

## Rail Doing the locomotive

There are countless reasons why a rail network is the jewel in the crown of any public-transport system. When it comes to moving us around a city, no method of transport offers greater speeds, higher capacities and more reliability than light rail and its underground cousin, the metro. When it comes to connecting cities, rail also offers convenience, comfort and centre-to-centre travel.

The catch? Well, rail's main drawback has always been its high cost. In the past the way most cities made it economically viable was to generate revenues from retail spaces built into stations. Yet with large-format retail – from department stores to shopping malls – struggling all over the world, this may not be a suitable business model for long.

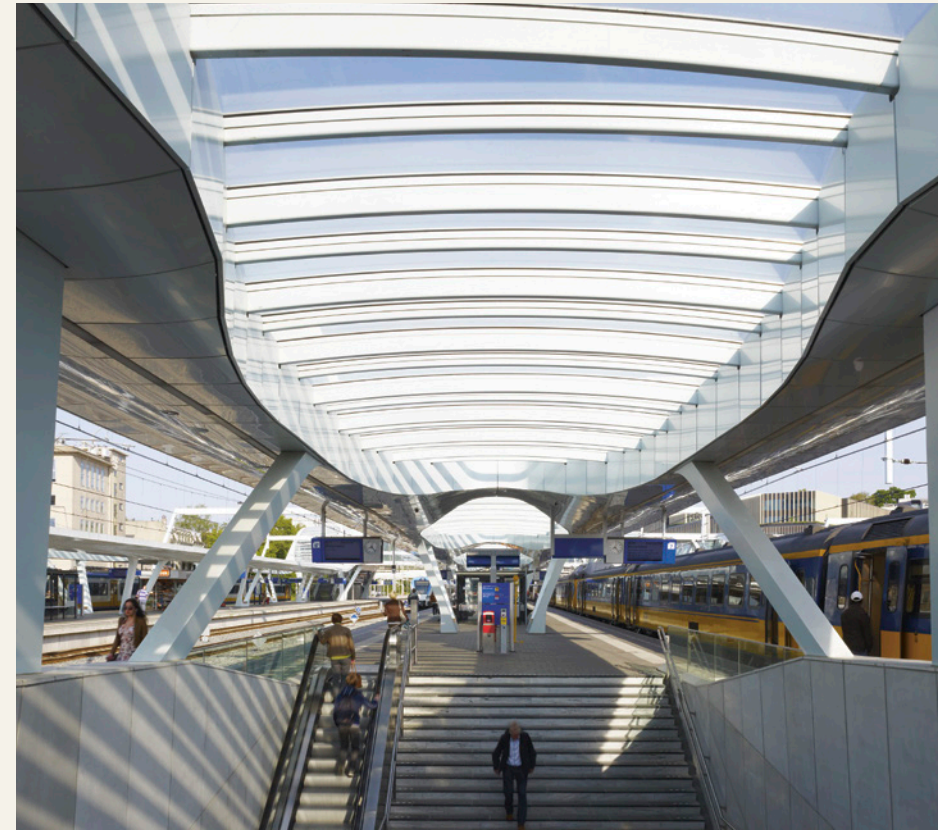
Instead, planners should look to cities that have tried something different. In Hong Kong, for instance, rail stations are used as platforms for residential property development and the transit operator is a rare thing: profitable. Rotterdam station is productive in a different way: 130,000 photovoltaic cells spread across its roof create valuable energy. Meanwhile, the central station of Arnhem has been placed at the heart of a new development and is an economic engine for the city.

### New cathedrals *Arnhem, the Netherlands*

Gone are the days when train stations were unloved buildings in seedier parts of town; the modern equivalents are architecturally spectacular and act as the beating hearts of vibrant city districts. In the Netherlands, the government has implemented a long-term plan to turn six vital stations into “cathedrals of a new era” and Arnhem Central in the country's east is a prime example.

When the plan for the new station was drawn up in 1996, the architects at the Amsterdam-based UNStudio knew that they wanted to create a new meeting point for the city. So they added commercial spaces, a conference centre, a big bus station and walkable links to a plaza with offices, shops and a cinema complex.

When it was finally completed in 2015, after several stages of construction, Arnhem Central was a destination in its own right; global companies have since taken up the office space and passenger numbers are set to be double what they were in 2009 by 2020. It's a perfect example of what modern rail stations should be: prime locations; multi-modal hubs integrating bus, tram and bike; new economic engines; and catalysts for urban renewal.



### Companies building the future of mobility *Leaders of the pack*

- 1. Bombardier:** The Canadian aerospace and transportation company Bombardier is a market leader in automated trains and metros. One of its most impressive driverless projects is the Downtown Line in Singapore, the longest fully automated underground metro line in the world. The company supplied Singapore with 264 unmanned Movia metro vehicles, which can travel at 90 km/h.
- 2. ThyssenKrupp Elevator:** As the number of tall buildings under construction increases, so our need for smart ways of getting up and down them grows too. The German manufacturer ThyssenKrupp Elevator (see page 114) is creating the technology to achieve just that. The Multi – the world's first rope-free lift system – allows more people to travel higher within a building without lift shafts taking up too great a portion of the floor plan.
- 3. Audi:** All big car brands are hurrying to adapt to the changes in the automotive industry but Audi has taken great strides. The German marque is developing technologies that will transform the mass-produced private automobile more dramatically than anything in its 109-year history. From autonomous technology that will be able to take over from the driver to longer-lasting batteries that will make electric vehicles more viable, the legacy player is across key developments in a sector that is now moving at great speed.