WHY "TRAIN X"?

BY ROBERT R. YOUNG

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It will be lighter, more comfortable and travel safely at 150 m. p. h.

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FIRST THE AUTOMOBILE and then the airplane put the squeeze on the railroad passenger business. Rising costs have increased this squeeze to the point where our fleet of passenger cars has shrunk to a handful of under-maintained, rattly old cars. New buying has virtually stopped. Yet, the relentless competition of ever newer and newer autos and planes goes on. Freight cannot long bear the huge losses that the passenger business can show on declining volume.

The railroads have never been able to look to the taxpayer as the airplanes and automobiles have to furnish ways and terminals. Hence, if the railroad passenger business is to be saved under private enterprise it must save itself. The crisis that 25 "do nothing" years have portended descends upon us on the eve of a threatened protracted military emergency.

Something is needed as revolutionary in its performance as it is startling in its economies. Train X may be the answer to the stockholders, as well as to the traveler's prayer.

The Association of American Railroads has accused the Chesapeake and Ohio before of "building castles in Spain." Well, the inspiration for Train X did come from the Spanish National Railways for whom two radical new trains are being built by the American Car & Foundry Company, patterned after a train successfully built and operated in Spain during the war.

Today's obsolete passenger car is an outgrowth of the freight car. Its mechanical evolution has been confined to the narrow limitations of the requirements of interchange with all preceding cars. This path of least resistance has led to engineering compromises that have perpetuated a clumsy type of equipment which the railroads can no longer afford to either buy or operate. Its worst fault is that it is topheavy — grossly topheavy in these days of high speeds, high costs and material shortages. The General Motors "Train of Tomorrow" with its Vista Dome only exaggerated the topheaviness. However, the railroads could hardly look to a competitor for salvation—one that abandoned high wheels on its own vehicles 40 years ago and has not since let a season go by without bringing the center of gravity lower and making the ride smoother and quieter.

The so-called "light-weight" car or "streamliner," which was already out of date when it was introduced by Budd 12 years ago, was lightened 30 percent as against the old "standard." model 1890, with which travelers unfortunately continue to be so much more intimately familiar. The saving in weight, however, was immediately cancelled out by the demand for better accommodations, so that the saving per passenger vanished. In either case, therefore, the locomotives are still forced to haul "around and around again" a ton of dead weight per coach seat and three tons per berth, not including the diner and locomotive which add another 50 per cent. Passenger comfort, stopping distances, as well as topheaviness, have all limited progress in the realm of speed-however much power was improved. It is true time tables have been reduced since 1890, but mostly through improved signalling, dispatching, roadways and reduced station stops. Competition calls for higher between-station speeds.

The lighter, articulated trains of a few years ago which got along with fewer trucks were on the right track, but inflexibility of train make up and delays caused to the whole train because one car or part required shopping discouraged our unresourceful railroad men from re-ordering.

First, Train X will bring the center of gravity down by consolidating in a headend car electric generators, batteries, refrigerating units, water tanks, pipes, and miscellaneous gear which now clutter-up the underside of passenger cars. That change is so simple you would have thought it might sometime ago have been introduced. It will make for lower first cost and lower maintenance.

The other features of Train X are not so simple but most of them are as old as the hills in their application outside of the railroad industry. That is why Kenneth A. Browne, Research-Consultant of the C&O, is so sure that what he now has on the drawing board and in manufacture will work out successfully in practice. For example, a feature in use on roller coasters since 1880 will supplement the lower center of gravity in making speeds of 150 miles per hour as safe as present speeds with present equipment.

Present day standard rail trucks actually generate a de-railing force on the lead wheel; for, when the leading axle meets a curve at high speed, the wheel flange is forced up against the rail in its descending hemisphere, so that the wheel tends to climb up and out over the rail. The flange of the trailing or rear-wheel of the truck. on the other hand, meets the rail in its ascending hemisphere, thus biting into or gripping the rail. Train X. then, will use the one axle car to overcome this basic speed limitation of present equipment. All of its wheels will be trailing.

Cars will be about one-third the length of conventional models, the resultant six inch saving in lateral clearance on curves, brought inside the car, will add comfort to bedroom, dining, and aisle space. Floors will be two and one-half feet nearer the rails, the roofs will be lowered by three feet. In place of standard railway car wheels of 36-inch diameter, these smaller cars will have 28-inch wheels with rubber centers.

Train X will be integrated into a unit. Since there will be but a single pair of truckless wheels at the rear of each car during train operation, forward support for each car will be provided by the coupling to a preceding unit. Each car, however, will carry for switching operations its own front dolly axle and wheels which will lower to the rail when the coupling lock is opened. The diaphragm and all service lines will disconnect as the cars part and rejoin automatically on coupling without any manual attention. Raising the dolly wheels will lock the coupling. The ends of the locomotive and the back of the observation car will also carry standard AAR couplers for emergency switching operations as required by existing law.

Suspension will be designed so that the train can automatically bank itself into a curve like a bicyclist. This will permit nearly doubling of permissible speed on curves without any increase in noticeability by passengers. As an advertising man has said, the train will flow around curves. The elimination of trucks will automatically improve riding characteristics and reduce noise and vibration.

Train X will ignore interchange restrictions, burn precedent, and approach the problem fresh, the only limitations being safety, passenger comfort, and present roadway, which last, incidentally, is not only grooved exactly to the desired course whatever the weather, but also is as smooth as glass, better than concrete, less bumpy than air—a basic advantage the railroads have long allowed to go unexploited.

Browne is designing for a top speed of 150 miles per hour. Brakes, springing, power, etc., will be worked out accordingly—all simpler problems to deal with because of the reduced weight. Starting and stopping will be easier and quicker. Curves and grades now programmed for costly elimination can be easily negotiated unchanged.

Train X will get down to a third of the weight of present "light weight" equipment, which is in the automotive and aircraft range-without sacrificing safety. The structure will have a specific strength far above present equipment and will be made to meet all the safety requirements of the AAR and the U.S. Mail. The weight and power required in the locomotive will be proportionally reduced, so that there will be great savings all along the line-from mass production of the fuselage type cars on down to fuel, maintenance, repairs and wear and tear on roadbed. This train can take half the traffic off the highways which will quintuple rail travel and save billions of taxpayers' money for highway repair and enlargement.

The details involved in this project would fill several books. Here, we can only convey to you the outline of what will come experimentally to the rails by 1950, if, as we believe he will, Browne succeeds in combining available materials and designs into his new ideal.