



PCC

The wonder car

Faced with worn-out cars and falling ridership, electric railway leaders set out to design the perfect streetcar

By G. Mac Sebree



1935: PRESIDENTS CONFERENCE COMMITTEE FINALIZES ITS STREETCAR DESIGN

AS THE ROARING TWENTIES hurtled toward the big stock market crash, Americans were already deserting public transportation for the mass-produced automobile. Transit executives saw their ridership drop alarmingly, and wondered how to stem the tide. The streetcar was the dominant form of transit in cities of 50,000 and more, and there were some 74,000 cars in service.

Yes, there was trouble in Streetcar City. Of those 74,000 cars, fully 54,000 were worn out and obsolete. And with just a few exceptions, the rest were unattractive, unappealing, and no competition for the automobile.

A counter-attack was called for, and one was produced. In 1928, Charles Gordon, editor of the influential *Electric Railway Journal*, told the American Electric Railway Association

that a new type of streetcar was urgently needed. He envisioned a streamlined car that would challenge the emerging motor bus; in short, a car with pizzazz.

In December 1929, acting on a plan authored by Gordon and the progressive Dr. Thomas Conway Jr., an ex-professor of finance who had rescued two major interurban companies, a group of operating executives formed the Electric Railway Presidents Conference Committee (ERPCC). The goal: come up with a revolutionary car by 1935.

The ERPCC comprised 28 operators, from Chicago Surface Lines with 3740 cars to Honolulu Rapid Transit with 78. Three interurbans joined, including Conway's Cincinnati & Lake Erie, but only one, Pacific Electric, bought cars.

Twenty-six industrial members, such as the St. Louis Car

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Toronto's well-maintained PCC fleet was the largest in North America. In July 1962, six of the cars stand outside Lansdowne Carhouse.



KRAMBLES-PETERSON ARCHIVE

During a 1934 transit-industry convention in Cleveland, four cars from the PCC development program pose on the Shaker Heights line. From right: ERPCC Model B 5300 (Pullman, 1934), Chicago Surface Lines 7001 (Brill, '34), CSL 4001 (Pullman, '34), and B&QT Model A 5200 (Twin Coach, '29).



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Brooklyn & Queens Transit, home of the ERPCC's research lab, ordered the first production PCC's, in July 1935. Late in life, No. 1028 from that first order works a fan trip on October 27, 1956.



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W. C. JANSSEN PHOTO; KRAMBLES-PETERSON ARCHIVE

Most PCC owners ran their cars singly, but a few had them built with couplers for multiple operation. Two Boston cars (above) round the Riverside loop in 1963. Illinois Terminal's cars, like No. 453 entering St. Louis on a run from Granite City, Ill., in 1953, were double-ended and m.u.-capable.

Co. and Ohio Brass Co., were also included. Curiously, Twin Coach, a bus builder, also joined. It is interesting that, among ERPCC members, several, including Houston, Milwaukee, and Omaha, never bought any "PCC" cars, as the products of the committee's work came to be called. On the other hand, non-members such as Dallas and Minneapolis-St. Paul did.

FIRST ORDER OF BUSINESS for the ERPCC was to choose a chief engineer for the big project. Dr. Clarence F. Hirshfeld, head of the research department of the Detroit Edison Co., was hired and he lost no time in setting up a research laboratory in the Ninth Avenue car shops of New York City's Brooklyn & Queens Transit Corp.

Evaluated on the spot were advanced models from Chicago ("Rail Sedan" 3322, built in the Chicago Surface Lines shops in 1929 with multi-notch General Electric PCM control for smooth acceleration) and Baltimore (Peter Witt 6002, built by the J. G. Brill Co. in 1930 with Westinghouse VA control). Brooklyn car 5200 was also studied, one of three experimental cars built in the late 1920's by Twin Coach in a somewhat half-hearted attempt to crash the railcar market. It looked a lot like Twin's popular Model 40 bus, but with double trucks and steel wheels.

This led to a search for smooth, rapid acceleration, and a radical new truck that would subdue vibration and damp down the jolts and jars from rough track. GE and Westing-

house were commissioned to develop control systems utilizing a large number of resistance steps to replace the jerky motion produced by the typical drum controller then in almost universal streetcar use.

Hirshfeld's team quickly found that a resilient wheel, with a rubber insert, would reduce vibration and permit lighter trucks and carbodies. New concepts in controls, construction, and ways to adapt a standard carbody to permit varied lengths, widths, and single-end or double-end operation, all emerged on paper.

In early 1933, Brooklyn's 5200 (now called Model A) got the first prototype PCC trucks for testing, along with new-design motors and controls furnished by GE and Westinghouse. To try out a new body design, the ERPCC in early 1934 ordered a Model B from Pullman-Standard. It had a welded lightweight steel alloy body, and had thermostatically controlled ventilation and heating, plus glare-free indirect interior lighting. The main braking was with GE eddy-current brakes and featured the trademark magnetic track brakes seen on all subsequent PCC cars.

Model B was owned by B&QT as its 5300, and both it and 5200, the Twin Coach Model A, were tested in regular service. In contrast to the bus-like 5200, the 5300 had most of the body features of the production PCC cars, soon to come.

At long last, in February 1935, the ERPCC issued its final specifications for the new wonder car. It was to be a single-end, one-man car with a front entrance and center exit, 46 feet long and 8 feet, 4 inches wide. Some cities, particularly ones needing double-end cars, did vary from these specs. The car would have an empty weight of 32,000 pounds, use "floating" control, and have a maximum acceleration rate of 4.75 mph per second, a balancing speed of 42 mph, and a maximum safe speed of 50 mph. It would have dynamic, magnetic, and air brakes. The trucks would be of the new B-2 design, one that would endure, with variations, over nearly 40 years of streetcar production first in the U.S., then in Europe.

Not surprisingly, B&QT on July 8, 1935, ordered the first 100 production cars, 99 from St. Louis Car Co. and one from



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Chicago's 50½-foot, three-door "Green Hornets" (top) were the longest single-ended PCC's; most were rebuilt as rapid transit cars. Los Angeles (above) had some extra-wide PCC's that dwarfed their 3-foot, 6-inch-gauge trucks. San Francisco 1040 (St. Louis, '52) was the last domestic PCC built.

the Clark Equipment Co., which never built another car but which did build most of the PCC trucks in the U.S. The Brooklyn cars made their debut on October 1, 1936, with New York Mayor Fiorello H. La Guardia cutting the ribbon. The PCC era was under way.

The ERPCC was to retain tight control over the design. Having spent more than \$630,000 to bring forth the new car, it organized the Transit Research Corp. to hold the patent rights. When PCC production ended in the U.S. in 1952, the TRC continued to collect royalties for PCC applications in rapid-transit cars and in overseas car production.

In all, 4902 PCC surface cars were built in the U.S., all except the lone Clark car by St. Louis Car Co. and Pullman-Standard. (Brill, the third major streetcar builder, eschewed PCC patents and managed to sell only 40 of its rival product, the Brilliner.) The only major design change came in the late stages of World War II when all-electric cars began to be produced, eliminating air brakes. And the carbody got a re-design, with length increased by 5 inches and "standee" windows introduced. The PCC was also popular in Europe. Although most bore little if any outward resemblance to the U.S. versions, about 500 or so were built in Western Europe, and more than 15,000 by Tatra of Czechoslovakia for systems in Russia and other East Bloc countries.

There were three large fleets in North America. Toronto had the most cars, 745, followed by Chicago with 683 and

Pittsburgh with 666. Bringing up the rear were Johnstown, Pa., with 17 and Illinois Terminal, which had 8 double-enders for St. Louis suburban service. As systems were abandoned, many fleets were resold to other cities. Mexico City, which ordered only a sample car new, bought substantially the entire PCC fleets of Detroit and Minneapolis-St. Paul.

THE PCC CAR was hardly a failure, but at best it only postponed the demise of the vast majority of the traditional city streetcar systems. In the six years that it took to bring the car from concept to reality, more than half of the 74,000 obsolete trolleys had been retired, owing to the continued abandonment of transit by the public, the rising popularity of the motor bus, and the ravages of the Depression. All this greatly reduced the potential for the new car. Generally by this time, only the larger transit systems had the ridership or the means to support investment in new cars. Only 30 North American properties operated PCC's.

The wonder car turned out to be satisfyingly rugged; a few cities operated PCC's for a half century, bettering the longevity of the average clunker they replaced. Today, reconditioned PCC's work in a handful of cities, most notably San Francisco.

Although patented PCC technology has not, for the most part, been used in recent years, certainly the silent streamliner was a tremendous inspiration for the light-rail renaissance we have come to know. **■**