

Urbanization and Hong Kong Climate

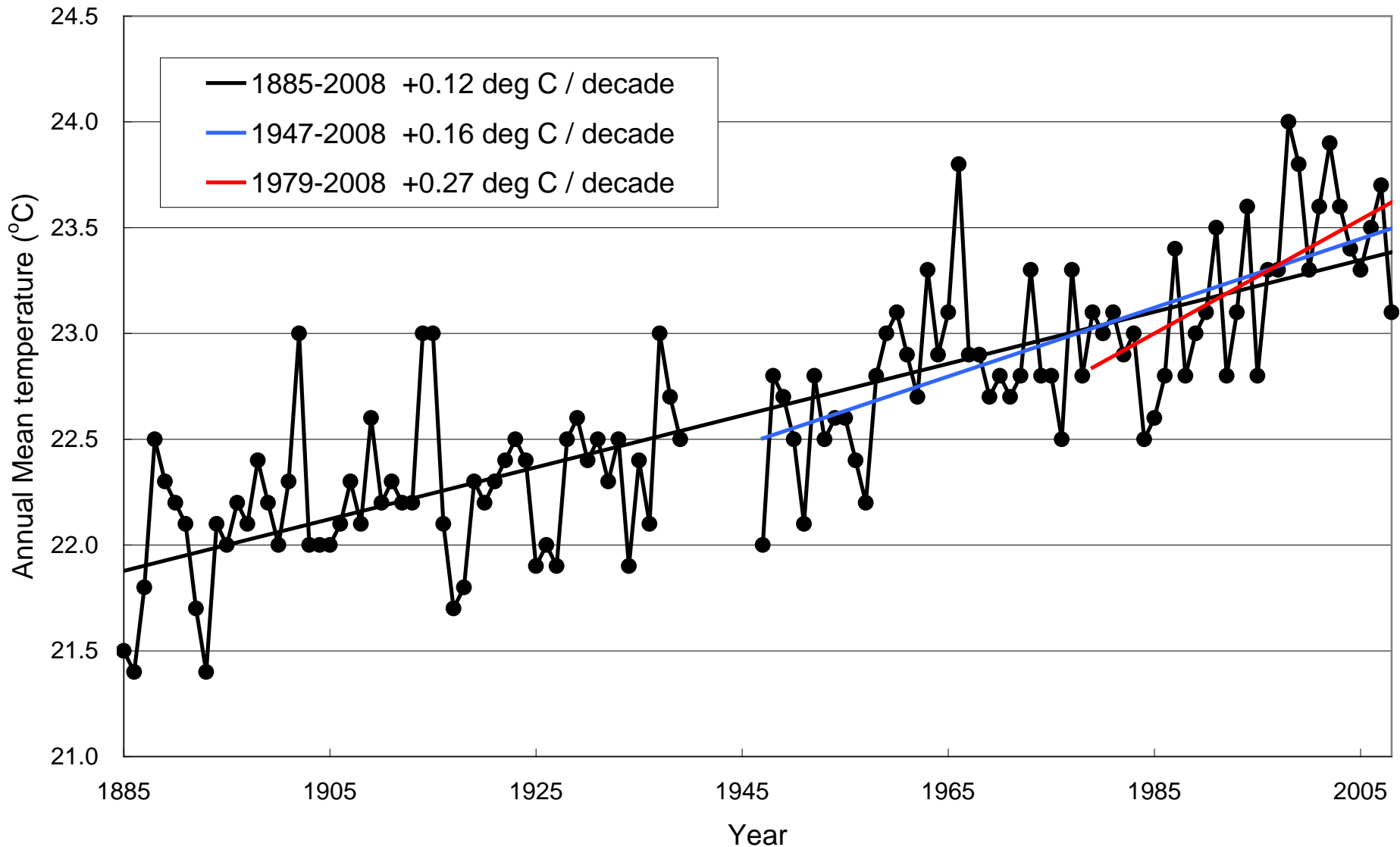
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Temperature trend in Hong Kong



Annual mean temperature recorded at the Hong Kong Observatory Headquarters (1885-2008). Data are not available from 1940 to 1946.

Global warming :

“The observed increase in globally-averaged temperatures since the mid-20th century is very likely due to the observed increase in man-made greenhouse-gas (GHG) concentrations”

(United Nations Intergovernmental Panel on Climate Change (IPCC), Fourth Assessment Report (AR4), 2007)

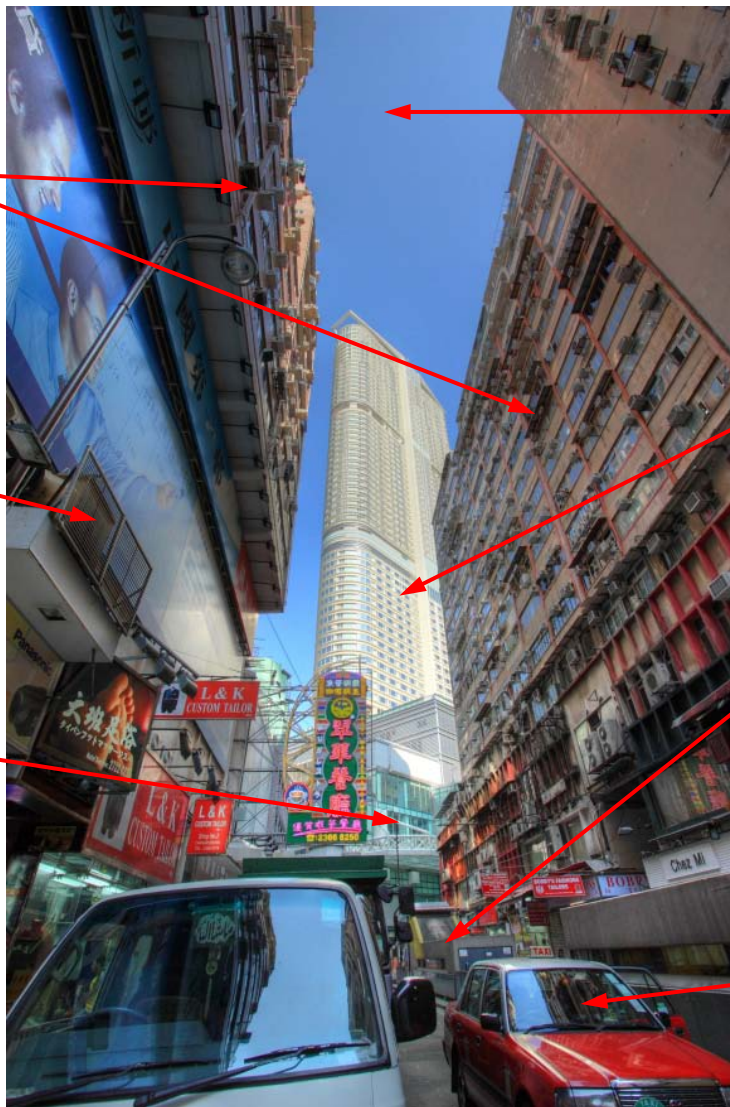
Urbanization :

- changes in land use
- reduced ventilation
- heat capacity of buildings
- man-made heat emission
- smaller sky view factor
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Oke, T. R., 1982: The energetic basis of the urban heat island, *Quart. J. Roy. Meteorol.Soc.*, **108**, 1-24

Grimmond S. 2007: Urbanization and global environmental change: local effects of urban warming, *The Geographical Journal*, 173(1), 83-88.

Urbanization – a snapshot in HK



Many air conditioners

Street level heat exhausts

Narrow street

Small sky view

Dense and tall development

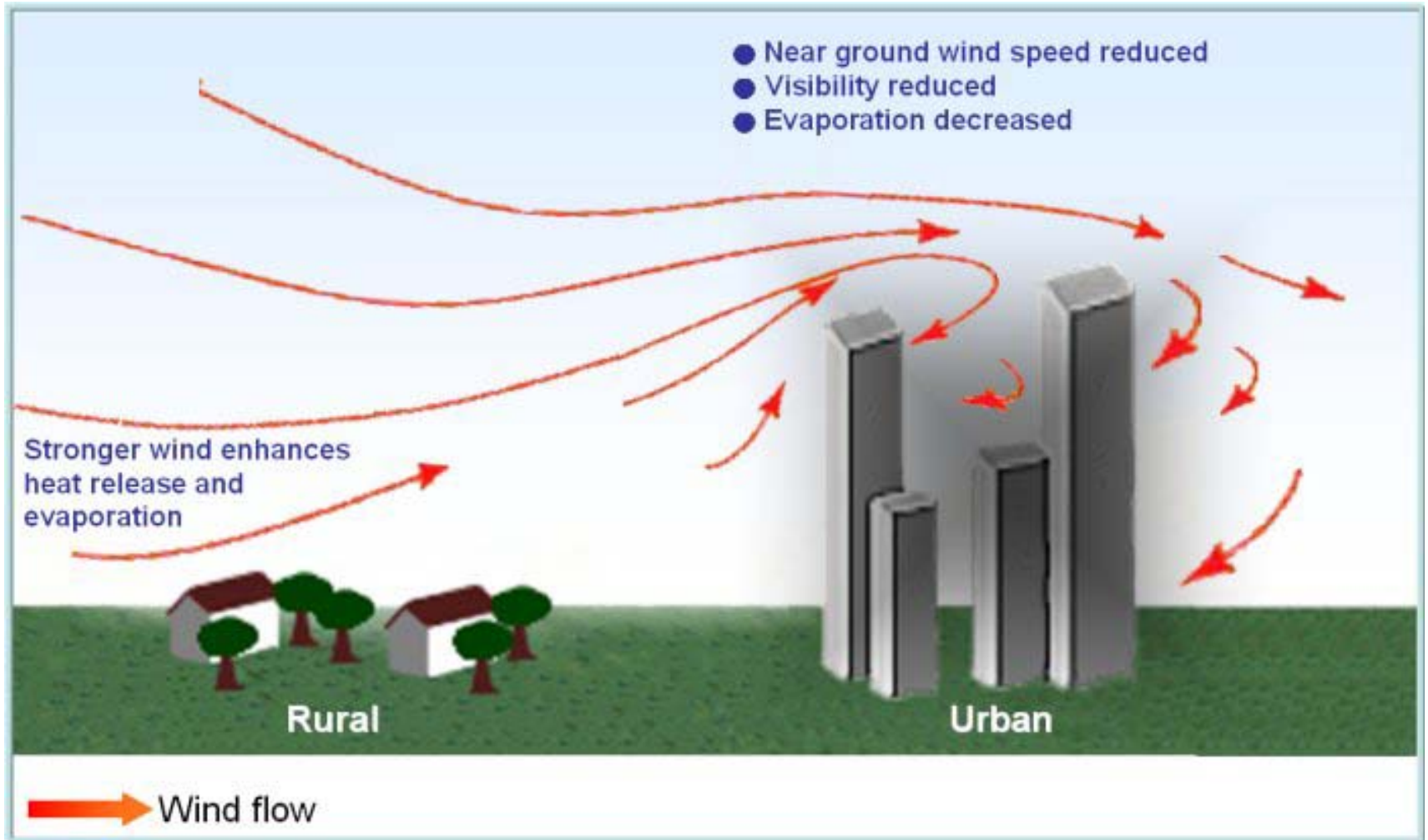
Near zero greenery

Heavy traffic

Besides temperatures, urbanization could also affect :

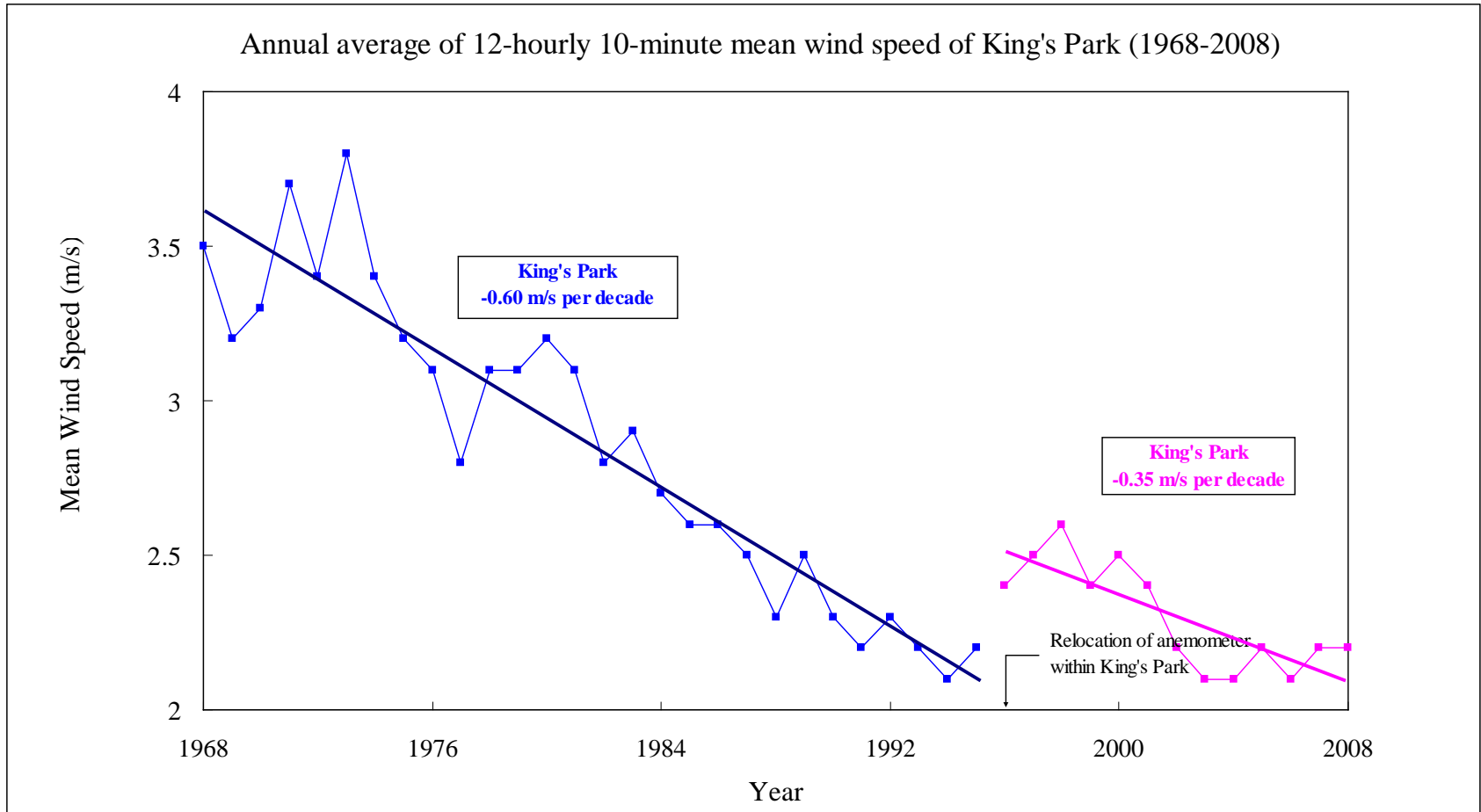
- (a) wind speed (air ventilation)
- (b) visibility
- (c) evaporation
- (d) solar radiation
- (e) rainfall distribution

Urbanization effect on wind speed, visibility and evaporation



Wind Speed Trend in King's Park

Dense developments in the urban area increase the roughness of the surface
Wind speed near the ground decreasing in the long run



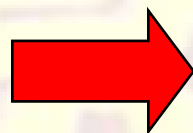
Annual average of 12-hourly 10-minute mean wind speed of King's Park from 1968 to 2008.

Implications on urban comfort ?

Increase in
temperature

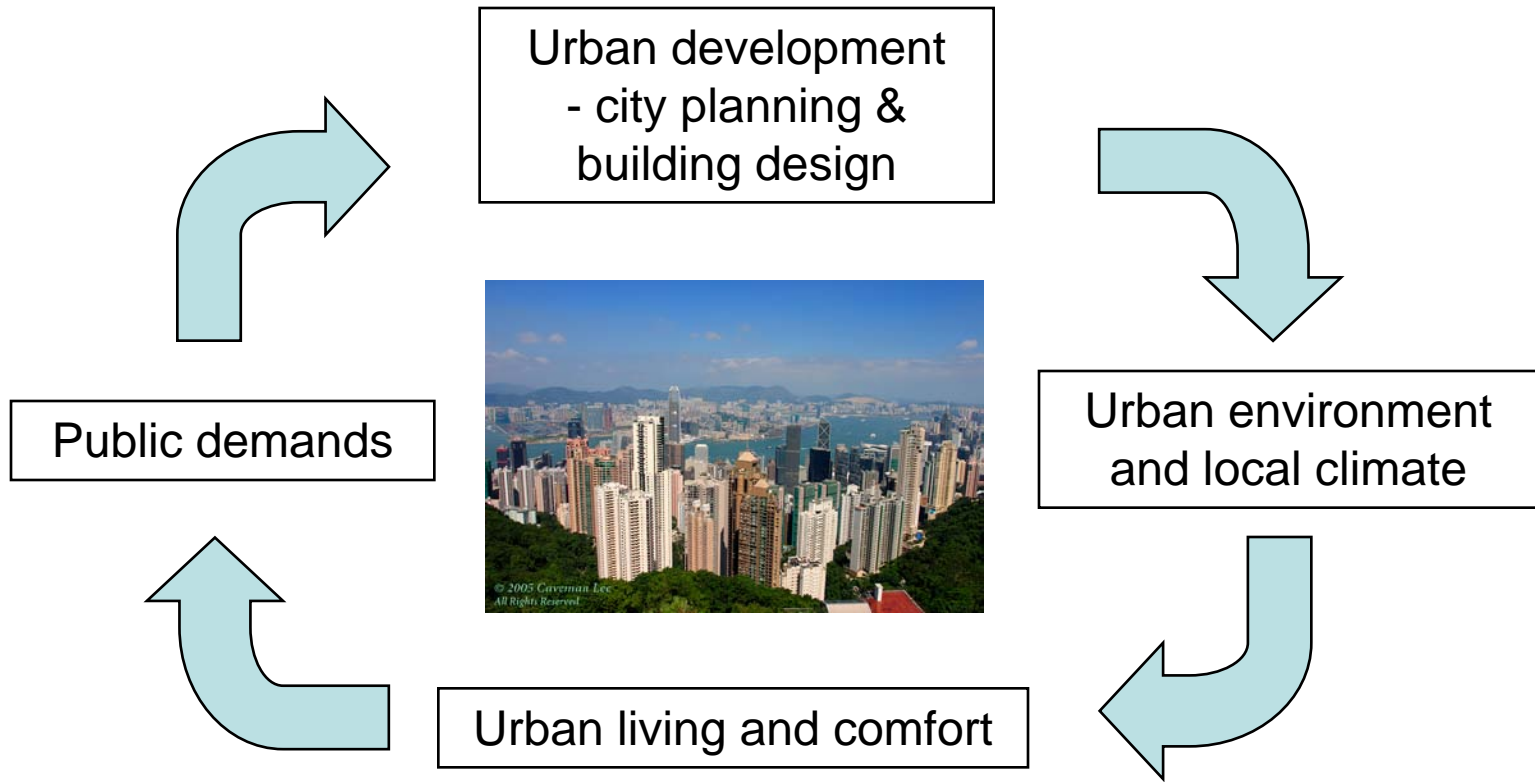
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Decrease in
urban wind speed



Hot and stuffy
summer

The feedback loop



Coming urban developments :
Western Kowloon, Kai Tak, Kwun Tong, Mongkok, Central Waterfront, etc.



Thank you

A path to green