Decline in U.S. Passenger Railcar Competitiveness Signals New Infrastructure Concerns

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Foreign-owned manufacturers have produced almost all passenger railcars used in the United States since the 1980s. In recent years, China has become a globally competitive supplier for U.S. cities looking to upgrade their public transit railcar fleets. Increasing automation of these rail systems, however, is raising concerns about the national security implications of deploying foreign technology in U.S. public transportation infrastructure. This EBOT outlines key factors behind the decline in U.S. global competitiveness in passenger railcar manufacturing and describes the contributions made—and the concerns raised—by foreign participation in U.S. public transit rail systems.

Slowdown in U.S. passenger rail manufacturing

U.S. public transit rail fleets[1] were long supplied by once iconic U.S. motor vehicle and railcar designers and manufacturers such as American Car & Foundry, Budd Co., Pullman-Standard Car Co., and St. Louis Car Co.[2] Rohr Industries supplied part of the original fleets for both the San Francisco and Washington, DC metro systems and Boeing-Vertol made light railcars for Boston and San Francisco, but both ceased railcar production by the early 1980s. United Streetcar made trams for Portland, Tucson, and Washington, DC, but was only in business from 2005 to 2015. Brookville Equipment Corp., the only remaining U.S.-based transit railcar manufacturer of note, has supplied tram fleets for Dallas, Detroit, Milwaukee, New Orleans, Oklahoma City, Tacoma, and Tempe.[3]

What derailed U.S. competitiveness?

U.S. passenger railcar manufacturing fell after the mid-20th century as intercity rail demand declined with the rise in popularity of road and air travel. U.S. rail R&D also declined in line with falling intercity passenger rail demand, meaning that U.S. firms were not able to meet cities' demands for increasingly automated public transit systems.[4] In contrast, the continued popularity of rail travel in Europe and Japan led manufacturers there to invest heavily in rail R&D. By the 1980s, U.S. cities had to turn to foreign firms to modernize or expand their public transit fleets. New York ordered its first non-U.S. subway cars in 1983 from Kawasaki (Japan).[5] Cities with newer systems have fleets predominately or only from foreign suppliers. For example, after receiving its inaugural Rohr railcars in 1976, the Washington, DC Metro turned to Breda (Italy) railcars in 1983. The Los Angeles Metro launched in 1990 with all Nippon Sharyo (Japan) railcars, and Houston's light rail system launched in 2004 with all Siemens (Germany) trams.

How the Buy America Act reshaped the U.S. railcar manufacturing sector

To promote U.S. production, the United States enacted domestic content restrictions on certain federally funded transportation projects in statutes and regulations collectively referred to as the Buy America Act, which require U.S. railcar assembly, and 70 percent U.S.-content, by 2020.[6] As a result, foreign manufacturers supplying the U.S. market must establish U.S. assembly plants to be Buy America compliant (Boxes 1 and 2).[7] Consequently, the United

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[1] This article describes public transit rail systems. These include both heavy rail systems (metros and subways) and light rail systems (streetcars, also referred to as trams or trolleys).

[2] These companies ceased passenger railcar production at various points from 1960 to 1990.

[3] Brookville has made and serviced rolling stock and parts since 1918. It began production of a modern streetcar in 2011. BlueGreen Alliance, "Passenger Rail & Transit Rail Manufacturing in the U.S."; Brookville, "Streetcar Division."

[4] Michael Renner and Gary Gardner, "Global Competitiveness in the Rail and Transit Industry."

[5] Kawasaki, "History of Rolling Stock Company"; WMATA, "Metro History."

[6] Buy America restrictions date to the passage of the Surface Transportation Assistance Act of 1978 (Public Law 95-599). These restrictions differ from the Buy America Act of 1933, which requires federal agencies to purchase domestic products. Federal Transit Administration, "Buy America" and Congressional Research Service, Domestic Content Restrictions.

[7] Another reason for U.S. assembly is that railcars are generally assembled near the market they serve to reduce transport costs. Center on Globalization, Governance & Competitiveness, "U.S. Manufacture of Rail Vehicles for Intercity Passenger Rail and Urban Transit."

Box 1: Selected foreign-based passenger railcar manufacturers and their current U.S. assembly locations

Manufacturer (headquarters)	U.S. assembly location
Alstom (France)	Hornell, NY
Bombardier (Canada)	Plattsburgh, NY
AnsaldoBreda (Italy) / Hitachi (Japan)	Pittsburg, CA; Miami, FL
Construcciones y Auxiliar de Ferrocarriles (Spain)	Elmira Heights, NY
Hyundai Rotem (South Korea)	Philadelphia, PA
Kawasaki Heavy Industry (Japan)	Lincoln, NE; Yonkers, NY
Kinkisharyo/Mitsui (Japan)	Palmdale, CA
Siemens (Germany)	Sacramento, CA
CRRC (China)	Chicago, IL; Springfield, MA

Source: Compiled by author.

Box 2: Accounting for U.S. assembly: Washington, DC's 2010 purchase of 748 Kawasaki 7000 series metro railcars

Completed in Japan:
- designed and produced 4 prototype railcars;
- disassembled prototypes and removed components;
- shipped 4 railcar shells to U.S. plant.

Completed in the United States (Lincoln, NE):
- assembled and tested 4 pilot railcars using all new components;
- manufactured all remaining railcar shells;
- conducted all final assembly, including in-plant testing, with final U.S. domestic content valued at 69 percent.

Source: Federal Transit Administration, letter to Washington Metropolitan Area Transit Authority, July 23, 2010.

States is primarily a producer of and a market for railcar parts. In 2018 total U.S. exports of railcar parts (HS 8607) were valued at $1.4 billion with imports of $1.0 billion, while U.S. exports of railcars (HS 8603) were valued at $125 million with imports of $7.6 million.[8]

More than 22,000 people worked in U.S. rolling stock manufacturing in 2017 (public transit railcars are only a part of this total). More than half (56 percent) worked in production operations such as metal/plastic workers and welders (annual mean wage $41,520); 9 percent in installation, repair, and maintenance ($47,240); and 8 percent in engineering ($51,850). Less than 1 percent worked in software development and programing ($89,110)[9]—which could suggest that foreign railcar companies keep higher-paying R&D intensive jobs in their home markets (Box 2).

China now a major global railcar supplier and new cybersecurity concerns

China Railway Rolling Stock Corporation (CRRC), a Chinese state-owned enterprise, is the world's largest rolling stock manufacturer. CRRC has built railcars and constructed railways and public transit systems for cities around the world. Several U.S. cities have awarded railcar contracts to CRRC since 2014. Using U.S.-located assembly facilities, CRRC is currently building 100 railcars for Boston, 840 for Chicago, 64 for Los Angeles, and 45 for Philadelphia.[10]

In early 2019, Washington, DC Metro added cybersecurity requirements to its new railcar procurement request in response to potential security concerns, such as malicious software control of trains and surveillance of passengers, should CRRC be awarded the contract.[11] Also in early 2019 both the Senate and the House introduced legislation that would prohibit using federal transportation funds to procure Chinese railcars, as well as require transit agencies to have cybersecurity risk management plans.[12] With little U.S.-owned passenger railcar manufacturing, cybersecurity risk assessment and risk mitigation have emerged as new concerns when assessing the role of foreign participation in the modernization of U.S. public transit rail infrastructure.

[8] HS 8607 includes parts of railway or tramway locomotives or rolling stock. HS 8603 includes self-propelled railway or tramway coaches, vans and trucks. See also USITC, "Rolling Stock: Locomotives and Rail Cars."
[9] U.S. Bureau of Labor Statistics, "May 2017 National Industry-Specific Occupational Employment and Wage Estimates, Railroad Rolling Stock Manufacturing."
[10] CRRC, "Back to the Future Returning Manufacturing to Springfield, Massachusetts."
[11] Memo from Geoffrey A. Cherrington to Paul J. Wiedefeld, March 5, 2019.
[12] The Transportation Infrastructure Vehicle Security Act was introduced in the Senate on March 14, 2019 (S. 846) and in the House of Representatives on May 15, 2019 (H.R. 2739).