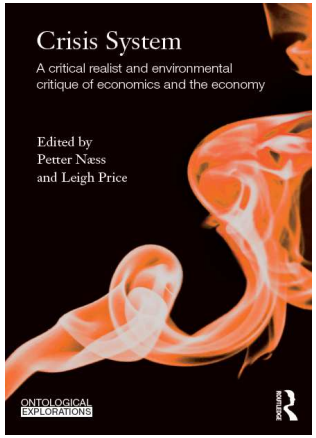
Densification as ecological modernization: achievements and limitations

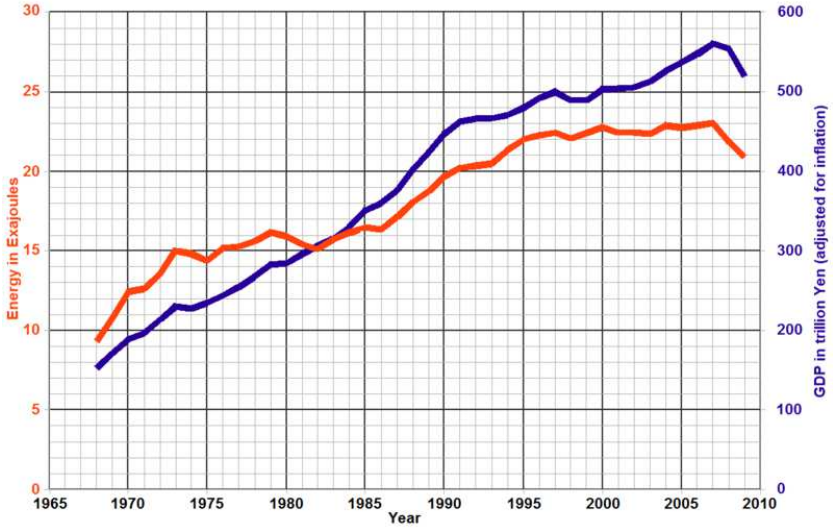
Presentation at the BeMInE seminar,
Helsinki, October 26-27, 2016

Petter Næss
Professor in Planning in Urban Regions
Norwegian University of Life Sciences
Head of the Urban Sustainability research group

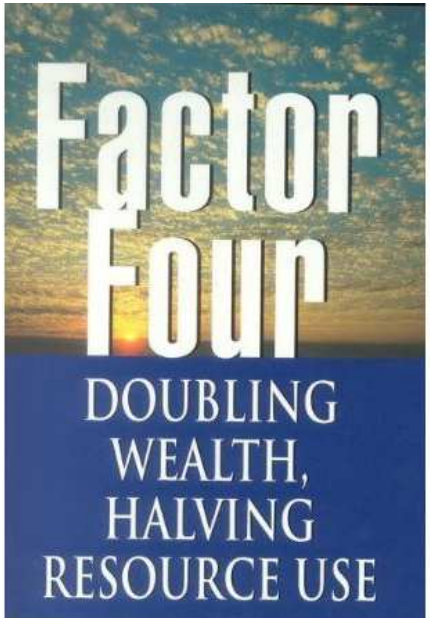


GDP = Gross Domestic Pollution?

- Historically, economic growth has been closely related to growth in pollution and consumption of natural resources (e.g. the graph of Japanese GDP and energy use, http://en.wikipedia.org/wiki/File:Japan_energy_%26_GDP.png)
- Can this relationship be broken?
- Yes, according to the proponents of '**green growth**'



Ecological Modernization – a strategy enabling capitalism to become environmentally sustainable?



Core elements of the theory:

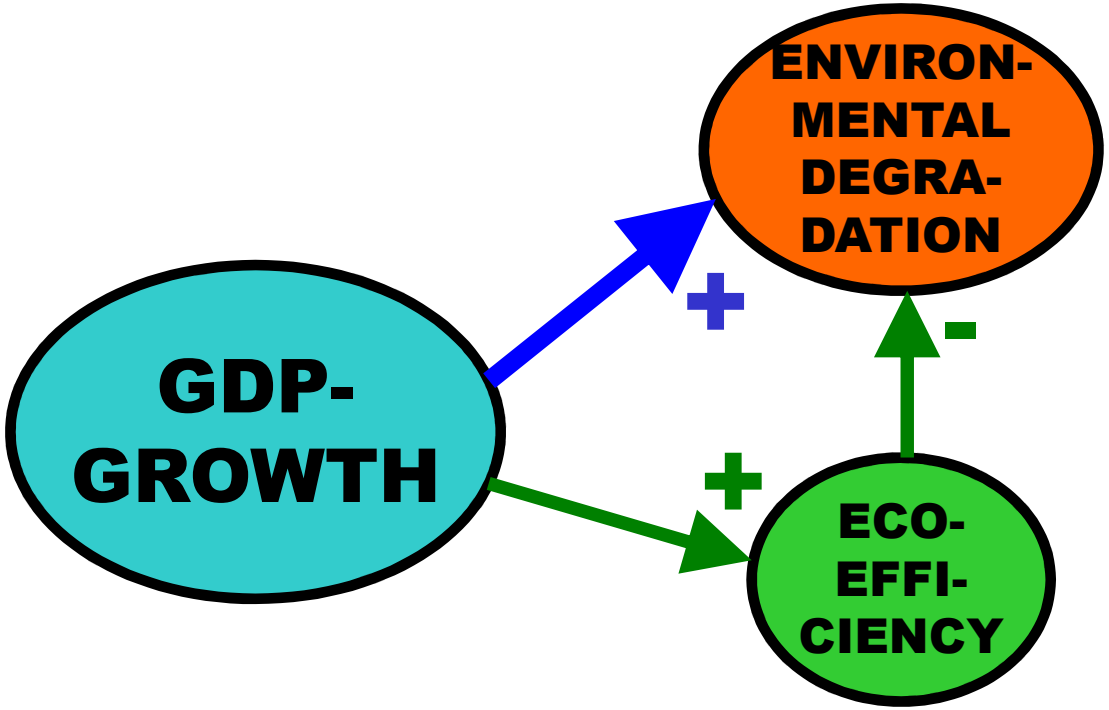
- Solutions to environmental problems **can be found** within the context of industrial capitalism
- The capitalism **in its present form** is limited by the capacity of the natural environment to absorb the effects of economic growth and to supply necessary resource inputs
- Capitalism must therefore undergo **a process of transformation** if it is to be sustainable in the long term
- **Decoupling** of economic growth from resource consumption and environmental load (”dematerialization”) are key elements in this process of transformation

Decoupling through increased **resource efficiency** and **substitution**

Urban development as a decoupling case

For urban development, the challenge of decoupling lies in finding ways to

- ***accommodate growth in the building stock*** and
- ***ensuring accessibility to facilities***
- while reducing negative environmental impacts resulting from the construction and use of buildings and infrastructure



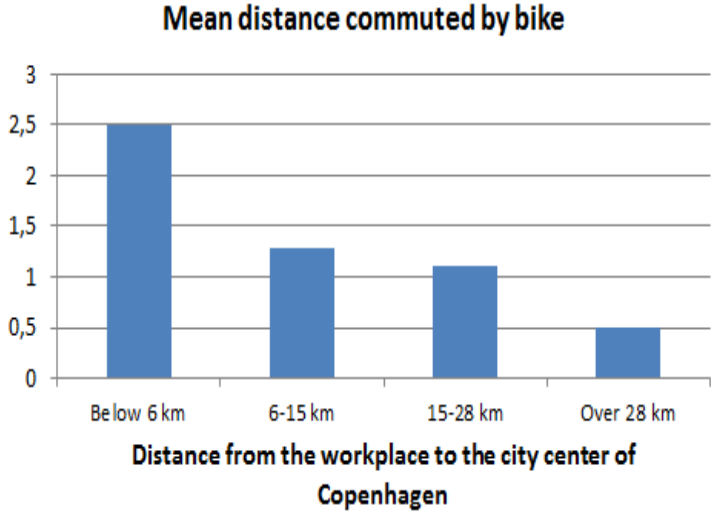
Main elements of a sustainable and climate-friendly urban development (I)

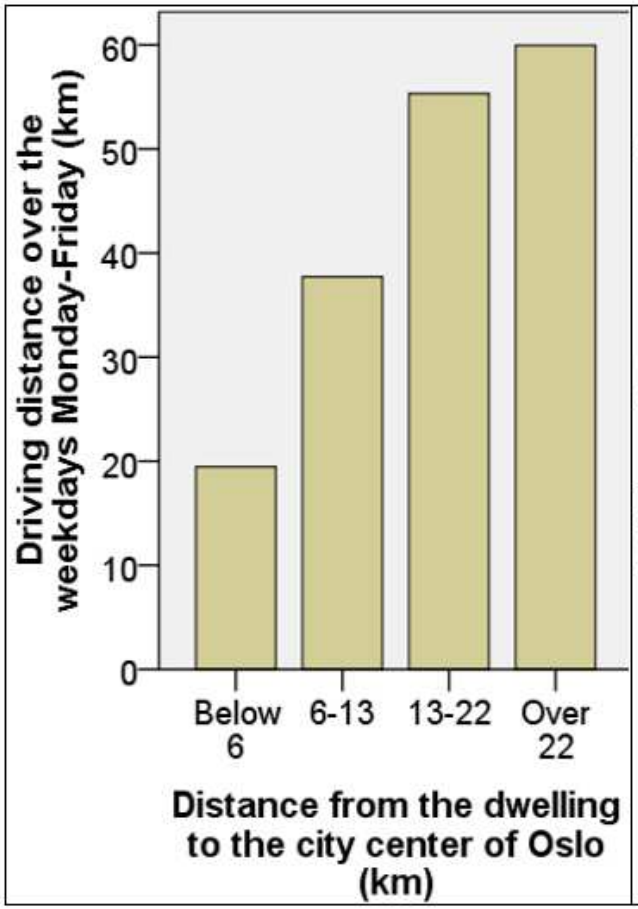
- **Re-use of urban land** instead of outward urban expansion, with densification channeled to areas already technically affected
- Build **resource-efficient housing types**. No more construction of detached **single-family houses** in the major urban regions – those already existing are more than sufficient
- Locate most new residential and office development to the **inner-city** and close to other major public transport nodes

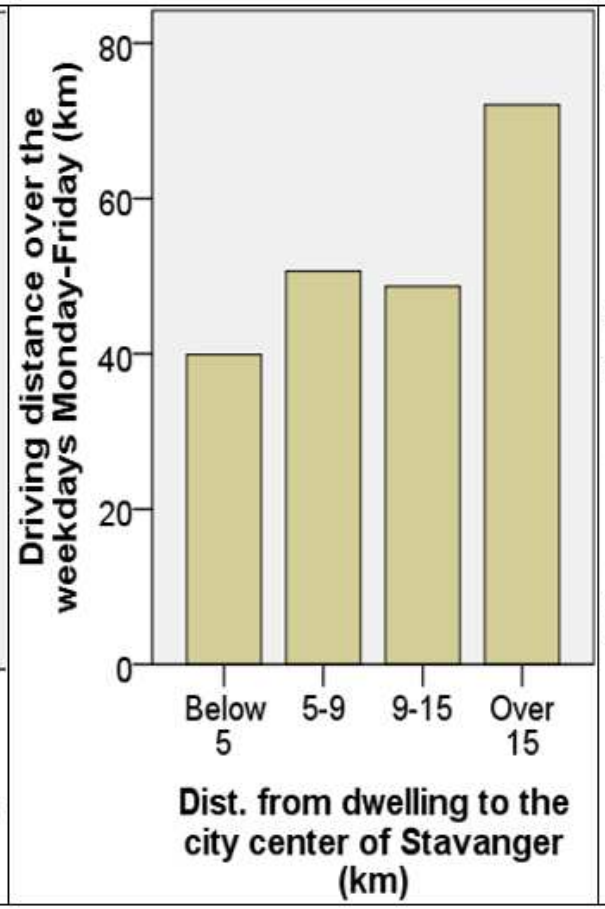
Main elements of a sustainable and climate-friendly urban development (II)

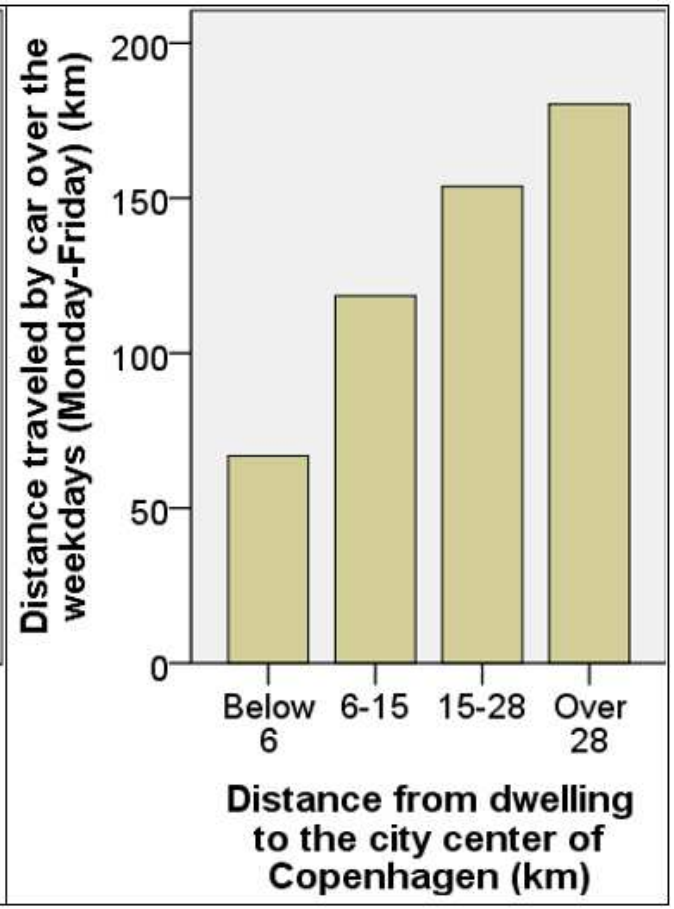
- **Restrictions on the use of cars** in the city, combined with public transport improvement
- **No increase** in road or parking capacity
- **Convert car lanes** on multilane roads into bus lanes, bike paths and/or rows of trees
- Increase the robustness to warmer, wilder and wetter weather:
  - Replace **asphalt** with **trees**
  - Build **green roofs** and roof terraces
  - Establish more **surface water**
  - Re-open **creeks**
  - Establish **canals** where feasible

Inner-city densification is particularly favorable to reduce car driving



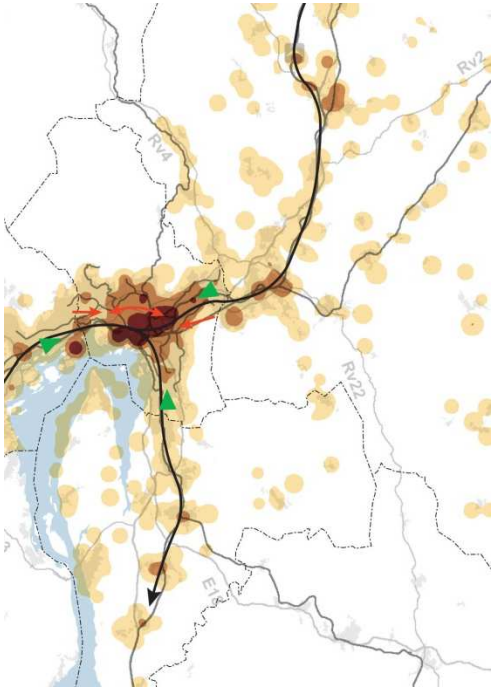






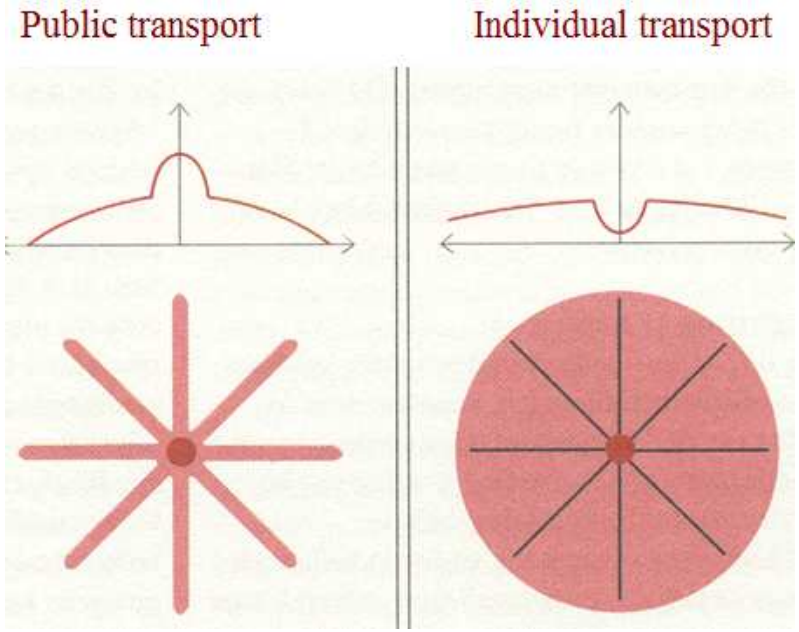
Why does the amount of car travel depend more on the distance from the dwelling to the **main city center** than to **local centers**?

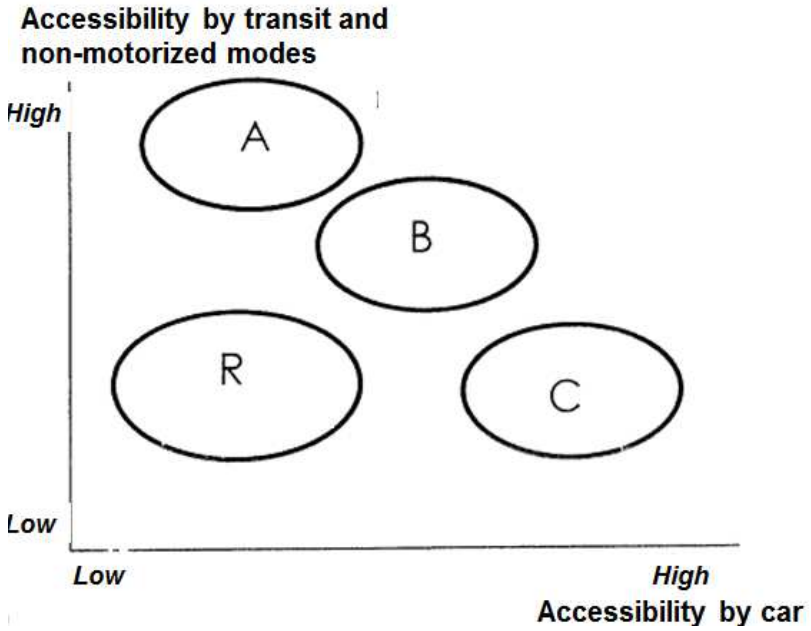
- For most travel purposes, most people do not necessarily choose the **closest** facility, but rather they travel a bit further if they can then find a **better** facility. This is especially true as regards **workplaces**.
- Travel distances therefore depend more on the location of the dwelling relative to **large concentrations** of facilities than on the distance to the closest facilities
- People who live **close to the city center** have a large number of facilities within a short distance from the dwelling and therefore do not have to travel long, even if they are very selective as to the quality of the facility
- Since **travel distance**s are often **short**, inner-city residents carry out a higher proportion of trips by **bike** or on **foot**



Workplace location at a city/metropolitan scale

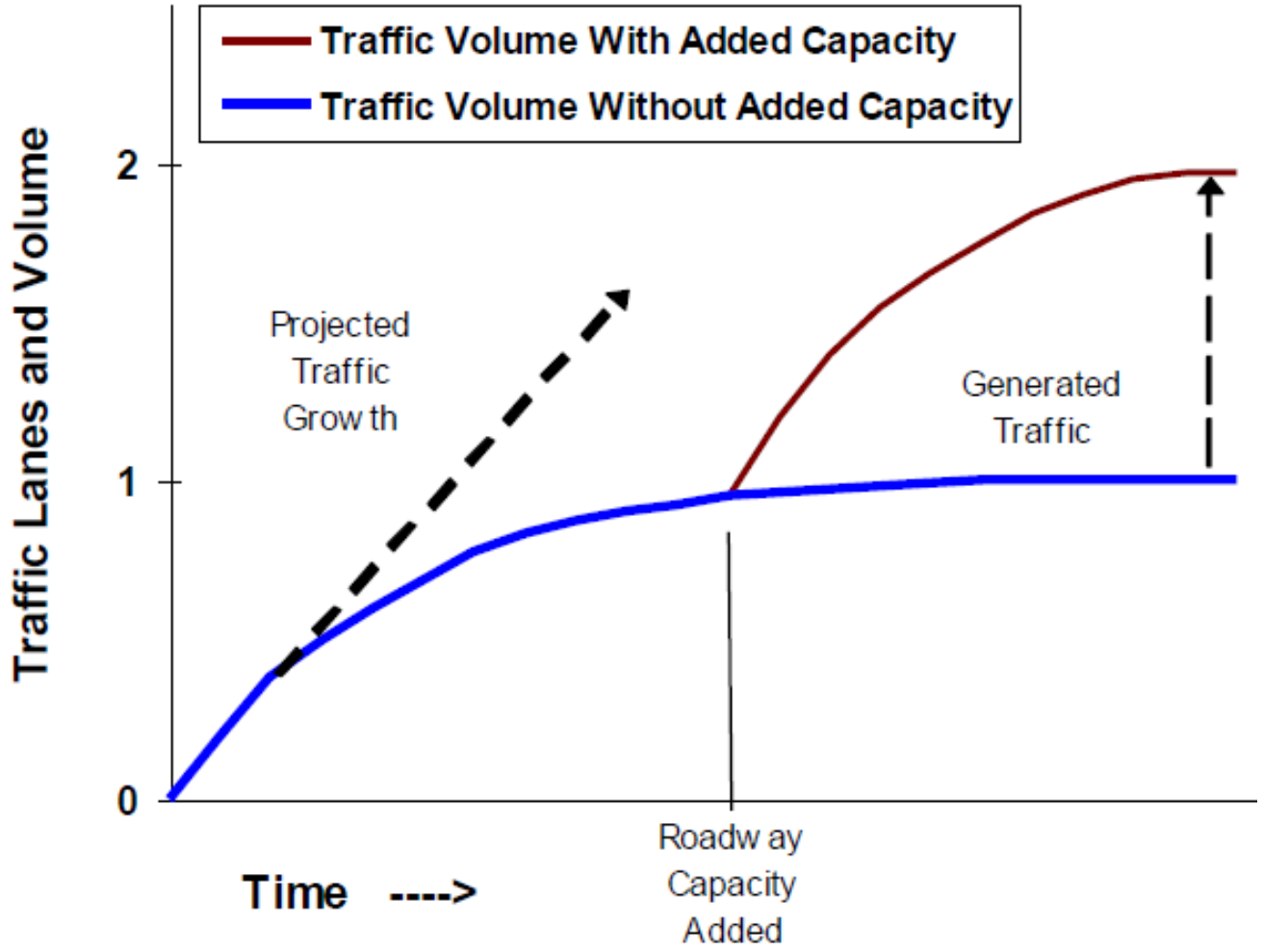
- In several Nordic cities, lower proportions of employees have been found to commute by car and higher shares to travel by public transit, bicycle or by foot to workplaces located in the inner-city than to suburban jobsites
- Typically, 80-90% commute by car to workplaces at the urban fringe, compared to 20% in the downtown areas of big cities (1 mill or more) and 35-60% in the central parts of medium-sized cities (0.1-0.3 mill.)
- No clear intra-urban center-periphery gradient for commuting distances



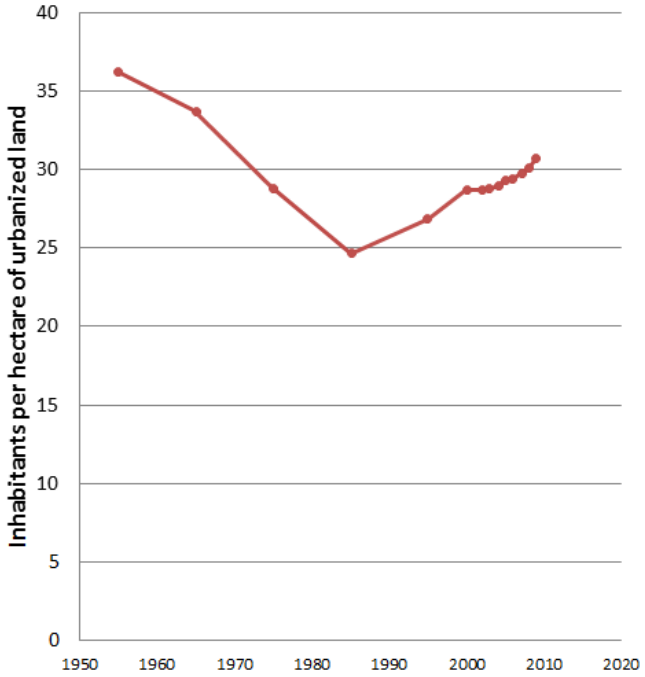


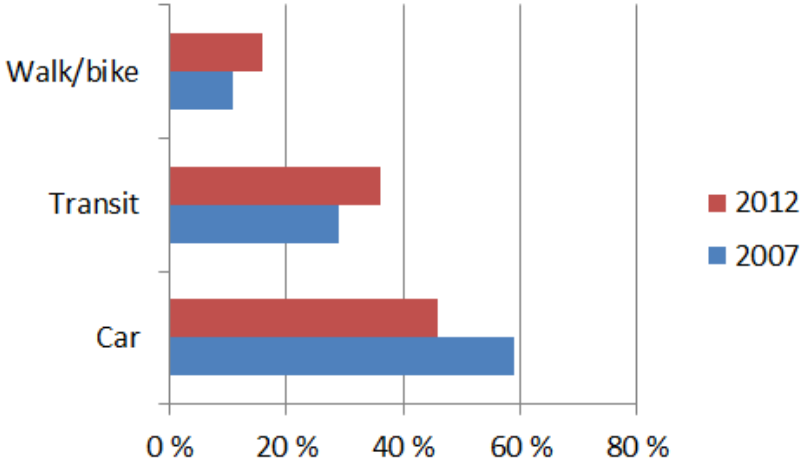
Road capacity increase in congested urban areas induces additional traffic growth

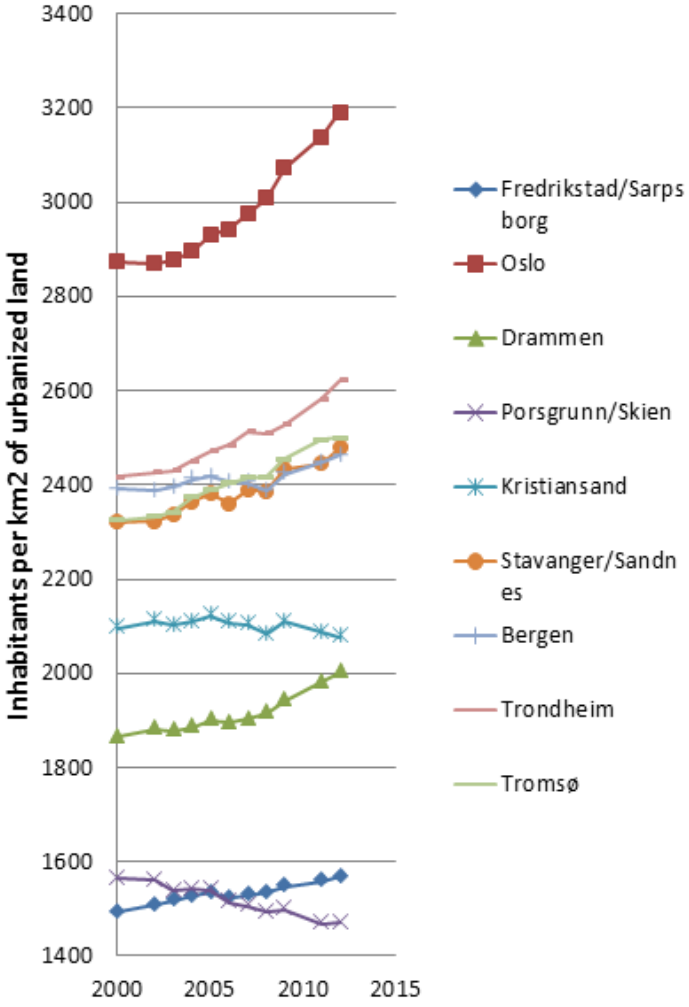
(Illustration: Litman 2012)



The urban containment policies of the largest Norwegian cities have saved land and reduced the amounts of car travel, but…







Limits to the densification strategy

- The most environmentally friendly densification possibilities will gradually be **exhausted**
- Many of the urban transformation sites have been made available due to **relocation** of industries (and thereby **of environmental impacts**)
- Insufficient to **avoid increasing** the environmental load – sustaining the present level will in many cases give continually increased environmental degradation
- If growth in the total building stock is to be curbed, construction of new, more environmentally efficient buildings should be combined with **demolishing the environmentally most unfavorable** parts of the built environment

Only **partial** decoupling is possible

- The environmental impacts of the building sector include ***construction impacts*** as well as ***operational impacts***
- Both types of impacts are larger for detached single-family houses than for apartments in densely built-up areas
- But also construction of dense apartment districts has its environmental impacts
- 'Smart' urban planning and housing design solutions can perhaps reduce some kinds of environmental impacts per new building down to one fourth or one tenth, but other categories of environmental impacts (notably those related to land consumption) are more difficult to reduce that much
- Reduction of the environmental impacts of the ***existing building stock*** is more complicated than the construction of new, environmentally efficient buildings
- It is therefore difficult to obtain a degree of environmental improvement of the existing building stock to ***compensate*** for the increased environmental load resulting from ***building stock growth***
- Moreover, many types of environmental impacts of the Nordic consumption of dwelling and other kinds of buildings are ***already at a level far above*** what could be considered environmentally sustainable

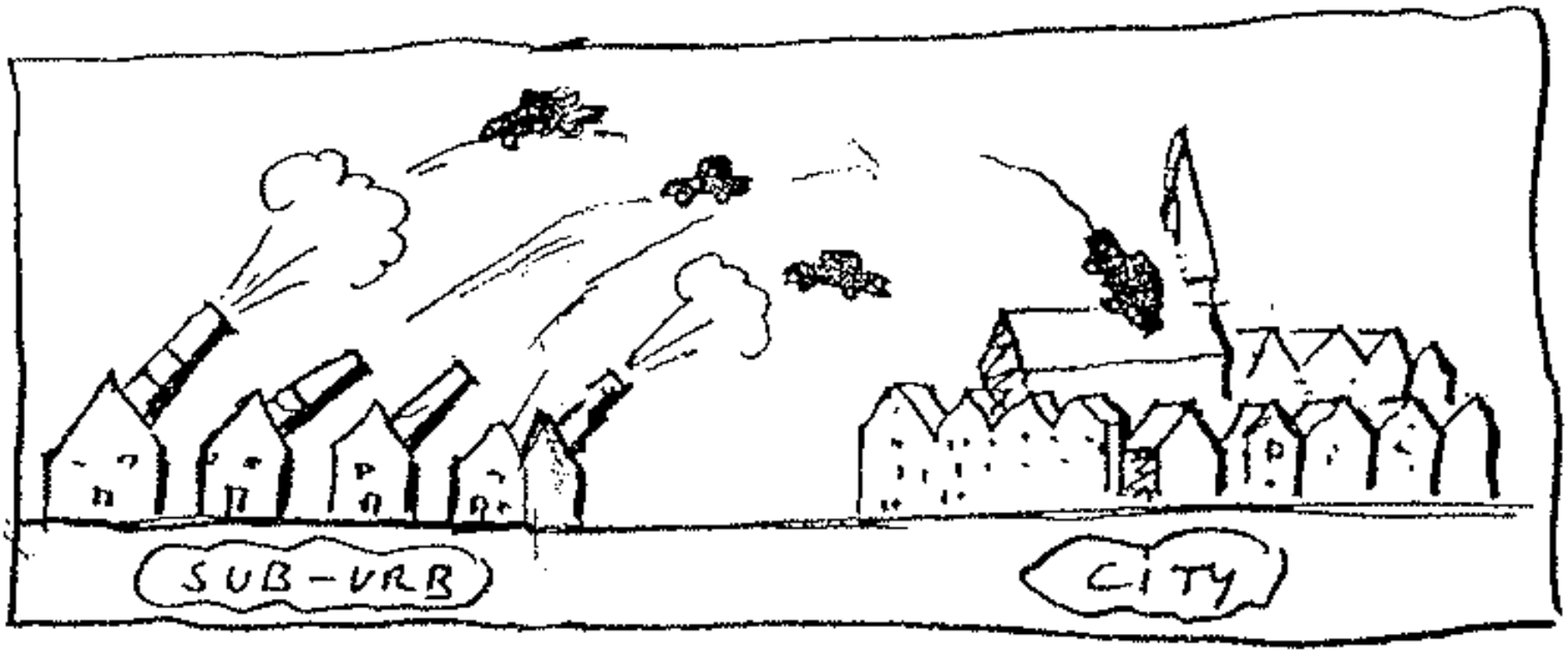
Georgescu-Roegen and the illusion of sustainable growth based on **recycling**

- Economic growth always has its base in some sort of **material consumptio**n, which implies steadily increasing volumes of products
- With ever-increasing product volumes **the recycling rate must increase** in order to avoid the consumption of more non-renewable raw material
- In practice, this implies that the products (including buildings and infrastructures) tying up resources must be taken out of use with **a shorter interval each time** (Høyer, 1997)
- Instead of making long-life products, the products would therefore have to become **increasingly short-life**!
- However, **recycling is not environmentally neutral**. It ties up and consumes energy and material resources, and even more so if the circulation rate is increased

“When it rains on the vicar, some drops will fall on the parish clerk…”

- Such plus-sum thinking has been crucial for forging the class compromise on which the social-democratic Nordic welfare state model is based. By baking a bigger cake, tough **conflicts on its distribution** between members of society could be soothed
- But what if the cake cannot, due to environmental and resource constraints, continue to be baked bigger?
- In a society with zero-growth or reduction in the total consumption, conflicts over the distribution of wealth between different population groups are likely to be intensified

Polarization or equalization?

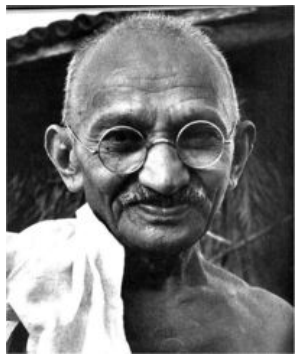


Densification in Oslo West and East

Densification, Tuengen alle

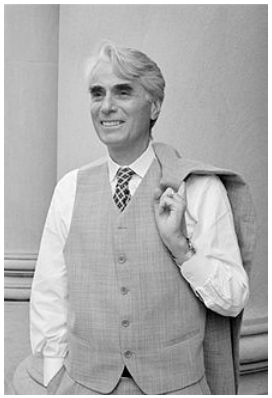
Densification, Hasle

“The world has enough for everyone's need, but not enough for everyone's greed.”



- The ‘decoupling’ that can be obtained between consumption growth and environmental degradation is at best only **partial**
- Growth in per capita consumption in affluent European countries is at odds with criteria for **environmental sustainability** and globally **just distribution**
- If ecological constraints, human needs and social justice are all to be taken into consideration, both **minimum** and **maximum consumption norms** should be set for dwellings and other key consumption goods
- To avoid such standards from just being non-committing pious wishes, efficacious governmental measures and **regulations** are called for
- Public regulations of consumption levels, let alone the redistributive nature of these regulations, would be sharply **at odds** with the current **neoliberal** hegemony

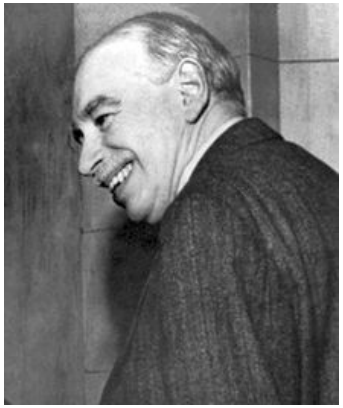
Needs, wants and ethics



- Some philosophers (e.g. Nozick, Machan) reject **welfare rights** and **social justice** as ethical principles. They build on the 17th century philosopher Locke, who held that one person's wealth usually did not prevent other people from also becoming rich
- Distinct from this, the United Nations **Human Rights Declarations** explicitly recognize that we have all, as humans, welfare rights

- Locke's (and Nozick's and Machan's) presupposition that there is always more land to acquire **obviously does not apply** in the contemporary situation of global ecological crisis and increasing scarcity of non-renewable resources – but **liberal welfare theory and neoclassical economics still build upon it**
- A trajectory for society that increases social and economic inequalities can have negative psychological and social consequences and is likely to reduce the possibility of low-income groups to exert political influence

Why do we so rarely speak about the need to curb the growth in consumption?



- **Keynesian demand-stimulating economic policy** has been the traditional social-democratic strategy for improving the material standard of living among the least affluent groups of society
- But the rise in total volumes of consumption that this implies is **environmentally unsustainable**
- Measures to curb luxury consumption (such as maximum limits to the size of dwellings) would be a strong **disincentive** against the economic competition on which capitalist society is based.
- Zero- or negative growth is at odds with capitalism's inherent **growth imperative** – could this be the reason why mainstream economists insist on the possibility of 'decoupling' consumption growth from environmental degradation?
- **Combining environmental and social sustainability** appears to be an almost **impossible** task within the confines of capitalism, be it in its neoliberal or in a more Keynesian form.