

Basic thoughts on noise reduction

■Improvement of the environment along railways: Basic thoughts on noise reduction

In the operation of trains, noise is created by the train cars moving through the air, by the wheels travelling on the rails, by the motors, and by other sources. In order to reduce noise, we are working in various ways to improve both the trains and our ground equipment.

JR East also endeavors to reduce noise during maintenance work on track and structures to further improve the environment along the lines.

■Measures for the Shinkansen lines

In accordance with the Japanese government's Environmental Quality Standards for Shinkansen Superepress Railway Noise, JR East has taken many steps to reduce this noise, such as the installation of soundproof walls and sound-absorbent materials, rail grinding*¹ and the modification of our railcars to operate more quietly. We have already completed the implementation of measures to reduce noise levels to 75 dB or lower in densely populated residential areas along our railway lines, and we plan to take further steps by expanding the scope of areas where noise levels need to be reduced to 75 dB or lower. Also, with the introduction of E5 Series railcars, which were developed based on the results of running tests using the Shinkansen "FASTECH" test train, JR East is working to improve the environment even as we increase train speed, including further reduction of noise and micro-pressure waves in tunnels*².

*1 **Rail grinding:** A measure to smooth out uneven places in rails caused by wheels traveling over them. This reduces noise by controlling car vibration.

*2 **Micro-pressure waves in tunnels:** An explosive sound caused by compressed air being forced out of a tunnel when a Shinkansen train enters it at a high speed. The sound is produced at the end of the tunnel.



The E5 Series employs low-noise pantographs.

■Measures for conventional lines

We have implemented voluntary measures for conventional lines to minimize noise, installing long rails*¹ and performing rail-grinding and wheel-truing*². We also comply with the Japanese government's Policy on Noise Measures for Construction of New Conventional Railways or Large-Scale Remodeling when we engage in this kind of construction or modification of our conventional lines.

*1 **Installing long rails:** Rail joints are welded such that the length of a single rail becomes more than 200 meters. With fewer rail joints, these rails reduce noise produced at joints when trains pass.

*2 **Wheel truing:** A measure to grind the unevenness of wheels caused by wear, to restore their circular shape.

■Measures for maintenance work

As the maintenance work is usually done during night, we give advance notice about the schedule and details of the work to residents in surrounding areas. We also make utmost efforts to minimize noise by using modified equipment producing lower noise. Furthermore, by using track that is designed to resist deformation, JR East is reducing the volume of required maintenance work.