

Algorithmic Sustainable Design: The Future of Architectural Theory.

Nikos A. Salingaros
University of Texas at San Antonio

Lecture 11

11.1. Duany-Plater-Zyberk (DPZ) codes.

11.2. The New Urbanism.

11.3. Stephen Mouzon's project.

11.4. Tall buildings.

11.1. Duany-Plater-Zyberk (DPZ) codes.

Michael W. Mehaffy

- In this lecture, I'm happy to welcome the participation of Michael Mehaffy, urbanist, philosopher, and educator
- Past Director of Education for the Prince's Foundation, London
- One of Alexander's generals: Lysimachos, Antigonos, Seleukos, Ptolemy, Mehaffy, Salingaros, *et. al.*

Introduction (Michael)

- New Urbanism is about:
- **The space between buildings**
- **The arrangement of buildings in space**
- **The complex connective system of public and private realms (including buildings!)**

Introduction (cont.)

- Challenges:
- **The connective system of public and private realms is surprisingly complex!**
- **Rapid new urbanization & growth — 50% of humanity now in cities**
- **Environmental pressures — climate change, resource depletion, etc.**

Introduction (cont.)

- Solutions:

- **Much greater urban efficiency**
- **Much greater urban connectivity — ability to move efficiently in many modes**
- **Self-organized patterns and pattern-generating tools — codes generate sustainable urban morphology**

Codes that create society

- A practical advance in urbanism
- Form-based codes unlike the ones legally binding all urban development
- DPZ smart code enables organic, human-scale urban fabric to emerge
- But must be calibrated to local and historical sense of place

Modernist versus New Urbanist

- Monoculture versus Mixed use
- Disconnected versus Connected
- Emphasis on largest scale versus Balanced scales
- No pedestrians versus Protect pedestrian
- Streets divide versus Streets that unify

Replace all the form-based codes

- Code books are modernist
- They automatically produce a modernist car-dependent city
- They destroy the pedestrian human-oriented and human-scaled city
- The only way to reverse urban destruction is to adopt codes for traditional urbanism

“Smart code”

- A generic urban code that guarantees human-scale habitat
- Contains many pieces that have to be calibrated for local needs
- Does not force the same rigid typology everywhere
- Available free online from DPZ

Calibration

- Measure the most wonderful examples from existing urban regions
- Different typologies for different uses
- Write measurements into code
- Adapts to locality and different uses

Calibration involves driving and walking around a city to document dimensions and measurements for the different regions of urban density. These measurements then become the basis for new building and urban re-generation. One needs to identify the best examples from the past and the present to get those measurements (for example, curbs, houses, multi-storey buildings, setbacks, trees, etc. that have not been destroyed). This is the urban DNA that is capable of regenerating a city. In some cases, all the DNA in a city has been corrupted, so we need to measure some other city's buildings and dimensions, therefore a "sister" city has to be identified for this task.

Transferability

- Smart code is written in a legal manner, so that it can replace current codes
- Switch is a purely legal matter
- Very easy to do through legislation

Andrés Duany's frustration

- Many prospective clients ask Andrés to do a project, but neglect to change their codes
- Impossible to build human-scale environment with the existing codes
- In most cases, you need to go outside city limits, where the government can relax the codes

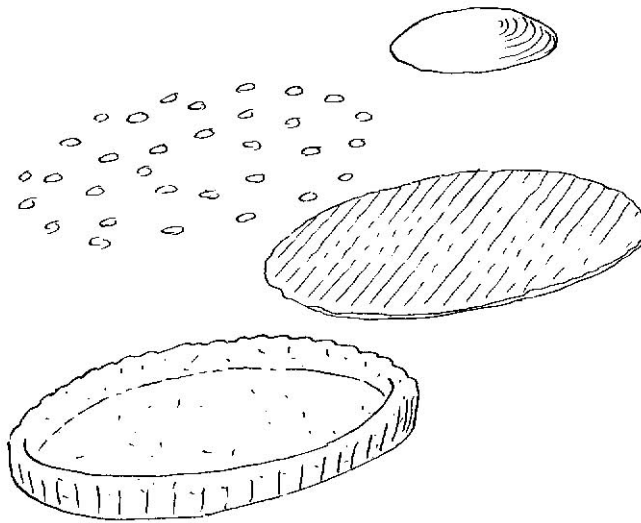
11.2. The New Urbanism.

A market-driven reform

- In 1993, six urbanist firms got together to write the "Charter for the New Urbanism"
- Defined rules and practices for recovering the best of traditional urbanism in today's projects
- Did not come from academia!

A FUNCTIONAL ZONE
admits
one single quality (function) of a City
at the exclusion of all others

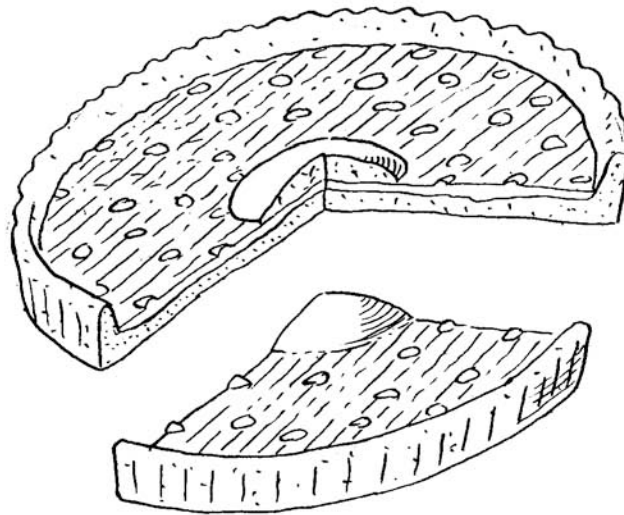
EXCLUSIVE



All that is not specifically obligatory is strictly forbidden

AN URBAN QUARTER
CONTAINS and PROMOTES
all the Qualities of a
CITY

IN - CLUSIVE



All is Permitted & Promoted
that is not strictly forbidden

Léon Krier's pie

Michael Mehaffy: New Urbanism's promises

- The return of urbanism is the return of the civic realm
- The return of urbanism is the return of the street
- The human patterns come first, and then the visual ideas follow — otherwise we are simply making people live in disconnected sculptures

Explosive growth

- Since the initial Congress (CNU), many firms have designed neo-traditional communities
- Some are more adaptive than others
- But new urbanist projects are getting better all the time

Market forces are pushing developers to create New Urbanist communities: not because of any philosophical reason, but driven by the profit motive. More human-scaled communities give a higher return on investment. It's very simple. Some builders who have created the most inhuman suburban sprawl have suddenly switched to the New Urbanist model, attracted by the economics of commercial value. Maybe they do not get perfect results, but it doesn't matter, since this is a tremendous leap towards the right direction. For this reason, we have hope for optimism. As more people get involved, competition among New Urbanist developers pushes for a higher quality product.

Defines the street

- Zone density in New Urbanism changes in the middle of a block, not in the middle of a road
- Therefore, street on opposite sides has the same urban character
- Street is the entity, not city block

11.3. Stephen Mouzon's project.

A success to learn from

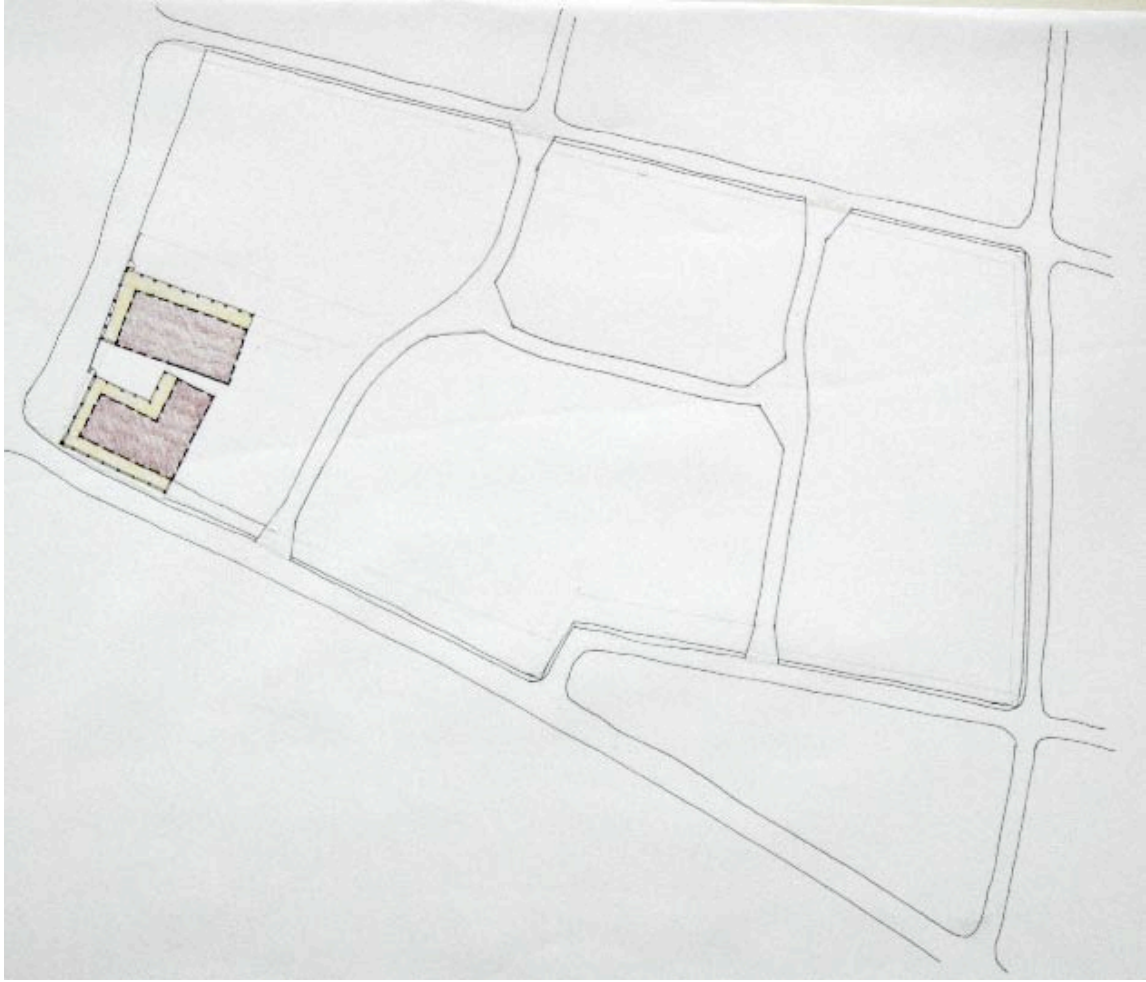
- Schooner Bay, Bahamas, a DPZ/Urban Guild project
- Stephen A. Mouzon, architect and urbanist, Miami Beach, Florida
- Application of codes to project
- One step at a time — Alexander

Mouzon's method

- "Once the paths were set, I began designing just one building at a time, not thinking about anything that would come afterwards. I worked with no intent of artistry at all ... just doing the little things that made the most sense for the site in question. Only after I had completed the block did I go back to draw the lot lines on another drawing."

Mouzon's method (cont.)

- "The character of the lots could not possibly have been designed without knowing what the buildings were, I don't believe. This ... is a technique we should have in the toolbox if you're looking for an organic or medieval character for a place: design first, lot lines later."



The first two buildings, and the main internal paths laid out



Tiny turning radii, so fix the internal chamfers



Secondary internal paths beginning to develop to access the backs of the lots



Block face to the left, now complete, is in the T5 zone

The T5 zone in the New Urbanist classification represents a downtown density, consisting of multi-storey buildings, denser than what occurs here on the right-hand-side. In this particular project, the number of storeys is still small. As mentioned earlier in this lecture, the T-zones change somewhere in the middle of the block so as to guarantee that the street is an urban entity defined by a single T-zone. The street is part of urban space that creates urbanism and community. Zoning changes should be implemented where they cannot be seen. What happens in the middle of the block is of minor importance to the human perception of a city.



After house on the top street was designed, the location for the path became obvious



First work unit added: an office attached to the house



Second and third work spaces added: a shop and an office



The nearly 30-foot space saved by not having cars in paths has ENORMOUS implications



Alleys for pedestrians, golf carts, and emergency vehicles only

New Urbanist projects come up against overly generous specifications insisted upon by emergency vehicles. For example, some cities and regions oblige any suburban road to be wide enough to allow a giant American fire engine to make a U-turn anywhere in the middle of the road. This is certainly not necessary, but a single code such as this determines the overall urban morphology of suburbs throughout the USA. We, instead, recommend ACCESS for emergency vehicles to every single point in the urban fabric, but this is not the same as having all our local streets built to the specification and width of highways. At this time, we are stuck with legal codes that need to be changed.

Thanks!

- Unpublished diagrams from the Schooner Bay project kindly provided by Stephen Mouzon
- Thanks also to DPZ and the New Urban Guild for permission to use them in this lecture

11.4. Tall buildings.

Simplistic typology

- Skyscrapers are usually designed according to a template
- Ignore context and environment
- Imposition of architect's will
- Can never arise from step-by-step adaptation

Unsustainable

- Skyscrapers can never be made sustainable
- Using the latest technology does not alter their intrusive character
- They introduce urban singularity

Michael Mehaffy on skyscrapers

- Claim that tall buildings are sustainable is a cruel fraud
- Excessive heat gain and loss from unshaded exposures and typical glazing systems
- “Heat island” effects
- Require materials with very high embedded energy

The production of high-tech materials used for glazing and “green fixes” of skyscrapers is extraordinarily expensive. Strong materials required for building skyscrapers are not cheap to produce. The energy required to produce all the very high-strength steel pollutes: the energy required to transport the steel to the site pollutes. Is the steel produced locally? No. It is probably imported from China, which has to deal with its pollution problems over there. These very energy-intensive materials appear “cleanly” on the worksite, which is deceptive. But when optimistic calculations are done by spokespersons for skyscrapers, they neglect those energy losses from the equation.

Michael on skyscrapers (cont.)

- Skyscraper floorplates are inefficient — excessive space requirements for lifts and for emergency exit stairs
- They block sun and view
- Create wind effects at the ground level
- Carbon benefits of urban density level off at 4 to 6 storey building envelope

Social problems

- Ground floor usually disconnected
- Alexander's Pattern 21: children living more than 4 storeys from the ground feel disconnected

- Léon Krier proposes tall buildings that are monuments, not residences

Bad tall buildings

- Iconic monsters isolated from city
- Totems for worshipping some lousy architect's ego
- Built to be visually recognized
- "Look at me!" — an expression of kitsch sitting in a dead plaza

Religious icons

- Le Corbusier's "towers in the park" has become a religious symbol
- Worshipped by modernist urbanists
- Despite repeated disasters, still used as "modern" typology the world over
- ... with towers of ever increasing height! People never learn...

There is something suspicious about people who never learn, in this case the large group of persons (architects, architecture critics, politicians) who continue to support the "towers in the park" idea. This is a sociological phenomenon. A person ignores physical reality usually because he/she has a religious faith in the concept. Only a religious attachment cannot be changed in the evidence of reality, of hard facts from failed experiments. But the faith is kept, and the faith is transmitted in our architecture schools. I'm not talking here of a genuine religious concept connecting to a higher order in the universe, but instead of a pseudo-religion, a genuine idolatry that worships architectural icons. Le Corbusier's diagram has a diabolical seductiveness.

Good tall buildings

- Must be very few in any city
- Always in the high-density center
- Ground floor helps urban fabric
- Examples from late 19C, early 20C
- Thin, not too tall, hierarchy of scales
- No setbacks

Conclusion

- There are several branches of New Urbanism practiced today
- All of them are far better than zoned car-dependent sprawl, or skyscrapers in the park — a monstrous idea
- Communities the world over are building neo-traditional developments