

*Workshop on interactive multi-actor spatial planning, Wageningen, 23 Sept. 2006*

# What agents for what planning?

Building multi-agent system models for  
changing planning needs

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# Outline

1. Introduction
2. Planning: perspectives, models and issues
3. Collaborative decision and public participation in planning
4. Interactive Multi-Actor Spatial Planning (IMASP )
5. Conclusion/ Discussion

# 3 main pieces:

1. Planning – in its many forms
  2. Collective decision & Public Participation
  3. Agents (ABM, MAS)
- *How do these come together in IMASP and PSS?*

# a. Land Use Planning

- An **ill-defined** notion:
  - Many different **perspectives**, definitions, **theories**, **modes** of organization and practice
  - **Social**, **political**, **technical**, **scientific**, and **institutional** dimensions
  - Varies across **place**, **scale** and **time**
  - Many discrepancies between **theory** and **practice**

## b. Collective decision making

- A variety of different **models and metaphors**, from many disciplinary angles
  - Economics, sociology, political science, management sciences, AI,...
- **Public participation** in planning
  - Democratic imperative
  - Political mandate
  - Practical necessity
  - Planners' excuse for **not** planning?...

## c. Agents in planning

- Rapid advances in ABM and MAS
  - About to pass the **Turing Test**?...
  - Is more **realistic** always better?
- What is their **role**?
  - Supply responding to a demand?
  - Technologically generated need?
  - A solution in search of a problem?
  - A technology too attractive not to exploit?
  - Something about to revolutionize planning?...

# Land Use Planning

# A definition:

**Land use planning** involves actions taken by some to affect the use of land controlled by others, following decisions taken by third parties based on values not shared by all concerned, regarding issues no-one fully comprehends, in an optimistic attempt to guide events and processes that very likely will not unfold in the time, place and manner anticipated.



# Planning actions: from past to future

- past
- present
- future



- react
- respond
- mitigate
- control
- manage
- adapt
- anticipate
- prepare
- change
- shape
- create

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- react
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operational

managerial

- prepare
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- shape
- create

strategic

# Enter Planning Support Systems (PSS)

- motivated by **democratic** principles of information provision and participation
- enabled by **user-friendly** technology
- aimed at providing **scientifically-based** insights to both the planners and the public
- combine land-use **models** with GIS and visualization tools

# Planning must address the following questions about the future:

- Possible futures:  
‘what may be’ (if...)
- Desirable futures:  
‘what should be’ (so that...)
- Contingent futures:  
‘what could be’ (assuming...)

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**Scenarios**

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**Visions**

- Contingent futures:

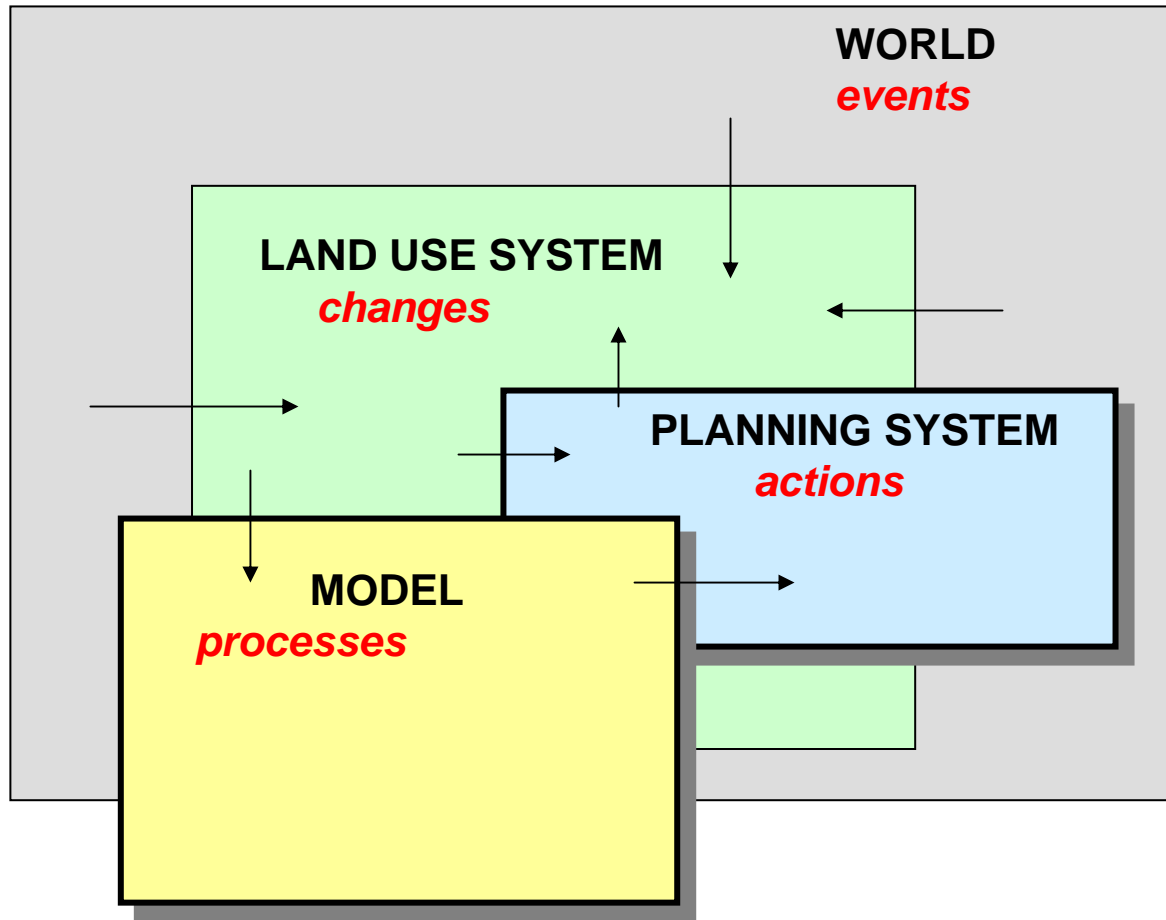
‘what could be’ (assuming...)

**Stories**

# Functions of models in future-oriented, normative planning

- Possible futures:
  - explore bounds of what is possible
  - help test planning strategies against these
- Desirable futures:
  - help figure out alternative strategies for getting from ‘here’ to ‘there’
- Contingent futures:
  - help ‘sell’ particular accounts about the future

# 4 realms of change must come together:



Multiple uncertainties characterize the different kinds of events, changes, processes and actions that planning deals with:

- **UE**: uncertainties about events and changes in the external **e**nvironment (**‘World’**)
  - **UR**: uncertainties as to future actions in **r**elated fields of choice (**Land use system**)
  - **UV**: uncertainties as to appropriate **v**alue judgements (**Planning system**)
- (Friend and Jessop, 1969)
- **UM**: uncertainties regarding the reliability of the **m**odel(s) used



- The future is characterized by several qualitatively different kinds of **uncertainties**.
- The job of planning is not to eliminate the uncertainties but to **tame** them.
- There are **tools** to help do that!

# 1. Scenarios: what may be

- A concept well familiar to both modelers and planners
- The forte of PSS!
- Very (too?...) easy to produce in quantities with land use models
- Many definitions

# Scenarios for planning

- All are **alternative narratives** about what the future might look like
- They may describe **end states** or courses of events leading to these
- **Critical distinction**: are these end states or courses of events **under the decision-makers' control**?

# Two kinds of scenarios for planning:

- Scenarios as possible futures outside the purview of the planning system
  - First-order scenarios: states of the **WORLD**
- Scenarios as alternative courses of action within the purview of the planning system
  - Second-order scenarios: alternative plans or strategies about the planned **LAND USE SYSTEM**

# Opportunities for PSS (1): Scenarios

- PSSs must include functionality to generate, and explore the local implications of, alternative ‘world’ futures described by scenarios
- Scenarios may be supplied by either macro-scale models or by the users
- Land use models should be open to inputs from the ‘world’ that affect their boundary conditions

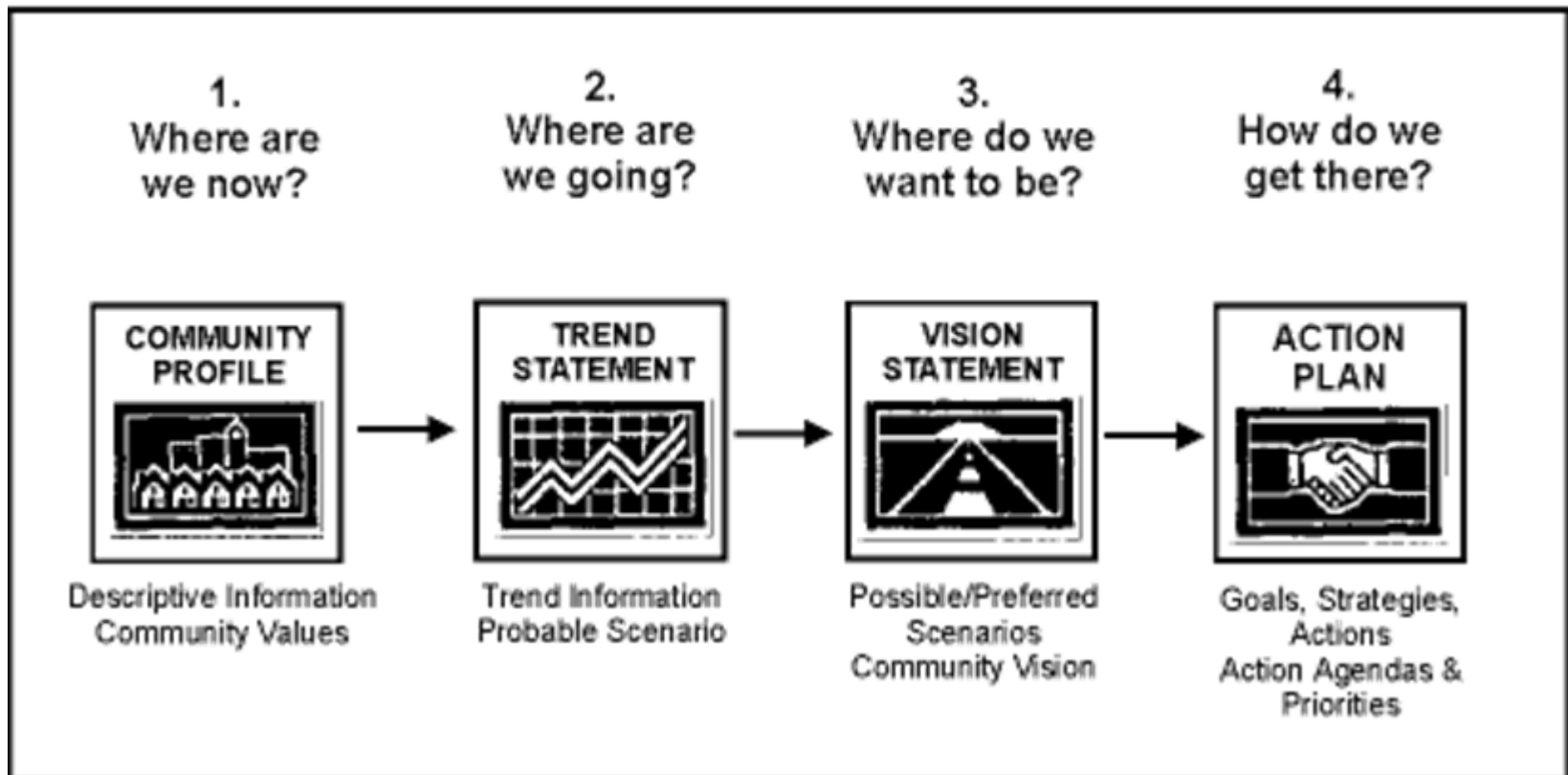
## 2. Visioning: what should be

- Aims to develop “a clear and succinct description...of what the community should look like after it...achieves its full potential” (Bryson 1995)
- normative, forward-looking
- collaborative
- a (poor) substitute for strategic planning?

# The visioning process

## THE OREGON MODEL

A COMPREHENSIVE COMMUNITY VISIONING PROCESS



### 3. Story-telling: what could be

*“Spoken words are the symbols of mental experience”*

• Aristotle, De Interpretatione

- People do not connect through common information, but through **common interpretations**
- Models for planning must ‘**tell a meaningful story**’



# Exploit the power of narrative!

- Science and rhetoric **can** (do!) coexist
- Goal: **persuade and engage**, by translating information into meaning
- Narratives in planning:
  - visions of order/ disorder conditional upon choices to be made
  - (dynamic) **land use models** can provide persuasive narratives
    - **intrinsic logic of system relationships**

# Opportunities for PSS (3): Storytelling

- Help translate land use models into **socially meaningful** stories
  - connect with archetypal themes:
    - small-town *Gemuetlichkeit*, a world without birds,...
- **Illustrate** the stories with compelling visualizations and spoken narrative
- Identify common story-lines and **decision points** in alternative plans with different outcomes

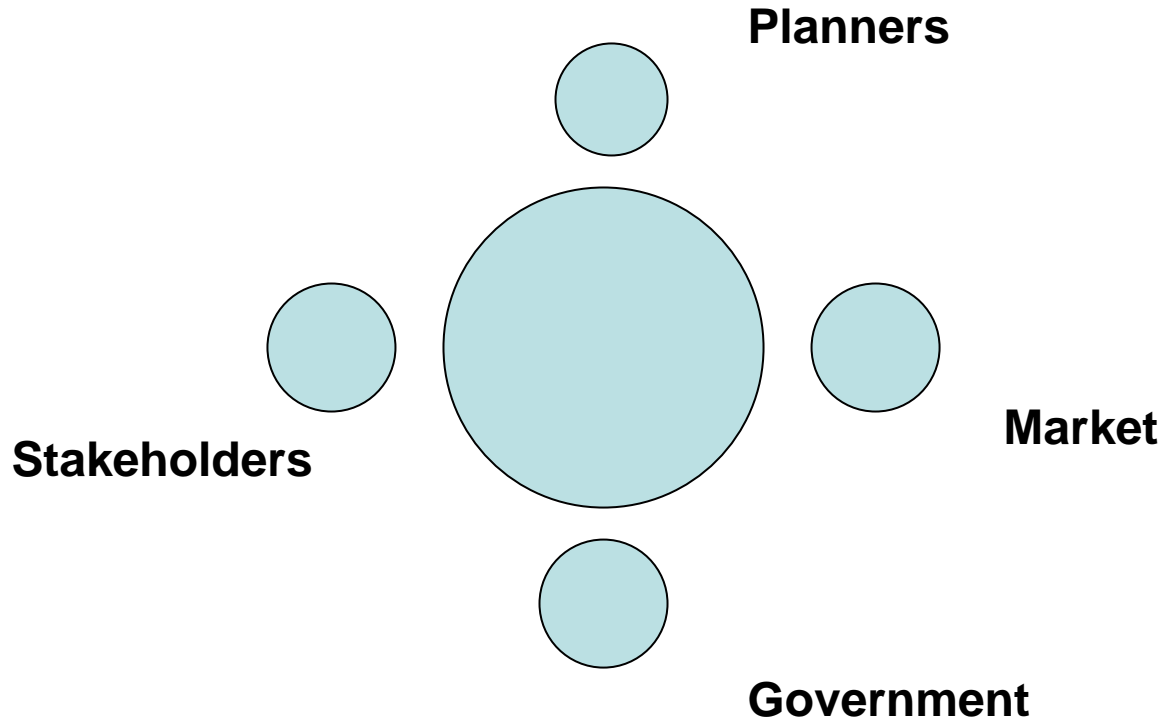
# Collaborative Decision

# Arguments for participation

- Increase group planning capabilities
- Involve stakeholders in decisions
- Represent interests of decision makers
- Reduce later resistance
- Give different people a voice
- Find out basis of likely opposition
- Legitimate action
- Create spirit of citizenship

# 'Planning is like a game'

- What is a game?...



# Many models and metaphors:

- Games (formal)
  - Notions of utility, strategy, competition, cooperation
  - As in microeconomics
- Games (role-playing)
  - E.g., CLUG (Feldt et al. 1972), Metropolis (Duke), Green Revolution (Chapman)
- Games (computer, multi-player: MMOGs)
  - E.g., Alphaville: disputed elections. See [http://www.technologyreview.com/read\\_article.aspx?id=13606&ch=infotech](http://www.technologyreview.com/read_article.aspx?id=13606&ch=infotech)
- Basis: ***individual interest***

# Other models of collective decision

- Aggregation of preferences (**voting**)
  - Predetermined options
  - Majority will
  - Vote trading
- Social cognition & deliberation
  - Dynamic, fluid processes
  - Conflict resolution
  - Generation of new options
  - Learning
- Basis: ***social welfare***

# Interactive Multi-Actor Spatial Planning (IMASP )



# Capabilities of ABM

- 2 kinds of ABM ('soft' and 'hard' AI)
  - Problem-solving software
  - Representations of decision & behavior
- 2 applications of ABM in planning
  - Actors in lands use process
  - Participants in planning process
- That's too vague: Participation in what exactly?...

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**Stories**

- What IMASP for
  - Scenario development
    - Thinking ‘outside the box’
  - Visioning exercises
    - Fusing what’s desirable with what’s possible
  - Effective story-telling?
    - Generating powerful narratives to educate and warn

# Questions for a **research agenda**

- Comparative advantages of agents over humans?
- Use of human-computer-human systems?
- Development of online planning games (MMOG model)?
- Involving children in civic processes?
- Potential risks of IMASP?