

News from the
**National Association of
 Railroad Passengers**

Vol. 27, No. 1  January 1993

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News from the National Association of Railroad Passengers (ISSN 0739-3490), is published monthly except November by NARP, 900 Second Street, N.E., Suite 308, Washington, DC 20002, (202) 408-8362. ©1993 National Association of Railroad Passengers. All rights reserved. Membership dues are \$24/year (\$12.00 under 21 or over 65) of which \$5 is for a subscription to NARP NEWS. NARP Hotline, updated at least every Friday PM: 1-900-988-RAIL.

Postmaster: send address changes to National Association of Railroad Passengers, 900 Second Street, NE, Suite 308, Washington, DC 20002.

(This has news through Jan. 11. Vol. 26 No. 11 was mailed Dec. 11.)

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Clinton's Rail Passenger Opportunities

X2000 Takes 75 MPH Curve at 101 MPH!

The Swedish high speed train Amtrak is now testing carried reporters on a Dec. 10 Philadelphia-Lancaster demonstration run. It took a 75-mph curve at Ronks (east of Lancaster) at 101 mph. (In non-revenue tests on Dec. 12, the train reached 155 mph at Lawrence, NJ, en route from New Brunswick to Trenton and on curves reached speeds up to 50% above normal limits.)

Since the most likely near-term improvements to Amtrak corridors will rely on existing tracks, this trip brought—and made—very good news.

The tilting train's impressive ability to run through curves with superb comfort up to 40% faster than conventional trains yielded many prominent, enthusiastic news reports. Amtrak plans to purchase 26 high-speed trainsets for Boston-New York-Washington service once Boston-New York is reduced to three hours. Contrary to some reports, however, Amtrak plans also to look at other trains and then write its own specifications for high speed trains to be built in the U.S.

Amtrak has asked the Federal Railroad Administration to allow X2000 revenue service at 135 mph, 10 mph higher than the normal Metroliner speed limit. This should produce some impressively early station arrivals, particularly in April on the "Nonstop Express" runs (Dec. Travelers' Advisory).

The electrified X2000 proves the technology is here for three-hour Boston-New York running times—including some 150 mph running—within Amtrak's \$900 million infrastructure budget (plus \$450 mill. for 26 trainsets), of which Congress appropriated \$443.7 mill. for Fiscal Years 1991-93.

See X2000 page 2

RAIL LINK PROGRESS

Efforts to get a railroad link in Boston's Central Artery Project are advancing. State Rep. John A. Businger (D-Brookline) leads the bipartisan Massachusetts Legislative Central Artery Rail Link Caucus; membership includes 114 of the state legislature's 200 members. *The Boston Globe* reported Dec. 2 that James Kerasiotes, who on Dec. 1 succeeded Richard Taylor as state transportation secretary, said he was "intrigued" with the Central Artery rail link plan put forward by Citizens Transportation Action Campaign.

Claytor Applauded at Little Rock

"... We ought to take [the 2-1/2 cents of the federal gasoline tax going to deficit reduction] right now and put it to work. That would be about \$3 billion right there. We'd like to take about a billion dollars of that, and we'd get our national railroad passenger system, with people back at work right away, in first-class shape.

"I would like to talk about high speed rail, which is coming. The French TGV and the Japanese bullet train are down the road quite a piece because [they] would require building a whole new railroad.

"We have high speed rail right now between Washington and New York, at 125 mph. We tested a train last week at 150 on the same track. We're ready to put that kind of high speed rail—right away—around the country; New York to Boston, and in other cities around Chicago. . . . All we need is capital improvement, capital money."

—Amtrak Pres. W. Graham Claytor Jr., speaking Dec. 15 to the Little Rock economic conference (Applause followed Claytor's message, then Pres.-elect Clinton said, "Now that was a good statement!")

Amtrak President Claytor's selection as one of only about 300 invitees to the economic conference—and the praise he received—is encouraging, as is the fact that Pres.-elect Clinton was talking up passenger trains to general audiences over six months ago (see "Clinton in Context," back page) and continued to do so.

CLINTON ON PASSENGER RAIL

Associated Press ran a widely published item quoting presidential candidates' responses to the question: "Should the federal government continue to provide subsidies to Amtrak?" Clinton's answer: "All industrialized nations subsidize passenger rail. Passenger rail creates jobs, conserves energy and provides an opportunity to avoid airport expansion. My administration will also invest in a high-speed rail network between our major cities" (*Corvallis [OR] Gazette-Times*, Oct. 14).

On Dec. 8, Claytor met in Washington with Federico Peña, the former Denver mayor then chairing Clinton's Transportation Cluster Group, Greg Lawler and other senior transition peo-

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But people from Seattle to Miami and from Albany to San Diego want to know if the tilt technology means new air-competitive services can be offered within the next few years without electrification.

Fast Non-Electric Locomotives

For first-generation air-competitive service in non-electric corridors, Amtrak seeks the most appropriate diesel or turbine-powered locomotive capable of 110-125 mph, the best coach for taking curves at above-normal speeds and concerted efforts to minimize the amount of lower-speed operation.

Amtrak's next set of new locomotives will be its most powerful diesels—46 General Electric 4000-horsepower "AMD-103 DC" units scheduled for delivery at the rate of about one per week from May '93 to Feb. '94. They will go to Auto Train and Western long-distance trains, allowing two new units to replace three existing units on Auto Train and peak period "California Zephyrs."

A future version of this powerful 103-mph locomotive, if equipped with alternating current (a.c.) traction motors, might be capable of 110-125 mph. Indeed, encouraged by the performance of its three a.c. prototype diesels, Amtrak is considering use of a.c. motors to offset reduced horsepower (3200) on the following set of 10 dual-power locomotives, designated "AMD DC DP," whose delivery should commence late in 1994. These units will replace old FL9s that power many Empire trains; the reduced horsepower was needed to offset the weight of the third-rail electric equipment.

Thus, assuming timely development, locomotive candidates for non-electric corridors include an a.c. variant of GE's AMD 103 and at least two other locomotives now being developed: a "diesel X2000" and a fast turbine-powered locomotive.

Grade Crossing, Freight Conflicts, Cab Signals

Formidable non-power-related obstacles even to 110 mph service help explain why Britain's 125 mph non-tilting "world's fastest diesel" HSTs have attracted so little attention here and why the competitive edge for non-electric U.S. services goes to trains that can take curves at higher speeds.

- Safety considerations impose limits on how fast trains can negotiate highway grade crossings, probably 100 mph.
- Attitudes toward faster operations vary from railroad to railroad. Santa Fe seems positive on the prospect of 110-120 mph passenger operations in the San Joaquin Valley—assuming, of course, non-Santa Fe sources pay the upgrading costs—and has said it would use the opportunity to increase somewhat the speeds of some freight trains.

But Conrail in Oct. began circulating a very conservative policy paper advocating *separate rights-of-way wherever* passenger trains exceed 90 mph! First general media coverage of this was in the Jan. 4 *Philadelphia Inquirer*, which quoted Amtrak Pres. W. Graham Claytor Jr. as saying the policy "goes too far. I think it is going to be subject to considerable change."

Amtrak thinks sharing of *tracks* in corridors should be examined on an individual basis taking into account freight traffic density; but that, in general, trains limited to 150 mph or less should not require separate *rights-of-way*.

- VIA's Montreal-Toronto tilting LRC diesel trains have done 90 mph for years—recently raised to 100 mph—without cab signals, but Federal Railroad Administration regulations limit U.S. train speeds to 79 mph except with costly cab or "supplemental" signal systems.

NARP is interested in readers' views on whether we should ask FRA to review the appropriateness of raising that limit above 79 mph, taking into account the fact that the whole issue should become moot as freight railroads adopt "ATCS" (Automatic Train Control System), a system-based on transponders in the track—which offers even greater safety than cab signals.

What Service Can Be Offered and Where

The "Amtrak and British Corridors" table shows most of the candidate U.S. corridors and some current service characteristics, and hints at service improvement possibilities. Running-times the British get with 125 mph diesels and non-tilting coaches presumably could be matched or bettered with 110 mph locomotives and tilting coaches.

Intermediate stops (not shown) vary among corridors and heavily impact running times. The fastest Montreal-Toronto LRC schedule averages 84 mph (335 miles; 100 mph top speed) thanks to only one intermediate stop and virtually no slow running.

Ridership is greatly influenced by service frequency, which can be increased with faster operation, as reflected in Michigan's Chicago-Detroit study results, summarized below.

CHICAGO-DETROIT: EXISTING SERVICE AND INVESTMENT OPTIONS						
IN MILLIONS						
Cost	Cost/Mile	Annual Ridership*	Daily Roundtrips	Running-Time	Speeds (mph) Average	Top
(Existing Service)		0.4	3	5:20	52	79
\$111	\$0.40	2.2	6	4:00	70	110
\$602	\$2.15	3.5	10	3:30	80	125
\$2.270	\$8.11	5.5	18	2:45	102	"150+"

*Estimates are for 2010 and exclude one-way trips under 50 miles.

When funding is tight, it is worth noting that even an investment of under \$111 million producing consistent 90 mph speeds would be a big improvement, generating more riders and making rail competitive for intermediate markets such as Chicago-Jackson and Chicago-Battle Creek. Each improvement would reduce operating subsidy needs and build the case for further investment. ■

AMTRAK MAINTENANCE SLIPPING

On October 20, Amtrak furloughed 257 (about one-quarter) of the workers at its largest maintenance facility—Beech Grove, near Indianapolis. Indeed, maintenance of equipment (specifically, heavy overhauls) and maintenance of right-of-way have been the major victims of Amtrak's FY '92-'93 economic reverses; 6% of locomotives and 40% of cars are past their recommended overhaul date and those percentages are climbing.

Outgoing Federal Railroad Administrator Gil Carmichael was so appalled by what he learned about Amtrak's heavy overhaul cutbacks that he told the open session of Amtrak's Board on Dec. 2, "This worries me. I think the board learned yesterday that this cannot go too long too far." ("Yesterday" refers to a briefing on heavy overhauls Robert Burk, Amtrak's Chief Mechanical Officer, gave the board's operations committee.)

The heavy-overhaul cutback is a time bomb that, if not reversed, could cause Amtrak service quality to unravel while Clinton is president; some passengers already are suffering from the effects of these cutbacks. Thus Claytor began his talk at Little Rock by saying that, given the money, Amtrak could get the furloughed workers back on the job within weeks.

AMTRAK & BRITISH CORRIDORS-RANKED BY AVERAGE SPEED

All services shown are non-tilting. All are diesel powered, except Washington-New Haven is electrified and the fastest trains on the New York-Albany-Buffalo line are turbine-powered. The far right column is important because reducing the number of "slow" miles can be a more cost-effective way to begin reducing trip times than raising the top speed. The customer is concerned mainly with travel time, service frequency and fares.

Route	Mileage	Fastest Present Schedule	Local Weekday Roundtrips	Speeds (mph)		% of route at	
				Avg. ²	Top	70 mph + up	55 mph + below
London-Edinburgh ³	391	4:08		95	125		
London-Exeter	174	2:03		85	125		
New York-Washington	225	2:35	17	76.8	125	← Metroliner ⁴	
		3:14	16	63.8	110	← Non-Metroliner ⁴	
Chicago-Milwaukee	86	1:32	7	56.1	79		91%
New York-Albany ⁵	141	2:20	8	55.4	110		87%
New York-Buffalo ⁶	437	7:52	2	54.6	110		90%
Washington-Richmond ⁷	109	2:00	5	54.3	70		91%
Oakland-Bakersfield	312	5:55	4	51.4	79		81%
Chicago-Detroit	279	5:20	3	51.3	79		62%
Chicago-St. Louis	282	5:25	2	50.5	79		79%
Washington-Charlotte	479	9:34	1	49.8	79		62%
New York-Boston	231	3:59	10	49.4	103 ⁸		
Seattle-Portland	186	3:55	1	47.5	79		57%
Los Angeles-San Diego	129	2:43	9	45.9	90		70%
New York-Hartford	112	2:39	8	39.9	90 ¹⁰		

Notes

- 1 Excludes long-distance trains serving the same markets, as these generally are slower because station-stops are longer (baggage) and the bigger trains accelerate more slowly.
- 2 For U.K. services, average for fastest trips; for Amtrak services, average for all local weekday trips.
- 3 1991 diesel schedules; faster electric service began in 1992.
- 4 Overall New York-Washington average is 69.5 mph; average for fastest Metroliner trip (eastbound only) is 87.1 mph.
- 5 Part of the New York-Buffalo corridor.
- 6 Service extends 23 miles farther to Niagara Falls, NY.
- 7 Part of the Washington-Charlotte corridor.
- 8 Track speed is 110 but diesels in use can only attain 103.
- 9 Service extends 25 miles farther to Springfield, MA. New York-New Haven segment is common with New York-Boston.
- 10 Less than 5 miles at 90 mph; remainder is 80 mph or less.

SPEEDING AROUND CURVES

Historically, railroads banked curves fairly sharply to permit fast passenger-train speeds. "Superelevation" is the number of inches the outside rail is above the inside rail—usually four today vs. six or 6-1/2 in pre-Amtrak times. (The Northeast Corridor remains six but freight traffic is relatively light and does not exceed 30 mph except at night—50 mph is allowed from 10 pm to 6 am.)

Over the past few decades, railroads reduced superelevation to minimize the damage heavy freight trains cause to the track as well as the derailment potential of modern high-center-of-gravity cars. Recognizing these problems, Amtrak has not objected to the railroads' actions although the speed limit drops roughly five mph per inch of superelevation removed.

The X2000's computer-controlled tilt mechanism more than compensates for the lost superelevation. The train tilts to offset 70% of the centrifugal force, thereby producing a comfortable ride. Tests found that "100% tilts caused nausea among some passengers who saw the horizon tilting without feeling the effects of the curve . . . 70% . . . prevents discomfort but leaves enough force to let the stomach and inner ear confirm what the eye sees." *The ESPA Express*, Aug.-Sept. '92.

The X2000 also benefits from radial steering technology that guides the wheels around each curve, each axle pivoting independently.

Although higher track superelevation will continue to be important on predominantly or exclusively passenger lines, elsewhere tilting or low-center-of-gravity trains move the focus to the measure (also in inches) of "unbalanced elevation" (a.k.a. "cant deficiency"), the number of additional inches a curve would have to be banked to create a "perfectly balanced" ride at a given speed—that is, one where the rider thinks he or she is standing vertically.

Most Amtrak trains run at three inches of unbalanced elevation (four inches Washington-New York; five inches New Haven-Boston). The tilt mechanism allows passenger comfort at a higher unbalance: the Philadelphia-Lancaster X2000 run was at 12 inches although a lower level probably will be used in regular service.

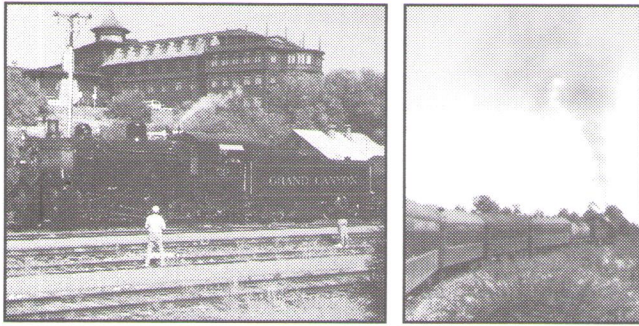
In the two examples in the table below, assuming identical curve radii, passengers on the tilting train will feel a slightly smaller sensation even though traveling much faster.

Amtrak also will test the German ICE coach, whose lack of tilt mechanism should mean lower capital and maintenance costs but whose low center-of-gravity may allow operation at seven inches of unbalanced elevation—not quite as high as the tilting train but still more than twice what is allowed for conventional cars. An ICE passenger would feel all seven inches.

	Amfleet Train	Tilting Train
Superelevation (banking of track)	4"	4"
Unbalanced Elevation (Train)	3"	9"
(Passenger's Sensation)	(3")	(2.7")*
(Tilt)	(0")	(6.3")*
Total elevation	7"	13"
Top speed on two-degree curve**	70.7 mph	96.4 mph

*The "70% tilt" discussed above means the passenger feels only 30% of the vehicle's 9" unbalance; the FRA's safety-based regulations focus only on the train (i.e., 9").

**Allowable speed is the square root of: total elevation divided by .0007 divided by degree of curvature. Thus an ICE train at 7" unbalanced elevation on the same curve could go 88.6 mph.



The Grand Canyon Railway (GCR), which restored passenger service Sep. 17, 1989, on the 64-mile former Santa Fe Williams-Grand Canyon branch, now carries 90,000 passengers a year. Thanks to GCR, Williams is flourishing again after a decline due to the 1980s opening of I-40. To improve on the 33,000 autos a year GCR says it now keeps out of the national park, GCR seeks permission to build a four-mile spur to Grand Canyon Airport where GCR plans a park-and-ride facility and nearby hotel; shuttle trains would make the 11-mile airport-Canyon run. The railway's historic Canyon terminal now, as in the past, is next to the El Tovar Hotel, which is on the South Rim and visible behind the steam engine. Scheduled Nava-Hopi Tours, Inc., buses directly link Amtrak/Flagstaff (from #4, to #3), GCR/Williams and the Canyon; Amtrak can sell the whole package *except* you must deal directly with GCR (1/800-THE-TRAIN) if you make a *roundtrip* on GCR.

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ple. (Peña, of course, was nominated on Dec. 24 to be transportation secretary.) Lawler knows Amtrak well; he was a long-time aide to James J. Florio, including when Florio (now New Jersey's governor) chaired the House Energy and Commerce subcommittee with jurisdiction over Amtrak.

Peña and his associates seemed fascinated with Claytor's message about Amtrak's potential, so much so that the meeting extended much longer than planned.

NARP told transition officials that the President-elect's own interests require correcting Amtrak's growing maintenance backlog (see "Amtrak Maintenance" box) and producing some tangible improvements in Amtrak corridor services within the next few years. [NARP has also said that Amtrak revenues are down *partly* because of "Amtrak's failure to adapt to changes in the market place that have increased the importance of selective discounting and of price experimentation generally."]

Despite Clinton's apparent enthusiasm, however, nothing is guaranteed. Consider:

- The stronger the economy grows, the smaller the likely size of any special infrastructure package, which Clinton set at \$20 billion during the campaign.

- A loud transportation-lobby chorus is focused on "full funding of ISTEA," the five-year highway/transit authorization with virtually nothing for Amtrak but much road and transit money. NARP has urged the transition to include Amtrak in any infrastructure package, even if it is limited to the \$5 billion that could "fully fund ISTEA" this year. Under no circumstances should such a package be limited to "highways or to the jurisdiction of the House Public Works Committee."

- The American Road and Transportation Builders Assn. and other highway groups will fight to shift back into the highway trust fund the same 2-1/2 cents Claytor mentioned as a logical source for passenger rail.

- Clinton, in his Arsenio Hall Show appearance in June, immediately followed his plug for California high speed rail with "build short-haul aircraft," and the bulk of the statement was devoted to increasing education expenditures.

In short, Amtrak's efforts to boost market share significantly during Clinton's first term face threats, ironically, from a possi-

ble economic recovery as well as from competition for scarce funds from other interests inside and out of transportation. He needs to hear as many requests as possible to include passenger rail in his infrastructure efforts. ■

CLINTON IN CONTEXT

Shortly after playing the saxophone to help open *The Arsenio Hall Show* on June 3, President-elect Clinton said the following after Hall asked him to "talk a little bit about what you would do for the economy. That's part of the LA riots and some of the other frustrations all over this country."

[Clinton] "Absolutely. A big part of California's problem is you lost a half a million jobs. The state government is broke, \$11 million in debt. You're cutting back on education when you ought to be increasing investment in education to prepare all these kids for the future they need to live. My theory is that we've got to increase our investment in this country. After World War II, we rebuilt Europe and Japan. After the Cold War, we've got this marvelous window of opportunity when we can rebuild America, and we better get at it. The only way you ever rebuild a country is to invest in your people—in their jobs, their education and their health care.

"First, we ought to take every dollar we're cutting the defense budget by and invest it in building an economy for the 21st century. In California, what does that mean? Build high speed rail networks. Don't buy the trains from Europe and Japan. Build them here. Build short-haul aircraft. Build modern waste recycling systems. Build a modern fiber optics network. Put millions of people to work building a rich country for tomorrow. . . ."

NARP REGIONAL MEETINGS

(All dates shown are Saturdays; some require RSVP and registration fee; more on other regions next issue.)

Region 1 (CT, ME, MA, NH, RI, VT): Feb. 6, 12:30-5; Boston; Essex Sea Grill across Atlantic Ave. from South Sta.; \$15; speakers: Amtrak NECIP Project Dir. David Carol; Mass. Asst. Sec. of Transp.—Central Artery Project Stanley Durlacher; NARP's Ross Capon; send check payable to: Rail Travel Center, 2 Federal St., St. Albans, VT 05478-1610; contact: Carl Fowler, 1/800-458-5394. To attend luncheon, registration must arrive by Jan. 29.

Region 2 (NY): Feb. 27, 11:30-3:45; Albany; Empire State Plaza Conference Center (part of state capitol complex); \$5 meeting only, \$18 with lunch (starts at noon); contact: Don MacLean, 518/377-4390 (home).

Region 3 (DE, NJ, PA): Mar. 27; 8:30-4; Pittsburgh; Grand Concourse Restaurant, One Station Square (former P&LE Sta.); \$25, includes lunch; speaker: Rocco Piano, Port Auth. Transit rail div.; contact: Bob Abraham; c/o KARP P.O. Box 126; Pitcairn, PA 15140-0126 by Mar. 12.

Region 6 (IN, MI, OH): Mar. 13, ARP mtgs. 10 am, main mtg. 1 pm after lunch; Ann Arbor; Sheraton Inn, fee TBA; contact: Clark Charnetski, 313/761-3814 (home).

Region 7 (IL, MN, ND, WI): Feb. 27; 10:30 am; Bloomington-Normal; Holiday Inn (US 51 north); \$20; speaker: Tom Smith, CEO, Rail Div., Morrison-Knudsen; high speed rail presentation by Illinois DOT; contact: Ken Bird, 708/960-3170 (home).

Region 8 (AK, ID, MT, OR, WA): Mar. 13; Tacoma; Quality Hotel-Tacoma Dome, 2611 East "E" St.; \$16 before/\$20 after Mar. 5; speaker: Ron Scolaro, Amtrak Government Affairs Officer West; contact: Jim Hamre 206/848-2473 (home).

Region 9 (AR, KS, MO, OK, TX except El Paso): Feb. 27; Bloomington, IL—see Reg. 7.

Region 10 (CO, IA, NE, SD, UT, WY): Mar. 27; Lincoln, NE; Ramada Inn Downtown; fee to be determined; visit to BN dispatching center; contact: Dan Lutz, 402/464-3571 (home).

Region 12 (CA, HI, NV): Mar. 20, 9:30-12:30; Los Angeles; Hilton Hotel (near 7th & Flower Metro/LRT sta.); \$4 meeting only, \$25 includes breakfast buffet; speaker: NARP VP Eugene Skoropowski; special activity: post-meeting Metrolink ride (additional cost); contact: Carl Schiermeyer, 714/964-0200 (day).