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

- 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

![Image of rail defects]

**4551/4552 -2 ^1-M OB**

**4737/4738 +1 OB =1 M**
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