

SkyTrain's Experience in Mitigating Noise

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Vehicles



Unique Components of SkyTrain

- Propelled by a Linear Induction Motor mounted on the bogie (i.e. no propulsion forces through the wheels)
- Forced steering bogies (based on angle between car body and bogie) allow radial steering to curve radii of 50 m
- Fully automated operation (no drivers)
- Direct fixation of rail to concrete guideway



Noisy History of SkyTrain – 1985-1990

- Corrugation across the system, leading to extensive research and maintenance efforts
- New wheel profiles created for MK-I vehicle
- Extensive track grinding exercise, to remove corrugation and restore an appropriate rail profile



Noisy History of SkyTrain – 1990 - 2000

- Relatively steady state
- Maintenance grinding efforts undertaken with in-house staff
- Wheel turning interval fluctuated between 150K to 60K as rail grinding effort was optimized



Noisy History of SkyTrain – 2000-2010

- New vehicle introduced (with a wheel profile designed for a different system)
- Wheel turning set at 60K for MK-I, and 80K for MK-II
- Start of rail spalls at joints in the system



Rail Spall



Noisy History of SkyTrain – 2010-2015

- 48 new cars added to existing fleet
- Visual evidence of rail defects accelerating in growth and appearance
- First rail break discovered in 2012
 - At weld repair location
- Corrugation back across the system
 - Issues keeping rotary grinders in service



Rail Defects



Rail Defects



Rail Defects



Back at the Start

- Extensive grinding effort to restore rail to desired profile
- Review of wheel profiles to determine if better profile is available
- Review of maintenance effort across system, to determine resources required for optimal maintenance

