

City Talk

The Sydney monorail rolls through the city's downtown in the last days of its operations in June 2013. Below: Tokyo's automated guideway transit system.



MONORAIL DOESN'T HAVE CRITICAL MASS WE NEED

I have seen a lot of discussions recently over the potential suitability of various mass transit systems, especially for the Choi Hung-Sau Mau Ping-Po Tat extension of the proposed East Kowloon line.

The Transport and Logistics Bureau suggests using a light rail system or guideway system, but some parties are pushing for a monorail system.

Let me try and explain the advantages and disadvantages of these systems.

Light rail system is similar to a mass transit railway one, but as it has lighter carriages, it is a better choice for areas where commuter traffic is not too heavy.

As it travels on a standard 1,432 millimeter twin track gauge, a wide range of rolling stock is available, and its components are easily upgraded and replaced.

Being lighter, it can also climb steeper slopes and run quieter, making it ideal for operations in a satellite district.

Monorail systems run on a single rail, usually on overhead viaducts.

They are visually pleasing and quiet, hence used for ferrying tourists around a city or for theme parks.

They have limited capacity and their main disadvantage is proprietary systems and specialist components that make them not incompatible with rivals.

Monorail operators often find that after a few decades of starting up, manufacturers have lost interest in that line of business or even ceased to exist, resulting in difficulties getting parts, causing the system to become too expensive or hard to maintain for commuter use.

A guideway system is a dedicated vehicle path, applicable to ground-level and viaduct operations.

Rubber-tired vehicles are often used, and the main advantage is the ability to add carriages to meet demand, and minimal in-built infrastructure as it does not need steel rails or a power supply.

It is therefore the best system for a new district where traffic patterns have yet to be established and capacity has not reached that for a light rail system.



Nuts and bolts

Edmund Leung

It can also climb steeper gradients than steel-wheel and rail-rolling stock.

Compared to the above systems, the heavy mass transit rail system is for much larger passenger capacity.

It is most efficient for busy city travel but invariably, with the heavier infrastructure, investment costs are much higher, and they occupy a larger footprint at station locations, which makes planning hard in a built-up city.

As it cannot climb steep slopes, auxiliary systems – elevators and escalators – will be required for use in hilly terrains to get passengers back to road levels.

I therefore find it interesting that some systems are proposed as alternatives to others.

For me, they are progressively different systems to cater for a range of commuter needs, starting with guideways, then light rail and then heavy rail.

Readers will note that I have not put monorail on this list as I believe it is not for commuter use, and there have been very few cases of monorails seeing continuous operation for decades.

Sydney is typical of what happens eventually to a monorail system.

A guideway system is a better option for low-capacity commuter travel as it is flexible and with AI, the operation of various vehicles will require a smaller number of operators than buses.

The phrase “horses for courses” can aptly be applied to commuter transport systems and an inappropriate selection can often lead to operational and maintenance headaches.

Fortunately, transport engineers are well versed with the pros and cons of these systems, and we can rely on them to find the optimum solution for us.

Veteran engineer Edmund Leung Kwong-ho casts an expert eye over features of modern life