New York City Transit Noise Reduction Report

New York City Transit's (NYCT) Noise Committee investigates noise and vibration issues that may affect the health, safety or quality of life of our customers and employees and the communities we serve, and it expedites any necessary mitigation actions. Formed in 2009, the Noise Committee consists of technical experts from the Departments of Subways, Stations, Buses, Office of System Safety and Construction & Development Environmental Services. Beginning in 2015, the Noise Committee is posting an annual noise reduction report on the MTA website.

This annual report provides an update for the previous year on capital investments and improved maintenance that contribute most to reducing transit system noise. For example, the report highlights what are known to be key noise-abating track treatments, including the number of track-feet of continuous welded rail added, the number of track-feet of low vibration track installed, the number of resilient rail fasteners installed, as well as an update on the maintenance, inspection and operation of trackside lubrication systems and the number of subway car wheel truings. In addition, the report includes noise reduction efforts with regard to fan plants and in the design of new buses and subway cars. Future reports will include relevant station and environmental initiatives and the latest in NYCT noise abatement efforts as they are developed.

Noise Abatement: Track

Resilient Rail Fasteners. Resilient rail fasteners reduce noise by absorbing vibration from wheel-rail interaction and is the best method to reduce vibration and vibration-generated noise in supporting structures.

Resilient fasteners can reduce noise, as compared with non-resilient fasteners. NYCT installed more than 13,647 regular resilient rail fasteners in 2020, plus over 8,804 super resilient rail fasteners in 2020.

New Low Vibration Track (LVT). A new type of LVT is being installed throughout the NYCT System to determine its cost effectiveness. Several locations have been completed and preliminary results show a marked improvement in vibration-generated noise. The Culver Viaduct LVT installation, which ended in 2013, was for 18,000 track-feet. The #7 Line Extension LVT track installation, completed in 2014, was for 13,600 track-feet. In 2016, 23,006 track-feet LVT was added when the 2nd Avenue Subway Line opened for business. In 2017, 13,629 track-feet LVT was added, in 2018, 656 track-feet LVT was added throughout the System, 2019 and 2020 did not include any LVT. A total of 41,649 track-feet of regular track was replaced in 2019 but none was replaced in 2020.

Welded Rail. A proven noise reduction technique, welded rail continues to be installed where applicable, with approximately 13,567 track-feet added throughout the system in 2020 which is approximately 27,134 feet of Continuous Welded Rail. This includes continuous welded rail where rails are welded together to form one uninterrupted rail that may be several miles long. Because there are few joints, this form of track is very strong, gives a smooth ride, and needs less maintenance; trains can travel on it at higher speeds and with less friction.

Top-of-rail Friction Modifiers. This is a technique that lubricates contact surfaces of the rail to reduce squeal, which can be very effective under certain circumstances: Eight units were added to our system in 2020.

Noise Abatement: Car Equipment

Ring-Damped Wheels. All NYCT revenue subway car wheels continue to be outfitted with ring-damped wheels, which reduces bell-like ringing of wheels.

Wheel Truing. Flat wheels sometimes develop over time and can cause extreme noise conditions, in addition to potentially causing damage to rail and or the subway car itself. When it is ascertained through inspection that flat wheels exist the wheels are removed from the truck of the subway car and sent for wheel truing. Approximately 719 wheels were trued in 2020.

New Car Design and Manufacturing. C&D Environmental Services initiated a program of system-wide measurements of public noise exposure, providing NYCT with statistical confirmation that improved design and manufacturing have led to quieter subway cars. This noise abatement factor will only improve as we replace older cars in our fleet.

Noise Abatement: Fan Plants and Electric Substations

In addition to incorporating noise reduction techniques for new fan plants and substations, NYCT Transit has added silencers and vibration isolators to a number of existing above-ground fan plants to reduce emergency ventilation fan noise and ground-borne vibration to adjacent structures.

Noise Abatement: Buses

All recent, current and future bus purchases require sustainable design incorporating the latest noise reduction methods available, such as through the use of state-of-the-art mufflers, to reduce the noise level exposure of passengers and bus operators as well as adjacent pedestrians, vehicles, housing and businesses. Future studies may be performed to ascertain the effectiveness of current operations in regard to noise mitigation.

Conclusion

MTA New York City Transit continues to make substantial progress in reducing noise throughout the system. The combined thrust of these noise reduction efforts increasingly provides direct benefits to passengers, employees and the public. It is a top priority for MTA NYCT to respond to noise complaints, perform noise measurements and be an asset for community outreach on such matters. We take a proactive approach when proposing methodology, mitigation techniques and analyzing our entire transit system for noise related concerns.