



Nu är det premiär för DSMGs nyhetsbrev. Ambitionen är att komma ut med 4 nummer per år. Innehållet kommer att variera, men ett stående inslag blir Runes hörna, där vår ordförande Rune Wigblad delar med sig av sina tankar. I det här numret kommer en imponerande sammanställning av olika maglevtåg som vår medlem Kenji Eiler åstadkommit. Läs och inspireras.

I redaktionen för nyhetsbrevet ingår för närvarande David Örnberg och Jan Wogel. Vi tar gärna emot bidrag och synpunkter.

[maglev.scandinavia@gmail.com](mailto:maglev.scandinavia@gmail.com)



David Örnberg



Jan Wogel



## Runes hörna juni 2022

Vi har nu med stolthet skapat en ideell förening (DSMG = Den Skandinaviska Magnettågs Gruppen) eftersom det uppenbarligen kommer att bli en lång kamp för att det ska kunna bli något magnettåg till Sverige.

Medan Sverige står i begrepp att starta ett pilotprojekt med den gamla tekniken Höghastighetståg på "Ostlänken", och valrörelsen bara handlar om för eller emot höghastighetståg, väljer Japan, USA, och Kina pilot-satsningar på magnettåg för höga hastigheter (400-600 km/h). Nyligen vittnade Japans nya premiärminister om att magnettåget fortfarande har högsta politiska prioritet ([https://www.nippon.com/en/news/yjj2022052800140/?fbclid=IwAR3CWhme209jPQITkD\\_tFo6AY\\_KQ\\_8450uFkqF5YNCR4HdEN9k6q5Nj0v78#.YpH3GEOxgPc.facebook](https://www.nippon.com/en/news/yjj2022052800140/?fbclid=IwAR3CWhme209jPQITkD_tFo6AY_KQ_8450uFkqF5YNCR4HdEN9k6q5Nj0v78#.YpH3GEOxgPc.facebook)). Medan Kaliforniens höghastighetståg har stora svårigheter ([Train to nowhere: can California's high-speed rail project ever get back on track? | California | The Guardian](#)) satsar NorthEast Maglev (USAs Östkust) på magnettåg av Japansk typ (<https://northeastmaglev.com/>), för att knyta ihop Washington med New York och med ett pilotprojekt mellan Washington DC och Baltimore i en första etapp.

En svårighet som vi arbetar med i magnettågsgruppen (DSMG) är att bedöma vad som händer i Kina. Kenji har nu inför MaglevBoard <https://www.maglevboard.net/en/> presenterat en utmärkt översikt över utvecklingen av olika magnettågsvagnar de senaste tre åren. Denna intressanta översikt bifogas detta nyhetsbrev. De flesta tågagnarna har utvecklats i Kina. Vi vet också att de lokala/regionala myndigheterna i Kina ligger på och vill bygga ut magnettågsbanor. I början av 2020 fanns lokala planer på 9 magnettågslinjer med en hastighet på 400-600 km/h i Kina. Förutom visionen Shanghai-Beijing fanns det ett tryck från

många provinser att få magnetåg som visade sig i olika offentliga publiceringar. Debattinlägg från den tiden överskattade dock betydelsen av dessa publiceringar i en centraliserad stat som Kina. Under våren 2021 fattades ett centraliserat beslut i Kina som innebär att de närmaste 5 åren satsade på två pilotprojekt för magnetåg vilket har framhållits i senare debattinlägg. För ett år sedan kom det ett uttalande (mars 2021) från LU Dongfu som är högsta chef för det kinesiska järnvägsföretaget CRC, där han pekar ut två pilotprojekt de närmaste fem åren i Kina, det vill säga fram till 2026 ([https://asiatimes.com/2021/03/china-revs-new-high-speed-train-building-spreed/?fbclid=IwAR0MPpsKxRxwAvMQhsdaHHrfUSeg9CIYD2Caw\\_nhX6CTSNHEdqmarUp-Fn0](https://asiatimes.com/2021/03/china-revs-new-high-speed-train-building-spreed/?fbclid=IwAR0MPpsKxRxwAvMQhsdaHHrfUSeg9CIYD2Caw_nhX6CTSNHEdqmarUp-Fn0)).

Min bedömning är att Kina förmodligen står inför en så kallad "ketchupeffekt". Om ungefär fyra/fem år kommer alla projekten ur flaskan på en och samma gång.

Rune Wigblad



What has happened in the last 3 years...

Meeting The International Maglev Board (IMB)

8.4.2022

Dipl.-Ing. Kenji Eiler

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The International Maglev Board



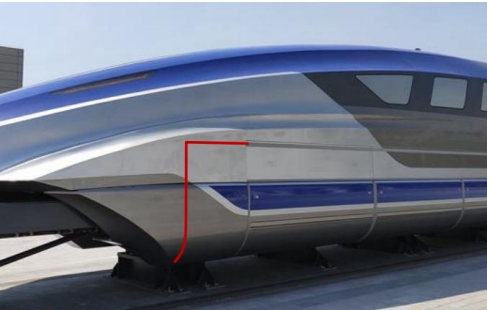
## May 24, 2019: Presentation of the CF600 mockup in Qingdao

### Presentation of the car body mockup

Image source: Sakura (Twitter)



The missing flap compared to the standard train is clearly visible



Mockup has no extension of the side panels as in the serial train. These can not be retrofitted either



Mockup is pushed on railroad wheels, but only inside the Factory premises because UIC profile exceeded



The mockup comes very close to the real pre-series vehicle. Nevertheless, clear differences can be seen



## April 29, 2020: Qingyuan Maglev presentation



July 6, 2018: Award of the contract to CRRC  
Manufactured by CRRC Changchun Vmax =  
120 km/h 8 poles per SG, nominal air gap  
8-10 mm

## August 21, 2020: Maiden voyage in the hall



## 8/28/2020: Start of construction on the Qingyuan Maglev line



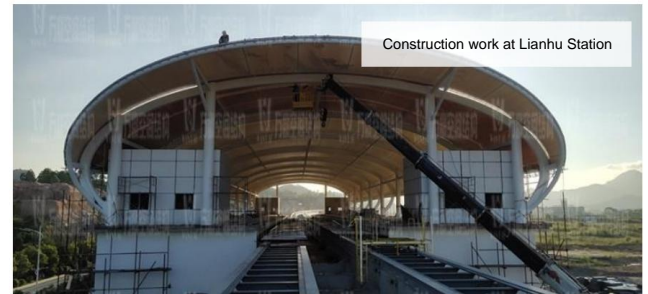
Casting of support #0 in the night, 8/28/2019

total 38 km long  
Phase 1 8.1 km 4  
railway stations (Yinzhan, Changlong Avenue,  
Changgang and Changlong Theme Park)

2nd construction  
phase Extension both to the east and to the west



1st construction phase in 2021



## May 2020: L0-951 with inductive charging

- Inductive charging instead of gas turbine
- Current collectors still available? • Improved aerodynamics at the expense of acoustics

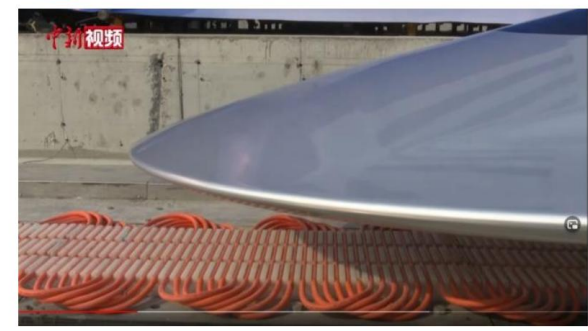




2021-01-13: CRRC SCM-620

Test vehicle for a design speed of 620 km/h

Detailed analysis is stored in the IMB Cloud

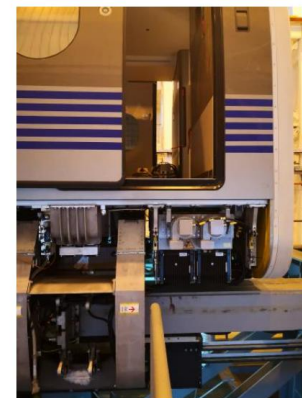


## Feb 2021: CF-600-001 First test rides with the middle section in Tongji

V max ~ 80km/h

Trial for 2 months

Modification of the section for 1-section driving operation



# "CF-X" - presentation on May 20, 2021 in Tianjin\*

\*5. World Intelligence Conference



Air conditioning, possibly only space for it, since no increase to be seen



Reaction rail LIM or stator pack

Possibly stator winding? = long stator vehicle?

View from door Ri. In front

inverted "U" profile



cheap plastic bucket seats



bow section of carbon fiber

8 poles per SG (4 each vehicle side)

No LIM', since the drive is mounted in the middle

- Manufacturer: CRRC Tangshan
- Approx. 10 meters long, 2.1 meters wide (corresponds to Berlin subway small profile), possibly Vmax 200 km/h
- 5 SG per car body, possibly permanent magnets for field support according to source
- Each SG via Z-support and 4 air bags
- Designed for low traffic (1 door per side/car, few windows)
- Design optimized for small curve radii and low overall height
- Carrying and guiding corresponds to the combined "U" pole arrangement of type KM (e.g. TR02, Linimo, EcoBee)
- The drive is not arranged on both sides above the poles, but in the middle of the track
- Possibly long stator drive, analogous to the development of the SWJTU

**Preview: Exact analysis will follow as soon as more image material, time and motivation is available!**

## July 2021: CRRC Maglev 3.0 "Green" in action in Changsha

The use of the train was not yet clear

Implementation by the CRRC Zhuzhou

- April 27, 2021: Speed record 160.7 km/h

Repainting of the train

- Since July 1, 2021: Use in Changsha as an express train
- Increase Vmax to 140 km/h
- Changsha series train: increase from 100 to 110 km/h (designed for 120 km/h)
- Travel time saving 3 min from 19:40 to 17:00 min for 18.55 km with one intermediate stop
  - Disadvantage: The position of the doors does not exactly match the Changsha 1.0 series train ÿ Not all doors can be used to board the train

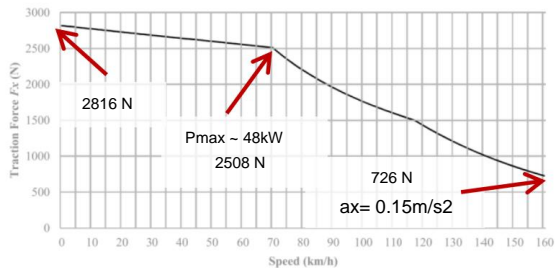


Doors are narrower than the standard train.  
Also, the distances are not identical.



# Fengyuan Maglev: vehicle

LIM type "JX-130" with aluminum conductor for weight reduction, length 2020 mm, String voltage 220 VAC



~ 2.5 kN/LIM gives 75kN traction for 3 sections at v=0  
Linear motor in Changsha has more thrust initially, but the thrust curve flattens out faster (708 vs. 726 kN).

It should be noted here that the thrust characteristic has nothing to do with the electr. efficiency.

- VVVF Inverter conforms to 2.0 series
- 1500 VDC via power rail
- New magnetic poles type "TMC-35"
- 8 poles per SG. total 40 per vehicle section
- Compared to TMC-33 (Changsha): Lifting power +6% with +12.5% larger hovering gap (required for fast travel with larger deflection)
- Possibly higher number of turns per pole



## July 20, 2021: CF-600-001 "Rollout"

Manufactured by CRRC Qingdao

- Aerodynamic and control engineering design Vmax 600 km/h
- Underfloor area corresponds to TR design
- Suspension magnets and cantilever arms correspond to TR09 design
- Aluminum car body is completely different from TR
- Center section M1 tested for 2 months in Tongji

- Li-Ti battery pack



## 9/30/2021 Fengyuan Maglev – Construction and commissioning of the 1st construction phase

August 2019: Start of 1st construction phase 9.121 km, v<sub>max</sub> 100 km/h, 4 intermediate stations

July 11, 2021 Months of the 1st turnout segment (of 6)

9/20/2021 Laying of the last 12.5 m long rail

September 30, 2021 Rollout on track L1

1.12.2021 Commissioning of inspection and towing vehicles

12/24/2021 maiden voyage

Track will be built in 3 phases:

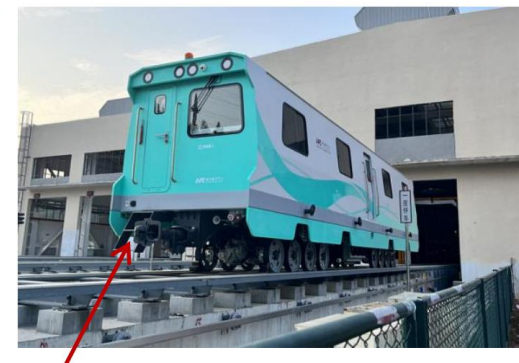
1. Zhangjihuai High-Speed Railway Station - Folk Custom Park Tunnel
2. Folk Custom Park Tunnel - Chengdong Tourist Center
3. Chengdong Tourist Center - Zhangjihuai High-Speed Railway Station

- Conceived for tourism operation
- Route connected to Zhangjihuai high-speed railway
- 4. Application range in China

Max 5.1% gradient, r<sub>min</sub> = 75 m

Bidirectional inverter with regenerative feedback

Cover of the conductor rail y weather protection



Vehicle Manufacturer CRRC ZELC (Zhuzhou Electric Company)  
3 sections, design speed 100 km/h

Scharfenberg coupling for towing

Since the track is designed for Maglev-typical distributed loads, the vehicle weight has to be distributed over a total of 16 rubberized wheels

A line route diagram (线路示意图) for the Fengyuan Maglev project. The diagram shows the route from the starting station (自起点磁浮高铁站) to the terminal station (终点民俗园站). The route passes through several intermediate stations: 世外桃园站 (预留), 奇梁洞站 (预留), 城北游客中心站, and 古城国胜站. The total length of the route is 9.121 km. The diagram includes a map of the area and a list of stations.

**Preview: Exact analysis will follow as soon as more image material, time and motivation is available!**

<http://www.hngdkg.com>

February 9, 2021: TSB drives 169 km/h

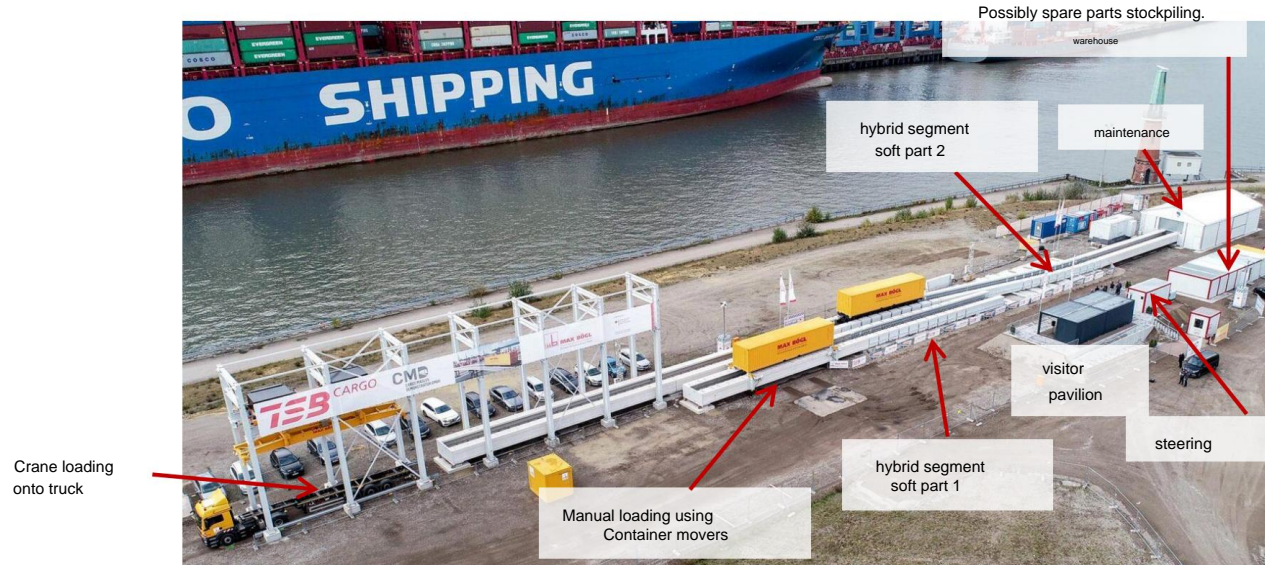
Ride with 3 sections

Distance 3.55 km

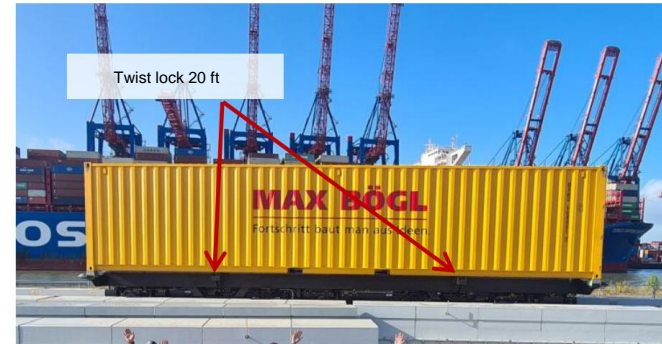
Previous world record: 307.8 km/h (1978, HSST)



October 2021: Cargo TSB is officially presented



- Groundbreaking on August 4th, 2021 in Hamburg at the lighthouse Ellerholzhafen
- Open to the public 11.10 – 15.10 / 900 trade visitors
- Continued operation until November
- The route is only 120 meters long including the loading crane
- Y route with hybrid segment switch
- Demonstration of an autonomous vehicle with two 40 foot container



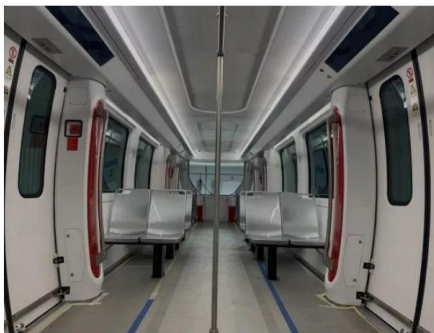
**This is just a brief summary. Exact analysis will follow as soon as more interest and a lot of motivation is available!**



## TSB goes into licensed production - initially only a single prototype



- Built-in structure including suspension frames were largely made by Max Bögl made
- The car body corresponds to the structure gauge of the TSB
- The panel construction of the car body is identical to that of the TSB, the front of the vehicle was adapted to a Chinese design
- Presumably better aerodynamics than Bögl's TSB design
- Interior differs significantly from ingenuity design
- Bucket seats instead of TSB's fabric-covered benches
- Corners of the magnetic poles have a different color (brown instead of red) than at TSB



### My opinion:

- Bögl entered into the joint venture primarily for strategic reasons in order to be able to sell the vehicle system better in China "Made in China".
- Bögl's TSB will be a flash in the pan as there are already many other Urban Maglev systems exist. I don't see many chances there because the system doesn't offer anything special that other systems don't have
- An operator of a future TSB is the monopoly of Max Bögl and his cooperation partner in China. You cannot simply fall back on another manufacturer.

## "CF-Y" - not yet officially presented

- Manufacturer: CRRC in Tangsha
- Year of construction 2021
- Probably 2000 mm gauge
- Factory test track: 1560 m long
  - Approx. 12 meters long per section
  - 5 SG per car body
- Constructed for medium traffic (1 double door per side/car)
  
- Carrying and guiding corresponds to the combined "U" pole arrangement of type KM (e.g. TR02, Linimo, EcoBee)
- Drive probably conventionally on both sides
- Power supply probably 1500 or 750 V DC

Z-support for roll axis similar to other models



**Preview: Exact analysis will follow as soon as more image material, time and motivation\* is available!**

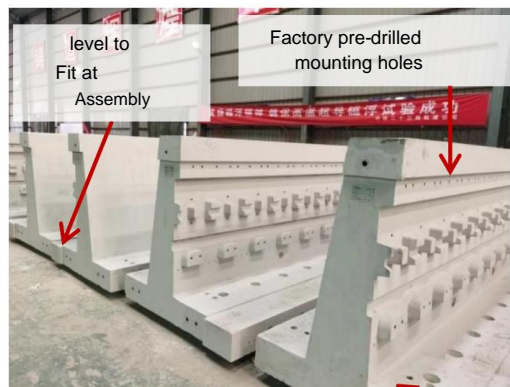
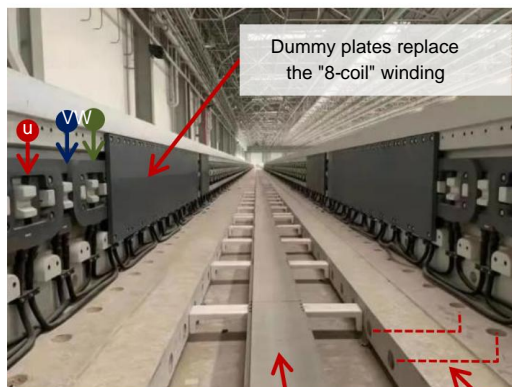
\*@Johannes: A cold beer helps ;-)

## November 2, 2021: SCM-600: Research on the EDS system

- Comparable with Japanese MLX, design 600 km/h
- Other pole pitch and gauge  $\gamma$  Not compatible with JR system
- Shanghai Superconductor Technology Co.,Ltd. supplies the high-temperature superconductor coils (conductor tape) to CRRCC Chanke of the type "ST-6-L"

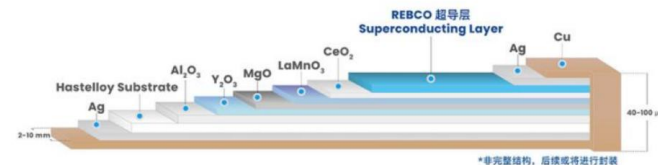


- Inductive charging system in the middle of the route
- Reduced indoor prototype of the track with LIM winding in 2 levels (front/back), phase U+, V+, W+
- No "8" coil winding and the cross line to be seen  $\gamma$  possibly only the drive is tested here because the speed is not sufficient for dynamic hovering
- Assembly of the winding directly in the concrete body through pre-cast Concrete forms, segments about 5-7 meters long
- Pre-drilled and face ground straight from the factory



Inductive power supply (Dummy)

Prepared drilling for cross line



Crack temperature ~ 77°K

# December 15, 2021 Hanging "Maglev train" with LIM

Car body corresponds to the conventional CRTC monorail  
Roof is reinforced to accommodate the additional VVVF WR

Length 2 sections 10 m, width 2.3 m, height 3.6 m

32 seats, 88 people, in total 120 people

V max = 120 km/h

4 SG with 2 LIM each ̄ less thrust than other magnetic tracks

Hover function not clearly comprehensible, since no large roles can be seen.

Possibly PM. SCM rather unlikely due to the lack of cooling peripherals

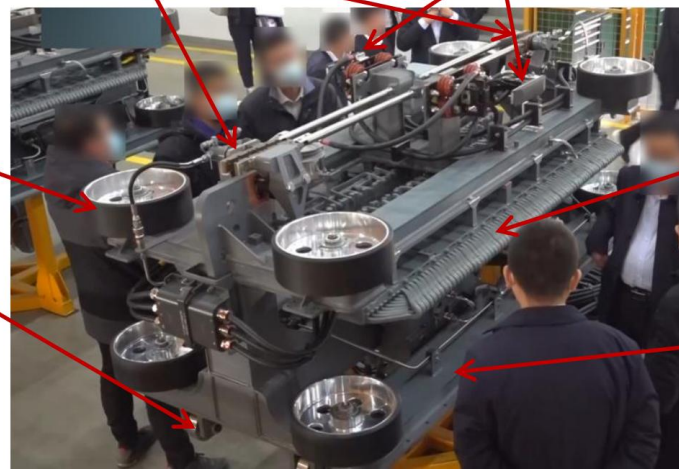


4 suspension frames for the 2-section vehicle

pantograph

750 or 1500 VDC and ground

mechanical shoe brakes



LIM

PM?  
SCM?



Recording joint SG

Roll axis damper

pneumatics and car control.  
No VVVF!

Lateral guidance is provided by wheels

emergency castors carrying function

## CRRC CF250



M1 car body: The almost identical construction to the TR08 car body recognizable.



Design was first presented in Shanghai in 2018 with a model at a trade fair  
2 sections with a system width of 12.384 m (2 instead of 4 SG per section)  
2 WSB per section = 4 times the braking force, but at  $v_{max}$  200 km/h  
Air conditioning on the roof instead of inside the car (TR08, SMT)

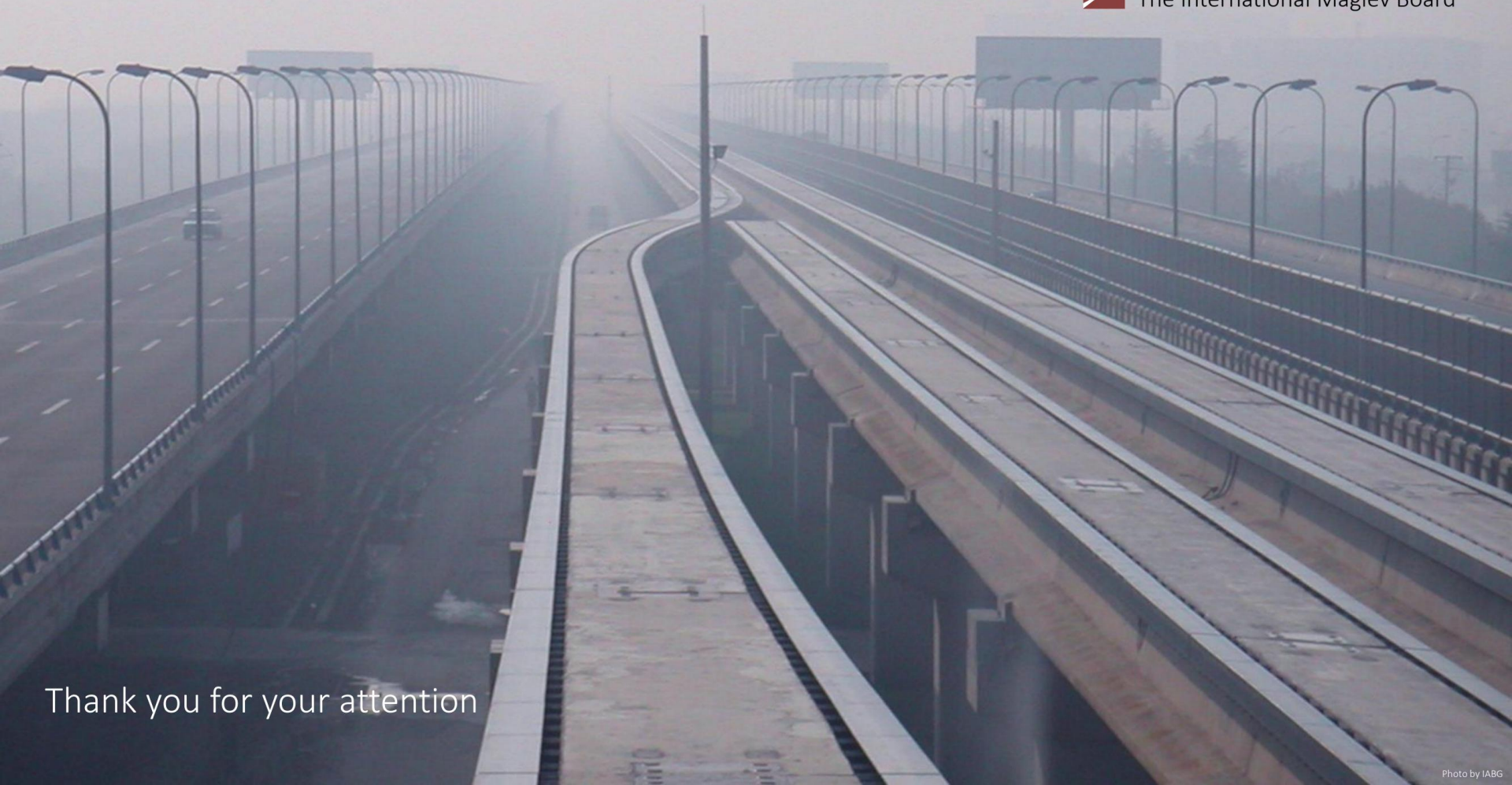


**Detailed analysis is in progress and will be timely  
IMB sent internally**

## March 2022: Changsha CF101-01 pre-series train undergoes major revision for the first time



- Pre-series train will be taken out of service on March 29, 2022
- In use since May 2016
- Overhaul of the entire vehicle • "Balanced Frame Repair Operation" / frame repair
  - Cracks in the car body?
  - Dismantling of all attachments. Inspection of all components
  - Body and suspension repair and maintenance Some parts/ components are rebuilt to improve downtime and ride comfort
- Comprehensive revision required every 7 years or 1.4 million km • Corresponds to around 75,500 journeys (one way) • After frame repair, 1.2 million km interval • For comparison: Beijing subway: 600,000 km
- Repair to be completed in July 2022



Thank you for your attention