

# City Talk



The Mexico City train overpass collapse fueled outrage and demands for a probe.

## HOW THE CITY AVOIDS MEXICAN DISASTERS

The train accident in Mexico City has, once again, struck fear into commuters' hearts.

After all, their lives hinge on the integrity and safety of the railway system.

In this case, the beam supporting the railway tracks failed to serve its purpose, causing a section of the viaduct beam to collapse together with the running train.

This line only started operating in 2012, so it is not a worn-out system in urgent need of repairs. But fatalities of more than 20 and injuries to over 80 cannot be ignored.

Viaducts are used for railway alignment, segregating them from road traffic. They help minimize the use of road space, which is especially important in congested cities.

But with trains running on viaduct beams, the safety of the operation heavily depends on the strength of the beams and the columns supporting them; a stringent inspection and maintenance schedule is vital.

According to pictures of the accident scene, the two adjacent columns remain intact.

It also showed that the column's bifurcation (the point where the railway line begins splitting into two lines to allow trains to travel two different routes) suffered more damage.

That half of the beam had dislodged from the rail and fell to the ground, while the other half of the beam was still supported on the other column.

What is not certain is whether the critical failure first occurred at that column support or at the midspan of the bridge.

We suspect that it could be a design defect or issues with the construction quality.

It could even be that the beam was designed and constructed appropriately, but suffered damage during an earthquake, and the subsequent inspection and repair work was inadequate.



### Nuts and bolts

Edmund Leung

After Mexico City suffered an earthquake in 2017, it is possible that some cracks could have developed in the structure and weakened it over time.

From the visual evidence, we can almost rule out that the accident was caused by a heavy vehicle hitting the column.

Whatever the reason, a thorough inspection of the complete viaduct system, including all columns and beams and their supports, now seems inevitable to secure the necessary confidence of the city's commuters.

In Hong Kong, we are fortunate that there are not many railway viaducts that cross road traffic, but in case they do, those columns are well protected in case vehicles were to crash into them.

Our design code also requires that these columns be able to withstand substantial impact by heavy vehicles, both at bumper level and at a higher point of likely impact, to ensure no chance of column failure.

Furthermore, where viaducts run close to road traffic, the column bases are protected from road traffic to further minimize such an occurrence.

Finally, we have a comprehensive system of inspection and quality control from design to construction, ensuring that the whole structure is in good order and capable of serving us throughout its lifespan of 50-plus years.

So next time we enjoy the scenery when we travel on railway viaducts with its commanding views, we need not be concerned with risks of viaduct structural integrity threatening our safety.

Happy and safe railway travel to all.  
**Veteran engineer Edmund Leung Kwong-ho casts an expert eye over Hong Kong's iconic infrastructure**