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Keio University

**Industry-Academia Collaboration Project to Develop New Air Purification Technologies
to Facilitate “Subways with the World’s Cleanest Air”
—Field Studies inside Subway Stations Get Underway—**

Keio University Faculty of Science and Technology and MANN+HUMMEL Japan Ltd. (M+H), together with Yokohama Industrial Development Corporation (IDEC Yokohama), have taken the first steps in their endeavor to create “subways with the world’s cleanest air.” This collaborative industry-academia undertaking, which has been adopted as a designated research project by the Keio Leading-edge Laboratory of Science and Technology (KLL), seeks to develop new and unprecedented technologies that will remove dust generated by subway carriages, brakes, and other means. It aims to achieve this by combining Keio’s expertise on particle electrostatic charging with the latest filtration technologies possessed by M+H. The subway has a great influence on people’s living environment and is an indispensable part of the transportation infrastructure in urban areas of Japan. For the first stage of this project, the behavior of PM_{2.5} and other particulate matter inside subway stations will be analyzed. The initial field studies began on July 17.

1. Background

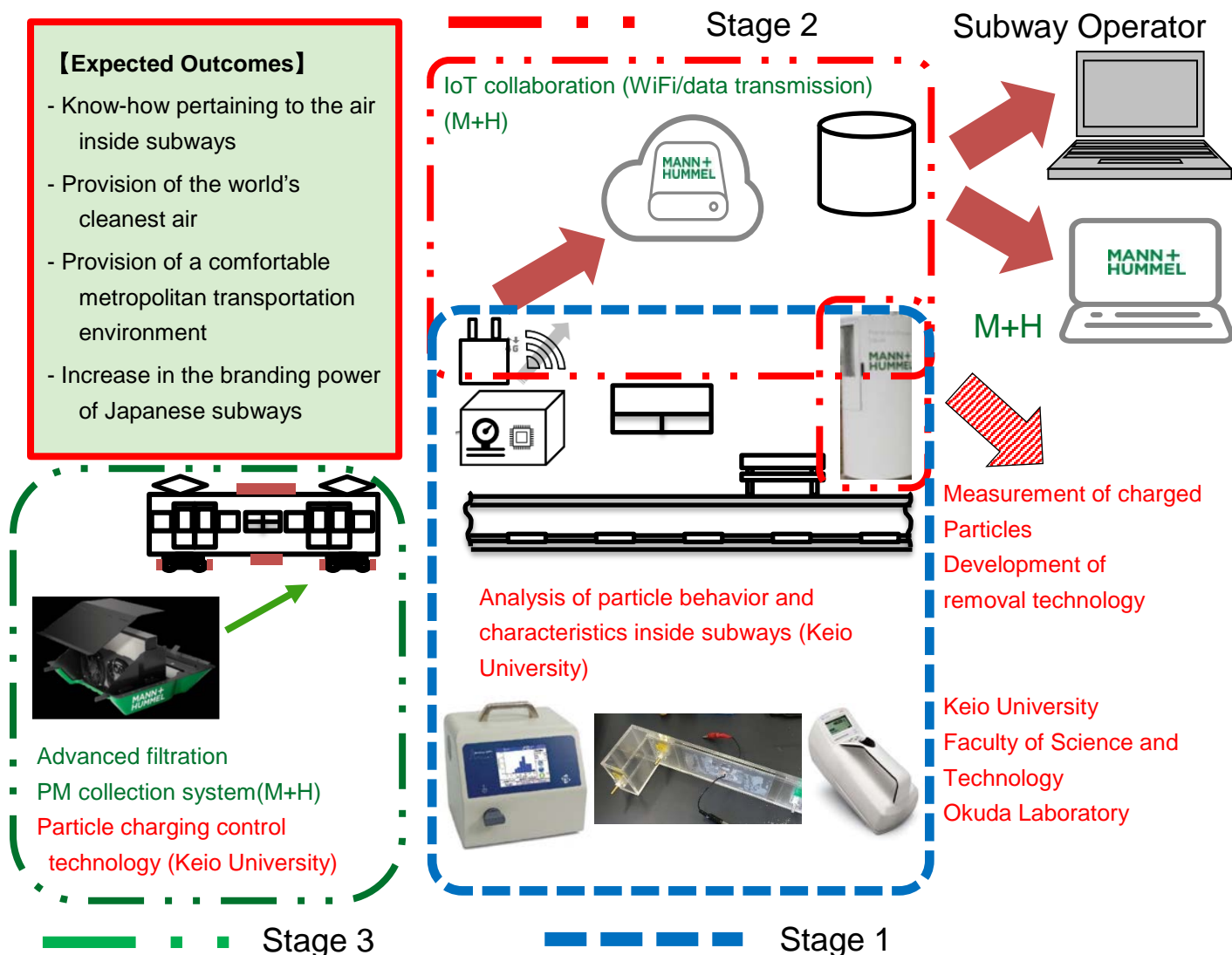
The subway is an extremely important part of the transportation infrastructure in urban areas of Japan and is an essential component of the livelihoods of many people. However, despite the fact that the subway system and carriage interiors are enclosed spaces and the attendant concerns about contaminated air, no systematic investigations on the true state of air quality in subways have been carried out. Based on this background, Associate Professor Tomoaki Okuda of the Faculty of Science and Technology at Keio University and MANN+HUMMEL Japan Ltd. (M+H; managing director: Motoi Fujiwara), with its head office located in Yokohama, have joined forces with Yokohama Industrial Development Corporation (IDEC Yokohama) to embark on the first steps in their endeavor to facilitate “subways with the world’s cleanest air.”

2. About the project

This collaborative industry-academia undertaking, which has been adopted as a designated research project by the Keio Leading-edge Laboratory of Science and Technology (KLL), aims to develop new technologies that will remove dust generated by subway carriages, brakes, and other means, by combining Keio University’s know-how on electrostatic charging of brake dust with the filtration technologies possessed by M+H. In the first stage of this project in July of this year, field studies were conducted to analyze the behavior of PM_{2.5} and other particulate matter (PM) inside the subway. In the second stage, it is planned to take real-time PM measurements using IoT while in the third stage, a demonstration experiment of a PM removal technology will be conducted.

The future goal is to make a comfortable environment for metropolitan transportation a reality through the understanding of air quality within the now-quotidian metropolitan living space of the subway and by the leveraging of innovations and technologies to remove and process particulate matter. In addition to making direct contributions to subway users, by establishing “the world’s

cleanest air” as a byword for transportation systems, an increase in branding power, not only for Yokohama City, but Japan as a whole with a view to overseas expansion, can be anticipated.



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