

# SAKAMOTO LAB.

Sound environment in urban and architectural space



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Sounds surround our lives. Sounds have great impacts on our quality of life. Sakamoto laboratory treats various issues on acoustic field control, measurement, prediction and assessment in order to realize better sound environment in architecture and city.

- ◆ **Acoustic measurement:** Impulse responses, Sound insulation, Sound reflection and absorption
- ◆ **Building acoustics:** Sound insulation of building façade and room walls, sound absorption
- ◆ **Creation of 3D sound and its application :** 3D sound reproduction. Audio-Visual presentation
- ◆ **Development of prediction methods :** Wave-based numerical analysis and its application
- ◆ **Environmental noise :** Road traffic, railway and aircraft noises, Wind Turbine Noise, Equipment Noise
- ◆ **Room acoustic design :** Acoustical design of Auditoria, public and living spaces

## Creation of Noise Map

**Estimation of noise source strength**

Small sized vehicle  
Large sized vehicle  
Length of period

**Estimation of noise propagation into building area**

Accurate and efficient methods for creating environmental noise maps that are effective for environmental management are examined for noise source strength and noise propagation in build-up area. For source model, we propose a usage of aerial photographs and machine learning.

## Various environmental noise modeling

Development of automatic data processing

- Measurement: Video camera, Sound level meter
- Auto processing: Event detection, Running speed, Vehicle type classification, Sound power level

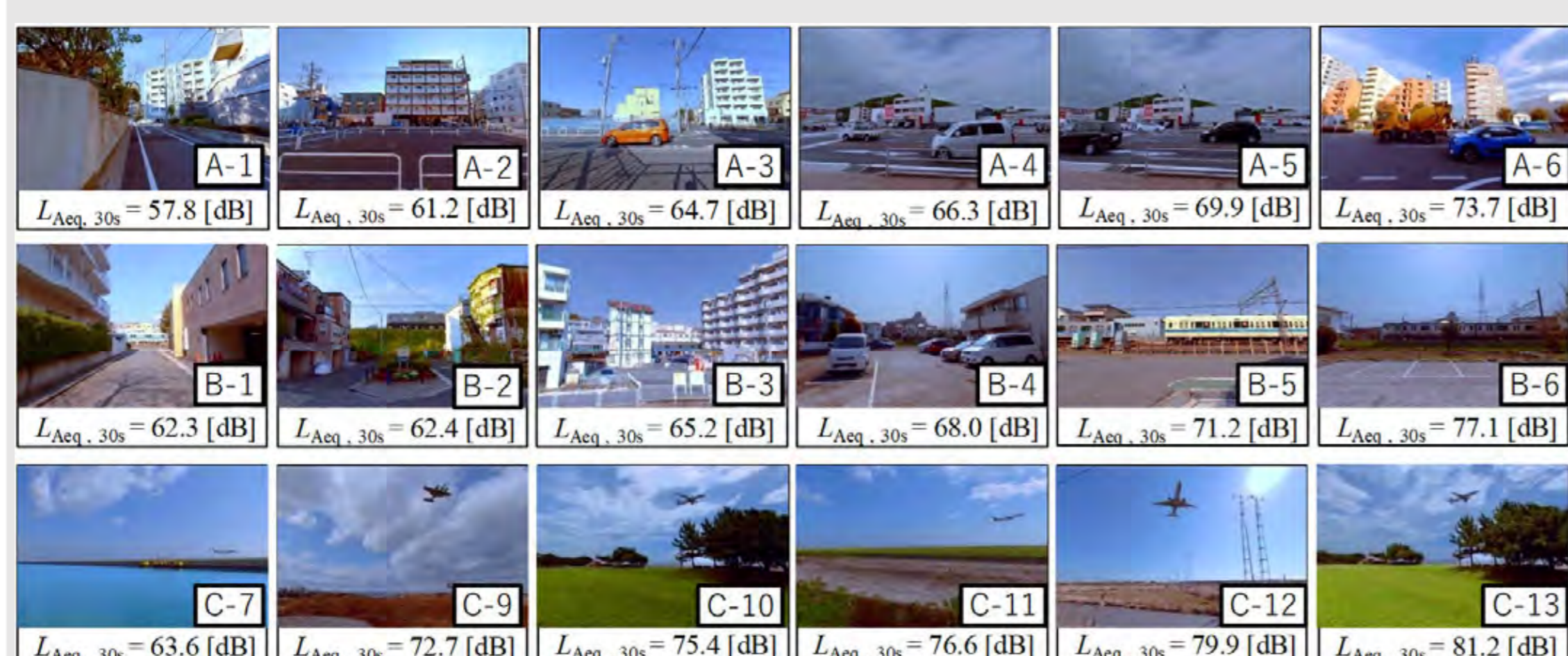
Our laboratory contributes to developing Japanese road traffic noise prediction model. This research includes development of an automatic measurement system of sound power levels and elucidation of noise propagating factors such as ground effects and shielding effects by buildings.

Scale: 1/40

Field measurement of ground effect

## Effects of visual information to noise evaluation

Subjective impression of noise is dependent on the visual information. The extent of such an effect of visual information on the noise evaluation is quantitatively investigated by psycho-acoustical experiments. In the experiments, variations of source kind and listening environments and contexts are focused on.



## Sound field simulation system

Low-frequency sound reproduction system in a hemi-anechoic room and an audio-visual reproduction system using a dome screen type video device in an anechoic room are constructed. They are utilized for psycho-acoustical experiments.

