



HELSINKI CITY TRANSPORT HKL TODAY & TOMMORROW

SWERIG 6.9.2016 Stockholm

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Helsinki City Transport
Head of Rolling Stock

HKL – HELSINKI CITY TRANSPORT

- HKL manages metro, tram and the Suomenlinna ferry
- HKL maintains the tracks, stations and other public transport infrastructure
- HKL's most important partner is HSL, Helsinki Region Transport. HKL operates the metro, tram and ferry traffic ordered by HSL.
- HKL's turnover was 153,9 M€ and HKL employed 1056 people in 2015

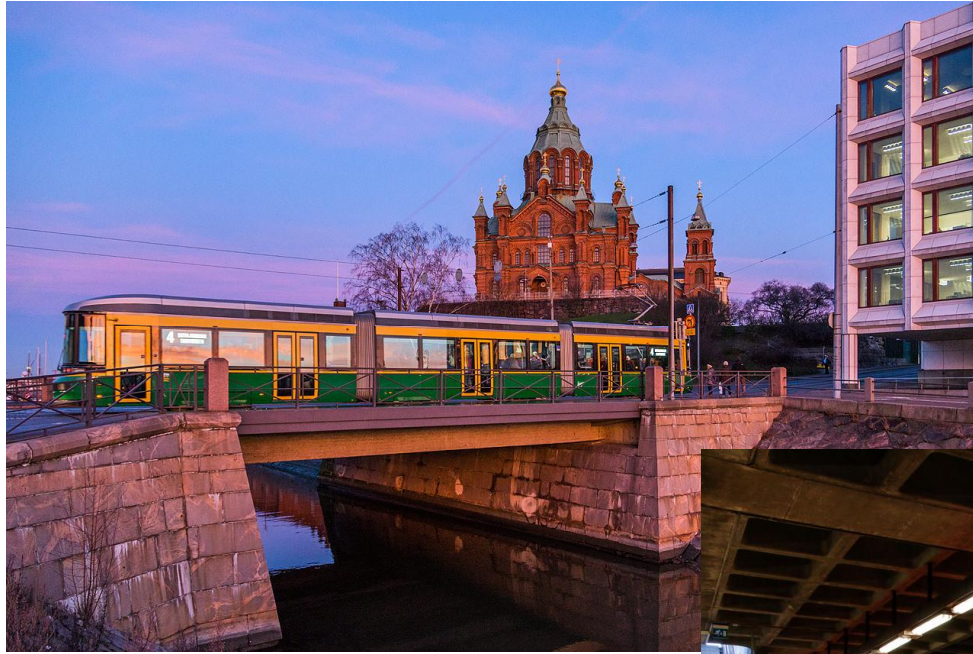


HKL INVESTMENTS 2016–2025

	M€
• Laajasalo, track and bridges	167
• Laajasalo, trams	108
• Raide-Jokeri, trams (Artic, Skoda)	105
• New metro trains (M300, CAF)	94
• Raide-Jokeri, track	94
• New trams (Artic, Skoda)	88
• Raide-Jokeri, depot	24



STATUS AND LIFE CYCLE OF HKL VEHICLES



METRO-FLEET

M100: 84 coaches / 42 train-units

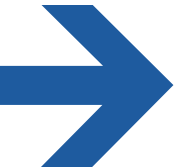
- Average age 35 years
- Excellent condition
- Good availability of components
- Good in-house knowledge
- Refurbishment planned on 2017-2020

M200: 24 coaches / 12 train-units

- Average age 15 years
- Good condition
- Some components are obsolete
- Limited in-house knowledge (propulsion)
- Refurbishment planned 2017-2020

M300: 80 coaches / 20 train-units

- New vehicle under warranty
- No in-house knowledge



TRAM-FLEET (PART 1/2)

NRV I: 30 articulated high-floor vehicles

- Average age 42 years
- 20 pcs in mediocre condition, 10 pcs stored
- Good availability of components
- Good in-house knowledge
- Scrapping 2018-2024

MLNRV I/II : 52 articulated partial low-floor vehicles

- Average age 33 years
- Good condition
- Good availability of components
- Good in-house knowledge
- Scrapping 2025-27



TRAM-FLEET (PART 2/2)

MLRV: 40 multi-articulated low-floor tram

- Average age 14 years
- poor condition (car-bodies and components)
- Some components are obsolete
- Limited in-house knowledge (maintenance contract)
- Refurbishment or scrapping 2018-2020

MLNRV III: 60 articulated low-floor trams
(all pivoting bogies)

- New vehicle under warranty
- Limited in-house knowledge

MLRV II: 70 multi-articulated low-floor trams
(all pivoting bogies)

- New 8-17m longer version of MLNRVIII tram
- 30 pcs will be ordered 10/2016



NEW HELSINKI TRAM - LIFE CYCLE COSTS



- Maintenance: 1,20€ per km (preventive + corrective)
- Availability: >98% (05:00 every morning)
- Reliability: 25 failures per 1000 000 km (with prototype cars)

Artic is designed and built for low LCC costs:

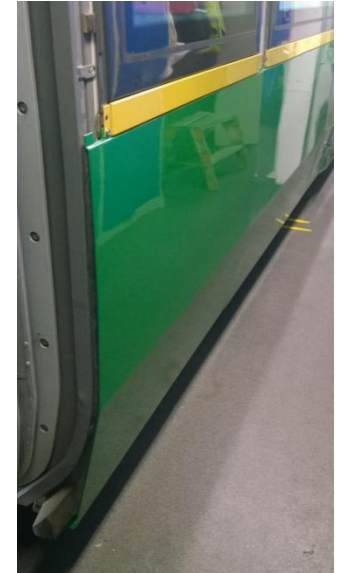
- Low energy consumption (pivoting bogies, high-revision motors, inverter technology)
- Low maintenance need (minimal wear, robust structure, excellent materials)
- Quick maintenance (3-5 times faster maintenance compared to competitors)
- Reliable technology (smart functions to warranty operations even during failures)
- Easy overhauls (10 ,20 and 30 years overhauls can be done in 3 weeks)



NEW HELSINKI TRAM - MAINTENABILITY



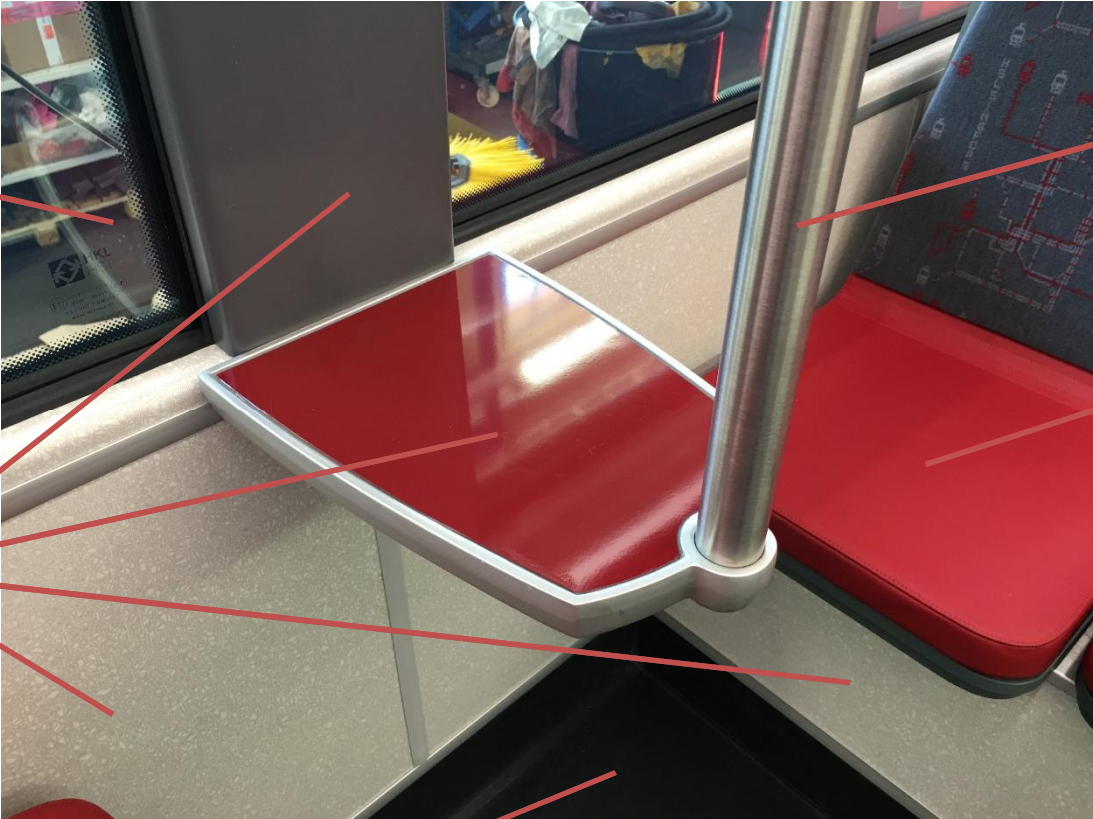
Maintenability is optimised with innovative structure. Exterior panels and windows can be changed within 20 mins. Interior panels in less than 10 mins. Wheel set can be exchanged in 45 mins.



NEW HELSINKI TRAM - ROBUST MATERIALS

anti-scratch windows

robust HPL



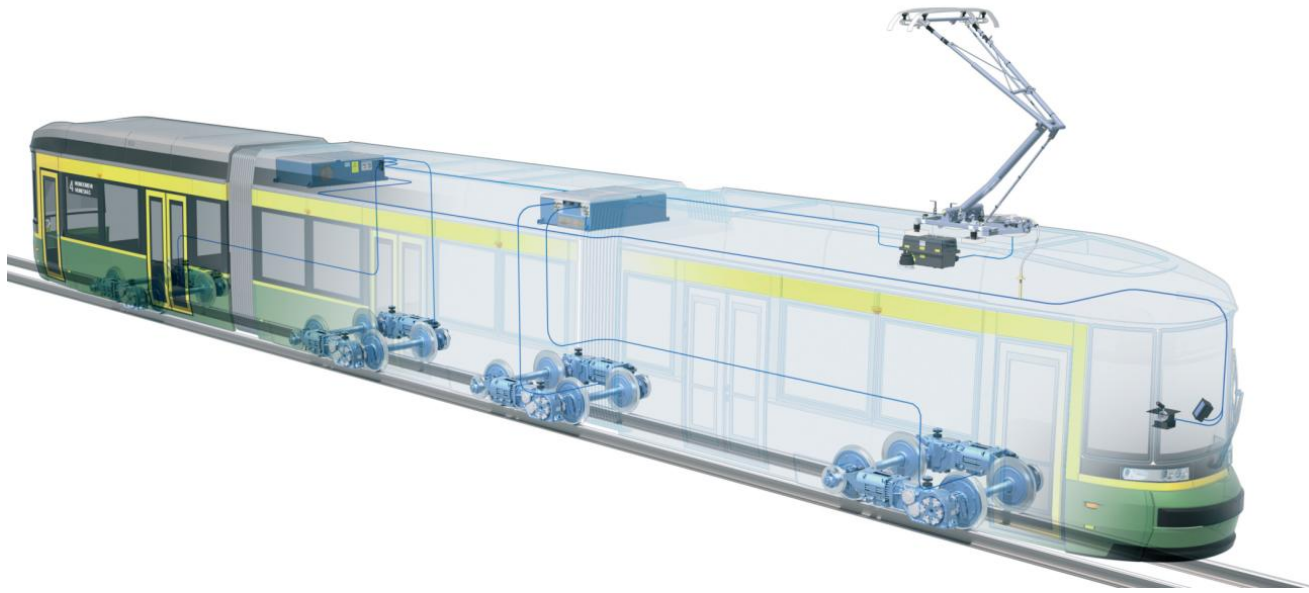
stainless steel

E-leather

rubber-floor



NEW HELSINKI TRAM - ENERGY CONSUMPTION



According to the measurements the energy consumption of Artic is 5 % less than low capacity high-floor articulated trams of Helsinki

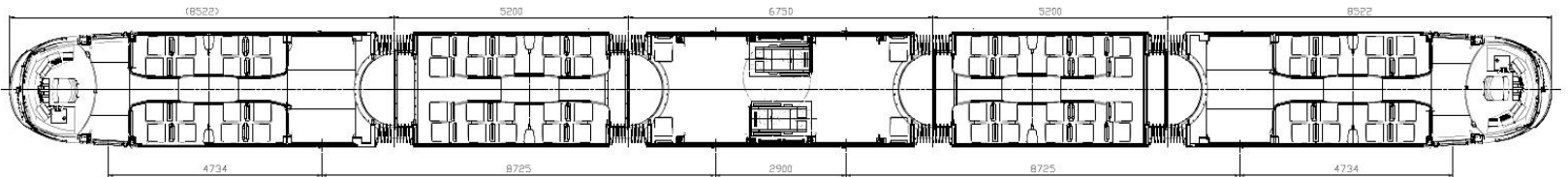
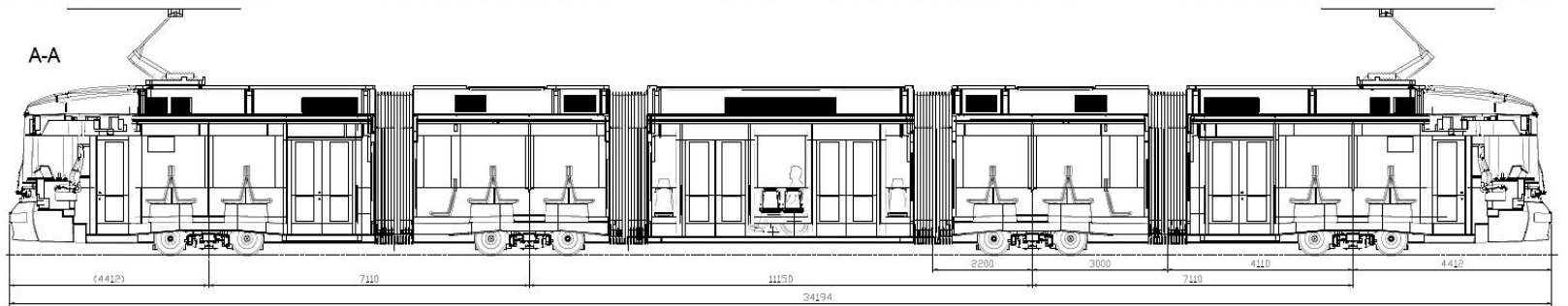
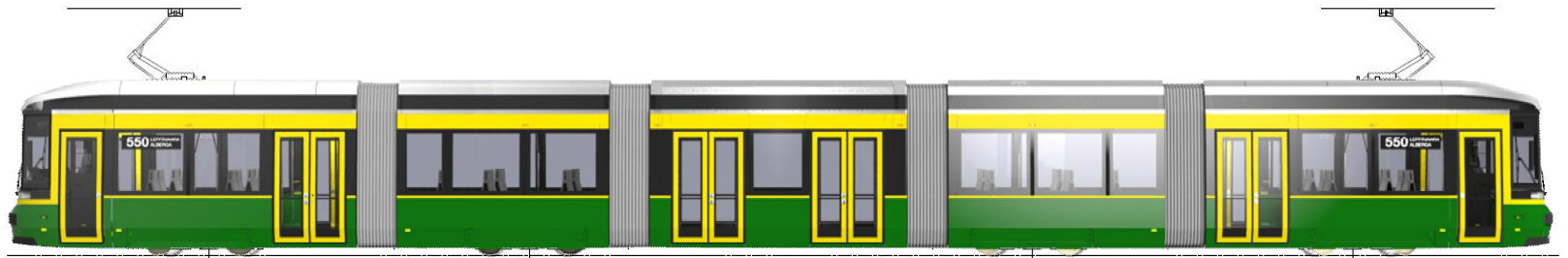
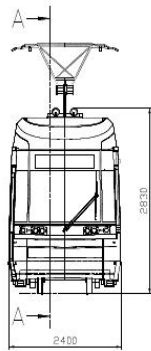
Compared to first generation low-floor trams the energy consumption of Artic is about 30 % lower. The difference can be even 50% higher in winter conditions when innovative energy recovery system is in function.



FUTURE HELSINKI TRAM – SKODA ARTIC 34M

- Length 34,5m
- Bi-directional
- Inter-operatable with 15 m radius track
- 76 seats, 180 standees (5p/m²)
- Stepless entrance with automatic kneeling
- Can be prolonged up to 43 m
- Based on premier Artic concept with pinnacle solutions
- Hybrid multi-articulated structure with all pivoting bogies





34,5m Artic lay-out



FUTURE HELSINKI TRMA – SKODA ARTIC 45M

- Bi-directional
- Length 45m
- 96 seats, 256 standees (5p/m²)
- Stepless entrance by kneeling in 2 modules
- Hybrid multi-articulated structure with all pivoting bogies
- Four motor bogies and one running bogie with active brakes
- Based on premier Artic concept with pinnacle solutions
- Hybrid multi-articulated structure with all pivoting bogies

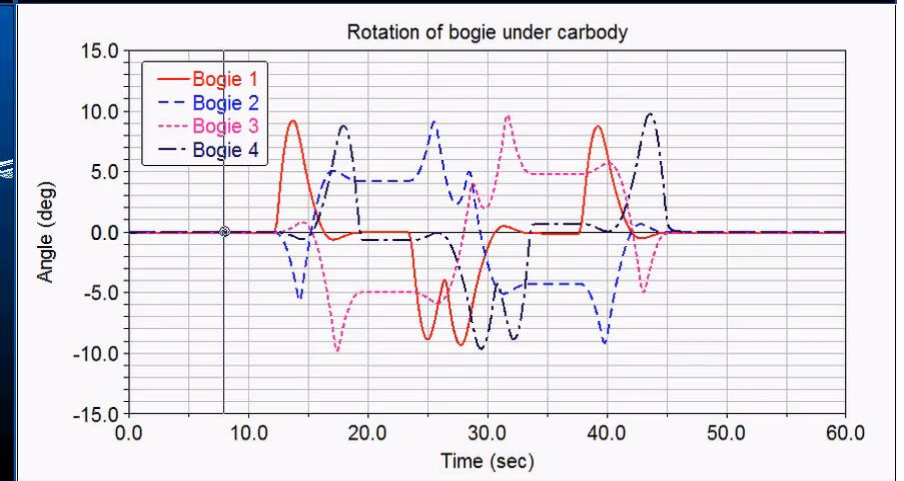
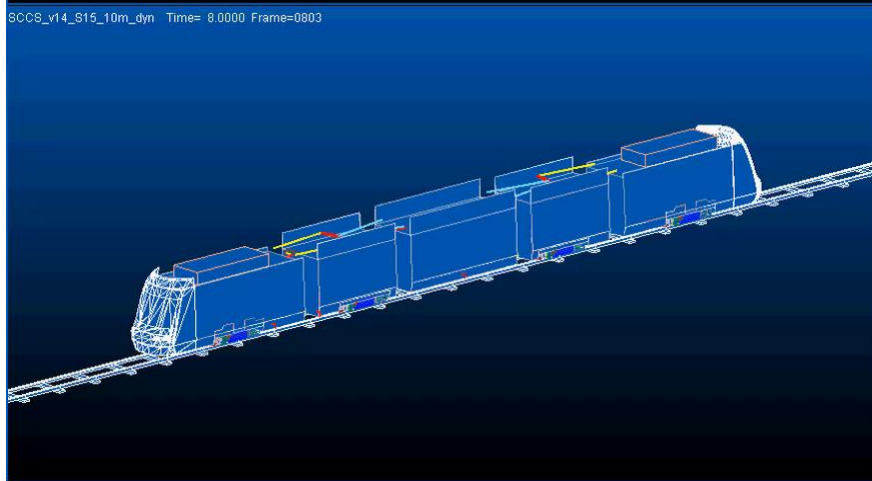
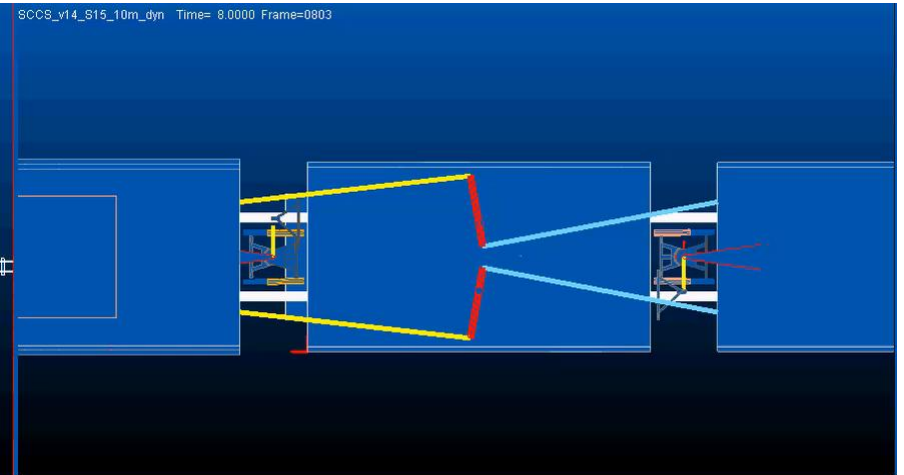
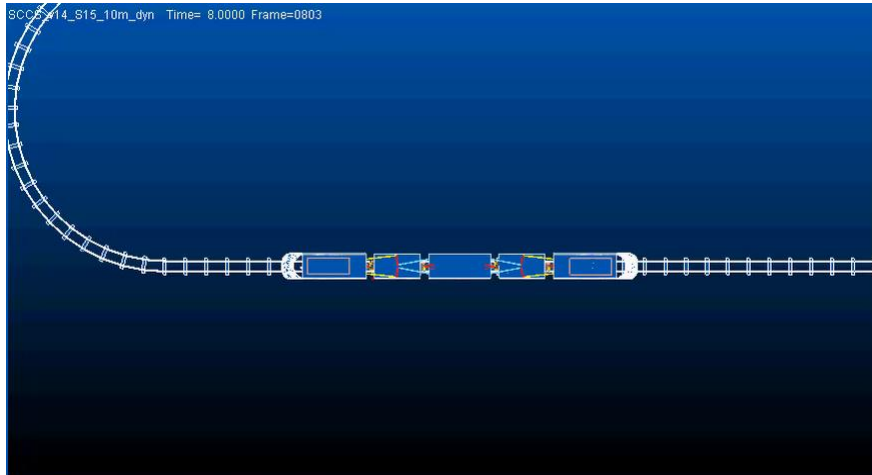




45m Artic lay-out



HYBRID MULTI-ARTICULATED TRAM



KNEELING

- simple linear motor between modules
- automatic distance measurement with laser
- no need for wheel wear or load compensation
- platform height can vary +/-100mm





THANK YOU!