Section 1

City characters

CITY CHARACTERS

The hot and noisy city

Seen from a northern perspective, hot and noisy cities are often associated with the South. Yet the temperature in the city is not only determined by its geographic location, but increasingly by the way the city lives. The temperature of the city and its quarters throughout the day and throughout the years can be measured. In temperate climates, cities are usually slightly warmer than the surrounding area, which is often seen as comfortable during the night and especially in winter, when this condition helps to save heating costs. The noise level in the city can be measured differently, as well as different age groups are more less influenced by noise. It is undisputed that constant noise, and especially at night, is detrimental to human health. This has led the Western countries to heated debates for both planning and scheduling actions around airports. Just the right amount of noise in just the right quarters is seen as a sign of liveliness and quality, and as such contributes to the livability of a city. Yet looking at the livability rankings of cities on a global scale, none of the hot and noisy cities can be found in the top positions.

The cool and calm city

Cool and calm cities are often associated with a high quality of living and productivity. If this is a desirable property of the city, is it possible to build cool and calm cities in the tropics, or to convert hot and noisy cities towards lower temperatures and reduced noise levels in order to increase livability? And what

would it take to achieve these goals? Looking at the Asian island city of Singapore, some of these questions might be answered.

Sources of noise

On the large scale, airplanes and particularly busy airports are a constant and prominent source of noise “from above”. Thunderstorms contribute to large-scale noise as well, and can have a significant impact if they occur frequently – in Singapore more than 150 times per year. Above the ground, the constant hum of external air-conditioners can create quite a noise profile in the city. On the ground, cars are the most prominent contributors to **city noise**. Up to a certain speed the engines are louder than the wheels, and above a certain speed the tyres generate more noise than the engines. Inside the building, the constant noise of the air conditioning systems and ventilation of different computing and household equipment are prominent, but also traffic noise can contribute significantly. In high density developments, the noise is almost as strong on the top floors as on the bottom floors, with only slightly higher values on the middle floors. Over time, noise can move from being an annoyance to having adverse health effects.

Sources of heat

The main source of heat, of course, is the sun. Airplanes and airports contribute an increasing amount to urban heat. Air conditioning systems on, at, and around buildings are also contributing. Industrial areas and ports are large sources of heat. Cars, trucks, buses and subways, also add a significant amount.

A scenario for a calmer and cooler city

Imagine a situation in which we try to convert a hot and noisy city into a cool and calm city. Which actions are necessary, how costly would they be, what advantages would they have, and how can we make sure that they would have the expected effects in the time allocated? To answer these questions, we need to understand the interactions between all factors responsible for heat and noise and the city, we need to build a model, and we need to simulate the effects of changing each one of these factors.

Reducing heat in the city

Reducing the heat in the city is important, because above a certain temperature range, human action and human work become difficult. This is increasingly the case in Singapore, and the mechanical systems used to reduce the heat for the individual, are producing more heat for the overall city. Looking at the sources, the actions could be as follows: increase the reflectivity of buildings, add exterior shading devices, improve the insulation of walls and windows, and increase the efficiency of

every single electrical device used in the building; move the airport to a location where the wind carries away the heat from the city, allow only fuel efficient air planes and optimise the path they take for taking off and landing. In addition, replace all combustion engines in cars with electrical drives, so that minimum heat is generated where the cars are driving. Also generate the necessary electricity with renewable resources far enough away from the city to not increase its temperature.

Reducing the noise in the city

Reducing the noise in the city could have very positive impact on the health of the citizens and would increase the livability of the city. Optimised taking off and landing paths for more fuel efficient and thus quieter and fewer air planes is one possibility. Replacing or even better eliminating individual air-conditioners from buildings and combining them in central systems would be a small-scale action. Switching from combustion engines to electrical drives would add significantly to reducing noise in the city. Finally, placing noisy and polluting factories away from the city would be the most obvious action to take.