


INTERCITY INROADS

Behind the scenes of passenger railroading
with Bob Johnston





A lineup of P40 diesels waits for reactivation at Amtrak's Beech Grove Maintenance Facility on April 12, 2010. Electrician Rob Bolling prepares No. 830 for rewiring.

Beech Grove TO THE RESCUE

If America's passenger railroad didn't already have shops it could count on to keep the art of locomotive and car repair alive, it would have to invent them

Story and photos by Bob Johnston

Can cars and locomotives roll on forever? For Amtrak, the answer would seem to be yes — so long as there is a place to repair them and skilled workers to do it.

That's why the Beech Grove heavy maintenance facility received \$32.3 million of Amtrak's \$1.3 billion of American Recovery and Reinvestment Act funds. The money will repair 21 passenger cars (for \$19.3 million) once deemed too expensive to fix, and rehabilitate 15 sidelined P40 locomotives (\$13 million). In the East, a separate \$58.5 million allocation will return 60 single-level Amfleet coaches and cafe cars to service at the company's Bear, Del., car shop (see page 53). The returning equipment is helping Amtrak accommodate its exploding ridership until new rolling stock and motive power can be ordered. But the real dividend of this timely infusion of stimulus money is that it comes in the nick of time to help preserve the institutional knowledge of a ready-for-retirement workforce with special skills and effectively improve the shops' efficiency by adding extra work shifts.

BRINGING BACK THE P40S

"I used to be the young guy around here!" remarks 22-year veteran locomotive technician Jack Johnson. "Now there are people coming up who can learn the ropes — and I don't have to worry as much about being bumped to the unemployment line." Amtrak hired 108 new workers at Beech Grove to augment a workforce that now totals 583 union employees and 15 managers.

Before the stimulus program kicked in, Johnson and his locomotive shop cohorts — along with employees in the coach, wheel, forge, paint, and numerous component repair shops on the 107.5-acre former New York Central-owned property southeast of Indianapolis — performed only major overhauls at regular intervals to keep active engines and cars on the move. For the road-wearier diesels, that means continuously updating electronic and mechanical systems, and undertaking major reconstructive surgery on motive power unlucky enough to be involved in bad grade crossing accidents. Now the craftsmen are no longer just repairmen, but reanimators.

"What we found when the P40s got here were locomotives that got caught in a kind of time warp," explains locomotive shop general foreman Brian Tabor. The 15 units chosen for rebuilding had been stored for a decade or more behind Amtrak's Bear, Del., car shop once higher-horsepower and electronic brake-equipped P42s arrived beginning in 1996, only three years after the debut of the first-generation GE-built Genesis passenger engines.

The original plan was to have the P40s



Beech Grove's "truck garden" inventories wheels for Superliner, Horizon, and Heritage cars.



Superliner I coach 34040 survived the 1993 wreck of the *Sunset Limited*, but had to wait 17 years for extensive structural repairs, new wiring, and a complete interior makeover.

and P42s work side by side for years. Then Amtrak ordered an additional batch of newer units as part of management's "glidepath to self-sufficiency" strategy, which envisioned adding new routes and frequencies driven by mail and express business. Alas, uncharted expenses and inadequate revenue doomed the initiative. Following the pattern that saw nearly new steam locomotives sidelined by post-World War II diesels, Amtrak's relatively young P40s were banished to a handful of service areas when the mail and

express plans dissolved. Maine's new *Downeaster*, the *Auto Train*, and the *Sunset Limited* (the latter two trains shared a locomotive pool based at Sanford, Fla.) became the last bastion of P40s before all active units were retired by 2005.

Though some P40s were leased to commuter operators over the years, most sat idle. "When we opened up the cabinets there was rust everywhere — must have been the salt air," surmises diesel tech Johnson. When TRAINS visited "the Grove"



Looking almost brand-new, 17-year-old P40 No. 818 waits at “the pit” for new cab signals. This area was once an open-air workstation that Amtrak later covered.

in April, Johnson was busy installing advanced cab signal equipment into the nose of No. 837, while fellow technician Hoang Nguyen updated the engineer’s control panel. In addition to the cab improvements, all P40s are receiving upgrades to their prime movers that give them the same 4,250-hp rating, electronic fuel injection, and 110-mph top speed as the P42s. By the time each unit leaves Beech Grove, it has been completely rewired and outfitted with new hoses and cable connectors, after a complete sandblasting and paint job following any necessary body repair. The rebuilt engines will

retain their 26L mechanical air brake valves, however (in contrast to the P42’s electronic air brake system), making the P40s better suited to pulling trains assigned only one locomotive for operation.

STIMULUS SAVES SUPERLINERS

The bruises the P40s endured were never-ending, but the young diesel fleet survived practically intact — save for unit 819. It was only a few months old when it plunged off the barge-damaged bridge spanning Alabama’s Big Bayou Canot with the eastbound *Sunset Limited* early on the

P40 LOCOMOTIVE ASSIGNMENTS

A total of 15 P40 locomotives are undergoing renovation. Here’s where the completed units were running on July 5, 2010.

No.	Train assignment	Base
815	Saluki/Illini turn	Chicago
817	Hoosier State	Beech Grove
821	Saluki/Illini turn	Chicago
831	City of New Orleans	Chicago
832	Hoosier State	Beech Grove
837	Lincoln Service	Chi./St. Louis

morning of Sept. 22, 1993. The horrific derailment killed 47 passengers and crew. For 17 years another casualty of that foggy night, Superliner coach 34040, sat forlorn in Beech Grove’s weeds with other wreck-damaged cars because making it roadworthy again was deemed too expensive.

“One end and side sills of the car were completely ripped off, the doorway was smashed in, and the floor beams needed replacing,” remembers Steve Fowler, assistant superintendent of Coach Shop 2, where heavy overhauls occur. (Coach Shop 1 handles preventive maintenance.) So the 34040 and others like it needing extensive body work were always passed over in favor of cars that could be rehabilitated within Amtrak’s shoestring budget. During the dark days of 2002, as the company flirted with bankruptcy, only necessary major repairs took place. Indeed, the survival of Beech Grove and its skilled workforce were at risk.



ODD DUCK DINER GETS (ANOTHER) NEW LIFE

The **Capitol Limited passengers** enjoying breakfast in Viewliner dining car 8400 (above) must have loved the scenery whooshing by the double-level windows that morning in 1990. Most probably didn’t know they were sitting in what would become a tangible symbol of the trials Amtrak has endured over its 39-year existence. Today the car, built as a diner prototype using one of the last stainless steel shells produced by the Budd Co., is perched on stilts and stripped to the walls (above

right) in Beech Grove’s Coach Shop 2. The car was first outfitted by Amtrak in 1987 and ran until 2002, when it was sidelined by a lack of spare parts for its two different types of experimental trucks.

The prototype, along with two sleepers, was meant to test designs for production-model single-level cars to replace Amtrak’s 1950s-era Heritage hand-me-downs. Under a tightening budget, the company bought 50 Viewliner sleeping cars (built 1995-96 by Morri-



Hoang Nguyen

Then Amtrak President David Gunn arrived and made “state of good repair” the company credo. He also brought in a new management team that set high expectations of efficiency and cost control, especially at Beech Grove, which had acquired a reputation as a lackadaisical and undisciplined workplace. New goals came down, including the completion of major overhauls on 21 Superliner Is that were by

then more than 25 years old [see “This Ain’t Magic,” TRAINS, October 2003]. The reconditioned cars, with rebuilt trucks, new lighting, wood paneling, appliances, and other modern accoutrements, re-equipped the *Empire Builder*, *Capitol Limited*, and *Coast Starlight*. The “Empire” program helped energize everyone. Still, the 34040 sat.

That changed when Amtrak received its stimulus funding in early 2009. Yes, fixing 14 sidelined Superliner Is and six Superliner IIs, plus the prototype Viewliner diner (below) would be expensive, but restoration would make them revenue producers instead of useless assets at a time when ridership was poised to regain momentum. Work began almost immediately, as soon as additional employees were hired, and the first car (Sightseer Lounge 33016) emerged on Aug. 6, 2009. The first reactivated P40 (No. 832) debuted in Chicago March 6, 2010,



Locomotive technician Jack Johnson wires new cab signal equipment into the nose of P40 No. 837 on April 12, 2010. Beech Grove released the engine back into service on June 3.

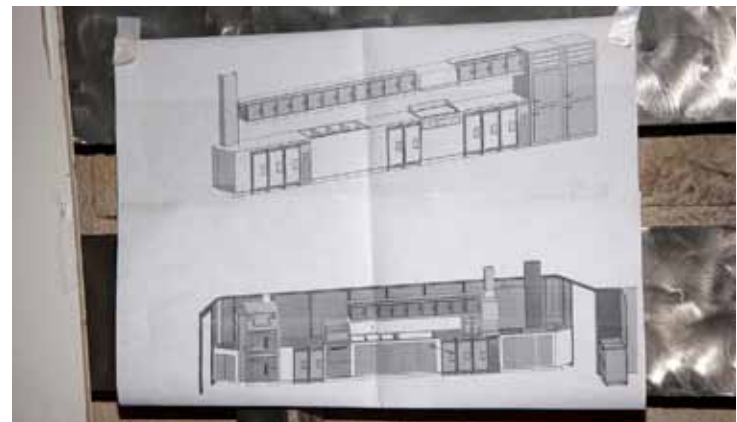
at the Amtrak/TRAINS magazine town hall, and entered service April 8 after returning to Beech Grove for cab signal equipment.

With more craftsmen to do the work and a timetable to meet, Beech Grove added second and third shifts. The efficiency payoff that comes with a larger staff means that skilled electricians and pipefitters don’t have to sit idle while other tasks are being performed sequentially, as was previously the case. Today, the 129 employees assigned to Coach Shop 2’s 7 a.m. to 3 p.m. shift do mostly exterior sheet metal, electrical, and mechanical tasks, while 54 people working

from 3 to 11 p.m. concentrate on interior installation and finishing. With seven cars under repair at any one time, workers can move to different positions if there is a conflict. The third (overnight) shift consists of just four carmen. “They do the burning and grinding, operations that are unsafe to do with lots of people around,” Fowler says.

MORE CARS, PLEASE

The sheer enormity of what these men and women must accomplish becomes apparent as Fowler rattles off the litany of repairs each car needs. “We replaced the roof



son Knudsen and Amrail before each went bankrupt), but no diners. “It’s about 3 percent complete,” says Steve Fowler, who’s been at “the Grove” for 41 years and worked on the diner in (now vacant) Coach Shop 3 where it was assembled. “We are going to install Superliner II trucks to get it rolling again, but that requires fabricating a new floor with new spring bolsters and pockets, new water tanks, and everything else.” The irony is that the car will once again serve as a rolling labora-

tory for the design of a new dining car fleet, part of a 130-car order placed July 23, 2010, for new dining, sleeping, baggage, and baggage-dorm cars that will finally replace all remaining Heritage equipment, including some diners that are 62 years old. Taped to the walls of the car’s stripped interior are drawings of proposed floor plans for seats, refrigerators, and heating units — an open canvass waiting for the men and women of Beech Grove to do their thing. — *Bob Johnston*



Better not open that Dutch door! Superliner I coach 34036 suffered this mishap in Toronto when the *International* was still running. Now it's stored at the Grove, and likely beyond repair.

REBUILT SUPERLINERS ON THE MOVE

Type	Car	Damaged	Date	Rebuilt	Where they were on July 5, 2010
Coach-Bag	31006	Stevenson, Wash.	April 2005	May 30, 2010	California Zephyr
Sleeper	32014	Arlington, Texas	Dec. 1998	In preparation for repair	Beech Grove
Sleeper	32040	Mineola, Texas	July 2006	Under repair	Beech Grove
Sleeper	32046	Kensington, Md.	July 2002	In preparation for repair	Beech Grove
Sleeper	32049	Chicago	Jan. 2007	Under repair	Beech Grove
Sleeper	32065	Fauna, Texas	Jan. 2008	Under repair	Beech Grove
Sleeper	32112	Hayward, Calif.	Aug. 2002	March 3, 2010	Capitol Limited
Dix Slpr	32501	Crescent City, Fla.	April 2002	Under repair	Beech Grove
Lounge	33003	Wendover, Utah	Sept. 2001	Dec. 30, 2009	Chicago yard (preventive maint.)
Lounge	33011	Chicago	Dec. 2007	Jan. 30, 2010	Southwest Chief
Lounge	33016	Stevenson, Wash.	April 2005	Aug. 5, 2009	Southwest Chief
Lounge	33036	Kingman, Ariz.	Aug. 1997	Under repair	Beech Grove
Coach	34040	Bayou Canot, Ala.	Sept. 1993	Under repair	Beech Grove
Coach	34087	Flora, Miss.	April 2004	Under repair	Beech Grove
Diner	38017	Kingman, Ariz.	Aug. 1997	Under repair	Beech Grove
Diner	38026	Hyder, Ariz.	Oct. 1995	In preparation	Beech Grove
Diner	38031	Arlington, Texas	Dec. 1998	Jan. 30, 2010	Chicago yard (off Southwest Chief)
Diner	38049	Topeka, Kan.	March 2000	June 5, 2010	New Orleans (for next day's <i>Sunset</i>)
Dorm-Slpr	39008	Blackwell, Mo.	Sept. 2005	Under repair	Beech Grove
Dorm-Slpr	39023	Hayward, Calif.	Aug. 2002	March 1, 2010	Coast Starlight

all the way down on that coach-bag (31006) and had a new door fabricated. This Super II transition dorm (39008) needed a new end-sheet and rebuilt restrooms," he says.

Once the structural defects are remedied on one part of a car, other workers then pounce to tackle appliance installation, wiring, plumbing, and interior finishing.

"We're implementing our new dining car design on the 38049, using less carpet and more hard surfaces to make it easier to clean," Fowler says.

The 3 p.m. shift change occurs. The next round of tradesmen picks up where their brothers and sisters left off, giving new life to the gritty soldiers involved in some of Amtrak's most infamous mishaps: the *Sunset Limited* Alabama crash of 1993, or the same train's still-unsolved sabotage derailment west of Phoenix two years later, along with the CSX track defect accidents of the *Capitol Limited* and *Auto Train* in 2002.

What happens after these 21 cars leave Beech Grove? Less than a dozen remaining obvious candidates are left out back, but many were already passed over and can only contribute a few cannibalized parts before they're scrapped. Nevertheless, as Amtrak expands its fleet with the refurbished cars and anticipated orders of new single-level and bilevel equipment, there will always be a need for an in-house shop capable of performing overhauls that keep the cars functional and fresh. Outsourcing this work is problematic, since an outside bidder will mark up costs to make a profit and establish workflow priorities that might conflict with Amtrak's own service and safety standards.

Critics have complained that the Obama administration's \$8 billion of stimulus cash for high speed rail has not been spent fast enough because of all the multi-partner agreements that must be executed, but Amtrak put the \$90.8 million for Beech Grove and Bear to work immediately creating jobs. "I have 32 years with Amtrak and I'm still midway on the roster," says Assistant Superintendent Rick Burton. "There are a lot of 35-plus-year employees ready to retire, so it's a great time to bring these new people in to learn their crafts," he adds.

The challenge will be to keep the work flowing long enough so an institutional knowledge transfer can take place. Though a dedicated source of annual funding would help solve the planning and budget woes that have plagued Amtrak for nearly 40 years, the initial 2011 outlook isn't promising. In July, the House committee responsible for transportation appropriations called for a \$4.1 billion jump in highway spending while suggesting Amtrak get \$833 million less than the company requested.

But for now, the cars will keep rolling out of the shop looking as good — or better — than they did three decades ago. **I**



A stainless steel panel will cover the layer of insulation seen on this Superliner sleeper.



At 3 p.m., a Beech Grove supervisor checks the progress of work between shifts.



TRACK 29 ... AND YOU CAN GIVE ME A SHINE

While Beech Grove tackles once-idle Superliners, Amtrak's Bear Car Shop in Delaware is rejuvenating 60 tube-shaped Amfleet cars that were sitting for years in the weeds with the P40s behind the shop. A full Amfleet Level 3 overhaul can cost up to \$723,000 per car (and includes installing handicap-accessible fiberglass bathroom modules, new plastics, windows, emergency lighting, and upholstery, plus upgrading electrical and mechanical systems). Given that expense, Amtrak managers fielded only enough Amfleet cars to maintain a fixed-capacity daily schedule, rather than lengthen trains so more people could ride at lower fares.

The shop's \$58.5 million stimulus infusion will change this equation, and also provide funds to convert 20 Amfleet I food-service cars into revenue-producing coaches by cutting two windows on each side where the center-car snack bar used to be. As a result, 54 new employees were hired to help staff two full daytime shifts totaling more than 300 workers and an overnight crew of about 20 that repositions equipment and prepares work areas for the next day.

In early June, new-hire Vernon Patrick (above) was busy installing raceway lighting fixtures in former Amcafe 28350, as part of its transformation into 72-seat coach 82998. Patrick had just started at the end of April after being out of work for two years. Each cafe-coach conversion will cost up to \$1.4 million (including the Level 3 overhaul) and gives Amtrak immediate seating capacity. The stimulus money will also

overhaul 13 Amfleet coaches and 15 cafes, repair 11 wreck-damaged coaches, and convert one cafe into a diner-lounge. (The program's first graduate, coach 25103, entered service July 13, 2009.)

Once the electricians finish, car 28350 will move from Track 24 of Bear's eight-track indoor facility to Track 29, spot 1, where each car receiving a Level 3 overhaul begins its 36-day journey to completion.

"We use a spot shift system," explains facility superintendent Lew Wood. "The cars spend four days at each of nine spots on Track 29, then shift to the next spot. The first three spots cover the tear-out phase — where air conditioning, 480-volt electrical, and air brake valves are replaced — and by spot 4, reinstallation begins." This includes the exacting job of cutting off the luggage racks to make room for the modular bathrooms. Each shift has a specific job target and the first shift of the day advances the previous day's second-shift work. "What we impress upon everyone is that if you don't finish and stop a car for one day, you're really stopping nine cars," Wood says.

A spiffed-up Amfleet I or long-distance Amfleet II car leaves spot 9 every four days. "Considering we started getting these cars in 1975 and we've been taking a stab at fixing them up ever since," observes Assistant Superintendent Ed Hill, "the stimulus program is probably one of the final stretches at making these cars up to date. If we're going to keep 'em, you've got to keep 'em modern." — *Bob Johnston*



Taking the high speed gamble Who wants to play?

It's about more than just the trains for the companies that have bid on an American fast-train future

by Bob Johnston

If all goes according to plan, by year's end, Florida Rail Enterprise will pick which group of companies will help it realize its high speed dreams. There are eight construction consortia expected to bid on one of the first dedicated right-of-way projects to be jump-started by a portion of \$10.4 billion in federal high speed rail funding that's been dedicated thus far. The division of Florida's department of transportation, created specifically to manage all of the state's rail ini-

tiatives, will pick one winner. That concessionaire will be expected to design, build, operate, maintain, and substantially finance an entirely new 84-mile rail line from central Tampa, down the middle of congested Interstate 4, to Orlando International Airport, and finish on time and within budget.

The prize is bigger than it might seem. Florida leaders hope to extend their system to Miami in coming years, and the winner of the Tampa-Orlando contract would be the logical choice. Winning the bid may also give

the group credibility to take future prizes in other states, such as California's planned San Diego-Los Angeles-Bay Area network.

Will all this be worth the financial risk of doing business in the United States? After all, it's a country that still can't politically commit to a dedicated, annual transportation funding source for supporting anything except highway construction.

That's the question that the engineering consultants, rolling stock manufacturers, financial advisers, heavy construction com-



A Tokaido Line train (left) arrives in Tokyo on Jan. 11, 2007. Builders of fast trains face risks and hurdles to breaking into the U.S. market, as Siemens found out when it showed its ICE train off in hopes of landing them in Northeast Corridor service in 1993. Left, Scott Lothes; above, Bob Johnston

tion) from their governments.

The good news is that now, America can begin building a network with a choice of state-of-the-art technology that has proven itself elsewhere. And though the companies coming to the table have foreign origins, they will need to rely on domestic labor and suppliers to comply with buy-American requirements and cost-effectively deliver an acceptable product. Many have already carved out a significant U.S. presence and reliable track record in commuter rail. Nippon Sharyo and Sumitomo, partners in the Japan entry, built equipment that now operates on Chicago's Metra, Caltrain, and Virginia Railway Express. Kawasaki, a successful bidder for U.S. heavy rail transit projects, boasts major plants in Yonkers, N.Y., and Lincoln, Neb. At the U.S. High Speed Rail Association conference in New York last November, Siemens showed participants an overhead photo of the vacant land adjacent to its Sacramento, Calif., light rail vehicle plant where a high speed rail production plant could be constructed.

Other partners also wear familiar faces. Skanska USA Civil, the Swedish company that's part of the Siemens consortium, has undertaken projects that include construction of Amtrak's *Acela Express* maintenance shops in Boston, New York, and Washington. It also built New York's 63rd Street/Queens Boulevard subway tunnel connection and Bay Area Rapid Transit's rail extension to San Francisco International Airport.

Foreign passenger operators have also made inroads. There's Veolia, a French company whose U.S. affiliate is now headed by

panies, and passenger train operators from around the world who pooled their resources and expertise into bidding teams have been investigating. The payoff could pay dividends for decades for the players willing to take a chance. Or not.

Poster boys

Though the trainsets themselves represent only a fraction of the investment and risk each consortium will take on, they're the face the public will see charging down the

Interstate 4 median. The equipment represents the latest iteration of cutting-edge technology from around the world. Three names are familiar: Bombardier and Alstom, joint builders of Amtrak's *Acela Express*; and Talgo, whose Cascades trainsets in the Pacific Northwest have proven wildly successful. But U.S.-based builders are conspicuously absent. The country has sat on the high speed sidelines while other countries refined their products, fueled by continuous investment (and protection against outside compe-



The builder of France's TGVs (Alstom) and their operator (SNCF) have joined Bechtel to bid on Florida's contract. Armin Schmutz



A view from the cab: A driver burns across the Italian countryside on June 24, 2006. Alstom's new AGV design will serve in Milan-Rome-Naples service. Armin Schmutz

During a Dec. 3, 2010, test run prior to the Seventh World Conference on High Speed Rail in Beijing, China's signature CRH380A trainset hit 302 mph over a portion of the new Beijing to Shanghai line. That's twice the 150 mph Amtrak's *Acela Express* achieves for 18 miles in Rhode Island and Massachusetts operating on a mixed-use corridor it shares with slower intercity trains, commuter operators, and modest freight traffic.

Also In December, Alstom delivered the first of 25 bilevel AGV trainsets to Italian private operator NTV, which plans to launch service on a new government-built Milan-Rome-Naples corridor by September. The builder then signed a \$535 million deal with Moroccan National Railways to provide 14 AGV trainsets by 2015 on combined high speed (200 mph) and conventional (100 mph) trackage between Tangiers and Casablanca, Morocco.

Opportunity and challenges

The common thread among participants: All are confident that the production and operating expertise they enjoy in their native countries can be exported because it is technology the United States currently lacks. Florida's "starter" system between Orlando and Tampa is an ideal toe-in-the-water trial run for navigating procurement,

former Amtrak President Tom Downs [see "City Rail," *TRAINS*, January 2011]. The company operates South Florida's Tri-Rail, and ran Metrolink's trains until last summer. It manages bus and light rail operations on transit systems throughout the U.S.

New to the rail game here are companies with worldwide recognition, like Richard

Branson's U.K.-based Virgin, which also recently established a U.S. airline. JR Central, a principal private-sector operator on the Tokyo-Osaka Tokaido Line route in Japan [see pages 62-63], is also in on the bidding.

The Chinese reverse-engineered and licensed Siemens ICE technology, and are partnering with General Electric on their bid.

The pitfalls of car-building

Larry Salci has a message to anyone interested in domestic passenger carbuilding. "There's only one thing worse than no contract. It's bidding a bad one."

He should know. When we sat down in September 2008, at Colorado Railcar's Fort Lupton, Colo., front office, Salci was about six months into his abbreviated stint as president. The company was attempting to survive with new orders while completing projects so seriously underbid by the management of its predecessor that it was running out of cash. Within three months, Colorado Railcar would complete its final orders.

Salci was a Chrysler executive on loan to Detroit's South East Michigan Transportation Authority when Budd Co. tapped him in 1982. Budd hired Salci to run its transit products division which, at the time, had a massive backlog of orders. They included more than 900 cars for the Chicago Transit Authority, Metro-North, and the Long Island Rail Road, as well as 125 Amfleet II single-level long-distance cars for Amtrak.

"Unfortunately, they had underbid the 600-car CTA contract by about \$100,000 a car," Salci recalled, "and at Pullman, although Amtrak's Superliners were the last order, the real bullet they took was the R46, 750-car subway order for New York." Over the next five years, Budd would bid on 16 transit contracts, but lose them all to foreign competitors that benefited from government subsidies.

"Bombardier beat us on the R62 subway car order because they brought \$100 million of Canadian financing to the table when interest



Larry Salci. Bob Johnston

rates were high. Overseas builders could price aggressively because the dollar was strong at the time, and their home markets were protected," Salci said.

New U.S. players like Rohr (which landed huge orders for Bay Area Rapid Transit and Washington Metro) and Morrison Knudsen were attracted by the promise of funding, but stymied by its unpredictability. That's what happened to MK in the early 1990s, when it bid on a 50-car order for single-level Viewliner sleeping cars with an option to build hundreds of cars in the same shells. Those hundreds were to become much-needed baggage cars, diners, lounges, coaches, and more sleepers.

"They took the risk of assuming all the fixed costs of hiring, engineering, and tooling on the base order, and gambled they would get the options," Salci said, "but the options didn't happen." MK hired him in February 1995 to finish the Viewliner and California Car orders and develop a strategy to sell off the assets. Then, yet another "let's starve Amtrak to make 'em efficient" wave swept through Congress and the Clinton administration's budget and transportation departments. It took another 15 years for a 130 single-level-car order to materialize; the winning bidder was Spanish carbuilder CAF, which is slated to begin deliveries in 2012.

"The problem with the passenger car business," Salci said, "is that without the strong domestic support of its government — which the Europeans and Japanese have — you're left at your own risk. There are just too many wild cards here." — *Bob Johnston*

permitting, and regulation requirements on a dedicated right-of-way with a manageable scale. Should the bid be successful, the players can realize economies from unused production capacity, and perhaps otherwise-idle engineering staffs.

The question is, recalling the 1989 Don Henley song: "How Bad Do You Want It?" As former Budd Co., Bombardier, and Morrison Knudsen executive Larry Salci pointed out prior to his 2008 departure from Colorado Railcar, foreign companies attempting to crack the U.S. transit market have had mixed results. Some, like Kawasaki and Bombardier, have achieved successes, but others stubbed their toes by underbidding their competitors, then choking on the subsequent orders (see "The Pitfalls of Car-Building").

Another looming question is what crashworthiness and train control standards the Federal Railroad Administration is likely to impose. Guidelines are being developed within the Engineering Task Force of the Railroad Safety Advisory Committee. In September 2010, it issued a 171-page document titled Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service (available at www.TrainsMag.com).

"The resulting requirements, which the FRA expects to be completed by spring 2011, will be included in a separate 'Rules



Britain's Eurostar employs modified Alstom TGV trainsets on its London-Paris/Brussels service. A set pauses in Paris on Sept. 30, 2008. Armin Schmutz

for Particular Applicability' for both Florida and California," FRA spokesman Warren Flatau says.

Referencing the crashworthiness report, Flatau acknowledges that "crash energy management features are important for achieving compatibility with conventional railroad equipment without a significant increase in

axle loads, and high speed rail equipment that meets these guidelines will enjoy the same benefits." But his agency believes "that a railcar that provides good crashworthiness and occupant protection can be designed without a significant weight penalty."

This position appears to be a departure from the FRA's previous stance, which pre-



China reverse-engineered Siemens' ICE trainsets, and now hopes to sell them for U.S. service. A Chinese-built CRH380A trainset departs Hangzhou, China, on Dec. 3, 2010. TRAINS: Matt Van Hattem

A consortium involving a Chinese, a Brazilian, and a Spanish company are marketing the CRH380A. CSR

vented the wholesale importation of both Sweden's X2000 and the Germany's Siemens-built original ICE. Both had waivers for Amtrak Northeast Corridor test runs during 1992 and 1993. Subsequently, FRA refused Talgo's request to take the trainsets it was making for Washington and Amtrak's Cascades to other states. FRA ruled their mono-coque frames relied on crush zones to mitigate impact, but didn't comply with domestic rolling stock buff strength requirements. Those specifications also may have played a role in the braking and truck frame problems that sidelined Bombardier-Alstom's *Acela*

with the Rail Safety Improvement Act of 2008's positive train control directive, Flatau says FRA is prepared to certify any PTC system that meets the act's statutory requirements. Those include prevention of collisions, over-speed derailments, movements through misaligned switches, and protection of maintenance workers operating within the limits of track authorities. This opens the door for off-the-shelf systems, such as the interoperable European Railway Train Management System, to be eligible for certification.

Shifting winds

But perhaps the biggest roadblock ahead for would-be builders of U.S. high speed rail systems is how to gauge the effect counter-

ailing political forces may have on the bidders. Florida Rail Enterprise delayed a request for proposals for five "early works" projects, primarily site preparation at 16 locations where the I-4 median width or overpass height needs to be modified, until after its representatives had met with Republican Gov. Rick Scott's transition team. The next step is a request for qualifications from the eight consortia bidding on the project, but that document's content will be affected by what level of financial risk and reward the state expects the bidders to assume.

Publicly, Scott and Republican leaders in the Florida legislature have said they don't want the state's taxpayers to be on the hook for any risk, but that is not a realistic expectation, say officials with public-private partnership experience. Samara Bar-end, the vice president and strategic development director at AECOM, a Florida consortium participant, told the New York high speed gathering that public financing accounts for 50 to 70 percent of the investments in projects around the world.

"Frankly, the private sector does not want to take on the ridership risk of forecasts not generating a sufficient revenue stream," she said. "Yet private sector financing is critical to advancing high speed rail beyond the limited debt capacity of federal and state governments."

Putting on an American face

"When someone talks about France or Japan, what do most people think of?" asks transportation designer Cesar Vergara. "The Eiffel Tower and maybe Geisha girls, sure, but they also know about the TGV and Shinkansen. America deserves an iconic high speed rail image of its own, too, not an imported one."

Vergara had a hand in designing the paint scheme and fins at the ends of Cascades Talgo trainsets, which sleekly transition the low-slung cars to the F59PHI locomotives that pull them. The lighted mural on the Talgo cafes' ceilings? That's Vergara's work, too (see Bistro Car photo, page 51).

When he was at Amtrak, Vergara also was on the team that worked with General Electric's engineering staff in designing the nose of the P40 locomotive, affording maximum crash protection for engineers. He can also claim the "disappearing stripe" effect that originally adorned the sides of those engines before repainting. Another project in the early 1990s was converting an original Metroliner self-propelled cab car into a Northeast Corridor "conference car" that could be chartered for business meetings in the days before *Acela*.

More recently, Metro-North hired him to work with manufacturer Kawasaki Heavy Industries on exterior and interior elements for the soon-to-debut M8 fleet. The commuter EMUs are to serve on the railroad's New Haven, Conn.-New York line.

At Metro-North's New Haven coach yard last November, Vergara joined Kawasaki senior staff project engineering officer Kenichiro Imai to show off the new M8s. True, these are less-exotic coaches, designed to take people to and from work every day. But Vergara feels



Kawasaki's Kenichiro Imai and Cesar Vergara at Metro-North's New Haven, Conn., coach yard.

the symbiotic relationship between design and functionality is especially applicable for high speed rail equipment.

"The idea is to make a promise with a beautiful exterior and keep it with a beautiful interior," he says. Vergara points out a new seat design with an indented back in the M8 that offers more lumbar support and three more inches of legroom than similarly spaced seats on earlier equipment. Handles, luggage racks, and light fixtures are all contoured, "shapes that are fun inside of the car even though it is rectilinear," he says. Outside, a black stripe at the ends of each M.U. pair helps connect

them in a train to give a dotted line effect when passing at speed.

Imai notes that some of his company's plans were modified after a lot of discussion and many trips between Japan and New York before production began. "We brought the functionality, he brought the design, and we met somewhere on Cesar's side of the middle," he jokes.

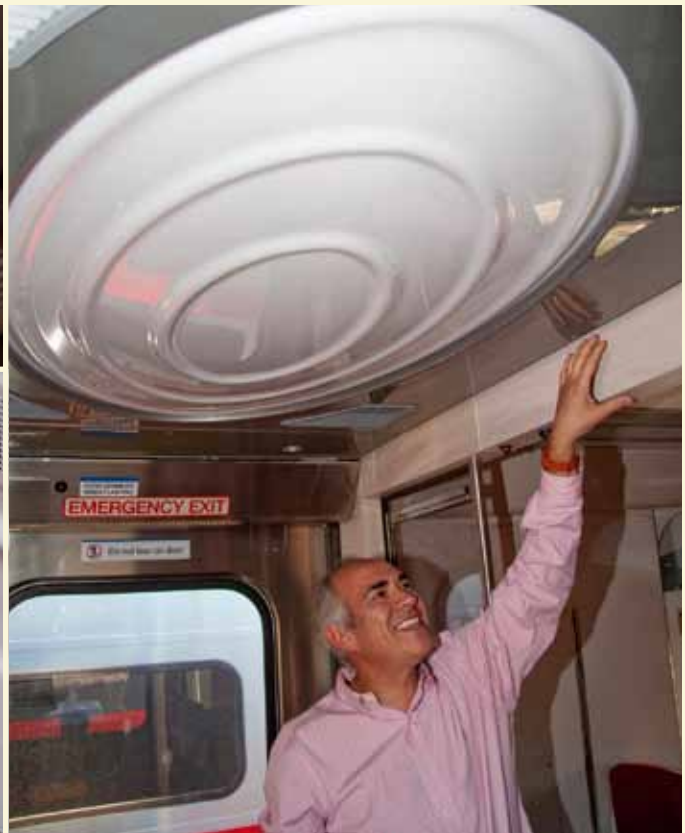
That give-and-take illustrates the potential conflict between a manufacturer wishing to minimize costs, and the customer. After all, the builder wants the equipment to bring passengers to the station and please them again and again once on board. High speed trainset consortia and the government entities that hire them will have to keep that in mind as the procurement process moves forward.

"You don't fall in love with the lungs or the kidneys. They'd better work and work well, of course. But you fall in love with the skin. A train is no different," Vergara says. "You want a transportation system you can be proud of; something beautiful that belongs to all of us, because the real customer is the passenger." — *Bob Johnston*



Rounded design elements adorn the rectilinear interior space of Metro-North's new M8 M.U. electric cars. (Clockwise from above) Overhead baggage rack, elliptical lighting fixture that greets passengers as they enter the car, and molded seat back with indentation that provides passengers with more lumbar support while creating 3 to 4 more inches of legroom for the person sitting in the next row.

All photos, Bob Johnston



At the same conference, Richard Lawless, president and CEO of U.S.-Japan High Speed Rail, warned, "Federal long-term funding commitments are unclear, and I would certainly say they are unclear after

the November [2010] elections." He also argued that qualification criteria should not undermine system integration. "If it is proven, it should be allowed to be deployed and operate as such," he said. "Interconnectivity

and interoperability may be physically challenging, but we have to make sure it doesn't stand in the way of getting a system built."

Transportation Secretary Ray LaHood notes that there are more than 35 foreign and domestic companies "getting ready to hire American workers and implement high speed intercity rail using their expertise. This is a job creator." But what they are seeing is political indecisiveness and backbiting, typified by incoming House Transportation and Infrastructure Committee Chairman John Mica. Though representing a nearby Florida district, he has been openly critical of the Tampa-Orlando project, and suggested it be cut back to an Orlando Airport to Disneyworld demonstration.

The problem with that scenario is that such a project would be perceived as no more than an amusement park ride by both high speed rail's proponents and detractors, proving nothing about the viability of the travel mode in America. It could never be characterized as a success, and would therefore be unlikely to attract any bidders.

Mica believes most of the high speed rail money should be spent by reducing travel times in the Northeast Corridor even more than today's 2-hour, 45-minute New York-



A father and daughter enjoy first class on a London-Glasgow Virgin Rail Pendolino in August 2009. Virgin is vying to become a U.S. high-speed operator. Bob Johnston

Who's in on the bidding?

				
Team (Country)	Florida Mobility (Spain)	Bechtel-SNCF (France)	Parsons-Samsung-KTX-11 (Korea)	Fluor-Balfour Beatty (Japan, U.K.)
Probable trainset	Talga 350 / 250	AGV	Hyundai-Parsons	efSET
Manufacturer	Talga	Alstom	Korail	Mitsubishi
U.S. partners	Invensys, Prince	Bechtel, Amtrak	Rotem	HDR, Lane, PCL Civil, FHSR Group, Parsons Brinckerhoff
				
Team (Country)	ACS-Dragados-CSR (China, Spain, Brazil)	Florida Rail Ventures (Germany, Spain, Sweden, France)	Vinci-OHL-Alstom-Virgin (France, Spain, U.K.)	Bombardier-Kiewit (Canada, U.K.)
Probable trainset	CRH380A	Velaro / Viaggio	AGV	Zefiro 380
Manufacturer	CSR	Siemens	AlstomAECOM, PBS&J, Hubbard,	Bombardier
U.S. partners	G.E., T.Y. Lin	Jacobs, Granite, Veolia	Archer Western	Kiewit

Talga and AGV, Armin Schmutz; Hyundai-Parsons, Lawrence Gillen; efSET, Scott Lothes; Zefiro 380, Siemens; Virgin, Bob Johnston; ICE train, Keith Fender; TRAINS: Matt Van Hatten



Shells of Talgo cars await outfitting for Hiawatha Service trains at the company's Milwaukee plant. TRAINS: Andy Cummings

Washington *Acela Express* timetable.

He would like to see the federal government buy a significant portion of Amtrak's Northeast Corridor assets, then resell them to potential high speed operators and real estate developers. That could be possible because ridership projections are solid, thanks to the risk Amtrak took with Acela. It's also possible because of public investments that date back to the 1930s, when a Great Depression-era stimulus program helped the Pennsylvania electrify its railroad to Washington and Harrisburg, Pa.

From a private investor's standpoint, as expressed by Citigroup Managing Director Ron Marino at the New York conference, "The biggest bang for the buck is in the Northeast Corridor." Though he didn't specify exactly what improvements would be needed, he said that an expenditure of \$12 billion could increase the New York-Washington *Acela Express* average speed from 82.5 to 110 mph, thereby reducing average trip times to 2 hours, 5 minutes.

However, Foster Nichols, the vice president of transit and rail systems at consultant Parsons Brinckerhoff, estimates a comprehensive Boston-Washington dedicated right-of-way system would cost \$98 billion. He envisions reduced trip times and increased capacity of around 10,000 to 12,000 passengers per hour, compared with a 1,500



A Talgo 350 locomotive takes shape at the company's Madrid plant in 2000. The company has won contracts for Wisconsin, Washington, and Oregon. Bob Johnston

hourly average that Amtrak delivers today. A separate Amtrak proposal pegs such an investment at \$117 billion. Both detailed plans involve separate rights-of-way to avoid the existing 90-mph Metro-North New York-New Haven segment.

"High speed rail is a high-impact public works project requiring a long-term commitment of resources," Nichols says, "So, 'Can we afford it?' is not the question we should be asking. The question we should

be asking is, 'Will our children or grandchildren be glad we did this for them?'"

With so much potential in future projects like California's and Florida's, there is risk and reward at stake for the Florida bidders. Yet despite the inherent uncertainties that lie ahead, the manufacturers need not fret. If the United States can't get its political and funding act together, there are plenty of other countries that are clamoring for their products and expertise. **I**

POWER

How three Amtrak engines spent a year on the road

by Bob Johnston



Imagine a prizefighter slogging through a heavyweight boxing match. During the battle, “cut men” in the corner minister to his needs. Then at the end of 15 rounds, just as the boxer looks forward to a little rest, he’s told, “Get back out there! You’ve got another fight!”

That must be the way it seems to the

277 active diesel locomotives that keep Amtrak’s far-flung national network of 75,063 annual nonelectric passenger trains in motion 24 hours a day. Unlike their brothers at commuter railroads, whose duties are confined primarily to weekday rush-period bursts, these locomotives may be asked to pull a train continuously for

days. Then turn around and do it again.

To get an idea of how these machines meet this extraordinary challenge, TRAINS asked Amtrak to select three locomotives not otherwise captive to a geographic area whose travels the magazine could follow from July 1, 2011, through June 30, 2012. Chief Mechanical Officer Mario Bergeron



Amtrak No. 90 pushes a *Hiawatha* from Milwaukee into Chicago Union Station on April 2, 2012. Bob Johnston; inset TRAINS: Drew Halverson

chose three engines, all General Electric Genesis-type P42s delivered in 1997:

- 44 — led 44th President Barack Obama's inaugural special from Philadelphia to Washington, D.C., in January 2009.
- 66 — painted for Amtrak's 40th Anniversary in the "Phase II" scheme, the one in

which the company's F40 locomotives were first delivered in 1976.

- 90 — slated to receive its third diesel engine (changed after a million miles, about seven years) before June 30.

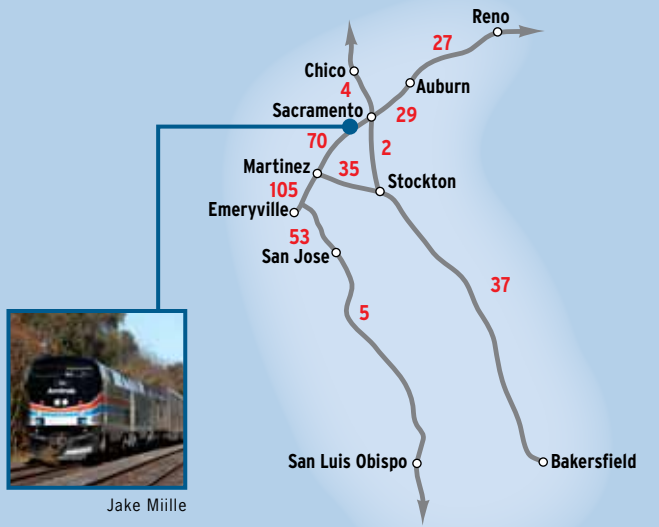
Via the Internet, TRAINS asked readers to photograph these locomotives on their

journeys, while Amtrak employees fed operating details back to media-relations managers Steve Kulm and Danelle Hunter throughout the year. It was quite a trip! So here it is — a blow-by-blow account of the secret lives of Amtrak's hardworking, knockout locomotives.

WHERE'S WALDO, ER ... 44, 66, and 90? EVERYWHERE!



Drew Mitchum



Jake Miille



Kevin Bleich



TRAINS: Jim Wrinn

FAST COMPARISON			
Road No.	44	66	90
Miles traveled	172,951	155,555	153,417
Trips made	339	347	252
Fuel used (gals.)	292,590	193,900	219,490
Routes traversed	23	25	24
Track segment most traveled (trips)	Martinez, Ca - Oakland 105	Chicago - Milwaukee, Wis. 88	Buffalo - Albany, N.Y. 48
Major route missed	Sunset Limited	Cardinal	California Zephyr
Same day long-distance turns	21	24	21
Next day long-distance turns	52	26	45
Slow stopping event	Locked axle on Coast Starlight (April 7)	Backing up ATSF 4-8-4 No. 3751 to Grand Canyon (May 14-20)	Prime mover changeout Chicago (June 7)
Lifetime miles (as of June 30, 2012)	2,932,090	2,972,270	2,630,702

PATTERN? WHAT PATTERN?

When private railroads operated passenger trains, their locomotives were always captive to “home road” routes even if they ran on other lines. Thus, Union Pacific E8s and E9s made regular appearances on the north side of Chicago’s Union Station when the *City of Los Angeles* came to town on Milwaukee Road rails, but you’d never see them lifted for a GG1 electric at Harrisburg, Pa., on the Pennsy’s *Broadway Limited*. In the Amtrak era, diesel assignments are dictated only by two principal factors: state ownership and train control capability.

The California Department of Transportation owns (and Amtrak maintains) a fleet of 15 F59PHI locomotives built between 1994 and 2001 for its *Pacific Surfliner*, *Capitol*, and *San Joaquin* corridors. An additional 21 engines of this type built in

1998 for Amtrak augment the California service and power Washington- and Oregon-sponsored *Amtrak Cascades* Talgos between Eugene, Ore., and Vancouver, B.C. North Carolina also owns and separately maintains F59s and GP40s for its Raleigh-Charlotte *Piedmonts*.

These service-specific engines might have a “right of first refusal” to pilot passenger cars with which they are color-matched, but that didn’t stop all three of the Amtrak P42s we followed from stepping into state-supported trains’ turf. While No. 90’s state duty included just five Seattle-Vancouver, B.C., *Amtrak Cascades* round trips, loco 66 pulled 48 *Piedmonts* in August and September, and 44 made 144 California corridor trips during October and March stints, not including 32 visits other months on either the *California*

Zephyr or *Coast Starlight*.

The “TRAINS 3” are equipped with cab signals that allow all to operate over any host railroad track carrying scheduled Amtrak trains. They can also slip on side-mounted pickup bars to run in BNSF’s ex-Santa Fe Railway Automatic Train Stop territory, allowing 90-mph operation. Except for 66’s two round trips as a second engine from Chicago to Pontiac, Mich., in July and 90’s standby stint at Philadelphia and Harrisburg in November, the locomotives stayed out of the Northeast Corridor and the Amtrak-owned 110-mph Porter, Ind., to Kalamazoo, Mich., segments, where dedicated pools of diesels are equipped with two types of Positive Train Control: the Advanced Civil Speed Enforcement System in the Northeast and the Incremental Train Control System on the *Blue Water* and *Wol-*



verine trains in the Midwest.

Until June, 18 P42s equipped with the Michigan signal package were exclusively assigned to that service and the corresponding run-throughs at Chicago Union Station to Illinois corridor trains. These specially equipped engines rarely venture elsewhere. But because Union Pacific's cab signal system is being overlaid with ITCS to facilitate 110-mph operation on Chicago-St. Louis *Lincoln Service* tests this fall, seven additional locomotives are being fitted with the train-control gear at the Chicago Locomotive Maintenance Facility. The first was P42 No. 63, which was being worked on farther down track 8, where locomotive 90 was having its prime mover changed out on June 7 [see page 52]. Less than two weeks later, after two round trips to Quincy, Ill., our 66 got the ITCS gear.

Other than signal-compatibility issues, few other factors determine where Amtrak's diesels can roam. If personnel manning the motive-power desk at the Consolidated National Operations Center in Wilmington, Del., see a shortage of AEM-7 or HHP8 electrics developing, the switch to electric propulsion on long-distance trains south of Washington might be made at Philadelphia. Or a diesel may draw a *Keystone* assignment, as 90 did throughout November when it ran on the *Pennsylvanian* and was stationed as a "protect" locomotive at Harrisburg and Philly for several days.

Some of the 15 remanufactured P40s, which still have mechanical rather than electronic braking, usually find their way to the front of the Virginia-Florida *Auto Train*, because engineers on that overnighter prefer the mechanical system when han-



Ever-photogenic Amtrak heritage unit No. 66 heads up a display of Superliner cars for National Train Day 2012 at Los Angeles Union Station on May 12. Kevin Bleich



No. 44 leads a sister on train No. 48, the eastbound *Lake Shore Limited*, on Feb. 6, 2012, on track 2 of CSX's main line in Syracuse, N.Y., near the lead to DeWitt Yard. Edwin L. Post

dling a 30-plus car train that operates in direct-release braking, rather than graduated release, as all other Amtrak trains do.

You'll also see on the map [pages 48-49] that no P42 travels south of Albany-Rensselaer, N.Y., because 17 dual-mode Genesis P32DMAC locomotives with A.C. traction motors and third-rail shoes for electric operation into New York's Penn Station handle all trains. If the company had more of them, *Empire Service* round trips west of Albany and the *Adirondack* north wouldn't require an engine change to P42s. All three of the units we tracked came through Albany, on a combined 50 visits to either Montreal on the *Adirondack* or Toronto on the *Maple Leaf*. They usually got swapped out of the westbound *Lake Shore Limited*'s Boston section after first running through Albany from Chicago on train 48/448.

For obvious geographical reasons, the P32DMACs are based at the former Turbo-liner Albany-Rensselaer shop, and the West Coast F59PHIs get serviced at Amtrak facilities in Oakland, Calif., and Los Angeles. But the rest of the fleet passes through Chicago for 92-, 184-, and 368-day preventive maintenance, so each locomotive's due dates play a role in their assignments.

44: CALIFORNIA-BOUND

This guy rolled into Chicago leading the *Hoosier State* from Indianapolis on July 1, 2011, fresh out of the paint shop at the Beech Grove Heavy Maintenance Facility. Amtrak's Life Cycle Preventive Maintenance program prescribes protocols for everything mechanical and cosmetic, from changing oil filters (every 90 days), purging radiator fan grease lines (184 days), replacing certain electronics (368 days), rebuilding trucks (5 years), changing out the 16-cylinder diesel engine (7 years) to exterior painting (10 years).

"For the past five years, we've worked

with General Electric and our engineering department to come up with a life cycle for servicing or replacing every major component on the locomotive," says Chicago Assistant Superintendent Sarabpreet "S.P." Bumra. "We do change-out here for components that come from either GE or the backshop at Beech Grove," he adds. The idea is to achieve a balance between heading off breakdowns before they occur while not replacing parts prematurely. Should problems arise, constant locomotive health monitoring using Amtrak's Train Communications System [page 52] alerts maintenance personnel via email while trains are in motion.

The process worked well for 44, which headed to California July 2 on the *Zephyr* and answered the bell for 154 trips and 69,615 miles before suffering an air-brake fault on a Chicago-Milwaukee train Thanksgiving weekend. After coming off the *Silver Star* the day after Christmas, a speed sensor on traction motor 1 was replaced in Washington. Traction motor 3

was also changed there, following snowy round trips to Chicago on the *Capitol Limited* and *Cardinal* in January. A hot bearing sensor was replaced in Los Angeles on March 10, and new air compressor contactors were also swapped in L.A. after a San Diego run on March 27.

The only real debilitating incident occurred after two round trips to Seattle several weeks later, when 44 stalled as the second unit of the northbound April 7 *Coast Starlight* climbing Cuesta Grade out of San Luis Obispo, Calif. A UP freight locomotive stepped in to help, and 44 went to Oakland, where shop forces determined that the problem was a locked axle fault. After that was corrected, 44 ran for 30 consecutive days on the *California Zephyr*, *Lake Shore Limited*, *Maple Leaf*, *Adirondack*, and 14 *Hiawathas* before its 368-day inspection in Chicago. It would rack up the most miles of any of the three locomotives over the year.

66: GLAMOUR QUEEN

The annual inspection for 66 came in mid-July, a good time to be in Chicago, because it was then available for the nearby Train Festival 2011. Loco 66 spent a long weekend backing up steam locomotives on charters to Rock Island, Ill.; Iowa City, Iowa; and Muscatine, Iowa. Soon, 66 was on a continuous Southeast swing that would take it to New Orleans; Miami; Newport News, Richmond, and Lynchburg, Va.; and on 48 Charlotte-Raleigh *Piedmont* trips.

But by October, the poor locomotive was exhausted! After coming off the *Carolinian* in Washington on Oct. 2, it would not start, and an inspection revealed that wheel L1 needed truing, a procedure that corrects flat spots, thin rims, and tread wear. Fortunately, those maladies could be remedied at Washington's Ivy City Maintenance Facility, and two days later 66 was off to Chicago on the *Capitol Limited*. It made

THE P42 AND P40 GENESIS DIESEL FLEET

	July 2011	Sept. 2011	Dec. 2011	March 2012	June 2012
Active	211	216	211	212	210
Required	161	161	161	161	160
Available	172	178	181	182	175
Out of service*	39	38	30	30	35

*Includes programmed maintenance; dates are for the end of each month.

OTHER DIESELS: P32-8 AND F59PHI

	July 2011	Sept. 2011	Dec. 2011	March 2012	June 2012
Active	54	53	51	52	53
Required	42	42	42	42	42
Available	41	41	37	37	36
Out of service*	13	12	14	14	17

*Includes programmed maintenance; dates are for the end of each month.



No. 66 rolls past Metra's Morton Grove, Ill. depot with northbound *Hiawatha* 337 as photographer's daughter, Avery, waves. Marshall W. Beecher

a same-day turn back to D.C. and a round trip to Savannah, Ga., on the *Palmetto* before another Washington once-over discovered a broken horizontal shock absorber bolt on the engineer's side. The problem was detected at 4:46 a.m. Sunday, Oct. 9, repairs were made by 11:39 a.m., and 66 was on the point of Northeast Regional 99 to Newport News at 5 p.m. that afternoon. Ten days later 66 would be back in Chicago for a 92-day inspection, but not before visiting Charlotte and Boston.

Next up: Nine *Southwest Chief* consecutive-day round trips; two to St. Louis after Thanksgiving; one to Emeryville, Calif., on the *California Zephyr*; and six to Seattle or Portland, Ore., with the *Empire Builder* (66 spent New Year's Eve barreling eastbound through the 7.79-mile-long Cascade Tunnel). Its 184-day inspection was due by the end of January, just enough time for a Chicago-Washington-Miami-Newport News-Charlotte-Washington-Chicago journey and two *Hoosier State* round trips to Indianapolis.

After visiting Longview, Texas, on a couple of *Texas Eagle* short turns while track work was being performed west of there, 66 headed to California, where it led 14 *Reno Fun Train/Snow Train* charters. Loco 66 spent the rest of March hauling 46 *Capitol Corridor* and *San Joaquin* trains. It



No. 90 heads up the southbound *Silver Meteor* between Orlando and Kissimmee, Fla., on CSX trackage Dec. 28, 2011, at 3 p.m. James C. Elphick

was headed back to California after a spin to Chicago on April 10 when 66's No. 1 traction motor started smoking and sputtering coming into Denver on the *California Zephyr*. The locomotive was swapped for the "protect" unit and sent back to Chicago, where it made two "short leash" round trips to Quincy, before being sent to Boston and then to Montreal.

In May, 66 again shared the spotlight on

a charter, this time with ex-Santa Fe 4-8-4 No. 3751 on a 1,332-mile round trip to the Grand Canyon via Parker, Coolidge, and Williams, Ariz., sandwiched between 10 *Pacific Surfliner* journeys and a circuitous return to Chicago through Portland via the *Starlight* and *Builder*. June was spent close to home making six or seven trips per day for 10 straight days on Chicago-Milwaukee *Hiawathas* while preparing for the ITCS

NO. 90 GETS A NEW MOTOR



With components removed, Romero Gutierrez prepares the engine room for the replacement 7FDL16 power plant. The interior is full of cabling and hoses to connect all systems. A crane carefully lowers the alternator and diesel engine into the carbody on June 7, 2012.

HOW AMTRAK TRACKS THEM

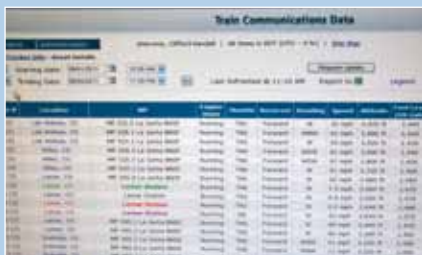
“In the old days, maintenance people would tap into a diesel’s computer once it got into the shop,” explains Cliff Kendall, Amtrak’s director of locomotive technology integration. “Now they can get emails telling them everything major that’s wrong with any engine headed their way.”

We’re sitting in Kendall’s office at the Consolidated National Operations Center in Wilmington, Del., watching a computer displaying operating characteristics of a locomotive almost 2,000 miles away leading train No. 3, the westbound *Southwest Chief*, near La Junta, Colo., on Aug. 4, 2011. Every five minutes the screen refreshes with P42 No. 139’s location, direction, altitude, throttle position, speed, traction horsepower generated, head-end power amperage drawn, fuel level and consumption, and other details, including snapshots from No. 139’s video camera.

The information comes from an onboard Wi-Tronix processing unit feeding the Train Communications Data system, Amtrak’s latest quest to improve operating efficiency, and a key component in keeping its diesel fleet on the road. The first foray into monitoring occurred in August 2008, with the launch of the Maintenance Events Analysis Program on Acela, HHP-8, and AEM7-AC electric locomotives, which logs and transmits faults back to the operations center.

The new system takes monitoring further by polling all telemetry systems and can notify key personnel. For instance, when any engineer makes an emergency brake application, Kendall and others get an email alert. He notes that the *Chief*’s locomotive has developed a ground in the auxiliary excitation supply. “It’s active but not ‘Priority 1’ because it’s not debilitating,” Kendall says. Troubleshooters get enough data to see the relation of all the locomotive’s subsystems to that fault, so they can instruct the train crew what corrective action might need to be taken, if any. And Los Angeles maintenance foremen will know what to look for long before the engine arrives.

Other system by-products are fuel efficiency analyses, which can tell engineers how to most efficiently handle a train without compromising schedules and safety. “The GPS system can instantly pinpoint any train’s location for emergency responders,” notes Kendall, “And its emergency communications feature can reach us in Wilmington when no other forms of communication are available. A parallel data system will also serve as a conduit for manifest, revenue, eTicket, and food-service-management initiatives. Train Communications Data “is the single most valuable technology tool that has been provided to the train operations department in the history of the corporation,” Kendall says. — Bob Johnston



Locomotive health data transmits every 5 minutes from the *Southwest Chief* on Aug. 4, 2011. Two photos, Bob Johnston



GPS-driven map shows the location of every Amtrak train. Red means the train is late; green means it is on time.

signaling installation. That will allow it to shine in the spotlight at 110 mph.

90: HEAVY LIFTING

Toiling in the shadows of its spiffy sibling, this gritty beast wasn’t slated for a trip to the beauty shop until 2015, but it would receive a new 7FDL16 diesel power plant and reconditioned electronics in June. Before that, 90 managed to visit all three Canadian cities Amtrak serves — Toronto, Montreal, and Vancouver, B.C. — a total of 38 times, and yet of the three locomotives 90 spent the most time in Florida. Along the way there were only nicks and bruises: a bashed-in cab signal pick-up bar discovered in Boston coming off the *Lake Shore* in July; replacements for burned-out traction motors in Niagara Falls, N.Y., after running 17 consecutive days last August on round trips from Albany to either Montreal (240 miles) or Toronto (403 miles); cab-signal and dynamic-brake issues at Philadelphia in November; and a new ditch light in Washington in December.

In the meantime, 90 cycled back through Chicago for October, January, and April inspections, only sticking around the Midwest long enough to claim its place on the preventive maintenance line. But dark clouds, literally, appeared coming into Albany-Rensselaer off the *Maple Leaf* on May 13 when heavy smoke was reported. The engine change-out would occur soon, but 90 would first make four more round trips to Toronto and then sprint a *Lake Shore-Capitol-Crescent-City of New Orleans* marathon with same-day turns at Chicago and Washington before coming home again June 2. After the new power plant was installed, 90 was kept close on two St. Louis round trips and four days of Chicago-Milwaukee duty (28 trips) to make sure everything worked properly before heading to Seattle and back on the *Empire Builder*.



No. 90's new roof hatch from Beech Grove goes on after the motor is installed, left. Above, machinist Tom Shriey connects the motor to other systems. Right, the Chicago crew that did No. 90's engine change out pose with their million-mile project. Six photos, Bob Johnston

EXPERIENCE COUNTS

Although the three locomotives TRAINS followed didn't suffer any catastrophic failures over the 12 months, company officials knew there was a chance that would happen.

After an uneventful first few years, General Electric's hard-charging P42 fleet has been plagued by fires in the turbocharger, traction motor ground faults, and bearing failures in radiator fans. But owing to such heavy use, Amtrak and GE have been able to amass enough operating experience to progressively limit those problems.

"Three years ago we started doing joint teardowns and found that overhead grease lines leading to the radiator fans were being exposed to temperatures so hot that grease just got stuck in the pipes. That's why we had lots of bearing failures," Bumra explains on a visit to the Chicago facility. "So the grease lines were repositioned to pump from inside the air compressor room. We now purge them on the 184-day preventive maintenance cycle, and we haven't had a bearing failure in quite a few years."

More recently, a team consisting of Diesel Locomotive Master Mechanic Bob Herdegen, Chicago supervisor Randy Hitchcock, Preventive Maintenance Foreman Kenny Williams, engineering personnel, technicians at train turnaround locations, and other supervisors undertook a root-cause analysis to understand the reasons for recurring traction motor grounds.

"As a result," Williams says, "we developed a campaign to install insulated separators — basically heavy rubber grommets — that prevent all the high-voltage traction motor leads from rubbing against each other. Now every time an engine goes over a pit, we check the grommets." As for the turbocharger failures, a recent incident occurred on a P42 pulling the *Lake Shore Limited* through Chicago's block-long Servicing and Inspection facility, filling the

Locomotives scheduled to pass another million-mile mark in the next year get a new 16-cylinder diesel power plant, but installing it isn't simple. When 90 came in to the shop in Chicago, workers disconnected all electrical connections, hoses, and water pipes, then removed the overhead hatches — actually modules containing electrical components — before the old engine with alternator attached was lifted straight up through the open roof. The oil filter tanks and oil cooler pipes were also lifted out for cleaning. Then the alternator was attached to the new engine on the shop floor (it gets replaced on a different life cycle than the prime mover), while the hatches were exchanged with ones Beech Grove's backshop had remanufactured. After openings sensitive to water damage were covered, the engine room was power washed. All was then ready for workers to install the new engine and reconnect piping, hoses, and electronics. — *Bob Johnston*



During the year that TRAINS tracked the Amtrak units, No. 66 made 88 trips between Chicago and Milwaukee, including this one arriving in Beer City on June 12. TRAINS: Matt Van Hatten

building with smoke. "Turbos out there are still coming apart, but a manufacturing issue has been corrected, so failures have been reduced tremendously," Bumra says.

Meanwhile, a steady stream of locomotives cycle through Chicago every day for preventive maintenance, or to be fueled, sanded, inspected, tested for performance, and sent out again. Were the three locomotives we tracked for a year ever together at

the same time in the same place? That happened just once — in Chicago — for a few hours on the Monday after Thanksgiving, when 44 was having those air brake faults tended to, 66 was being prepped to leave on the *Zephyr*, and 90 was arriving from Washington on the *Capitol*. Now only if the "TRAINS 3" could swap stories about the trips they took and the engineers who ran them, what other tales they might tell! **I**

PASSENGER

In remote pockets of Ontario and Quebec, passenger services with wide-ranging personalities provide a lifeline to the rest of Canada



CN northbound train No. 631 tiptoes across 810-foot Bellevue Trestle, just north of Sault Ste. Marie, Ont., on June 23, 2012. Bob Johnston

Long before concrete and asphalt crisscrossed North America, jaunty local passenger trains delivered goods and people on ribbons of steel to isolated settlements across the far-flung wilderness.

Amazingly, one Canadian region still relies on such trains to provide a vital link to outposts that lack both public transportation and all-weather highways connecting them to the outside world. Let's go to northern Ontario to see how four unique operations transport people where they need to go.

ALGOMA CENTRAL: BEAUTY AND THE BEAR

Canadian National Railway is supposed to be out of the passenger business, right? The railroad was, for a while. But all of that changed after CN acquired the Algoma Central Railway with its 2001 purchase of Wisconsin Central. The 296-mile Algoma Central, running from Sault Ste. Marie to Hearst, Ont., is not high-density trackage — the right-of-way is often weedy, with lots of jointed rail — but its sturdy trestles and abundant rock cuts through the Canadian Shield's arboreal and pine forests provide

the perfect backdrop for two different passenger services.

The *Agawa Canyon Tour Train* leaves Sault Ste. Marie daily from late June through mid-October for a 114-mile ride to spectacular Agawa Canyon, carrying up to 700 people in style there and back. The railroad refurbished a former Burlington dining car (with a toaster!) for full meal service and an ex-Santa Fe handicap-accessible coach; they accompany three F40PH locomotives and up to eight Denver & Rio Grande Western *Ski Train* coaches that CN bought in 2009 for \$10 million, aided by a

TRAINS

WHERE ROADS DON'T GO

by Bob Johnston



Riders on the Agawa Canyon Tour Train enjoy an engineer's-eye view on TV monitors (left); the train's former Ski Train cars arrive at Sault Ste. Marie. Two photos, Bob Johnston

\$5 million grant from the province of Ontario. The F40s bracket the coaches at each end of the train, yet because the cars don't have multiple-unit cabling, engines pull only in one direction while the trailing unit provides head-end power. More than 25,000 passengers made the 4-hour trip to the scenic canyon park in 2012.

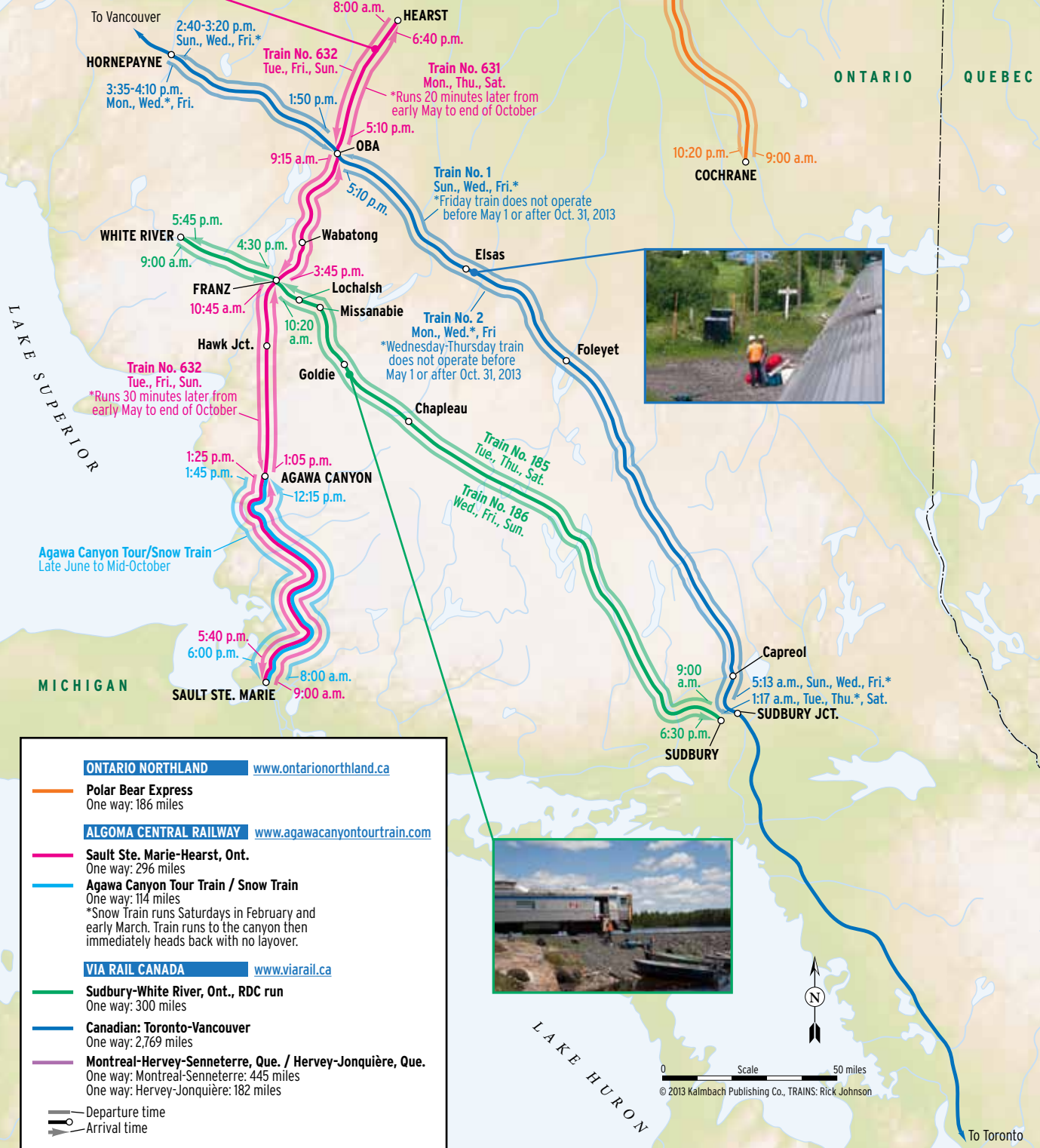
In contrast, the railroad's unnamed passenger trains, Nos. 631 and 632, to and from Hearst handle no more than 6,000 travelers a year. Unlike their spiffy cousin, these trains have no food service or amenities, other than the down-home camaraderie of their crew members. (They do have baggage cars, which the *Tour Train* lacks.)

From the last car of VIA Rail Canada's train No. 603, tracks on a causeway over the St. Maurice River recede into the distance at Windigo, Que. Scott A. Hartley

The coughing, wheezing power car (a former Alco PA "B unit" still bearing the Algoma Central slogan "Tracks of the Black Bear") causes the lights to flicker inside the train's coaches. But none of this seems to matter to Warren and Chris Cunningham of Columbus, Ohio, a father-son fishing duo who clamber aboard at Hawk Junction, the principal mid-route supply point with highway access. (The coaches' Santa Fe interior motif remains intact, while some baggage cars still retain their black bear logo, another Algoma Central legacy.)

Few passengers make the entire scheduled 9-hour, 40-minute trip, since virtually all of the cabins and lodges they travel to lie north of Agawa Canyon and south of Oba (where Canadian National's transcontinental main line crosses). On an early September trip, about eight riders destined for Errington's camp at milepost 206 in Wabatonag bought "combo" tickets at Sault Ste. Marie, enabling them to check their bags on the

ONTARIO'S WILDERNESS TRAINS



ONTARIO NORTHLAND www.ontarionorthland.ca

- Polar Bear Express**
 - One way: 186 miles
- ALGOMA CENTRAL RAILWAY** www.agawacanyontourtrain.com
- Sault Ste. Marie-Hearst, Ont.**
 - One way: 296 miles
- Agawa Canyon Tour Train / Snow Train**
 - One way: 114 miles
 - *Snow Train runs Saturdays in February and early March. Train runs to the canyon then immediately heads back with no layover.
- VIA RAIL CANADA** www.viarail.ca
- Sudbury-White River, Ont., RDC run**
 - One way: 300 miles
- Canadian: Toronto-Vancouver**
 - One way: 2,769 miles
- Montreal-Hervey-Senneterre, Que. / Hervey-Jonquière, Que.**
 - One way: Montreal-Senneterre: 445 miles
 - One way: Hervey-Jonquière: 182 miles

Departure time
 Arrival time



Led by two GP38-2s and looking like a true mixed train, the *Polar Bear Express* heads south outside of Moosonee, Ont., in 2008. Paul Latz

northbound passenger train, then ride the *Tour Train* to Canyon (and have breakfast in the diner), before transferring there for the rest of the trip north. At the camp, riders detrained onto a custom-made wooden stepbox, then boarded a flotilla of six motorboats for a 15-minute ride across a lake. Further up the line, George Karasek was the lone passenger off at Oba. The retired Algoma Central track foreman owns several houses there and keeps busy as a bounty hunter trapping beavers.

ONTARIO NORTHLAND'S JACK OF ALL TRADES

From Algoma Central's north end at Hearst, an early morning Ontario Northland bus makes a 2¾-hour trip to Cochrane, the jumping-off point for Ontario Northland Railway's *Polar Bear Express*. The train travels 186 miles to Moosonee, stopping at isolated settlements, while serving meals in the café car. The service runs Monday through Friday year-round, with a Sunday train added in the summer. The coaches are comfortable ex-VIA Rail (née CN) Daynighters and the same upgraded former GO Transit commuter cars that until Sept. 28, 2012, ran south of Cochrane to Toronto on the *Northlander* [see "Passenger," October 2012].



Crews on passing *Canadians* trade paperwork. Above and four map photos, Bob Johnston

But like no other remote service in Ontario, the *Polar Bear* handles boxcars brimming with supplies and flatcars hauling personal automobiles, light trucks, and SUVs. It's a true mixed train, transporting families, students, and power plant workers (and their supplies) across the massive Moose River bridge and into the roadless First Nations settlement of Moosonee. A larger community, Moose Factory, is reached by boat.

The *Polar Bear's* shift away from tourism to everyday travel was hastened by the decision this season to drop the train's full diner and dome car (both acquired from BC Rail in 2004) as part of ongoing austerity measures, since the province wants to sell the railroad. The *Northlander's* cancellation will further propel that shift, though closing other attractions such as the tourist boat *Polar Princess* has also contributed. Nevertheless, Ontario's government insists it will keep the *Polar Bear Express* running and subsidized, even if the railroad's current owner, the Ontario Northland Transport Commission, is dissolved.

That's good news for the varied cross section of passengers, who amuse themselves with conversation and computer games during the near 5½-hour ride through fairly unremarkable scenery. On an early June trip, the *Bear* hauled four coaches, the café car, four auto carriers, two cargo boxcars, two boxcars of baggage and supplies (one hauling a canoe, one heated boxcar for dogs and perishable items, and a power car. Motive power was a GP40-2 and GP9, although beefier locomotives led a freight train of at least 25 cars that preceded the *Bear* in both directions.

THE 'CANADIAN': ELEGANT WORKHORSE

Compared to the gritty heavy lifting performed by the *Polar Bear*, VIA Rail Canada's Toronto-Vancouver *Canadian*



Riders detrain from the *Polar Bear's* ex-GO Transit coaches at Moosonee. Bob Johnston



The *Bear* is Canada's Auto Train; vehicles loaded at Cochrane wait to go. Bob Johnston

seems rather genteel. The train is famous for catering to cross-country "rail cruise" travelers, yet it also provides a crucial remote service over the 930-mile, day-and-night segment between Capreol, Ont. (about 275 miles northwest of Toronto) and Winnipeg, Man. In fact, when VIA pared its transcontinental service in 1990, Canadian National's northern route was chosen over Canadian Pacific Railway's southerly route through more populous cities because it served vast wilderness areas.

VIA train No. 1 and 2's ability to provide rural mobility — not to mention meaningful public transportation for all Canadians

— was severely compromised by management's decision to cut service between November and April to two times per week, from the triweekly operation that runs May through October. Nevertheless, construction workers (who planned on being in "the bush" for a week at a time) comprised a good number of the passengers seen getting on and off the *Canadian* during a round-trip journey between Foleyet and Hornepayne, Ont., in mid-June 2012. During the

summertime triweekly operation, the eastbound and westbound *Canadians* meet every Wednesday and Friday afternoon near Hornepayne, once a CN division point. The town is a servicing stop for VIA, where passengers can stretch their legs while the silver cruiseliners are fueled and watered.

Not surprisingly on that mid-June trip, most of the passengers boarding or de-training at supply points across Ontario never thought about booking a sleeping car

for their short journey. But some did venture into the adjacent Skyline café dome car or walk through three *Manor* sleepers and an activity car to reach one of the two diners on the 23-car train.

"You've got time for the third seating for lunch in dining car B, before you get to Hornepayne," advised train No. 1's assistant service manager, Claudette Perrin. When she found out I was making a same-day round trip back to Foleyet on No. 2 and learned it was 2 hours late, she offered to have me make the switch where the two trains would meet, 25 miles west of Hornepayne, since the service managers had to exchange papers with each other's trains anyway.

Only 50 people combined were riding in the two coaches but some, like Jamie Baldhead, were traveling long distances. The young First Nations woman attends school in Moose Factory (she was on the *Polar Bear* the previous day) and was going to visit her parents in Saskatoon, Sask. But her boyfriend had to drive her from Cochrane to Foleyet, 129 miles, because no public transportation links the two towns.

RDCS HANGING ON

Not long after the Budd Co. finished building the *Canadian's* plush equipment at its Philadelphia plant in 1955, it began assembling the self-propelled Rail Diesel Cars that now pilot VIA Rail trains 185 and 186. Almost 60 years later, there's little doubt which set of equipment is holding up best. Then again, the aging RDCs don't have to put on airs like their pampered cousins do.

Trains 185 and 186 make three trips a week on alternating days between Sudbury and White River, Ont., the most significant roadless stretch of Canadian Pacific's transcontinental main line. On board lead RDC2 No. 6215, Howard Goheen clicks off the miles to the former logging settlement of Goldie, where he bought a cabin in 1964. "There actually was a bush road back then, but the minerals and resources department took it out in 1974 to keep the area pristine for outpost camps," the Canadian Pacific Railway retiree explains above the rumbling



Scott A. Hartley

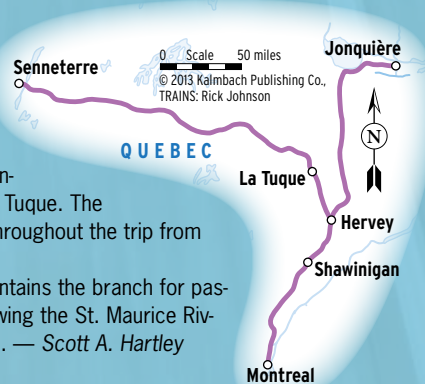
ABOARD VIA'S SENNETERRE SERVICE IN QUEBEC

Guy St. Laurent is a busy man. Though he has just one coach under his charge, his duties as service manager aboard VIA Rail's triweekly Montreal-Senneterre, Que., train No. 603 include collecting tickets, handling baggage, preparing and dispensing food and snacks during the nearly 12-hour ride, and assisting passengers boarding and disembarking along the train's 445-mile route through otherwise inaccessible parts of Quebec's Abitibi-Témiscamingue region. (The train's endpoint of Senneterre was once linked by rail to Cochrane, Ont., 154 miles west, but the line was abandoned west of La Sarre, Que.)

For the first 134 miles out of Montreal to Hervey, train No. 603's F40, baggage car, and coach tag along behind an identical consist designated train No. 601, bound for Jonquière, Que. (The combined consist is seen above at Shawinigan, Que.) Once the two trains split, St. Laurent's work picks up. The next 311 miles to Senneterre include four scheduled stops and 43 "requested stops" (flag stops) at three dozen isolated lodges; in reality, though, train 603 will stop for travelers at just about any point in the woods. Ahead on F40PH-2 No. 6403, engineers André Durocher and Richard Beaudoin keep their eyes on the right-of-way, prepared to quickly set the brakes if they see a waiting passenger. (VIA asks riders to call ahead for such stops, but the region has no cell phone service.)

Baggage service is a cooperative effort. VIA's enginemen are responsible for the work, but St. Laurent and even travelers pitch in. Fishing gear, coolers, canoes, outboard motors, and cases of beer are quickly put aboard the stainless steel, former Union Pacific baggage car. Back in 60-seat coach 8145, St. Laurent speaks in French and English to diplomatically shift riders as more passengers board. The train is full after the stop at La Tuque. The multitasking service manager provides meals throughout the trip from the car's compact open galley.

Though it has only one daily freight, CN maintains the branch for passenger train speeds. The ride is beautiful, following the St. Maurice River, and populated with high bridges and tunnels. — Scott A. Hartley



A VIA conductor rides Howard Goheen's ATV up into an RDC2 at Chapeau. Bob Johnston



VIA train 186 approaches Franz, Ont., led by RDC2 No. 6215; Howard Goheen (inset) enjoys the trip. Two photos, Bob Johnston

diesel engines and air compressor's intermittent "pocketa-pocketa-pocketa ... sigh." He boarded at Chapleau, the key mid-route supply point with highway access.

Trailing all-passenger RDC1 No. 6148 is another RDC2, with its seats removed. It contains Goheen's lawn mower and his all-terrain vehicle, resting near the car's baggage door. Lou Pentelia, who is traveling farther up the line to Lochalsh, loaded a big dining room sideboard that some friends with a pickup truck will help him move to his cottage, along with his Labrador retriever/terrier/pit bull, who waits patiently for his master to open the cage. Conductor Neil Daggett, meanwhile, safeguards multiple boxes of worms consigned to the Happy Day Lodge, 17 miles west of Chapleau, and Ernie's Campground near Missanabie.

It's a good thing no one on board was in a hurry, because Canadian Pacific wouldn't bestow "the Budd cars" any priority whatsoever, either going to or coming from White River. Most freights were too long for passing sidings, so there was no doubt which train would go "in the hole" and wait. The most puzzling incident, though, took place just before the eastbound trip, when 11 fishermen were about to load their gear at White River. The RDCs had been fueled and were ready to leave on time, but CP chose to let a freight through and drink at the fuel pad in front of train No. 186. The RDCs left 45 minutes late and loped behind the freight for another hour, with no opposing traffic.

Except for the *Agawa Canyon Tour Train*, which is supported solely by farebox revenue and merchandise sales (CN declines to say whether the operation is profitable), all of these remote services get public support. In 2011, CN received \$2.2 million from Transport Canada to operate its tri-weekly Algoma Central passenger train.

VIA won't divulge per-train ridership, revenue, or costs, but the carrier calculates that the 50 trains it operates weekly under its "mandatory services in rural and remote regions" (including the Senneterre/Jonquière, Que., and Churchill, Man., trains but not the *Canadian*) carried 109,000 passengers in fiscal 2011 and fell \$45 million short of covering costs. Ontario Northland declined to provide statistics for the *Polar Bear Express*.

Will they endure? The answer is a qualified "yes," so long as rural mobility remains a service the national and provincial governments feel they have an obligation to provide, just as they support highways. Because most passengers access the trains by road, there has been no effort to coordinate connections between the services in a way that makes it easy for a visitor to "ride 'em all," especially since published schedules may become unreliable. And you don't want to be stranded at places like Franz or Oba

unless you have a tent and some grub; there are no hotels or restaurants at either location. You can, however, reserve lodging inside the Cochrane depot, and Hearst has two motels near its train station. Fishing camps also abound, and some of them welcome short stays. If you want to get away for a week, there are lots of choices, including the Agawa train's caboose at Agawa Canyon. If you do, some truly unique passenger railroading awaits. **I**



In a timeless, small-town passenger-train ritual, CN train No. 631 on former Algoma Central trackage, takes on people and supplies at Hawk Junction, Ont., on Sept. 9, 2012. Bob Johnston