industrial Lead** UP [8]
 - Anaheim to Weibling
 - Former Southern Pacific Stanton Branch
- **Union Pacific Tustin Industrial Lead** UP [9]
 - South Anaheim to Marlboro
 - Former Southern Pacific Tustin Branch
- **Union Pacific Brea Chem Industrial Lead** UP [10]
 - LN039 Pioneer Blvd. to Brea
 - Former Pacific Electric Yorba Linda Line
- **Union Pacific Fullerton Industrial Lead** UP [11]
 - Fullerton Jct. (UP) to Basta (BNSF) OOS
 - Former Pacific Electric Fullerton Line
- **Union Pacific Chino Industrial Lead** UP [12]
 - C033 WO Tower to Chino
 - Former Southern Pacific Chino Branch
- **Union Pacific Crestmore Industrial Lead** UP [13]
 - C049 Pedley to Crestmore
 - Former Union Pacific Crestmore Branch



- **BNSF San Bernardino Subdivision** BNSF [1]
 - CP East Redondo to San Bernardino
 - Trackage rights: Amtrak, Metrolink; UP, West Riverside to San Bernardino
 - Former Santa Fe Third District
- **BNSF Cajon Subdivision** BNSF [2]
 - San Bernardino to Barstow
 - Trackage rights: Amtrak, Union Pacific
 - Former Santa Fe First District
- **BNSF Harbor Subdivision** BNSF [3]
 - Harbor Jct. to Van Ness
 - Lairport to G Street
 - The portion between Van Ness and Lairport abandoned in 2015.
 - Former Santa Fe Harbor Subdivision

- **Metrolink Valley Subdivision** SCAX [1]
 - CP Taylor to Lancaster
 - Trackage rights: Amtrak, Union Pacific
 - Former Southern Pacific Ventura Subdivision, Los Angeles Yard to Burbank Jct.
 - Former Southern Pacific Mojave Subdivision, Burbank Jct. to Lancaster
- **Metrolink Ventura Subdivision** SCAX [2]
 - CP Burbank Jct. to CP Las Posas
 - Trackage rights: Amtrak, Union Pacific
 - Former Southern Pacific Ventura Subdivision
- **Metrolink Orange Subdivision** SCAX [3]
 - Fullerton Jct. (BNSF) to County Line (SDNR)
 - Trackage rights: BNSF, Union Pacific, CP Stadium to Santa Ana (MP 175.6)
 - Former Santa Fe Fourth District (Surf Line)
- **Metrolink River Sub. West Bank Line** SCAX [4]
 - Soto (BNSF) to CP Dayton
 - Trackage rights: Amtrak, BNSF
 - Former Santa Fe Third District and Second District
- **Metrolink River Sub. East Bank Line** SCAX [5]
 - Soto Street Jct. (UP) to CP Taylor
 - C056 SCRRA Jct. to Riverside Downtown
 - Trackage rights: Amtrak, Union Pacific
 - Former Union Pacific Salt Lake Route and Southern Pacific Ventura Subdivision
- **Metrolink San Gabriel Subdivision** SCAX [6]
 - CP Pasadena Jct. to San Bernardino
 - Trackage rights: Amtrak; CP Pasadena Jct. to CP Bassett;

- **Metrolink Perris Valley Subdivision** SCAX [7]
 - CP704 (BNSF) to Perris South
 - Former Santa Fe San Jacinto Branch
- **Metrolink Pasadena Subdivision** SCAX [8]
 - Irwindale to CP Cambridge
 - Trackage rights: BNSF
 - Former Santa Fe Second District
- **Metrolink Rialto Subdivision** SCAX [9]
 - Bench to Rialto
 - Trackage rights: Union Pacific
 - Former Pacific Electric San Bernardino Line
- **Metrolink Azusa Industrial Lead** [10]
 - Orange Ave Junction to Azusa
 - Trackage rights: Union Pacific
 - Former Southern Pacific Azusa Branch
- **Metrolink Olive Subdivision** SCAX [11]
 - Atwood to CP Maple
 - Trackage rights: BNSF
 - Former Santa Fe Olive District

Union Pacific: CP Bassett to CP White; BNSF: CP Cambridge to San Bernardino

- Former Pacific Electric San Bernardino Line, Los Angeles to El Monte
- Former Southern Pacific Covina Branch, Bassett to Lone Hill Crossing,
- Former Pacific Electric San Bernardino Line, Lone Hill Crossing to Claremont
- Former Santa Fe Second District, Claremont to San Bernardino



Working amid razor wire, rust, and ramshackle factories, BNSF 3GS21C gensets Nos. 1307 and 1314 build local train Y-LAC1121-02 at Malabar Yard in Vernon on April 2, 2016. Greg McDonnell



Run through the jungle. Warbonnet GP60Ms Nos. 120 and 129 are in Torrance with the homeward-bound "First Watson" on April 1, 2016. Greg McDonnell

Continued from page 65
switcher colors that photographer Richard Steinheimer once compared to "a skunk-eyed traffic island recently removed from the improbable intersection of two 902nd streets" (TRAINS Railway Post Office, April 1960) are still operating in a hard-working tribute to LA Harbor circa 1959.

The most dramatic change in Southland railroading can be found beneath the umbrella trainsheds at Los Angeles Union Station. Much more than a name has changed at the stub-ended passenger facility on the Hollywood side of old Mission Tower. Where a steadily diminishing selection of long-distance and intrastate schedules huddled against the onslaught of jet liners and Interstate highways in 1959, a remarkable array of local cardings dominates today.

Ignore, for the moment, the fact that Amtrak's *Coast Starlight*, *Southwest Chief*, and *Sunset Limited* are the sole interstate passenger trains terminating at Union Station. Instead, focus on Amtrak California's selection of 22 weekday *Pacific Surfliners* linking San Diego, Santa Barbara, and San

Fullerton: a great place to watch trains



A great place to watch trains, even in a torrential spring downpour. BNSF train SLHWLPC1-14A holds on Main 2 as ES44C4 No. 7111 and four more GEs cruise through Fullerton with an LA-bound intermodal on May 15, 2015. David Styffe

Fullerton is a great place to watch trains. It's a town that I've called home for the past 25 years.

It was founded in 1887 when local land speculators George and Edward Amerige bought 430 acres of land north of Anaheim and offered free right-of-way and half interest in the land if George H. Fullerton, president of the Pacific Land and Improvement Co., a Santa Fe subsidiary, would revise his survey to include the site on a line being built from San Bernardino to Los Angeles.

For his trouble, George became the town's namesake. Soon thereafter, retired publisher and successful banker Charles C. Chapman bought an orange grove in eastern Fullerton and established the iconic Mission Brand Label. Incorporated in 1904,

the city thrived for the next half century as an agricultural center specializing in citrus groves.

The years following World War II brought a population boom where housing developments replaced orange groves as many American veterans settled in Southern California.

By the late 20th century, the last traces of the area's rural character had disappeared. Yet the downtown business district, including the Spanish Colonial Revival-style Santa Fe depot, built in 1930, survived and now flourishes as residents have embraced rail travel for business and pleasure. Fullerton station and its palm-shaded platforms have also become a train-enthusiasm hub unparalleled in the Southland.

Perhaps it is the mild

weather with average high temperatures ranging from 68 degrees in January to 85 degrees in August with lows in the 45–65 degree range. Perhaps it is the presence of Disneyland only 4 miles south on Harbor Boulevard, the depot welcoming vacationing visitors as they arrive on Amtrak's *Southwest Chief*. Or perhaps it is just the chance to watch trains. Lots of trains. Some 38 Metrolink and 24 Amtrak trains stop here on any given weekday; mix in 40 to 50 BNSF merchandise and intermodal trains in a 24-hour span and the action on this three-track main line rivals the famed BNSF Racetrack out of Chicago.

Combine all this with a couple dozen fine restaurants and bars within walking distance and there is good reason that many

railroad aficionados have deemed Fullerton as the most pleasant, maybe even the greatest, train-watching spot in the country.

As a young boy in the early 1960s, I begged my parents to bring me to this station at every opportunity. We would buy a bucket of fried chicken, sit on our station wagon's tailgate facing the tracks — waiting for the next *San Diegan* behind a set of warbonnet Alco PAs — and I would let the cocktail of aromas from the nearby orange blossoms, spent diesel fuel, and the Colonel's secret blend of 11 herbs and spices transport me to a place far better than the amusement park down the road.

Fullerton remains the only place that I've ever lived where part of me didn't want to be somewhere else. — *David Styffe*

Positively Sixth Street



Signatures of LA: the downtown skyline and graffiti-scarred face of 3GS21B UPY 2729. Greg McDonnell

Luis Obispo along 350 miles of track, plus bus connections to Bakersfield, where another 12 *San Joaquin* schedules serve Oakland and Sacramento. Of Amtrak's four busiest intercity national corridors, two of them sell seats at LA's Union Station.

Now, ponder the fact that Amtrak plays second fiddle to local transportation agencies for Southland passenger offerings. After decades of decline, commuter rail in Southern California began an ongoing resurrection with the inauguration of Metrolink in 1992. Established just in time to become indispensable following the 1994 Northridge earthquake, Metrolink's 388

route-miles connect Union Station with Lancaster, Oxnard, Riverside, San Bernardino, and Oceanside, where San Diego-sponsored Coaster trains forward riders to North County destinations. Some 165 weekday trains served Metrolink destinations in first quarter 2016, with a weekly average of 41,586 passengers. Those numbers have already increased with the opening of the 24-mile extension of the 91 Line to Perris Valley this spring.

As remarkable as all of this may be, Amtrak and Metrolink aren't the only rail transit players in town. Believers in the power of overhead catenary have been energized with



They're tearing down the Sixth Street viaduct, that iconic conglomeration of graceful steel arches and Art Deco concrete forms that has spanned the Los Angeles River linking downtown LA and Boyle Heights since 1932. Condemned by an irreversible alkali-silica chemical reaction that has been cracking and crumbling its concrete structure, the 3,500-foot-long viaduct — which also crosses several city streets, two railroad lines, and the Hollywood Freeway — was closed to traffic in January 2016. One of the most identifiable and beloved architectural features of the Los Angeles landscape is on the way out.

Its replacement, inspired by the arched trusses and elegance of the 1932 structure, is a stunning arched and cabled bridge designed by architect Michael Maltzan. It should be complete by 2019.

Like so many other attractive Angelenos, the 1932 Sixth Street span caught the eye of Hollywood. For decades, filmmakers and advertising agencies have cast their spotlights on Bridge No. 53C-1880 in the City of Los Angeles inventory. It's

Amtrak and Metrolink trains meet along the LA River at Sixth Street. Greg McDonnell

been an uncredited extra in dozens of films, from 1951's "Roadblock," to "Grease," "Gone in 60 Seconds," "Point Blank," and "To Live and Die in LA." The famed viaduct has been a backdrop in chase scenes filmed in the industrial streets below it, and along the concrete-lined LA River that courses beneath its distinctive arches. It's been featured in music videos by Madonna and the Foo Fighters, and been a perennial favorite of automakers for TV commercials and magazine ads.

For all of its 84 years, the Sixth Street viaduct has coexisted with the railroads that trace the banks of the LA River: Santa Fe on the west, UP's Los Angeles & Salt Lake Railroad on the east. It's carried Model Ts, roadsters, and coupes overtop of high-stepping Santa Fe Pacifics wheeling out of town with the *San Diegan*; it's felt the blast of exhaust from the stacks of Santa Fe Northerns and the hot breath of Electro-Motive E2s working UP's *City of Los Angeles* streamliner; it's reverberated the exhaust of high-hood Alco switchers, and FMs, warbonnetted PAs, and generations of Es and Fs, and cast its shadow on everything from stainless steel limiteds to drag freights and lowly transfers.

Crews with cranes,

jackhammers, and concrete saws are methodically demolishing the celebrated span as the rush hour heats up on a March 2016 afternoon. Bright LED signals beckon trains on both sides of the river on track operated by Metrolink parent, the Southern California Regional Rail Authority, as the East and West Bank lines of the River Sub.

A trio of heavily tagged UP gensets trudges up the East Bank and into 4th Street yard with a local freight not long before a Metrolink F59PHI screams by with an eastbound Riverside train. Minutes later on the opposite bank, an inbound Amtrak *Surfliner* and a Metrolink train stage a perfectly choreographed running meet as the viaduct presides over it all.

There will be an undeniable void once the demolition crews carve the elegant concrete and steel structure from the skyline. But here on the concrete banks of the LA River, the parade of trains, from graffiti-covered gensets towing of boxcars, tanks, and lumber flats, to California-styled F59s speeding by with *Surfliners* and Metrolink commuters remains as quintessentially LA as Chevy low riders, palm-lined streets, crowded freeways, and the classic profile of the Sixth Street viaduct. — Greg McDonnell

a growing network of LA Metro Rail trolley lines. While the trustees of 20th century traction preserve the past at the Orange Empire Railway Museum in Perris, the heirs of Pacific Electric blimps, "Butterfly Twelves," and Los Angeles Railway "Yellow Cars" command the present, connecting LA's metropolitan core with Azusa, Culver City, Long Beach, Norwalk, North Hollywood, and Redondo Beach. Inaugurated in 1990, two subways and four light rail lines currently serve Angelenos over 98.5 route-miles, with more to come. The year 2016 marks the completion of two significant route extensions — the Gold Line to Azusa, utilizing portions of

the former Santa Fe Second District, and the Expo Line west of Culver City, reviving PE's former Santa Monica Air Line.

In a land both blessed and cursed by its dependence on super highways, the greatest improvement in expediting Southland rail commerce has come from the construction of two "expressways for freight" — the Alameda Corridor and Colton Crossing.

Opened in 2002, the 20-mile Alameda Corridor connecting downtown Los Angeles to Long Beach bypassed 90 miles of branch line and secondary running over one-time SP, UP, PE, and Santa Fe alignments, eliminating more than 200 grade



"Los Angeles." No mistaking the hometown of these heavily tagged LA-assigned UP gensets. Greg McDonnell



Returning from the industrial spurs of Vernon, UPY 2723 clomps along the BNSF diamonds and past long-closed Hobart Tower at San Pedro Junction on Mar. 24, 2016. Greg McDonnell



Heading an eastbound stack train, BNSF ES44DCs Nos. 7530 and 7852 exit the "Mid-Corridor Trench" on the Alameda Sub at East 25th Street. Greg McDonnell

crossings on the interminable slog through south central LA. Highlighted by 10 miles of 40-mph triple-tracked trench running controlled by CTC, the corridor handles over 17,000 trains annually. Fifty-seven rail miles to the east, the Colton Crossing fly-over opened in 2013, eliminating a grade-

level BNSF and UP crossing at old Colton Tower, dating to 1883, and expediting running times for a good 100 trains per day including Amtrak and Metrolink.

Both projects underscore the dramatic shift in haulage patterns since 1959. Despite a significant amount of Southland boxcar

traffic in 2016, carload freight has long been out-distanced by the explosive growth of container traffic from the ports of Los Angeles and Long Beach. Where hotshot piggyback trains and expeditors were once the toast of the industry, intermodal has reigned supreme for more than 30 years. Trailers on flatcars can still be found, but they're usually entrained behind double-stacked ocean-going containers roaming "the main lines of mid-suburbia," as photographer Enrique Contreras describes the freight corridors of Southern California.

Traditional commodity shipments have evolved as well. Long gone are the perishable-laden Santa Fe Green Fruit Express trains laboring through the canyons of Cajon, eastbound SP Colton Blocks hammering over Beaumont Hill, and Imperial Valley sugar-beet haulers battling gravity and headwinds out of West Palm Springs. In their place, flanged-wheel pipelines of crude oil and ethanol course the coast and coil around Sullivan's Curve en route to South Bay refineries, while rock trains circumnavigate San Timoteo and Soledad canyons, bound for the bunkers of aggregate proces-



Fullerton station, arguably the greatest train-watching place in the country, bustles with people and trains as westbound BNSF GEs roll by on a summer's eve. David Styffe

sors in Gardena and Sunland.

A vast array of the latest and greatest from GE and EMD provide the tractive effort on LA's mainline rails. Long gone are the throaty, fuel-guzzling, emissions-spewing 16- and 20-cylinder muscle machines from the '60s and '70s. Clean and green are today's watchwords, exemplified by the concentration of Tier 3 and Tier 4 locomotives in the coastal basin.

A full palette of paint schemes more than makes up for anything the Class I carriers may lack in diesel diversity. BNSF and Union Pacific colors predominate, but Canadian National, Canadian Pacific, CSX, Ferromex, Norfolk Southern, and Kansas City Southern units regularly enter the scene, spiced by occasional heritage offerings from NS and UP's singular salutes to its merger partners. Santa Fe blue and yellow abounds on BNSF locals and yard jobs, along with a dwindling number of red-and-silver warbonnet units. Lost in such well-deserved nostalgia, it's easy to forget that UP's Armour Yellow and Harbor Mist grey dates to 1939 — proof positive that a handsome heritage never goes out of style.



Metrolink F59PH No. 869 accelerates away from Fullerton on a warm August evening, bound for Oceanside with train No. 608. David Styffe

Back in Fullerton, the sun is setting over three pairs of rails, afternoon yields to evening as another eastbound rolls into view. What'll it be this time? A San Diego-bound *Surfliner*? A trio of BNSF ET44C4s towing 2 miles of stacks, throttling up for the three-day sprint to Chicago? Metrolink No. 667

bringing baseball fans home from an afternoon at Angels Stadium?

Regardless of what rolls by next, there's always another train on the way into or out of LA. No matter what you think of Southland railroading, the truth remains, Los Angeles is one amazing railroad town. **I**

Florida East Coast
Railway train
No. 101, with rock
loads up front,
hustles over Spruce
Creek at Port
Orange, Fla.
Tom Danneman



GE takes the SUNSHINE



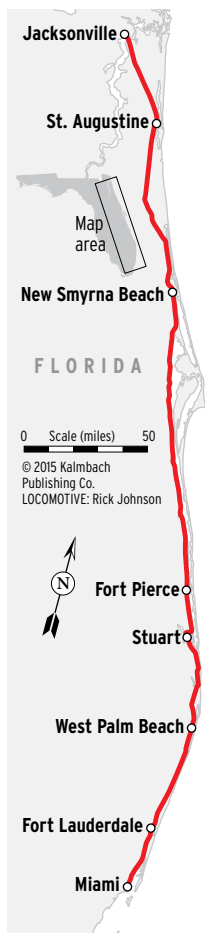
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Florida East Coast's new GE ES44C4s embody the railroad's bold vision by way of its retro *Champion* livery

by Drew Halverson



SYSTEM MAP



Palm fronds sway in the salty breeze along Florida's fog-shrouded San Sebastian River. An 8-foot-long alligator lurking in the weeds slowly emerges from below the water's surface as a muffled rumble reverberates off the shoreline. This is a new sound, one never before heard along these banks. Nothing like the thundering EMD prime movers of the past; it's more of a low chug. The rumble grows louder. From out of the mist, two gleaming General Electric ES44C4s appear. All decked out in Florida East Coast Railway's unmistakable red-and-yellow *Champion* livery, they sprint alongside the tranquil tidewater and send the gator sliding back into the murk.

The Champs present a striking sight, one that FEC founder Henry M. Flagler would surely have been proud of. It's a sight the old alligator will quickly grow accustomed to. This is the dawn of a new era along the Sunshine State's eastern coast, and GE powers it.

MOVING FORWARD

An industry trailblazer since its birth in September 1895, FEC has always had a knack for finding growth opportunities. First — and most notable — was the railroad's Key West Extension, a route connecting Miami to Key West via a series of overseas bridges that's still regarded as one of the greatest railroad engineering and construction feats in the country's history. Devastated by the 1935 Labor Day hurricane and doomed by the effects of the Great Depression, the

extension was abandoned. The bridges became part of U.S. Highway 1 to the Keys, but the brave venture put FEC on the map in terms of potential trade with Cuba, Latin America, and the West via the Panama Canal. That, of course, was Flagler's vision from the beginning.

Forward thinking has helped FEC prosper through an ever-shifting economic environment. Innovations such as two-person crews, end-of-train detectors, and cabooseless trains are just a few strategies first implemented by FEC that later became norms of the industry. Today's 351-mile main line rests on rock-solid concrete ties — many of which were produced in the railway's own crosstie facility.

Today, FEC leaders draw upon that tradition of innovation and

move toward future opportunities. Leading the charge is president and CEO Jim Hertwig, who recently championed intermodal development at PortMiami and Port Everglades. The goal: to attract post-Panamax ships (and their containers) to southern Florida as soon as the widening of the Panama Canal is completed in 2016. With the prospect of additional traffic, on top of already-increasing intermodal shipments, came the inevitable need for another bold move: an update in motive power.

DRIVING CHANGE

Florida East Coast has been an Electro-Motive stronghold since 1939, when 2,000-hp EMC E3s powered the popular *Henry M. Flagler* and *Champion* passenger trains — and introduced the epon-



**Surrounded by
tidewater swamps
in St. Augustine,
a pair of ES44C4s
power train No. 210.**
Mike Danneman



**FEC ES44C4 No. 823
leads train No. 226
through thick morning
fog.** Drew Halverson



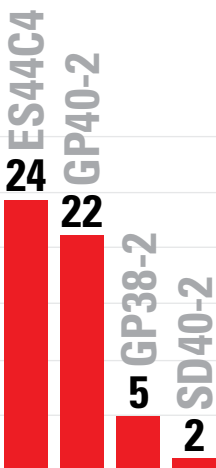
**Train No. 101 swings
into St. Augustine.**
Eric Hendrickson



A machinist at Bowden Yard in Jacksonville inspects new GE ES44C4 No. 818.
Mike Danneman



LOCOMOTIVES IN SERVICE



ymous paint scheme in the process. For 75 years, FEC relied on an all-EMD fleet, from E units, BL2s, GP7s, GP9s, SW9s, and SW1200s, to GP38-2s, GP40-2s, SD40-2s, and SD70M-2s.

All that changed in 2014 as FEC spurned tradition and signed a deal with GE Transportation for 24 ES44C4 locomotives. The new C4s made their FEC debut on Nov. 21, 2014, as Nos. 803 and 804 worked their maiden revenue run out of Jacksonville. During the following weeks, the remaining 22 ES44C4 locomotives were delivered from GE's Erie, Pa., plant.

As the GEs came on line, FEC's six-axle EMDs were quickly displaced. All but two of the road's SD40-2s were leased out, and the

former front-line fleet of 11 leased SD70M-2s was returned to the lessor. Charged with local work and yard duties, FEC's four-axle EMDs remain, including 25 GP40-2s (three of which are being overhauled at Progress Rail Services) and five GP38-2s.

So, why the change? "The SD70M-2s were great locomotives, but the time came to move on," says Fran Chinnici, FEC's senior vice president of engineering, mechanical, and purchasing. "GE earned our business by providing a locomotive solution with enhanced technological capabilities, increased strategic value, reduced total cost, and improved fuel efficiency. GE was very aggressive in their approach in terms of outlin-

ing the functionality and future benefits of the new technology offered by the locomotives, such as the capability to utilize the power in dual-fuel operations (liquefied natural gas and/or diesel). The inherent value of these units and future technological opportunities made this new partnership with GE a very smart choice for FEC."

The ES44C4s, purchased for through freight service between Jacksonville and Miami, are state-of-the-art: more fuel-efficient and cleaner environmentally than previous models. "The ES44C4 provides 4,400 hp with four driving A.C. motors and the same tractive effort as a six-axle D.C. locomotive," says Bill Lauro, director of locomotive sales at GE Transpor-



Framed by palms
and pines, train
210 rolls through
Bunnell, Fla.
Drew Halverson



Train 226, led by
ES44C4 No. 820,
speeds north
alongside U.S.
Route 1, south of
Jacksonville.
Mike Danneman

When it rains
it pours, nowhere
more than Florida.
Train 101 twists
through an
afternoon storm,
just south of
Magnolia siding.
Drew Halverson



POWER PLAYERS



FRAN CHINNICI
Senior VP,
Engineering,
Mechanical, &
Purchasing



DAVE KOBRYN
Locomotive
Superintendent

tation. “The ES44C4 provides new A.C. technology with better reliability, availability and significant fuel savings versus older-style locomotives.” The ES44C4s replace SD40-2s on a two-for-three basis.

One of the most important factors in FEC’s selection of GE was the potential for using liquefied natural gas, a fuel that can provide economic and environmental benefits to railroads. According to Chinnici, GE provides an LNG conversion rate of 80-20. That means that each ES44C4, using GE’s NextFuel Retrofit Kit with dual-fuel LNG technology, can sip a combination of 80 percent LNG mixed with 20 percent diesel, a tasty cocktail that provides a significantly lower total fuel cost.

Chinnici plans to construct and test two LNG tenders in 2015. “They’ll be built from the wheels

up,” he says, “each with a high-strength, rigid center beam and structural integrity much like that of a locomotive platform. Atop this high-strength platform will be a double-wall, 10,000-gallon cryogenic tank.” Once the initial testing satisfies all state and federal safety operating hurdles, FEC plans to have as many as 12 to 14 tenders produced to support the 24 ES44C4 locomotives.

Florida East Coast is working with the Federal Railroad Administration to ensure that the equipment, operating practices, policies, and procedures are developed and designed to maximize operating safety. “We will have measures of success built into our process throughout the testing phase, and FEC will expand testing and implementation of LNG based on the ability to perform against these

objectives,” Chinnici says.

According to Lauro, GE has local service engineers who will support FEC’s testing and expand support as the railroad makes equipment decisions. “We are connected to support FEC in its future LNG efforts and to expand our technology partnership with new solutions that benefit both companies,” he says.

On a day-to-day basis, the new ES44C4s receive expert care from FEC Locomotive Superintendent Dave Kobryn and his mechanical team. Kobryn, a proud FEC employee of 33 years, is charged with maintaining the railroad’s entire locomotive roster, as well as business cars *Azalea* and *St. Augustine*. “He treats the locomotives like they’re his own,” Chinnici says.

When it comes to pride in his company, Kobryn isn’t alone. Swing by FEC’s headquarters at



Jacksonville's Bowden Yard, where renovated offices and a new dispatch center are filled with determined staff, all of whom share the leadership's first-mover mindset.

And outside those air-conditioned rooms rest a handful of new GEs awaiting another journey south. Thanks to Hertwig, they wear the beautiful *Champion* livery inspired by FEC's flagship trains of old. Chinnici ensured that the livery was recreated with the best paint and attention to detail that GE had to offer.

Don't expect FEC's *Champion* image or its fighting spirit to fade any time soon. **I**

DREW HALVERSON is TRAINS' graphic designer. He would like to thank Fran Chinnici, Debra Phillips, Bill Lauro, and Jessica Taylor for their assistance with this story.

ES44C4 No. 819
leads train 123 over
the St. Lucie River
in Stuart, Fla.
Drew Halverson

RAIL



A big-picture study of the power that drives North America's 'Big 8' railroads

by Greg McDonnell

Here it is." On a lonely stretch of old Route 66 between Holbrook and Winslow, Ariz., the weather-beaten sign marking the Jack Rabbit Trading Post, an icon of the Mother Road, is sandwiched between two of the busiest transcontinental corridors in the nation. To the north, Interstate 40, the highway that replaced roughly the western half of U.S. 66; to the south, the double-track Los Angeles-Chicago BNSF Railway Transcon main line.

It doesn't take long for a headlight to pop over the western horizon. Minutes later, an eastbound manifest freight thunders past — one of 70 to 100 trains that shake the weathered boards of the Jack Rabbit sign every 24 hours. Hurling the mixed freight toward Gallup, N.M., is a four-unit, three-railroad, two-builder, A.C./D.C. consist that effectively illustrates the diversity and defining trends of modern North American motive power.

BNSF 6302 leads a four-unit, three-railroad, two-builder, A.C./D.C. consist past the "Here it is" sign along old Route 66 west of Winslow, Ariz. Greg McDonnell



Top 7 freight fleet overview

Total fleet size	28,155
Six-axle vs. four-axle by percentage	C-C: 77%, B-B: 23%
A.C. vs. D.C. by percentage	A.C.: 32%, D.C.: 68%
Builders by percentage	EMD: 52%, GE: 47%, Other: 1%
Model count	158
Top five models	Dash 9-44CW: 3,362 AC4400CW: 2,799 ES44AC: 2,686 GP38-2: 2,167 SD40-2: 2,162
Percentage of top 5 models vs. total	47%
Percentage 4,000 hp and higher	63%
Percentage by type:	
Switcher/genset	3.2%
Slug	1.9%
EMD GP	17.2%
EMD SD (less than 3,500 hp)	10.5%
EMD SD (greater than 3,500 hp)	10.4%
EMD MAC	5.2%
EMD ACe	4.0%
GE DASH 8/DASH 9	18.7%
GE AC4400CW/AC6000CW	11.0%
GE Evolution	16.6%
Other/special	0.1%
Average age	18.4 years

* Includes 1,086 Norfolk Southern Dash 9-40CW. Top 7 data excludes Amtrak.

Railroad	Total fleet	2004-2013 deliveries	GE	EMD	Other	Percentage delivered in past decade
BNSF	7,106	2,826	2,314	407	105	40%
CN	2,008	410	220	190		20%
CP	1,639	425	375	50		26%
CSX	4,211	955	704	167	84	23%
KCS	981	319	159	158	2	33%
NS	4,025	1,155	527	362	266	29%
UP	8,185	2,068	1,134	742	192	25%
Total	28,155	8,158	5,433	2,076	649	29%

* Tabular data updated to June 2013; specific totals can fluctuate almost daily.

A BNSF coal train in the charge of UP SD90MAC No. 8304, CSX AC6000CW No. 5002, and BNSF ES44AC No. 6386 crosses the Clark Fork River between Thompson Falls and Belknap, Mont., on Montana Rail Link's 4th Sub on Sept. 20, 2012. Tom Danneman

They're an eclectic lot: BNSF ES44AC No. 6302, CSX Dash 8-40CWs Nos. 7809 and 7843, and Union Pacific SD70M No. 4730. Together, they represent the Big Two builders and some of the best-selling locomotive lines in North America. They're also members of the three largest locomotive fleets on the continent, and examples of the apex of D.C.-traction technology, and state-of-the-art A.C. traction. And that's just for starters. They're just four of more than 28,500 locomotives employed in the service of the "Big 8" North American railroads: Amtrak, BNSF, Canadian National, Canadian Pacific, CSX Transportation, Kansas City Southern, Norfolk Southern, and UP.

So often, we're concerned with the minutia of motive power. But every now and again, it's a good idea to step back and look at the big picture. Who has the most locomotives? What is the best-selling model?

It's been 30 years since GE Transportation overtook Electro-Motive as the No. 1 locomotive builder in North America. So, just what are the GE vs. EMD statistics in the overall locomotive population? How do they stack up on a road-by-road basis?

Excluding Amtrak, the "Top 7" fleet posts an average age of 18.4 years. By builder, the EMD average is 24.6 years; for GE, it's 11.8 years. The oldest GEs are UP's 1987-vintage Dash 8s. Nearly 50 percent of the active EMD fleet was built before that date! Who has the oldest fleet? Who has the newest?

Is the high-horsepower D.C.-traction locomotive dead? None have been built or ordered since CN SD70M-2 No. 8964 rolled out of EMD London in December 2010. What are the road-by-road and overall A.C. vs. D.C. stats?

So here it is: A big-picture study of the power that drives North America's "Big 8" railroads. All in!

UNION PACIFIC STILL THE BIGGEST



UP SD70Ms speed an eastbound stack train near Cokeville, Wyo., on Jan. 20, 2013. Mike Danneman

Union Pacific has long been synonymous with “biggest in the industry.” From Big Boy 4-8-8-4s in steam days, to the giant double-engined diesel monsters of the 1960s, UP has always tended toward the extreme. It’s no surprise that today’s UP fleet can stake similar claims.

UP’s current fleet numbers nearly 8,200 locomotives — more than four times the size of the CN fleet, and equivalent to CSX and NS combined. Similar to that of western neighbor BNSF, UP’s fleet skews toward high-horsepower locomotives, with nearly 70 percent rated at 4,000 hp or greater. Translated, that’s nearly 5,600 locomotives! Even the road’s oddball SD9043MACs, some 306 strong, are a drop in the bucket, representing 3.5 percent of the UP fleet.

Following a decade-long absorption of the Southern Pacific and Chicago & North Western fleets, today’s UP roster is pared down — lean, mean, and standardized. The lease and subsequent purchase of nearly 1,450 SD70Ms between 2000 and 2004 allowed the road to eliminate scores of aging GE Dash 7s and EMD tunnel motors. At the same time, UP re-equipped its coal fleet with GE AC4400CWs. With the inclusion of units from C&NW and SP, the AC4400 is the most common model on the roster, with 1,485 examples.

Since EPA Tier 2 emissions rules took effect in 2005, UP’s locomotive-purchasing

Total fleet size	8,185
Six-axle vs. four-axle by percentage	C-C: 79% , B-B: 20%, Other: 1%
A.C. vs. D.C. by percentage	A.C.: 42%, D.C.: 58%
Builders by percentage	EMD: 57%, GE: 41%, Other: 2%
Model count	42
Top five models	AC4400CW: 1,485 SD70M: 1,445 ES44AC: 943 GP38-2: 664 SD40-2: 505
Percentage of top 5 models vs. total	62%
Percentage 4,000 hp and higher	68%
Percentage by type:	
Switcher/genset	4.3%
Slug	0.7%
EMD GP	15.6%
EMD SD (less than 3,500 hp)	7.3%
EMD SD (greater than 3,500 hp)	21.7%
EMD MAC	3.7%
EMD ACe	6.3%
GE Dash 8/Dash 9	8.2%
GE AC4400CW/AC6000CW	20.4%
GE Evolution	11.5%
Other/special	0.1%
Average age	17.8 years



Background photo by Mike Danneman



By the end of 2013, UP will have 1,003 ES44ACs. UP 8010 works an eastbound freight at West Colton Yard in Colton, Calif., in March 2013. Greg McDonnell



strategy has been consistent, annually selecting one or both of the builders' standard offerings: GE's ES44AC and EMD's SD70ACe. By the end of 2013, UP will roster 1,003 Evolutions and 517 ACes (bumping the ACe into the Top 5 in place of the SD40-2).

Nearly 1,100 GP15-1s, GP38-2s, and GP40-2s form UP's four-axle fleet. The units hail from a variety of backgrounds, though UP has worked to standardize them for a wide range of secondary applications.

A leader in the development of the new generation of switchers, UP quickly assembled a fleet of 21 RailPower Green Goats and later some 165 genset switchers from RailPower and NREC. While the oldest Green Goats were recently retired, the rest soldier on as replacements for EMD SW1500s and MP15s. Once a haven for hundreds of former SP end-cab switchers, UP rosters a dwindling 157 or fewer today.

UP's innovation didn't stop with switchers. In 2010, the road investigated rehabilitation options for its aging SD60s, contracting with EMD to perform ECO upgrades on 20 SD60Ms. Designated SD59M-2 by EMD

Fast facts

- UP's locomotive fleet is equivalent in size to that of CSX and NS combined.
- UP's SD70M fleet represents 80 percent of the D.C. locomotives EMD has built for North America since 2000.
- Active locomotives in UP's historic diesel fleet include an A-B-A set of E9s — Nos. 951, 963B, and 949 — and DDA40X No. 6936.
- UP rosters two active steam locomotives for special trains: 4-8-4 No. 844 and 4-6-6-4 No. 3985.



Three of UP's 1,485 AC4400CWs, the top dogs on the roster, work a westbound grain train at Topaz, Idaho, in January 2013. Two photos, Mike Danneman

and SD59MX by UP, the 3,000-hp rebuilds feature EMD's 12-cylinder, Tier 2-compliant ECO 710 prime mover. Ten SD59M-2s received more extensive modifications, serving as test beds for advanced emissions technologies. Class unit UP No. 9900 is equipped with EGR (exhaust gas recirculation) and exhaust-filtration technologies allowing the locomotive to test at EPA Tier 4 emissions standards. Meanwhile, the future of UP's aging 505-unit SD40-2 fleet seems secure. UP is putting SD40-2s through an extensive "SD40N" overhaul/upgrade program at its shop in North Little Rock, Ark. Initiated in 2010, the program has given 220-and-counting SD40-2s new life. UP could readily complete another 250 should it take aim at the remainder of the fleet.

Recent downturns in traffic, particularly in coal, have forced a significant number of UP units into storage. Reports indicate that UP has in excess of 1,000 units parked, evidenced by long lines of stored Dash 8s, SD60s, and even modern SD70Ms at terminals around the system. Some may never see revenue operation again. In mid-2013, the



EMDs stand in the snow at Denver's North Yard in April 2013.

former SP Dash 8-40B fleet and 50 long-stored Dash 8-40C locomotives had been stricken from the books. The quarter-century-old veterans did their part for UP, but it is unknown whether they will shuffle

off to scrap or find new work. UP retains ownership of another 404 Dash 8s, a not-insignificant number that represents just 5 percent of the railroad's sea of Armour Yellow locomotives. Unlimited power indeed!

BNSF A MOTIVE POWER EVOLUTION



A westbound BNSF manifest with an ES44C4 in the lead cruises by Frog Pond west of Trout Creek, Mont. Tom Danneman

Total fleet size	7,106
Six-axle vs. four-axle by percentage	C-C, A1A-A1A: 83%, B-B: 17%
A.C. vs. D.C. by percentage	A.C.: 37%, D.C.: 63%
Builders by percentage	GE: 59%, EMD: 40%, Other: 1%
Model count	56
Top five models	Dash 9-44CW: 1,791 SD70MAC: 785 ES44DC: 721 ES44AC: 715 ES44C4: 630
Percentage of top 5 models vs. total	65%
Percentage 4,000 hp and higher	75%
Percentage by type:	
Switcher/genset	1.8%
Slug	0.2%
EMD GP	14.4%
EMD SD (less than 3,500 hp)	6.6%
EMD SD (greater than 3,500 hp)	2.6%
EMD MAC	11.0%
EMD ACe	4.9%
GE Dash 8/Dash 9	27.8%
GE AC4400CW/AC6000CW	1.7%
GE Evolution	29.2
Other/special	0
Average age	15.1 years

To feel BNSF's heartbeat, head for the "Transcon," the former Santa Fe main between Chicago and Los Angeles. While the traffic base of the 32,500-mile railroad runs the gamut from Powder River coal to east Texas chemical traffic, any stop along the old Santa Fe main line will quickly show what makes BNSF tick. Headlight after headlight appears on both horizons as fleets of intermodal trains hustle the nation's goods at track speed behind today's most technologically advanced motive power. It's an exhilarating experience to watch, and the carrier's motive power strategies are closely tied to the rhythm and beat of this busy avenue of commerce.

Since 2005, BNSF has amassed a fleet of more than 1,400 GE Evolution-series locomotives that regularly handle the railroad's hottest intermodal schedules, a significant portion of which traverse the Transcon. Unique to BNSF, the A1A-A1A configured ES44C4 consolidates the reliability of A.C. technology with performance matching its older ES44DC and Dash 9 cousins. New-generation EVOs work side by side with the railroad's 1,791 Dash 9-44CW locomotives, although many Dash 9s have cascaded into regular freight and grain service, replacing aging second-generation EMDs and GE Dash 8s.

The coal fleet has evolved, too. In the past decade, BNSF has purchased 350

Background photo by Tom Danneman



EMD SD70ACes and 715 GE ES44ACs to supplant its 785 SD70MACs, some of which are nearing their 20th birthday. Some are being retired, and with coal traffic down, SD70MACs in merchandise and other service are common sights.

BNSF has been the most aggressive of all Class I railroads in fleet replacement, purchasing more than 3,000 new locomotives in the last decade. Roughly 40 percent of the railroad's roster is less than 10 years old, and more than 80 percent of those locomotives have been built by GE.

The arrival of those new locomotives has sent ripples through the entire fleet. Dash 9s have moved into a wider range of services, and most of the road's six-motor Dash 8s have been stored or retired. CN quickly snapped up 67 retired Dash 8-40CWs.

BNSF has formally re-assigned its remaining SD40-2s into yard and local service, a move that pushed several hundred GP15-1, GP30, GP35, and GP39 locomotives into retirement. The purchase of nearly 100 gensets from National Railway Equipment allowed the railroad to eliminate all but a handful of traditional EMD end-cab switchers. In total, the traditional EMD switcher and GP population represents only 15 percent of the BNSF fleet, one of the lowest percentages of any Class I.

While gaining efficiencies with its fleet standardization, including delivery of 175



Brand-new BNSF SD70ACe No. 9232 heads a Galesburg-bound coal train at Buda, Ill., in June 2008. Drew Halverson

ES44C4s and 100 SD70ACes in 2013, BNSF's mechanical group is already evaluating the next game changer. In early 2013, the road announced that it is working with both GE and Caterpillar/EMD to develop

road locomotives capable of operation on liquefied natural gas. Like the generations of Dash 9s and Evolutions before them, these locomotives could raise the bar for performance and efficiency.

Fast facts

- BNSF's Dash 9-44CW fleet is larger than CP's entire locomotive fleet.
- BNSF's fleet is 60 percent GE, the highest of any Class I railroad.
- BNSF is the only Class I railroad without a "classic" executive locomotive fleet.
- BNSF released a Hydrogen Fuel Cell/Hybrid demonstrator in 2009.
- BNSF rosters more than 5,400 wide-nose, "North American cab" locomotives, representing more than 75 percent of the total fleet, the highest of any Class I.

CSX ASSAULT ON THE ALLEGHENIES



On historic turf, CSX ES44ACs take an eastbound coal drag up Cranberry Grade at Amblersburg, W.Va. Brian Plant

Total fleet size	4,211
Six-axle vs. four-axle by percentage	C-C: 71%, B-B: 29%
A.C. vs. D.C. by percentage	A.C.: 32%, D.C.: 68%
Builders by percentage	EMD: 50%, GE: 49%, Other: 1%
Model count	50
Top five models	AC4400CW: 592 ES44AC: 402 SD40-2: 387 Dash 8-40CW: 374 GP40-2: 373
Percentage of top 5 models vs. total	51%
Percentage 4,000 hp and higher	53%
Percentage by type:	
Switcher/genset	4.0%
Slug	5.3%
EMD GP	18.9%
EMD SD (less than 3,500 hp)	14.9%
EMD SD (greater than 3,500 hp)	2.7%
EMD MAC	5.1%
EMD ACe	0.5%
GE Dash 8/Dash 9	14.9%
GE AC4400CW/AC6000CW	16.8%
GE Evolution	16.7%
Other/special	0.1%
Average age	21.4 years

Sooner or later, every diesel enthusiast must make a pilgrimage to Amblersburg, W.Va. Here in the lush forests of northern Appalachia, one can stand trackside and look out over the former Baltimore & Ohio main line wrapped around a 9-degree curve before it disappears into the forest. Most don't realize how much the next 9 miles of track, and the climb to the Briery Mountain summit at Terra Alta, have defined today's generation of motive power technology.

Since the dawn of dieselization this famed Cranberry Grade has tested the mettle of everything from F units to SD40-2s and SD50s, as well as today's latest A.C. locomotives. This tortuous piece of main line has helped shape CSX's — and the continent's — motive power strategy for more than 20 years. Most of today's leading A.C. technologies have undergone developmental testing on Cranberry. This year alone, both EMD and GE have tested extensively on the mountain under CSX tutelage.

By all practical accounts, GE has a substantial lead in the pull toward the top of the mountain. Since the dawn of A.C. traction, CSX has purchased models from both builders, but has clearly favored GE, acquiring 1,157 A.C. locomotives from GE versus 205 from EMD. Indeed, since an order for 20 SD70ACe units in 2004, CSX has exclusively purchased from GE, amassing a

Background photo by Drew Halverson

fleet of 402 ES44ACs and 302 ES44DCs.

Ballasted to the max for heavy-haul service, CSX ES44ACs weigh in at 432,000 pounds. Equipped with steerable trucks, the latest software, and high-power rail-cleaning devices, they're ideal for Cranberry. Most of the algorithms that allow trains to crest Donner Pass, the Canadian Rockies, and Blue Ridge summits have come thanks to GE locomotive design engineers who spent tough nights optimizing software on the climb out of the Cheat River Valley.

CSX initially employed A.C. traction exclusively in coal service, enabling unit reductions and the elimination of helper districts. Today, A.C. units work across the system. Mingled with 302 ES44DCs delivered during 2005-2007, 592 AC4400CWs and 402 ES44ACs make up the majority of the mainline CSX fleet. Once hailed as the future of motive power, 117 AC6000CWs fell into secondary service and storage, only to see a miraculous resurrection, complete with new controls and repowered with new GEVO16 engines. Today they have a second career back on the main line leading hotshots and intermodals.

CSX operates 235 EMD A.C. units, including 11 rare SD80MACs inherited from Conrail. Sixteen of the oldest SD70MACs recently found a home on the Paducah & Louisville, in which CSX has an ownership stake. In spring 2013, CSX tested the latest SD70ACe demonstrators from EMD. No order has been announced, but the race for A.C. supremacy in West Virginia is anything but over.

A surprisingly wide variety of older units fill out the CSX fleet, most of which continue to draw regular mainline assignments. Though U-boats and Dash 7s are gone, standard-cab fans can rejoice. From CSX's 387 SD40-2s to 156 standard-cab Dash 8-40Cs, classic motive power maintains a significant presence on CSX routes, particularly in former B&O territory and on routes across the Midwest.

One of the last Class I roads to roster SD50s, CSX operates 177, some of which were upgraded to Dash 3 specs by CSX shops (see pages 68-73). Between 2009 and 2011, 50 SD40-2s were also upgraded to Dash 3s at the CSX shop in Huntington, W.Va. Renumbered into the 4000-series, their unique CSX-designed cabs readily distinguish the 50 SD40-3s from their unrebuilt kin. While both programs have been suspended, the sheer volume of older six-axle units on CSX guarantees that many will labor on for years.

CSX still holds title to 796 four-axle EMD GPs and 177 road slugs, used in local and yard service. The road slugs — mated to a GP — retain their GP30, GP35, and GP40 carbodies, providing an extra dimension of interest. You can spot the slugs by



Its GP30 lines unspoiled, CSX road slug No. 2312 and GP40-2 mother 6414 pass McCarthy's pub in the First Ward section of Buffalo, N.Y.



At last count, CSX holds title to 177 SD50s and 387 SD40-2s. On Aug. 23, 2012, one of each, SD50 No. 8599 and SD40-2 8404, roll train Q263's auto racks into the sunset near North East, Pa. Two photos, Greg McDonnell

their "clean" rooflines. Given the upgrade programs established by CSX, most of the four-axle fleet will likely outlive their six-axle brethren. CSX has made a move toward genset switchers, purchasing 40 from National Railway Equipment and RailPower over a six-year period, but the program hasn't made much of a dent in the ranks of CSX's 130 EMD end-cab switchers.

Catch the classics while you can: SD40-2s and Dash 8s on mainline freights

and GP30 road slugs passing B&O color position light signals in Ohio. Savor the sound of massive AC6000s leading hotshot intermodals, and make the pilgrimage to Amblersburg. The flow of loaded coal trains may not be what it once was, but when they highball east from Rowlesburg to begin the assault on Briery Mountain, the sight and sound of the big GEs will clearly illustrate why Cranberry and A.C. locomotives are perfect for each other.

Fast facts

- CSX, with 117 AC6000CWs, holds title to the largest fleet of 6,000-hp models.
- CSX is the largest operator of mother/slug sets, most of which are built from classic EMD GP30s and GP35s. More than 175 road slugs are paired with EMD GPs in a variety of services.
- The CSX executive fleet consists of four ex-Amtrak F40PH locomotives.

NORFOLK SOUTHERN HERITAGE SCHEMES ON AC MACHINES



A pair of brand-new SD70ACes works at Clinton, Tenn., on a rainy Saturday afternoon in April 2013. Chris Starnes

Total fleet size	4,025
Six-axle vs. four-axle by percentage	C-C: 75%, B-B: 25%
A.C. vs. D.C. by percentage	A.C.: 6%, D.C.: 94%
Builders by percentage	EMD: 53%, GE: 46%, Other: 1%
Model count	44
Top five models	Dash 9-40CW: 1,086 GP38-2: 502 SD40-2: 435 ES40DC: 220 ES44AC: 141
Percentage of top 5 models vs. total	59%
Percentage 4,000 hp and higher	55%
Percentage by type:	
Switcher/genset	2.5%
Slug	3.2%
EMD GP	18.8%
EMD SD (less than 3,500 hp)	12.3%
EMD SD (greater than 3,500 hp)	14.0%
EMD MAC	0.4%
EMD ACe	2.5%
GE Dash 8/Dash 9	37.1%
GE AC4400CW/AC6000CW	0
GE Evolution	9.0%
Other/special	0.1%
Average age	18.6 years

Who would have thought a little paint could cause so much excitement? Arguably the most-watched industry event in the last quarter-century, NS broke its “dress black” code for a splash of color on 20 of its newest 2012 locomotives. But not just any color, as NS carefully selected and applied the paint schemes from predecessor railroads. The result? A public relations coup, enthusiast jubilation, and a cult following for otherwise standard ES-44AC and SD70ACe locomotives. Placed into visible services throughout the system, the A.C. locomotives have broken out of specific mineral assignments and now see a wide range of duties, from traditional Appalachian helper service to high-speed intermodals. Several have roamed nationwide, working run-through assignments on connecting railroads, including coal and oil trains. This has not only gained increased publicity for the vibrant locomotives, but it has also given NS — a relatively recent convert — operational experience with A.C. locomotives in a wide variety of services.

A.C. traction is old news for most Class I railroads, but not so on NS, which purchased its first ones, 24 GE ES44ACs, in 2008. NS identified specific coal services on former Norfolk & Western, Virginian Railway, and Conrail lines that could justify the purchase of higher-priced A.C. locomotives through unit reductions. Placed into coal

Background photo by Tom Danneman

train and helper service in Virginia and West Virginia, NS put the performance of its new A.C. units under a microscope. The road then turned heads by breaking its long-standing allegiance to D.C. power with multi-year orders for GE ES44ACs and EMD SD70ACes. Four years hence, 117 additional ES44ACs and 100 SD70ACes have joined the roster, with more on the way.

Although A.C. locomotives still account for just 5 percent of the NS fleet, the railroad's transition from D.C. to A.C. traction was one of last blows for the conventional D.C. locomotive. The combined effect of the NS shift to A.C. power in 2008 and BNSF's transition to the ES44C4 concept in 2010 essentially eliminated the demand for the domestic D.C. product line of both builders.

While brilliantly painted heritage fleet celebrities steal the limelight, the remaining 99.5 percent of the NS fleet is also worthy of note. The largest influence on the NS fleet can be distilled to just one word: Juniata. Inherited as part of the Conrail merger in 1999, the expansive Juniata shop complex in Altoona, Pa., was at first treated with cautious intent. That changed quickly as NS realized the facility's tremendous capabilities. From regular overhauls to contract construction for EMD, RailPower, GE, and others, Juniata is a one-stop shop and one of the few "megashops" left on any Class I.

However, Juniata's biggest claim to fame is its homegrown approach to locomotive modernization. NS has developed new technological solutions for class after class of locomotives. In 2013, Juniata will complete the last of a 57-unit fleet of SD50E lo-



Nickel Plate-painted ES44AC No. 8100 is bracketed by two other NS heritage locomotives in Spencer, N.C., on July 2, 2012. Tom Danneman

comotives built from the core of NS and Conrail SD50s. Extensively reworked, the 6300-series has taken ownership of helper assignments over the Alleghenies and work train service system-wide, relegating dozens of SD40-2s into yard and local service.

Building on the success of the SD50E, NS has turned attention to its 250-strong SD60 fleet. One by one, SD60s are being retired and processed through Juniata to become SD60Es, upgraded with the latest 710 Tier 2 engine, modified cooling, crashworthiness improvements, and a bold new NS-designed wide-nose cab. With an eye to the future, NS has bolstered its own SD60 fleet with purchases of secondhand units. The program, already approaching 50 units, is expected to continue through 2019.

Though demoted from premier assignments, SD40-2s abound, some 435 of them. NS has reworked dozens of the classics, eliminating the high noses preferred by both N&W and Southern, adding new "Admiral" cabs, and flipping the control stands for short-hood lead configuration. Similarly, large numbers of the GP38-2, GP40-2, and now GP59 fleets have been upgraded.

From high-hood elimination, cab upgrades, and improved crashworthiness to slug/mother conversions, NS has a plan for each of its medium-horsepower models. It seems there's nothing that Juniata won't

tackle: MP15Es with AR10 alternators and new cooling systems, GP38ACs rebuilt as ECO 710-powered GP22ECOs, scores of slugs and remote-control platforms, and new research cars ... and don't forget NS 999, the onetime EMD GP38 now equipped with more than 800 batteries!

Juniata is also home to the NS business train fleet including its celebrated quartet of EMD F units. With amazing regularity, office car specials powered by the Fs in classic A-B-B-A formation depart Altoona for points across the system. NS has continued to improve the EMD streamliners, with upgraded 645-series engines and AR10 alternators, rewired control systems, and the latest air brake and cab signaling equipment. This bodes well for three new arrivals, two F7As and an F7B purchased by NS in early 2013. We can only hope they're in line for a trip through Juniata.

Projects like the F units display the love for railroading that the NS culture exudes, from laborers all the way to its highest executives. From Pennsy pinstripes on a modern Evolution to the classic lines of its bulldog-nosed F7s, and a newly revived steam program, NS has successfully promoted modern locomotive technology without losing its appreciation of the history that has made it one of the nation's most successful railroads.



Getting scarce: high-hood SD40-2 No. 3324 at Fostoria, Ohio. Greg McDonnell

Fast facts

- The NS fleet includes 269 EMDs with high short hoods, including 4 former N&W GP38ACs, 22 ex-Southern SD40-2s, and 243 former Southern GP38-2s.
- Two prototypes for Dash 8 rebuilds have been done, one with an Admiral cab.
- The NS executive fleet is composed of an A-B-B-A set of EMD Fs rebuilt to F9 specifications and further upgraded.

CANADIAN NATIONAL BACK TO THE FUTURE



CN GP9s drift down Byron Hill on the former Wisconsin Central south of Fond du Lac, Wis., in August 2012.



Total fleet size	2,008
Six-axle vs. four-axle by percentage	C-C: 71%, B-B: 29%
A.C. vs. D.C. by percentage	A.C.: 2%, D.C.: 98%
Builders by percentage	EMD: 67%, GE: 32%, Other: 1%
Model count	34
Top five models	GP38-2: 246 Dash 9-44CW: 216 SD70M-2: 190 SD75i: 172 GP9: 126
Percentage of top 5 models vs. total	47%
Percentage 4,000 hp and higher	53%
Percentage by type:	
Switcher/genset	2.5%
Slug	4.0%
EMD GP	22.5%
EMD SD (less than 3,500 hp)	10.1%
EMD SD (greater than 3,500 hp)	28.7%
EMD MAC	0
EMD ACe	0
GE Dash 8/Dash 9	23.9%
GE AC4400CW/AC6000CW	0
GE Evolution	8.0%
Other/special	0.4%
Average age	21.2 years

Has anyone seen the DeLorean? CN's recent motive power philosophy seems to be straight out of the 1985 movie "Back to the Future," rocketing train-watchers back in time. Not to the movie's 1955 setting but instead to, say, 1990 and a time when high-horsepower, D.C.-traction locomotives were the order of the day. However, it's anything but whimsy, this mix of operational requirements and "out-of-the-box" solutions.

As BNSF and UP updated their fleets and sent several hundred well-worn GE Dash 8s and EMD SD60s into retirement, CN heard opportunity knocking. Unlike neighboring CP, CN's routes have few significant grades, enabling the road to avoid the expense of A.C.-traction locomotives



CN SD75i No. 5780 at Duplainville, Wis. Two photos, Tom Danneman

Background photos by Tom Danneman and Drew Halverson



Three brand-new CN ES44ACs lead coal empties through Azouzetta, British Columbia, in March 2013. Jeff Robertson

when lower-cost D.C. power would readily fit the bill. CN jumped at the chance to grab hand-me-down high-horsepower D.C. locomotives at bargain basement prices.

Between 2010 and 2012, CN amassed a fleet of 102 used Dash 8s from UP and BNSF, plus 43 former Oakway SD60s that had begun life as leasers on BN. When CN ordered new locomotives in 2012, it also worked with the builders to source more used power, picking up 42 Dash 8-40Cs built for Chicago & North Western and 47 more former Oakway SD60s. CN is expected to overhaul and upgrade these locomotives to the latest fleet standards, including fresh paint, at a cost dramatically lower than the price of new motive power.

While ruggedly efficient, CN's fleet retains its trademark flair for the unusual. Rarest of all are 20 GMD1s built between 1958 and 1960 and upgraded in the 1980s. London, Ont., shops built 101 of the boxy, 1,200-hp road-switchers in A1A-A1A and B-B versions. Only 18 were constructed as four-axle, but CN ultimately converted the entire fleet to B-B. CN also remains the largest Class I operator of GP9s, with 126 employed in secondary and yard service across the system.

A legacy of its romance with full-cowl locomotives, a design feature mandated on all CN units built between 1982 and 1993, 81 Dash 8-40CMs and 62 SD60Fs remain

on the roster. Included are 26 Dash 8-40CMs inherited in the BC Rail merger.

The last Class I railroad holdout on D.C. traction, CN may well have made history in December 2010 when EMD London delivered the road's latest SD70M-2 order. By all indications, CN 8964 could stand as the last new-production, high-horsepower D.C. locomotive built in North America.

CN finally embraced A.C. power in 2012, placing orders for 35 GE ES44ACs and 30 EMD SD70ACes. The GEs arrived by early 2013 and were pressed into heavy-haul coal service in western Canada. The SD70ACe order, which would have been the first production units to be equipped with individual-axle traction control, is reported to have been canceled in favor of an additional 30 ES44ACs.

CN employs its eclectic mix of locomotives with perhaps the greatest efficiency of any North American fleet. Whether A.C. units for the future, or "back to the future" with old school high-horsepower D.C. units, CN will be a motive power movie we'll continue to watch for years to come.



CN's 143 cows include 26 inherited BC Rail Dash 8-40CMs. Drew Halverson

Fast facts

- The last D.C.? CN No. 8964, an SD70M-2 delivered in December 2010 could be it!
- CN has 4 ex-Burlington Northern E9As for executive service (2 lettered CN, 2 Illinois Central), and 3 ex-Amtrak F40PHs for Algoma Central passenger service.
- CN is the largest operator of SD70M-2s in North America.

CANADIAN PACIFIC AN ERA OF CHANGE



Total fleet size	1,639
Six-axle vs. four-axle by percentage	C-C: 76%, B-B: 24%
A.C. vs. D.C. by percentage	A.C.: 50%, D.C.: 50%
Builders by percentage	EMD: 53%, GE: 46%
Model count	29
Top five models	AC4400CW: 478 SD40-2: 302 ES44AC: 291 GP38-2: 189 GP9: 76
Percentage of top 5 models vs. total	82%
Percentage 4,000 hp and higher	50%
Percentage by type:	
Switcher/genset	1.8%
Slug	0.4%
EMD GP	21.7%
EMD SD (less than 3,500 hp)	22.8%
EMD SD (greater than 3,500 hp)	2.6%
EMD MAC	3.5%
EMD ACe	0
GE Dash 8/Dash 9	0
GE AC4400CW/AC6000CW	29.2%
GE Evolution	17.8%
Other/special	0.3%
Average age	20.8

The May 2012 announcement that E. Hunter Harrison would join CP as president and CEO triggered a fury of speculation. How would CP change in the aftermath of a vicious and public power struggle? The wait was brief. The new management instituted a modified operating plan that touched every aspect of operations. CP launched new services, slashed yard and local activities, and gave train schedules a massive overhaul. The impact on the locomotive fleet was no less subtle.

Harrison proclaimed no need for new road locomotives before 2016, making the most recent delivery of 30 GE ES44ACs perhaps the last big power to arrive for some time. However, with the addition of those ES44ACs in early 2012, CP's GE fleet accounts for nearly 50 percent of its total locomotive roster. From coal to the fastest cross-country intermodal service, the 769 AC4400CW and ES44AC locomotives make up the backbone of today's CP fleet.

CP's 15-year old SD90MAC "Convertibles," once pitted head-to-head against rival GE AC4400CWs, have been excluded from the road's long-term fleet strategy. Traditionally among the first locomotives to be stored during traffic downturns and the last to be re-activated, the 58 MACs saw one last revival in 2012 before being permanently tied up and offered for sale.

CP has likewise dispatched the rainbow-

Background photo by Drew Halverson



ES44AC No. 9353 and an AC4400CW exit the Mount MacDonald Tunnel with an eastbound coal train. Six-motor GE A.C. units account for 46 percent of CP's fleet. Mike Danneman

hued lease-fleet SD40-2s that had been a fixture on the road for years. The vagabond lot from Helm, CIT, and NRE were furloughed in the Harrison operating plan, and were sent packing in 2012.

With the elimination of hump activity at four yards and the rationalization of yard and local jobs, several dozen aging switchers, slugs, and unusual "hump controller" units have been retired in the past year. Casualties also included the road's two NRE 3GS21B-DE gensets. While CP still rosters 29 locomotive models, just five make up 82 percent of its fleet. Watch for more rarities to see retirement soon.

The EMD/Progress Rail contract to revitalize CP's GP and SD fleet remains green-lighted by Harrison. Aging GP7 and GP9s, many past their 60th birthday, are being sent to scrap, with their components incorporated into GP20C-ECO locomotives at Progress Rail's Muncie, Ind., plant. Rolling out as 2200-series units, the 8-710G3A-T2 powered ECOs are the modern-day, fuel-efficient equivalent to the GP38-2. Thirty were placed in service at St. Paul, Minn., in late 2012 and early 2013. CP has ordered 40 more GP20C-ECO for



The sun sets on CP Geeps at Galt, Ont., and on CP's entire fleet of GP7s and GP9s; 30 GP20C-ECO's have arrived, and 40 more are on order. Greg McDonnell

2013 and is expected to follow through on plans for 150 of the new-age Geeps.

Less certain are plans for the SD40-2 ECO upgrades. Progress Rail's Mayfield, Ky., shop has transformed 20 SD40-2 cores into 710-powered SD30-ECO's, but CP has yet to exercise its option for more. For the moment, CP's 300-plus SD40-2s (including more than 100 Dakota, Minnesota & Eastern/Iowa, Chicago & Eastern units) are second only to AC4400CWs in the fleet, a ranking they're likely to hold for a while.

The only Class I road without a heavy locomotive repair shop of its own, CP has begun contracting out long-overdue overhauls of its aging GP38-2s, SD60s, and SD60Ms, many still in the factory paint applied 25 to 35 years ago. CP and Soo GP38-2s are being cycled through Progress Rail's shop in Mayfield, Ky., and NRE's plant in Silvis, Ill., while CAD Rail in Lachine, Quebec, had, until recently, been overhauling and repainting Soo SD60s and SD60Ms. Earlier this year, the program was abruptly suspended and the units stored. CP has since offered all 42 SD60s for sale or lease.

Five Canadian Pacific SD40-2s, all dressed in DM&E/IC&E blue and gold, snake their way out of Muskego Yard in Milwaukee, Wis. Drew Halverson



Fast facts

- CP's heritage fleet includes an FP9/F9B A-B-A set for executive and Royal Canadian Pacific service, as well as one steam locomotive: 4-6-4 No. 2816.
- CP has made lease returns and retirements of surplus locomotives totaling more than 460 locomotives since its operational realignment in 2012.
- Five locomotive models account for more than 80 percent of the CP fleet.

KANSAS CITY SOUTHERN THINKING AHEAD



KCS ES44AC No. 4801 lopes along the UP Cuero Sub near Guadalupe, Texas, in March 2013. Two photos, Mike Danneman

Total fleet size	981
Six-axle vs. four-axle by percentage	C-C: 72%, B-B: 28%
A.C. vs. D.C. by percentage	A.C.: 51%, D.C.: 49%
Builders by percentage	EMD: 69%, GE: 30%, Other: 1%
Model count	25
Top five models	ES44AC: 159 SD70ACe: 142 AC4400CW: 123 GP40-3: 89 GP38-2: 84
Percentage of top 5 models vs. total	61%
Percentage 4,000 hp and higher	51%
Percentage by type:	
Switcher/genset	7.7%
Slug	1.2%
EMD GP	19.0%
EMD SD (less than 3,500 hp)	15.8%
EMD SD (greater than 3,500 hp)	3.9%
EMD MAC	7.5%
EMD ACe	14.5%
GE Dash 8/Dash 9	1.3%
GE AC4400CW/AC6000CW	12.5%
GE Evolution	16.2%
Other/special	0.3%
Average age	21.7

In retrospect, it all makes sense. But the industry didn't see the railway market potential of the 1994 North American Free Trade Agreement in the same way that Kansas City Southern's visionary president and CEO Mike Haverty did two decades ago as he began building a new railway empire. Through a series of seemingly unrelated negotiations, KCS formed a 6,000-mile system that stretched from south-central Mexico to Saint Louis, carving a unique niche for this once sleepy Class I. Haverty was a decade ahead of his competitors.

The same can be said for the KCS diesel fleet. While accounting for only about 3.5 percent of the Class I locomotive population, KCS has been on the cutting edge of motive-power technology, often championing advancements ahead of its neighbors.

For mainline power, today's KCS is an A.C.-traction railroad. Most Class I railroads continued to purchase at least some D.C.-traction locomotives until recent years, with CN and BNSF doing so until 2010. Even big A.C. players like UP and CSX took delivery of D.C. units as late as 2004 and 2007, respectively. KCS and its Mexican counterpart, Kansas City Southern de Mexico, haven't purchased a new D.C. locomotive since the last order of EMD SD60s in 1991. From 1997 on, KCS and KCSM (formerly TFM) have gone A.C. all the way. The combined roads have

Background photo by Mike Danneman



amassed a fleet of 123 AC4400CWs, 75 SD70MACs, 142 SD70ACes, and 159 ES44ACs that now account for essentially one half of the roster. No other North American road boasts such a high percentage of A.C.-traction power.

The big A.C. locomotives are assigned to heavy coal, grain, and freight trains systemwide. The older SD70MACs have cascaded into general freight service, replacing D.C. locomotives that were demoted or eliminated altogether. By mid-2013, KCS/KCSM had significantly reduced its SD40-2 and SD50 fleets, many of which are in long-term storage or work-train service. Dozens have been retired, with most going to dealers such as Larry's Truck Electric for parts harvest and scrap. Some of the newer SD60s have been dispatched to Mexico; others are stored. Unlike other Class I roads that have held onto their SD40-2s, KCS appears to be the first headed toward a locomotive fleet without them.

The light infrastructure on many KCS routes requires the use of four-axle power. Bolstered with secondhand purchases over the last decade, KCS has made strides to modernize this growing fleet. While today's medium-horsepower fleet consists mainly of GP38-2s and GP40-2s, the mechanical department has made efforts to install microprocessors on many of these EMDs, upgrading them to Dash 3 specifications.

In 2009, KCS/KCSM became the first



Crossing the Colorado River bridge at Wharton, Texas, GP40-3s 2800 and 2951 run light back to Kendleton Yard after delivering cars to Edna.

major customer for EMD's ECO-repower concept, rehabilitating at least 24 GPs and two SDs. Rebuilt by EMD in London, Ont., MotivePower Inc. in Boise, Idaho, and in the road's own shop in Shreveport, La., the EMD ECOs are employed in a variety of secondary services on KCS and KCSM lines.

From Kansas City to New Orleans to the Mexican ports of Lázaro Cárdenas and Veracruz, KCS remains a step ahead of its

competitors in implementing a new approach to north-south railroading. When it comes to looks, KCS is arguably leagues ahead. Decked out in a dazzling rendition of the road's classic *Southern Belle* livery revived by Haverty in 2007, KCS and KCSM's A.C. units, Dash 3s, and ECOs — not to mention the A-B-A set of F9s assigned to office car trains and specials — are among the best-dressed locomotives anywhere.

Fast facts

- KCS has not purchased a D.C.-traction locomotive in more than two decades.
- First class: FP9/F9B A-B-A with Dash 3 upgrades and *Southern Belle* paint.
- With 51 percent of its fleet A.C., KCS ranks highest among all Class I railroads.

AMTRAK CHANGE HAS BEGUN



Dashing through the snow, P42DC No. 145 leads Amtrak No. 5, the *California Zephyr*, at Crescent, Colo. Mike Danneman

Total fleet size	419*
Six-axle vs. four-axle by percentage	B-B: 100%
A.C. vs. D.C. by percentage	A.C.: 11%, D.C.: 89%
Builders by percentage	GE: 64%, EMD: 25%, Other: 11%
Model count	17
Top five models	P42DC: 205 AEM-7: 51 Dash 8-40BPH: 29 F59PHI: 21 Tied, Dash 8-32BWH and P32AC-DM: 18
Percentage of top 5 models vs. total	82%
Percentage 4,000 hp and higher	72%
Percentage by type:	
Switcher/genset	14.8%
Electric	15.8%
EMD F59PHI	5%
GE Dash 8	4.3%
GE GENESIS	60.1%
Average age	17.8 years

* Fleet total includes stored units, but excludes non-Amtrak units used in North Carolina and in California's state-financed *San Joaquin* services. Average age does not include switchers.

Since February 2010, Amtrak has regularly issued a Fleet Strategy report aimed at providing a “living document, to serve as the cornerstone for future planning.” The latest version, released on March 29, 2012, provides an overview of the current fleet and Amtrak’s vision of the next 30 years.

A significant portion of the report deals with trainsets and new passenger equipment, but some of the 82 pages also focuses on locomotives. As of Dec. 1, 2011, Amtrak’s locomotive fleet totaled approximately 419 diesels, electrics, and switchers, a figure that accounts for 35 percent of the



Staples of the NEC, Acela and AEM-7 meet at Trenton, N.J.



Amtrak 454, one of 21 F59PHIs assigned to *Pacific Surfliner* services, calls at San Clemente, Calif. Two photos, Greg McDonnell

passenger locomotives in North America. As of the release date, Amtrak counted 396 units in its active fleet with 328 (excluding shop counts) regularly available for service. Peak requirements call for 281 locomotives.

By the numbers, Amtrak's current fleet seems to readily meet its operating needs, but equipment age is beginning to take its toll. As of this year, the first wave of reinforcements is on the way.

On May 13, 2013, the "Amtrak Cities Sprinter" ACS-64 electric locomotive made its public debut. With great fanfare, Siemens rolled out the first three of 70 8,600-hp ACS-64s that will allow Amtrak to replace its current 62-unit AEM-7 and HHP-8 active electric fleet. The \$466 million order should be completed by 2016.

Amtrak's AEM-7s, workhorses of the Northeast Corridor, are now a quarter-century old and have racked up an average of 4 million miles apiece. Despite rehabilitation programs and conversion of many to A.C. traction, the AEM-7s are ready for a well-earned retirement. The HHP-8s are a generation younger, but reliability issues have held them to just over a million miles each. The new Siemens locomotives will replace both classes and provide a uniform electric locomotive fleet on the Northeast and Keystone corridors.

The diesel fleet is the next likely target. Of the 334 diesels in Amtrak's active fleet, some 228 are GE "Genesis" locomotives in three configurations: the original 800-series Dash 8-40BPs, 18 dual-mode P32AC-DM

diesel-electric/electrics employed in New York-based Empire Services, and the ubiquitous P42DC. With an average of more than 2 million miles under their belt, the Vergara-styled GEs are showing their age. Rounding out the fleet are 21 well-worn F59PHIs in California *Surfliner* service, 18 Dash 8-32BWHs (now mostly in switching duty), and 45 switchers, some of which date back more than 60 years. Other than a

few recent genset purchases, Amtrak's newest diesels are 12 years old.

Of course the question is what locomotives, and when? While Amtrak would like to initiate diesel purchases now, it remains committed to passenger-car and electric-locomotive projects first. And despite its desire to begin replacement as early as 2016, no money has yet been budgeted for diesels and no request for bid released. **I**



Decked out in Amtrak's "Phase I" heritage livery, P42DC No. 156 hustles train No. 7, the *Empire Builder*, through Brookfield, Wis. Drew Halverson

Fast facts

- Amtrak's 419 units account for 35 percent of North American passenger power.
- Amtrak is the largest user of carbody-style locomotives in North America.
- Amtrak is the second-largest user of electric locomotives; NJ Transit is No. 1.