

## AFD Ep 448 Links and Notes - The Autorack [Bill/Rachel] - Recording Nov 13, 2022

- [Intro - Bill] The modern, closed autorack railcar, dating to the 1980s after three decades of development, is today an omnipresent sight across US freight railroad lines. They help to transport to dealerships 75% of the 15 million or so new light vehicles sold in the United States each year, along with over a million more US-built vehicles being moved to seaports for overseas sales. These specialized railcars, not unlike shipping containers, represent a standardization for efficient and protected transportation of a highly valuable finished good cargo that is manufactured in large, identical quantities and which was once very vulnerable to theft and vandalism before this innovation.
- [Bill] The autorack is also a key component of the global light automobile supply chain because it allows the consolidation of production centers into locations convenient to the producer, instead of dispersed for the convenience of the consumer. This site location issue became significant to US automakers with the changes in environmental regulation, labor laws and wage standards, trade agreements, and transoceanic shipping over the course of the 1970s, 1980s, and 1990s.
- [Rachel] Without the advent of the autorack it seems unlikely that so many automakers, both US-based and US subsidiaries of foreign companies, would have been able to locate or relocate their manufacturing operations into southern Right-to-Work states with lower prevailing wage and labor standards or monitoring, compared to the previous model of spreading production across the country in order to provide close-proximity supply to auto dealers. (Consider for example the recent discovery that subcontractors in Alabama for the US production subsidiary of Hyundai were using child laborers as young as 12 in factories.)
  - <https://slate.com/business/2008/12/how-foreign-car-factories-have-transformed-the-american-south.html> *The states in the Southeast had plenty to offer—large tracts of undeveloped land with road, rail, air, and sea access; fewer snow days; and federally subsidized power from the Tennessee Valley Authority. Above all, these states had longstanding cultures that made it difficult for unions to organize.*
  - <https://www.cnbc.com/2022/08/14/automakers-investing-in-the-south-as-evs-change-the-auto-industry.html> *Among the first to invest in southern states was Ford Motor in the 1950s and 1960s in Kentucky, followed by foreign-based, or transplant, automakers starting with Nissan Motor, which established a plant in Smyrna, Tennessee, in 1983. Others such as General Motors, Subaru, Toyota Motor and BMW followed suit through the 1990s. More have followed since then, including recent announcements by Hyundai Motor and Rivian Automotive to build multibillion-dollar plants in Georgia.*
  - <https://www.fastcompany.com/1512941/history-volkswagen> Although Volkswagen was the one of the first foreign car companies to begin manufacturing cars in the US with their Pennsylvania plant in 1978, they didn't join the southward move until 2008, when they opened a plant in Chattanooga, Tennessee.
- [Bill] Today a vehicle can be built anywhere in North America and shipped anywhere long distance by rail (and then if needed by ship), safely, securely, and relatively quickly. The cargo automobiles are typically offloaded at gated regional distribution hubs serving a number of dealerships within striking distance for a short-haul truck-rack to take them the final distance in small batches. For example, for a while there was a Ford hub in Ayer, Massachusetts, which is now closed, which served basically all the Ford dealerships in New England.
- [Bill] In many cases, as in the container business, the autorack trains will also first deliver to a much bigger transshipment hub for the automaker, either inland or on the coast,

where a large run of one particular factory's product can be re-shuffled into trainloads or shiploads bound for a single destination; it is rare for a single destination to want tons of the exact same product, which means there is not enough business to send a full trainload from the factory to the endpoint, but there might be enough for a full trainload of a bunch of different factories' products to that endpoint, and therefore shuffling the loads around at an interim point makes sense. That transshipment model also further encourages consolidation of production into a smaller number of factories in one place, as opposed to the old setup of producing the same model of car locally all over the country.

- [Bill] <https://en.wikipedia.org/wiki/Autorack> The current design of long, enclosed, bi-level or tri-level autoracks replaced open flatcars (including double-decker flatcars) or special boxcars. The special boxcars were an enormous pain to load and unload and couldn't carry many vehicles per car. The flatcars were able to carry more and load or unload somewhat more easily, but the vehicles on board were extremely vulnerable to damage (including simply flying gravel or weather) and were very inviting to thieves and vandals.
  - Circus trains and long military transport trains were fairly successful haulers of vehicles by rail flatcars, and of course long-haul trucks were beginning to appear sometimes on piggyback trailer flatcars in the 1950s (as we discussed in [our first containerization history episode](#)), but the retail auto industry had different needs from all these other rail transport users. Railroads and railcar manufacturers continued experimenting.
  - By the late 1950s, it was becoming clear that several design elements would be ideal for transporting new light vehicles to retail dealers: a bi-level or tri-level rack to carry more cars without being too tall to clear existing bridges and tunnels, roll-on/roll-off end-loading doors instead of side-loading doors, enclosed racks for protection, and a box length that maximized vehicle capacity without being too long to clear existing track curves.
  - (Interestingly, as a result of this iterative solution to the problem, today the underlying flatcars are owned and leased out by the special monopoly company "TTX" while the physical rack and shield system around and on top of these flatcars are owned by the railroad company itself, making each autorack car a joint partnership between TTX and a specific rail carrier, which we'll circle back to in a moment: <https://cs.trains.com/trn/f/111/t/248060.aspx> )
  - By the 1960s, multiple railroads and their suppliers were making and trying out autorack cars that were relatively similar to what we would recognize today, with some design variations. These were capable of carrying a dozen 1960s full-sized light vehicles or a dozen and a half compact cars. The protection question remained a big problem, with most designs merely offering a mild mesh or a few plates to repel debris. A sturdy enclosure did not happen until the mid-1970s. Autoracks would now have doors and corrugated steel siding. But in fact, even then, they weren't actually fully enclosed until the mid-1980s, when enough railroad trackage modifications were made across the country to allow autoracks the necessary bridge and tunnel clearance for roofs to protect the merchandise on the top deck. Non-roof autorack designs remained in service for a while for routes that had not yet been upgraded.
  - The standardization of design also meant that every vehicle could be transported by any autorack, and automakers were expected to comply with these size specifications, rather than needing specific autorack designs for specific lines of cars. (On the other hand, that was also basically the expectation in the early automobile era when they needed to fit into a boxcar sometimes.) As an additional layer of protection today, the automobiles being loaded onto the

autoracks are often covered in a white plastic material before delivery to dealers or at least before leaving the regional distribution hubs.

- There are now four internal configurations, all sharing a basic external design, which can carry a variety of vehicle types and quantities. The lowest density autoracks are a single enclosed level for moving a few very large, bulky vehicles like buses and farm equipment. The highest density autoracks are the “automax” version at maximum configuration for three levels of compact vehicles, which can cram in 26 vehicles. The more middle of the road configurations support either three decks of 15 sedans total or two decks of 10 larger vehicles like SUVs, minivans, and pickup trucks.  
<https://www.up.com/customers/track-record/tr081021-what-is-an-autorack-rail-car.htm>
- [Rachel] The bi-and tri-level flatcars are 89 feet long, while the uni-level flatcars are 82 feet long. The supersized “automax” cars are a whopping 145 feet long and are a double-length car that is articulated over a single middle truck. (Source: TTX)
- [Rachel] We have to talk about GM’s insane 1968 autorack concept “Vert-a-Pac”
  - <https://www.hagerty.com/media/automotive-history/all-aboard-when-new-cars-rode-the-rails/> Designed specially for transporting Chevrolet Vegas, the Vert-A-Pac could transport up to 30 compact cars nose-down, shaving up to 40% off of transportation costs.
  - *There was one little problem, however: Chevy wanted to deliver each Vega in ready-to-drive condition, which meant topping off all fluids before loading them onto the train. According to Railway Age, in order to stack the cars without the fluids leaking, Vega engineers designed a special oil-pan baffle “to prevent oil from entering the No. 1 cylinder of the car’s inline-four engine. Batteries had filler caps located high up on the rear edge of the case to prevent acid spills. The carburetor float bowl had a special tube that drained gasoline into the vapor canister during shipment, and the windshield washer bottle stood at a 45-degree angle. Plastic spacers were wedged between the powertrain and chassis to prevent damage to engine and transmission mounts. The wedges were removed when cars were unloaded. The doors were closed with a forklift tractor.”*
  - *Although the Vega wasn’t a great car—it had a reputation for unreliability, rust, and poor engine durability—it managed to last seven years and, of course, its short wheel base allowed for innovative shipping. When Vega and its rebadged sibling, the Pontiac Astre, were discontinued in 1977, so were the Vert-A-Pac racks.*
- [Bill] As the experimental designs consolidated from the mid-1950s to the mid-1980s and the current design used everywhere, eventually most manufacturers abandoned the field, leaving only the TrailerTrain Company, which became TTX Company in 1991, and which is now a monopoly supplier and co-owner with the rail carriers, as previously mentioned. TrailerTrain itself had been a joint venture originally of the Pennsylvania Railroad and Norfolk & Western Railway. Today it is owned jointly by 9 US, Canadian, and Mexican railroad companies. (TTX also in turn owns Railbox, a similar co-ownership pool model for boxcars, and Railgon which provides pooled gondola cars.) The main business of TTX, however, is flatcars (including autoracks) and intermodal piggyback carriers. This pooling arrangement, where the partner/owner rail companies pay for a proportional number of autoracks on TTX flatcars based on their projected share of automobile shipping in North America, is regulated by the

US government's Surface Transportation Board, the successor to the Interstate Commerce Commission. Under the pooling arrangement, the autoracks once leased and paid for are freely shared between all the railroads, so no one has to keep track of which specific carrier's autorack is being assigned to a delivery.

[https://en.wikipedia.org/wiki/TTX\\_Company](https://en.wikipedia.org/wiki/TTX_Company)

- [Rachel] <https://www.railwayage.com/regulatory/stb-extends-ttx-pooling-authority/>  
The STB has extended TTX's flatcar pooling authority 4 times, with the most recent extension conferred on October 1, 2014. The STB gave TTX a 15-year extension at that time. *STB listed numerous benefits of the pool, including promotion of research and development in new equipment, cost control as a result of standardized repair and maintenance, capital savings through more efficient use, and the increased responsiveness of the rail industry to the dynamic changes in the North American railroad network.*
- [Rachel] Amtrak's Auto Train (operating since the early 1980s after an unsuccessful privately owned 1970s Auto Train failed in 1981 - From [the Amtrak website](#): *The Auto Train transports you and your car (or van, motorcycle, SUV, small boat, jet-ski or other recreational vehicle) nonstop from the Washington, DC area to Florida, just outside of Orlando.*
  - It's the only motorail service in the United States. It covers 855 miles with non-stop service, replacing the need to drive that section of I-95, for nearly 200,000 riders per year. [https://en.wikipedia.org/wiki/Auto\\_Train](https://en.wikipedia.org/wiki/Auto_Train)
- Tons of interesting vintage photos of autoracks, including some in bad derailments!  
<http://industrialscenery.blogspot.com/2020/10/autoracks.html>