

Mitsubishi 'Urban Flyer' Assessment



Overview

The Mitsubishi monorail product follows the French SAFEGE ("*Seifejji*") design. Currently there are two installations at Shonan and Chiba in Japan. The Shonan monorail is a single track with passing loops at most stations. The larger Chiba system has two guide ways and more modern vehicles.

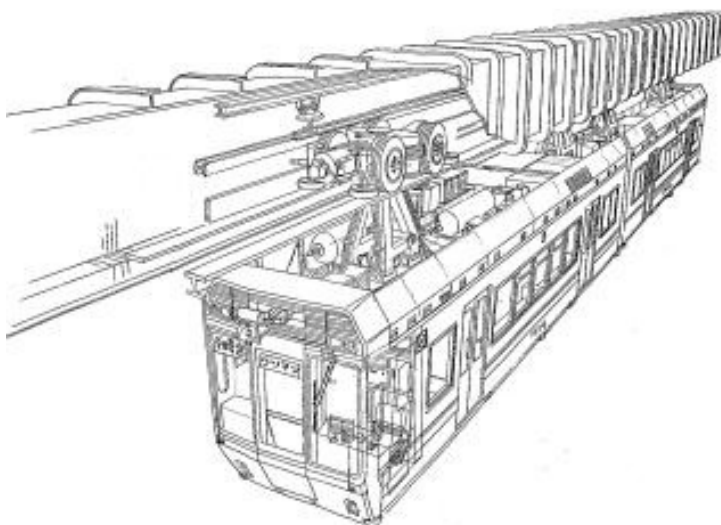
This product has potential for use in Australia provided that:

- Vehicle speed can be raised to the speed of cars on most city roads (80km/h). Operating speed is given as 65km/h but this may be due to the short distances between stations on the Chiba monorail route making higher speeds impractical.
- The guide way design can be improved to match that envisioned in the rendering in the front page image. This image is taken from the Chiba monorail site so it seems likely this can be achieved.
- Trains can be automated. This would allow a single crew member to manage security and safety on the vehicle. Due to a culture of vandalism in Australia all transit vehicles need a security guard.

Mitsubishi Urban Flyer Product

The following information is translated from the Chiba Monorail web site (<http://chiba-monorail.co.jp>)

1. The wheels, truck and main motor and the like are incorporated into a box-shaped track beam. Rubber tyres ensure there is little noise and vibration.
2. Horizontal vibration of the vehicle is reduced by the action of the suspension link which prevents swinging via the action of the guide wheel.
3. Installation width is kept narrow by using steel posts.
4. Support pylons can be mass produced reducing construction time. Due to the covered beam the system is not affected by weather conditions such as rain and snow.
5. At Chiba the vehicles are a two-car electric fixed formation constructed from an aluminium alloy. Four car sets can also be used.



Type 1000 Specifications

This is the older style of Urban Flyer in use on the Chiba monorail.



Format	Type 1000 (SAFEGE expression suspended type monorail)
Capacity	Total 79 people per carriage with 37 standing and 42 seated plus wheelchair places.
Principal dimensions	[Body length] height × width × length (mm) 15,400 × 2,580 × 3,705 [connecting surface between length] (mm) 15,400 [the truck centre-to-centre distance] (mm) 9,500 [fixed axis distance] (mm) 1,650
Own weight	21.5 tons
Car body	Aluminium alloy
Electric mode	1,500 V DC
Main motor	DC series wound, low-noise, output 65kW (voltage 375V, current 195A)
Control method	With field weakening electric cam shaft-type resistance control with dynamic braking
Brake system	Electric command-type direct electric brake, electro-pneumatic type switching, security brake and parking brake
Truck	Rubber tyre air spring-loaded two axle truck
Drive unit	With differential gear, single-stage deceleration right angle drive system (reduction ratio 6.833)
Suspension system	Trapezoidal link left and right damping with oil damper
Performance	[Operation maximum speed] 65 km / h [acceleration] 3.5 km / h / s [deceleration] 3.5 km / h / s (regular maximum), 4.5 km / h / s (emergency)
Guide-way	1.86m x 1.89m. Power rail is inside the beam.

Form 0 Specification

Form 0 is the new design of Urban Flyer.



- 14,800 mm × 2,580 mm × 3,085 mm:
- 30 people seating capacity, total people 78 per carriage
- VVVF inverter control: and control system and safety equipment & automatic train control system (ATC)

Form 0 Interior

This shows inward facing seats. We would prefer 2x2 reversible seating to allow seated passengers to better appreciate the excellent view from these vehicles.





Safety

- Automatic Train Control
- Auxiliary wheel suspension in the event that main tyres fail with safety wire rope
- As a measure to ensure safety of navigation on, it is equipped with a TD device to figure out where on the route and on the ATC unit to stop or control the train speed automatically train or running.
- Train to train and train to ground evacuation is possible via a chute.



- Carriages all have intercom units



Stations

The suspended design allows naturally safe stations with good disabled access to the vehicle. Presumably platform screen doors could be fitted.



Pylon design

A wide range of pylon designs are in use at Chiba.



Improving the Track Design

Some sections of the Shonan monorail have the sides of the guideway covered to create a smooth finish as shown below.



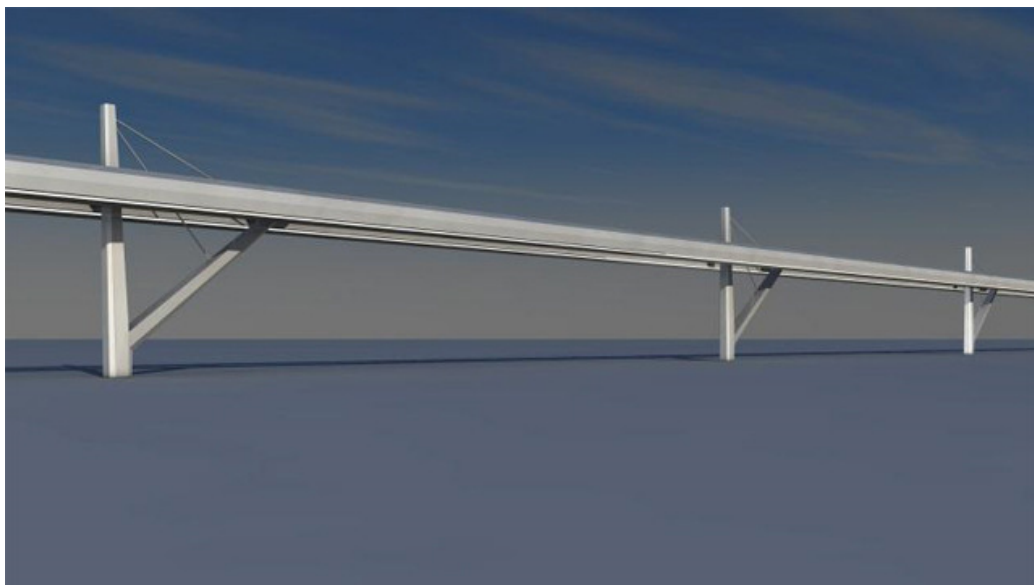
Covering the ribbing at the base of the guideway would further improve the appearance as shown in the adjusted image below.



Montreal Proposal

This proposal was suggested for a Montreal transit system. (See <http://www.trensquebec.gc.ca>) A key feature is that the guide way uses cable -stayed support improving the appearance of the guide way and increasing pylon spacing.

Of course this is just a design, how practical it would be is not known.



Mitsubishi Crystal Flyer

Little is known about this product except for this image on the Mitsubishi web site. To date we have been unable to contact Mitsubishi for more information.



As at 27th Jun 2015

<http://www.MonorailsAustralia.com.au>