



Small cities are jumping on the rail bandwagon with expensive subways and trams, boosting civic pride and adding a definite glam factor. But critics argue rail links – whether above or below ground – are far from the best transit option for diminutive urban centres

HAPPY

BY ALLISON MILIONIS

RAILS?

OPPOSITE PAGE

TOP Perugia's Minimetrol moves up to 3,000 passengers per hour in each direction. The cars, just 5.7 metres long, are pulled along the track by six kilometres of rope powered by electric motors.

CENTRE Jean Nouvel designed Minimetrol's stations and bright red track. The glazed above-ground stations give riders a beautiful view of the hillside landscape.

BOTTOM Up to 25 cars travel along Minimetrol's three-kilometre track, whose seven stops include Madonna Alta station. The cars arrive at 60-second intervals, virtually eliminating wait time.

Perugia made a big splash at the inauguration of its small metro line this past January. Perched on a hillside in Italy's central Umbria region, the tiny city had reason to celebrate. It had daringly invested in a tram – not to remedy commuter gridlock, but to reduce congestion and improve mobility through the city. At €95 million for a mere three kilometres of service, Minimetrol is hardly a bargain. But supporters say the sleek train serves their city well – and looks good doing it.

No wonder. The five stops and two end stations, some multi-level, some underground – strung along a bright red tramway that snakes from the city's west end to the central old town – were designed by Jean Nouvel. The Pritzker Prize-winning architect presided over the artistic design and planning, ensuring the stations would complement the hillside setting. Composed mainly of glass and steel and concrete supports that appear to float, each above-ground stop provides an ideal frame through which riders can view the Umbrian landscape. With 25 fully automated cars carrying up to 50 people each, the metro takes less than 12 minutes to travel from the base of the hill to the city centre at the top – faster than it takes a car or bus to make the trip. City officials estimate Minimetrol will replace nearly three million cars on Perugia roads each year, reducing carbon emissions and improving residents' quality of life.

Home to 150,000 inhabitants, Perugia represents one of many small cities opting to build expensive rail systems to achieve what the most glamorous cities in the world take for granted. While many state population growth as a reason for the investment, others note environmental concerns, high energy costs, or the simple desire to offer citizens a modern transportation



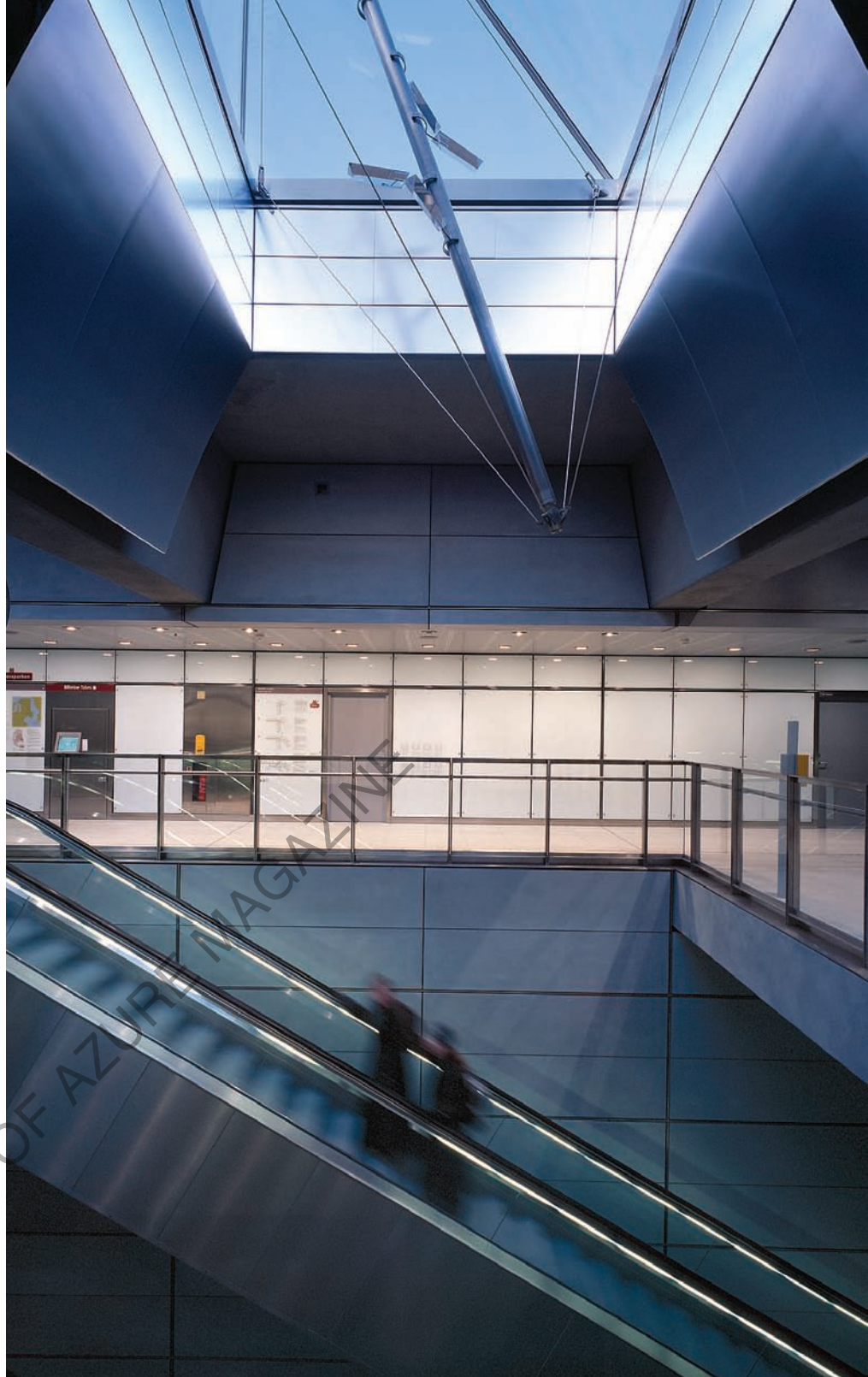
"WHAT MAKES THE LIFE OF THE CITY, AND HOW WOULD A SUBWAY IMPROVE UPON THAT?"

alternative. Regardless of the reason, the rail projects are usually met with buoyant enthusiasm and civic pride.

Rennes, located in northwestern France, is one of the smallest European cities to build a subway system. With a population of just over 200,000, it doesn't suffer from the congestion that strangles larger cities such as Paris or London. But the rail system is part of the city's overall planning philosophy: emphasizing a condensed downtown core and lamenting suburban sprawl, urban planners base the city's development on "a European and not a North American, or automobile-oriented, model." Like the Minimetrol, Rennes's trains are completely automated. The city's use of *véhicule automatique léger*, or VAL, for mass transit, follows other French cities such as Paris and Toulouse. A boon to riders, the driverless trains prove immune to rail workers' union strikes, a common occurrence in France. The two-car system serves 15 stations – over nine kilometres of track from north to south – in just 16 minutes, by remaining underground for 80 per cent of the trip. A second, east-west line is planned for the future.

On a slightly larger scale, Copenhagen recently swung open the doors to its award-winning metro. The Danish capital prides itself on a long urban history, which is exactly why it chose to build a large portion of its automated rail system underground. "Copenhagen is in its nature an old city with an extensive legacy. A heavy and visible transportation infrastructure will always draw focus away from the city's beauty and history," says Lars Mollegaard Nørretranders of KHR Architects. The firm oversaw the design and planning of the project, which includes two rail lines that service 22 stations, nine of them underground. KHR designed skylight prisms that allow natural light to infiltrate the underground stations, 20 metres below the street. The prisms also connect the activity below ground with the energy on the street above.

But not everyone is convinced that a rail system – above or below ground – makes sense for small cities, no matter their aspirations for greenhouse gas reduction or careful development. "There really isn't the density and critical mass to justify subway investments in many cities under five million population," says Robert Cervero, professor and chair in the department of city and regional planning at the University of California, Berkeley. "This is especially so in the developing world, where most rich people with good-paying jobs in urban centres drive, and most poor people don't commute to downtowns, which subways usually focus on. Certainly, skyrocketing fuel prices and rising concerns over global climate change could change the equation in coming years and justify future rail investments. But even then, bus rapid transit likely makes more sense for smaller cities worldwide."



OPPOSITE TOP Local firm KHR Architects oversaw the design and planning of the Copenhagen Metro, which was built primarily underground, so as not to detract from the historic city's beauty.

OPPOSITE BOTTOM Copenhagen's system, consisting of two rail lines servicing 22 stations, was awarded the world's best metro at the Metrorail 2008 Conference in Copenhagen. An extension is due to open in 2018.

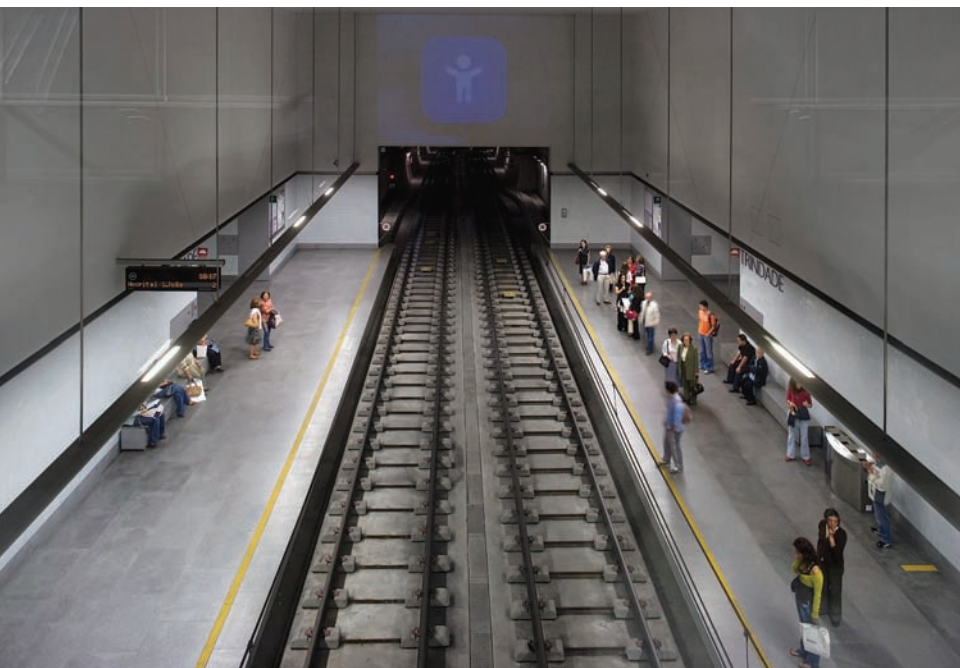
BELOW KHR Architects' specially designed skylight prisms direct daylight into the stations 20 metres below. They also provide passengers with orientation and security.

Panos D. Prevedouros, professor of civil and environmental engineering at the University of Hawaii, Manoa, concurs, adding that the construction of transit systems is a highly political endeavour. "From an engineering and economic standpoint, barring exceedingly rare circumstances, a subway for a small city is suicidal in terms of cost and effectiveness, unless the system is built largely as a donation by a superpower in exchange for other benefits, which leads to the questionable priorities and gains of those in charge," he says.

Prevedouros adamantly opposes the rail system planned for his adopted city of Honolulu, which could cost upwards of US\$6 billion. Though the population remains under a million, freeways and major thoroughfares are often snarled by traffic. The plan currently under way calls for an elevated rail system similar to Vancouver's SkyTrain. The 54-kilometre network would service a station every 1.6 kilometres, from the west end to the University of Hawaii. While supporters say it will get cars off the roads, cutting air pollution, Prevedouros, who is now running for mayor of Honolulu, argues that it will not attract riders or reduce traffic congestion. In an op-ed piece published in a local daily, he wrote, "Honolulu should rank last in priority of funding for a rail system due to its small population and tiny carbon footprint, which will grow larger if rail transit is installed." He explains that even in cities with medium to high utilization, rail systems do so little work in off-peak hours, and yet the trains run 20 hours per day, producing a huge carbon footprint.

But the arguments against rail systems hold little weight in most cities seeking new transit options. Indeed, large and small cities in Africa, Asia and even the Caribbean are implementing rail-based transit systems in the name of attracting business, tourism and, perhaps, political clout. In Santo Domingo, the capital of the Dominican Republic, a new rapid transit line – the second in the Caribbean, after San Juan, Puerto Rico's – was inaugurated in February. President Leonel Fernández championed the US\$700-million-plus project. Supporters rallied behind him, calling the move a major step toward a more modern city and a source of national pride. Critics, however, say it's a political ploy and an outrageous





HIGH ENERGY COSTS, ENVIRONMENTAL CONCERNS AND POPULATION GROWTH ARE SOME OF THE REASONS SMALL CITIES INVEST IN RAIL

ABOVE The electric-powered Metro do Porto in Porto, Portugal, is modelled on those of Milan and Strasbourg, France. The cars are 75 per cent laminated glass, to provide optimal visibility above ground.

BELOW With 78 stations (15 of which are underground) on four lines, the Metro do Porto can move up to 9,000 people per hour in each direction. The system also features a contactless ticketing program.

expenditure, considering Santo Domingo's frequent power outages and crushing poverty. Servicing 16 stops along a 14-kilometre line, the subway is intended for commuters. Even in Bogotá, which boasts an impressive BRT network, the new mayor is pushing for a rail system rather than expanding the bus lines.

Eric Owen Moss takes a wide-angle view of mass transit development, and like Prevedouros argues that each project and its goals should be assessed individually. The Los Angeles-based architect has conceptualized numerous urban planning projects; his most recent such design won the City of the Future, Los Angeles, competition that aired on the History Channel. His plan – weaving together buildings, freeways, train tracks, power grids and riverbeds to create a vibrant, functioning neighbourhood – would revitalize downtown L.A.'s impoverished east end and connect it to other areas. He says the choice of a transit system should respond to a city's humanity, as well as its topography. "What makes the life of the city, and how would a subway improve upon that? It seems to me [a public transit system] should be about what problems the technology is [able to] solve," he says.

But that doesn't make an impression on BRT advocates, who insist buses are the best form of mass transit – for any size city. "Very few cities can afford a subway system," says Aimée Gauthier, senior program director at the Institute for Transportation and Development Policy in New York. "BRTs make it possible for the government to operate a transit system without operating subsidies. It's virtually impossible to cover the cost of a subway – ever." And as far as image is concerned, Gauthier says investment in a good transit design, rail based or not, is up to the will of the government. "It's psychology," she says. "People want and will use good-quality transportation, and part of that is the image and branding. It is just good marketing."

While the glam factor may be part of a rail system's appeal over a BRT, the small cities that have chosen to invest in a subway, tram or light rail train have done so because it fit their respective needs and solved a specific problem. **AZ**

