

Feature Meeting Problem-Solving Needs around the World



Commercial Aviation & Transportation Systems

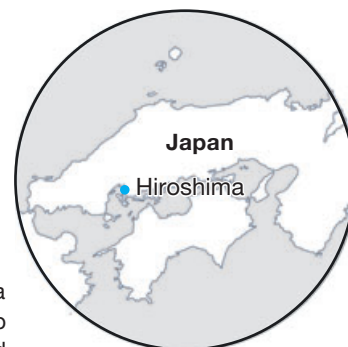
Shipbuilding & Ocean Development

Machinery & Steel Infrastructure Systems

Aerospace Systems

Delivering New Urban Transportation Systems that Are Safer, More Comfortable, and Friendlier to the Environment

Urban transportation systems are being reviewed in countries around the world against a backdrop of chronic traffic congestion, exhaust air pollution and a rapidly aging society. To help resolve these issues, MHI has developed advanced transportation systems like the Automated People Mover (APM) Systems, and 100% low floor Light Rail Vehicle (LRV), and so on.



Hiroshima’s highly advanced tram system — the most widely used in Japan — features the first domestically produced barrier-free 100% low floor LRV called “JTRAM”

It’s an easy means for people to get around. It produces no exhaust gas and is extremely energy efficient. The LRT (Light Rail Transit) is currently drawing attention worldwide for raising convenience to new heights, while leveraging the unique characteristics of trams.

One important player in the transition to LRT is the people-friendly LRV (Light Rail Vehicle). Barrier-free, step-less LRV cars are designed to allow passengers to board or alight directly from or to station platforms, but were not manufactured in Japan until recently.

Japan had long hoped for an LRV suited to its climate, topography and unique urban structure, and in 2005, MHI developed a bogie with an independent wheel system, an essential component of the LRV and the first of its kind in Japan. In the consortium U3 Project,



First domestically produced 100% low floor LRV, Green Mover max (5100-Series)

MHI together with Kinki Sharyo Co., Ltd. and Toyo Denki Seizo K.K., delivered the Green Mover max, the first domestically developed 100% low floor LRV to Japan’s largest domestic tramway operator, Hiroshima Electric Railway Co., Ltd.

The development concepts of the U3

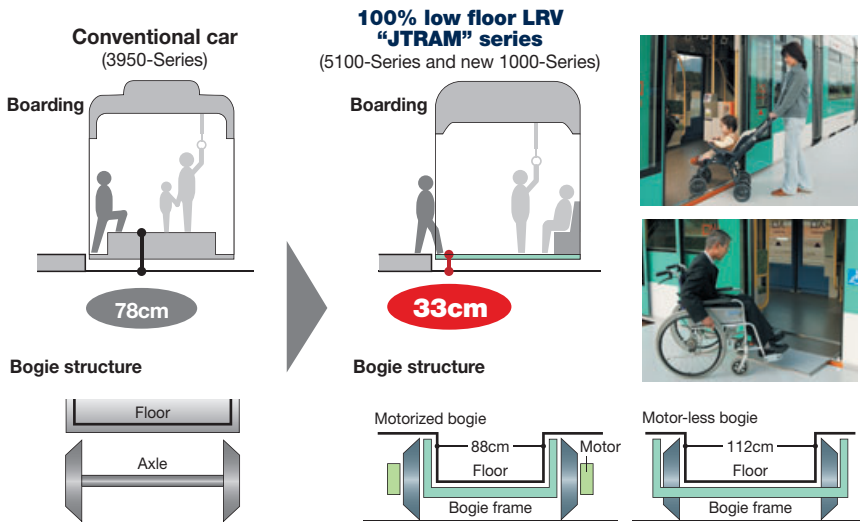
Project were defined as “Ultimate,” “User-friendly” and “Urban.” The conventional step down from the tram to the platform was eliminated, resulting in a more accessible transportation means for senior citizens, parents with baby strollers, and individuals in wheelchairs.

In February 2013, the U3 Project delivered the “JTRAM R,” (called 1000-series vehicles in Hiroshima) that maintains the barrier-free design of the Green Mover max while adopting a more compact design and shorter car length. Shortening the overall length made it possible for the 100% low floor LRVs to run on all lines in the city, including those where station platform lengths had previously made introduction difficult.

In the future, MHI will continue to provide transportation systems that are easy to use and reflect the needs of the times.

Safe and Pleasant Boarding with a Floor Height of 33cm

Comparison of ease of access and bogie structure



Newly developed axle-less cars

In conventional cars, the left and right wheels are connected by an axle, which determines the floor height. The newly developed, independent wheel bogie makes it possible to considerably lower floor height of the car by eliminating the axle and bringing the door threshold to within 33cm of the ground.

Automated People Movers and Rail Transit Systems at Work around the World

MHI also provides rail transit systems that contribute to the safe operation of railways, and APM (Automated People Mover) systems with fully automated cars running on rubber tires that are used in airports and urban areas. By taking regional issues and characteristics into account and comprehensively providing everything from car manufacture to administration systems, MHI is contributing to the resolution of urban transportation issues around the world.

Improving Comfort, Safety and Environmental Performance

Conserving greater energy with car control

As a means of transportation, trams are environmentally friendly. Using advanced control technology to run the motorized bogies on the U3 100% low floor LRV "JTRAM" makes travel more comfortable while keeping power consumption low and energy savings high.

CO₂ emissions per passenger-kilometer by modes
(g-CO₂/pkm)

Private car 188

Public bus 94

LRT, Trams 36

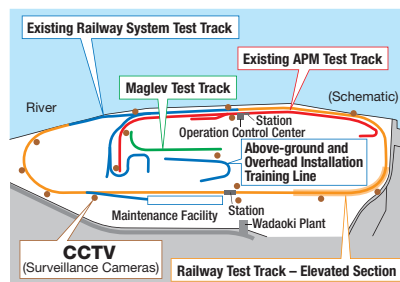
Source: Ministry of Land, Infrastructure, Transport and Tourism, 2002 white paper

Reduced noise and vibration

In comparison to conventional cars, the new bogie, low center of gravity, light car body and other features of the U3 100% low floor LRV "JTRAM" contribute to a reduction in noise and vibration.

Safety demonstrated on dedicated test line

MHI has a large-scale test rail track at its Wadaoki Plant (Hiroshima Prefecture, Mihara City) that was used to thoroughly verify the safety and comfort quality of the cars. In addition, with an eye on global development, MHI plans to establish Japan's first comprehensive railway transportation system verification facility in the same area (in 2014), with the aim of making the facility available to other corporations and public and private groups.



Improvements in safety and comfort to be undertaken at the MIHARA Test Center, Japan's first comprehensive railway transportation system verification facility



Singapore Changi Airport (APM)



Tokyo, Yurikamome (APM)



Dubai Metro (Rail Transit System)



New compact 18m 1000-series LRV began commercial operations in February 2013.

Voice Expectations of MHI

Admiration for development of domestically produced LRV and high hopes for expansion abroad

Vehicle comfort as a living space stands alongside vehicle performance as one of the desirable elements in the development of LRVs in Japan. Other differentiating elements from those of overseas include pleasant climate control, adequate number of seats, aisle width that allows for unimpeded movement inside the train, and the necessary facilities for correcting fares. MHI has developed an LRV that specifically meets Japan's uniqueness.

In the future, I hope the company will further refine safety and comfort by expanding the test tracks. In addition, I would like to see the expansion of this LRV, in which Japan's meticulous consideration is given full play, and would like MHI to expand its system coordination and operation services to areas overseas as well.



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