The compact city
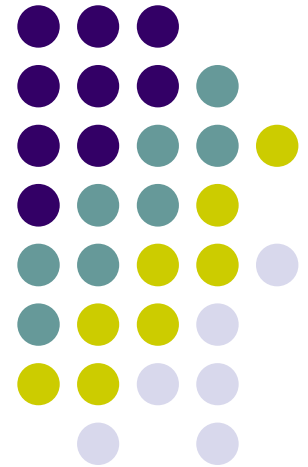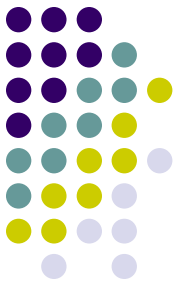
Outline

1. The Compact City
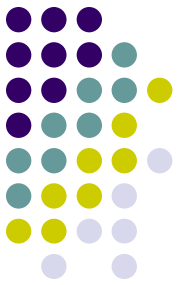   i.   Concept
    ii. Advantages and the paradox of the compact city
    iii. Key factor travel behavior
2. Urban sustainability
    i.   Definition
    ii. Evaluating the compact city concept with respect to urban sustainability
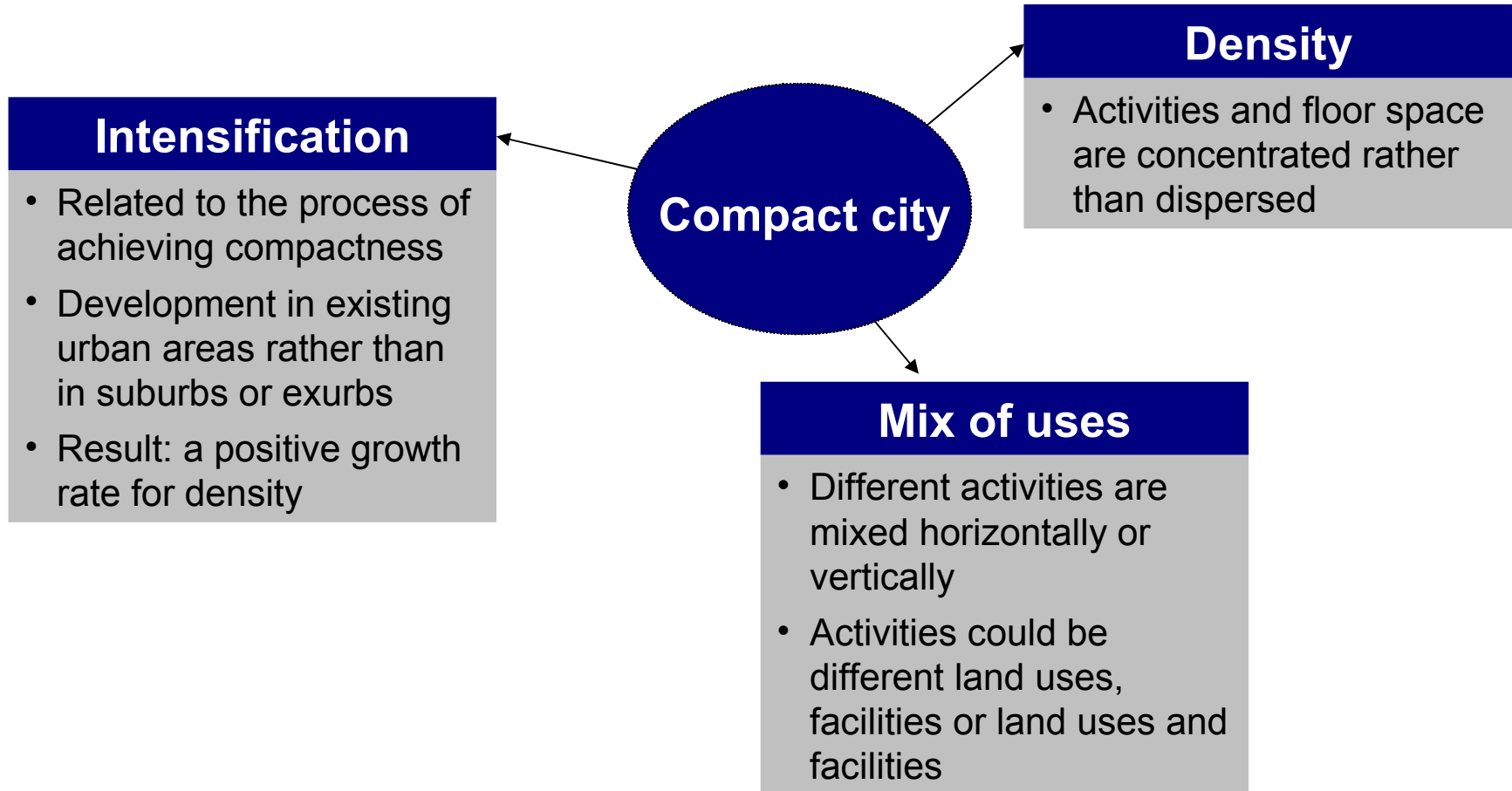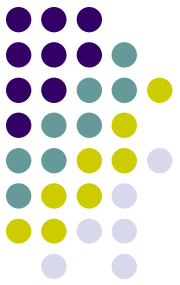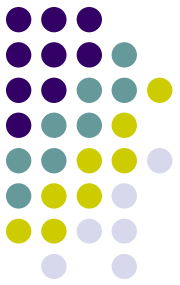3. Conclusion
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Urban development

- Periods of decentralization and deconcentration had exerted a tremendous pressure on the countryside
- The availability of land became an ever-growing issue owing to claims made by the rapidly increasing levels of mobility
- In the 1980's the population increased rapidly; when it stabilized, households became smaller and as a result number of households increased
- Whilst the need for housing and for urban space kept on growing, the negative effects of urban sprawl called for a change in the outwards-oriented movement in the surge for urban space.

> ➢ *The compact city concept was seen as an approach that could end "the evil of urban sprawl"*

Concepts describing the development paradigm of the compact city

Compact city

Intensification

- Related to the process of achieving compactness
- Development in existing urban areas rather than in suburbs or exurbs
- Result: a positive growth rate for density

Density

- Activities and floor space are concentrated rather than dispersed

Mix of uses

- Different activities are mixed horizontally or vertically
- Activities could be different land uses, facilities or land uses and facilities

4

The compact city

- The compact city concept aims at a high-density mixed-use, and intensified urban form.
- The idea emphasizes that urban activities should be located closer together to ensure better access to services and facilities via public transport, walking, and cycling, and more efficient utility and infrastructure provision.
- The basic provision of the compact city is the local community or neighborhood, though conventional urban planning models tend to plan towns and cities at a larger scale with a reliance primarily on automobile travel.
- In the compact city, human scale factors should be given greater emphasis from the viewpoint of achieving a better quality of life, and therefore consideration of the effects of the local environment are key components in such planning.

New Urbanism

➢ *New urbanism is an American urban design movement that arose in the early 1980's. Its goal to reform many aspects of real estate development and urban planning, from urban retrofits to suburban infill.*

- Creation of diverse, compact, and mixed neighborhoods

- Everyday activities, such as housing, work, schools, shops, and other amenities, are all ideally within 19 minutes' walking distance of each other

- The aim is to provide a pleasant, comfortable, interesting, and safe environment for pedestrians, and to provide alternatives to car use such as public, transit and cycling facilities
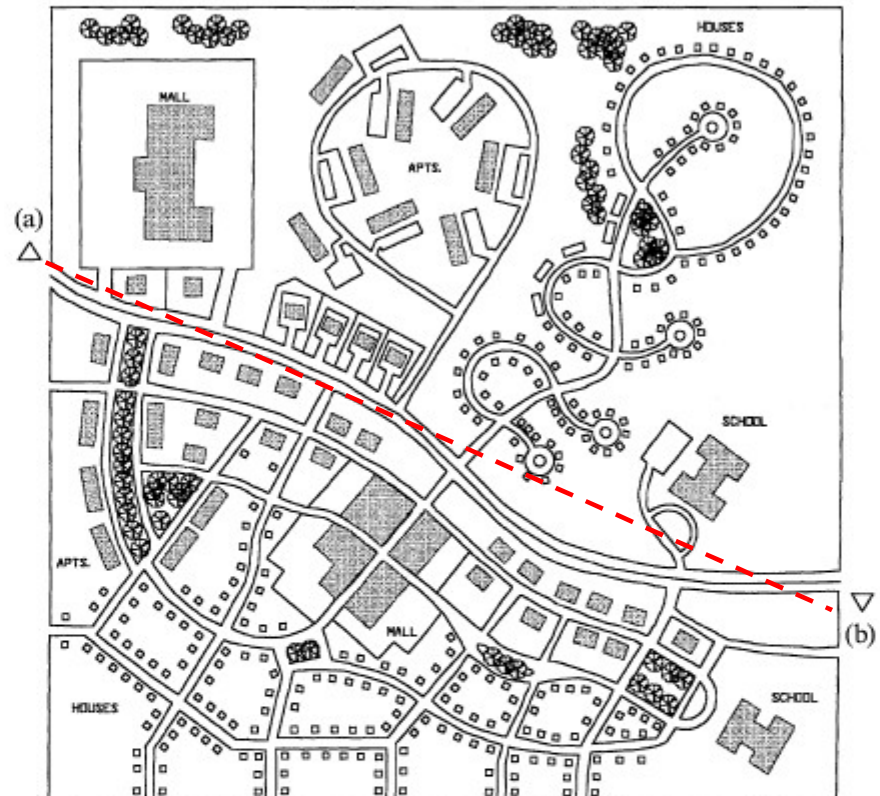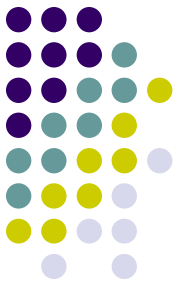
Fig.1 Contrasting suburban sprawl (a) with (neo) traditional neighboorhood development

Advantages of the compact city

- Less car dependency, low emissions, reduced energy consumption by
  1. Shifting from car to walking, cycling and public transport
  2. Reducing trip distances
  3. Reducing total number of trips
- Better public transport services, increased overall accessibility, re-use of infrastructure and previously developed land.
- The rejuvenation of existing urban areas and urban vitality, a high quality of life, the preservation of green space and a milieu for enhanced business and trading activities.
- Strengthening of the self-containment, diversity and multifunctionality of the city.
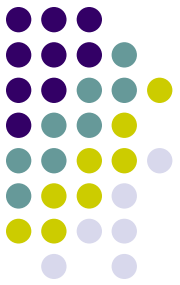
The paradox of the compact city

➢ *Why would compactness reduce energy consumption?*

• A number of developments which lead to an increasing density and/or a change of function or an expansion of activities give rise to stagnation or cannot take place at all, because the actual or expected environmental quality is seen as unacceptable. Often these developments are seen as desirable from a spatial point of view.

   • *Grey environment: The grey environment is seen as the part which relates to the hygiene of the physical environment and partly determines the quality of our day-to-day local and regional surroundings.*

➢ The *"paradox of the compact city":* The advantages are the reduced transport and space requirements. On the other hand, environmental problems are concentrated in the urban area, which can lead to conflicts between living and work functions.
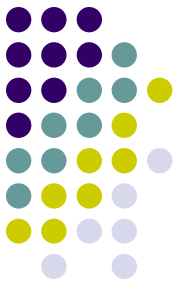
Environmental conflicts in compact cities

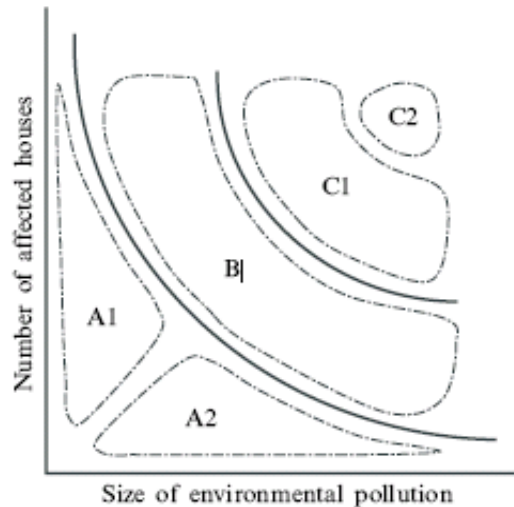Differentiation between relatively simple (A), relatively complex (B), and relatively very complex (C)

Fig.2 Categories of environmental conflicts around industrial sites

❖ **A: centrally issued standards can be implemented easily to create a separation between these site and residential areas.**

❖ **B: need for anticipation of the future environmental quality due to high costs which would be incurred in efforts to reduce the excessive environment load.**

❖ **C: highly substantial side-effets make it almost impossible to resolve these conflicts by implementing environmental standards.**
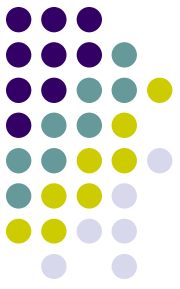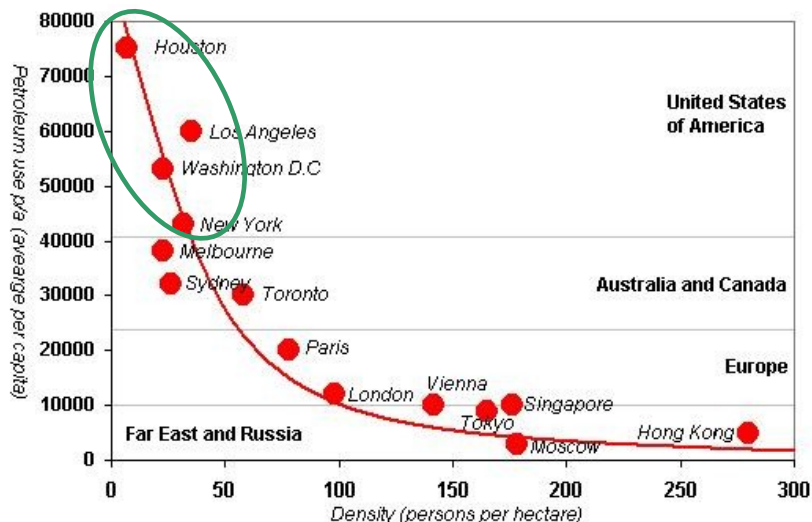
Key factor travel behavior

- Main goal: restrain dispersal of home, work, and leisure facilities to reduce commuting time and distances
- Advancement to "urban networks": which aims at concentrating new work and housing developments near to existing and potential public transport nodes and motorway intersections

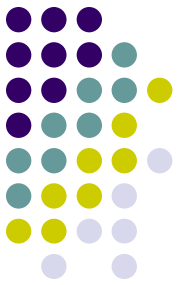Example: Housing debate in the US 1980's:

- Job-Housing balance: the spatial distribution of employees differed substantially from the spatial distribution from jobs causing an extra load of traffic.
- Excess travel ("wasteful commuting") due to too high average travel distances.

❖ **Reduce energy consumption**

❖ **Reorganize infrastructure**

Fig.3: Relationship between urban density and petrol use

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          with respect to urban sustainability
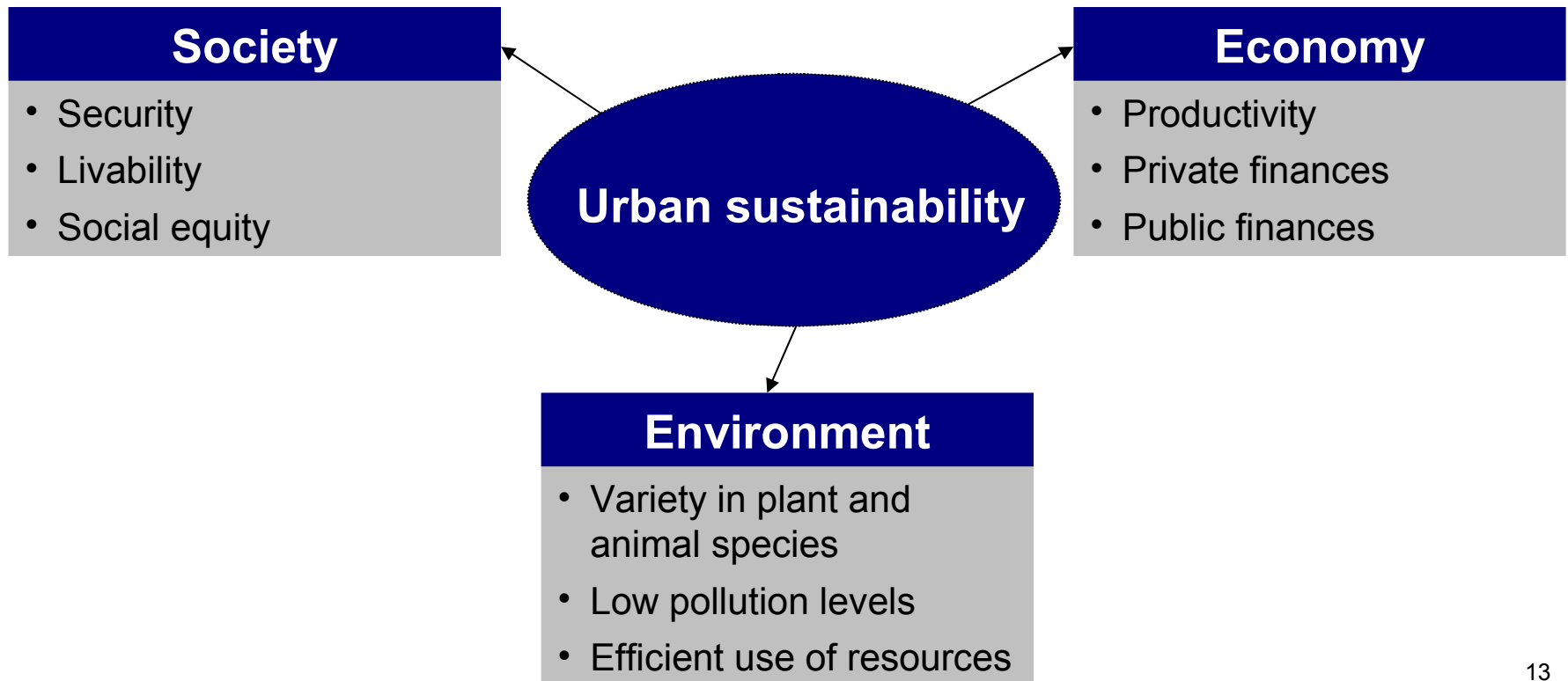
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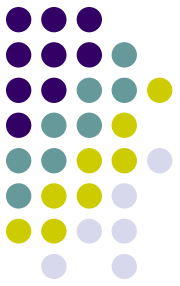
Urban sustainability

➢ *Sustainable development involves more than environmental conservation; it embraces the need for equity. Both intra-generational equity providing for the needs of the least advantaged in society, and inter-generational equity, ensuring a fair treatment of future generations, need to be considered.*

➢ Challenges generating models of urban sustainability:

- proliferate and transform the entire global economy into a balance-seeking relationship with our natural ecosystem
- reconcile humankind with the natural environment, whose health is the precondition for all human activity
- develop and maintain a continually re-balancing relationship among their internal social and economic activities and with their wider natural and agricultural landscape
- to develop a real and viable alternative to decline, not merely on a theoretical basis, but in a real place: *the sustainable city*
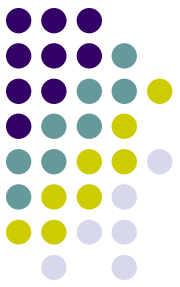
Indices for evaluating urban sustainability

The principles common to most definitions are the maintenance of the urban system's survival, the fostering of evolution in the long term, and the consideration of urban development in terms of three key features:

Society

- Security
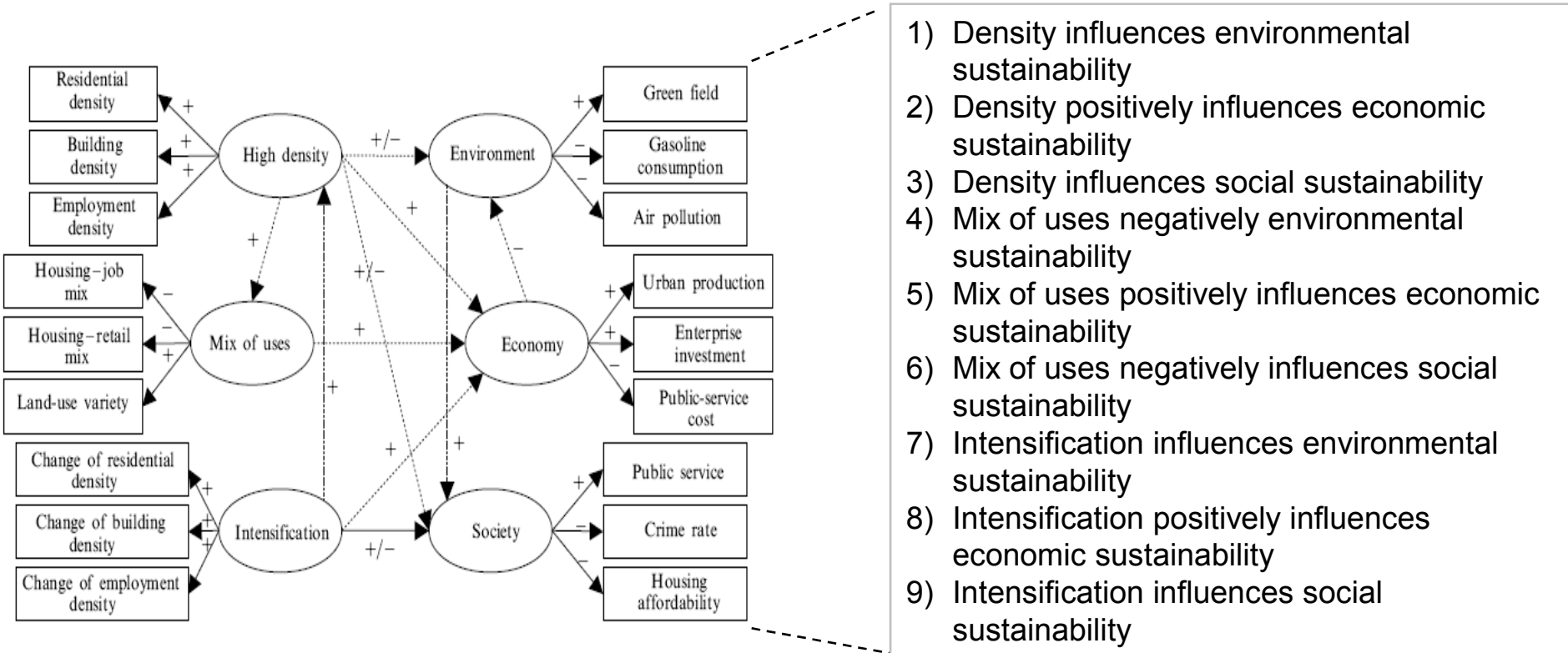- Livability
- Social equity

Urban sustainability

Economy

- Productivity
- Private finances
- Public finances

Environment

- Variety in plant and animal species
- Low pollution levels
- Efficient use of resources

An empirical example - Taiwan

Fig.4 Hypothetical path diagram

1) Density influences environmental sustainability
2) Density positively influences economic sustainability
3) Density influences social sustainability
4) Mix of uses negatively environmental sustainability
5) Mix of uses positively influences economic sustainability
6) Mix of uses negatively influences social sustainability
7) Intensification influences environmental sustainability
8) Intensification positively influences economic sustainability
9) Intensification influences social sustainability
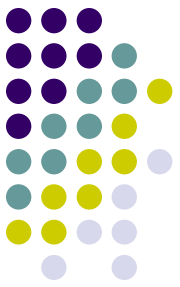
An empirical example - Taiwan

- The density and the process of intensification not only positively influence economic sustainability but they also negatively influence environmental and social sustainability.

- The mix of uses creates positive effects for economic sustainability and has a nonsignificant influence on environmental and social sustainability.
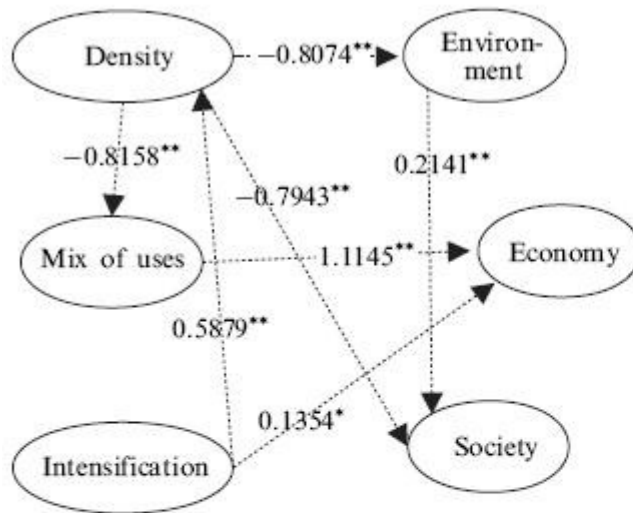

Fig.5 An empirical path diagram

❖ **Need for complementary strategies to guide compact-city based policy towards the goals of sustainability.**

❖ **E.g: increasing density under the limitation of environmental capacity; supplying a sufficient amount of green fields and public facilities.**

Effects of compactness on social equality

Compact city claim	Evidence
Better access to facilities	✓
Poorer access to green space	✓
Better accessibility to jobs	?
Better public transport	✓
Greater opportunities for walking and cycling	✓ ✗
Reduced domestic living space	✓
Poorer health	✓ ✗
Reduced crime	✗
Reduced social segregation	✓
Increased job opportunities	✓?
Lack of affordable housing	✓
Increased wealth	✗

Fig. 6 Effects of compactness on social equity

✓ = supports claim; ✗ = contradicts claim; ✓ ✗ = claim supported in some respects but not others; ? = evidence is ambiguous; ✓? = evidence is weak but tends to support claim.

Beneficial dimensions:

- Re-urbanization and evelopment of previously derelict land

- High density housing

- Large quantity of locally provided services and facilities

➢ Conflicts arise in attempting to identify future directions for policy, as forms of compactness appear to be positive for some effects and negative for others.
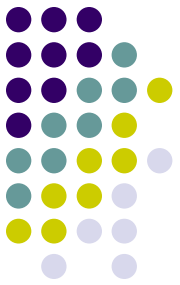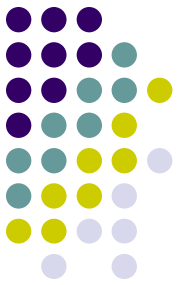
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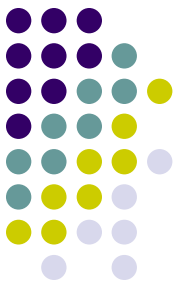
Conclusion

- Empiricism: for example, the reduction of car mobility did not occur, and the enormous need for housing made urban spread in the countryside unavoidable.

- Although the compact city was initially not meant to be a blueprint for sustainability, belief in the positive effects of this concept is widespread.

➢ *The compact city concept is most of all a spatial concept with the intention of intensifying the use of existing urban space as much as possible, thereby improving the quality of urban life and sparing the countryside.*

➢ *Compactness as a concept for sustainability seems primarily to be a belief in a simplicity that is not there. Hence its role has been taken up by the idea of urban sustainability.*

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    ii. Advantages and dilemmas

    iii. Key factor travel behavior

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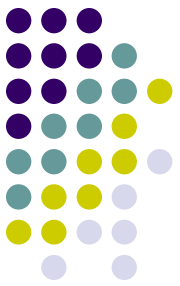
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