permeable morphology

shenzhen mega city plan 2030+
PERMEABLE MORPHOLOGY
SHENZHEN MEGA CITY PLAN 2030+
couteracting urban fragmentation by public space

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[ graduation thesis ]
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KEY WORDS:

PUBLIC SPACE, URBAN FRAGMENTATION

RESEARCH QUESTION:

HOW TO DEVELOP A NETWORK OF PUBLIC SPACE, BY URBAN FORM AND FUNCTIONS, TO COMPLEMENT THE GOVERNMENTAL MODEL OF 'LINEARITY AND CLUSTERS'?
Introduction

Read the city

The void strategy

Urban design
Introduction

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Urban design
Introduction

Read the city

The void strategy

Urban design
Shenzhen, China

**POPULATION**
- Shenzhen: 12,693,000
- Hong Kong: 7,055,071
- Amsterdam: 762,057
- Grand Paris: 10,142,983

**LAND AREA (sq km)**
- Shenzhen: 2,050
- Hong Kong: 1,104
- Amsterdam: 166
- Grand Paris: 2,723

**HISTORY (year)**
- Shenzhen: 31, since 1978
- Hong Kong: 167, since 1842
- Amsterdam: 734, since 1275
- Grand Paris: 2061, since 52 BC

Source: by author, based on google map 2010
Fragmentation is a combined process of increased integration at the large scale and splintered urban form at the local scale. (Marvin, 2008).
1) a strong increase in the urban dispersion
### Social disparity & typologic urban form

**Population**
- **Formal population**: 18% (2.3 million)
- **Informal population**: 51% (6.4 million)
- **Floating population**: 39% (3.9 million)

**Immigrants**
- **Local**: 17%
- **Migrants**: 83%

**Age**
- <14 y: 8.5%
- 15-39 y: 80%
- 40-59: 10.3%
- 60+: 3.1%

**Gender**
- Male: 51%
- Female: 49%

**Education**
- Primary school: 14.1%
- Secondary school: 77.6%
- University: 8.4%

**Household**
- 2.55 persons/household

**Income per person**
- Citizen income (capitar per income) = 3 x non-citizen income

The average age is **25.37 years old**. More than 20% of China’s PhDs work in Shenzhen.

### Notes
- Phase 1: anchor and fast grow, 1979-1993
- Phase 2: fast grow and urban sprawl towards periphery, 1994-2009

**Citizen income vs Non-citizen income**

- **Citizen income**
  - Per capita income
  - Income from formal sector

- **Non-citizen income**
  - Income from informal sector
  - Income from floating population

**Social disparity & typologic urban form**

- The weak population
- The consolidated population

**Household Income**

- **Citizen income**: $3,000
- **Non-citizen income**: $1,000

**Citizen income** is three times the **non-citizen income**.
2) Governmental model: linearity and clusters

City civic space and infrastructure map 2009
Centrality and networks

City civic space and infrastructure map 2009

Legend:
- commercial, office, civic facility
- corridor
- street
- metro
- border-crossing point

500m
Fragmented plots

Density map 2009

+ photo spot on the next page

500m
high density (>10 stories)
middle density (3-10 stories)
low density
Splintered urban form & the void

Shennan corridor, green buffer and Gangsha Urban village
Source: http://www.garlap.com/blog/article.asp?id=624, derived in 2010
Methodology

Principle of permeability

Urban-eco landscape
regarding to the nature of the territory, and humanity experience

Slow local street
complementing the large fast network, and as condition of diversity and complexity

Semi public space
merge the private and public space
A delta region under globalization
First nature: linking to HK

Shenzhen topography and infrastructure map 1985
Source: by author, based on H. Tian, 2004
Today: a field structure

Infrastructure map 2009

1km
- corridor
- street
- metro
- border-crossing point
Centralities and voids

City civic centrality, voids and infrastructure map 2009
Source: mapping by author based on Shenzhen Municipal Landuse Plan 1998-2010
by district, derived from http://www.szpl.gov.cn/ in 2009

commercial, office, civic facility
border-crossing point
urban green open space

1km
Voids and ecologic landscape

Green space and infrastructure map 2009
Source: mapping by author based on Shenzhen Municipal Landuse Plan 1998-2010
THE FUTURE
Centralities and networks in Hong Kong-Shenzhen megalopolis
Source: by author based on google map 2009
External logistic map 2009

1km

logistics, industry
corridor
street
metro
border-crossing point
Trend: a new polycentric structure to the south
Vision: the duality
Material: the unactivated void as transformation zone

- 1986: 800-meter-wide buffer belt
- 1999: reserved space for Shenzhen central park
- 2010: 107.1 ha unactivated green field
3 challenges

1 How to develop the void into a multiscale landscape network?

2 How to activate the void into a quality generator to enhance new polycentrality?

3 How to benefit the local neighborhoods in this opportunity?
Concept:
developing the proximity by re-distribution of public space

polycentric model = polycentric nodes + autonomous public space

void strategy = surrounding blocks + multi-scalar network of public space + activators [landscape/mobility/functional programs]
How to re-link the fragments by the potentials in the void?

1. Transform the non-developed urban void into an integrative place re-linking the fragments.
2. a multi-scalar public space system, considering landscape, slow local street and semi public space, for integrating the urban form and functions.

The built area map 2009 (corridors, metro line, city civic centralities)
Strategy: activate the void as urban structure
Strategy: activate the void as urban structure
Complement to the existing structure
3 prototypes of public space in Shenzhen

Landscape

Slow local street

Semi public space

L

M

S

1000BC

1980s

2009

public

private

informal
Public space in Shenzhen, a landscape space

http://cache.atlas.sina.com.cn/nd/citylifehouse/citylife/a7/4c/20090714_53815_1.jpg
bbs.21manager.com/disppbs-19534-0.html
Landscape: buffer space
Landscape: buffer space
Landscape: riverfront
Landscape: riverfront
Strategy: green belts
Strategy: water network
Strategy: fringe
The macro mobility
The micro mobility
Strategy: slow local street
Strategy: public transportation
Strategy: tunnel
Strategy: semi public space

Merge the big and small by:
street design
building typology
governance policy to encourage the network of private owned public space
Effects at the city scale
Effects at the local level
Design site as a test case
An integral void-urban project

by giving form and flexible landuse
Evaluate the current layout

- Mobility and pedestrian mpa
- Landuse map (commercial, office, housing)
- Street shops at the ground floor
- Plot to renewal map
Permeable landscape
Permeate into the building fringe
Proposed network of public space and activators
dispersive and cohesive form
void and mass

Permeable morphology
Design strategy: 3-step-linkage

Zero

1st linkage_anchor at the mega city

2nd linkage_flexibility from city to neighborhoods

3rd linkage_semi public space at certain blocks

4th_underground underpin
1st linkage_anchor

activators:
- central park program + riverfront
- metro stations
- green crossing
- boulevards
- high-middle level commercial/offices/hotel
- hybrid city square/ roof graden/
- restaurant/ cafe/ bar
- civic facility (ex. job info center)

potentials:
- corridor + shopping street
- metro station
- street shops

PPS: private owned public space
2nd linkage_flexibility

potentials:

street shops
mixed use area
metro/ bus stops

activators:

leisure circuit through the park+restaurant/ cafe/ bar boulevards
metro/ bus stations

middle-low level commercial/ services
social housing
food market
shop frontier at ground floor
2nd linkage_flexibility

Source: http://www.flickr.com/photos/horizon616/3052841146/
3rd linkage_daily use

potentials:
- bazaar
- food court
- old commercial building

activators:
- roof garden above the bazaar
- existing and new food court
- skywalkers + interior public space
- street market
- playground
- communal garden in the social housing
- middle-low level commercial/ services
3rd linkage_daily use
underground underpin

4th_underground underpin potentials:

metro station
-1 level commercial/ parking
-2 & -3 level parking

4th_underground underpin activators:

metro station
tunnel
-1 level commercial/ parking
-2 & -3 level parking/ logistics
Regeneration of mixed use blocks
Overview

Demolish
347,000 sqm
New in all
679,400 sqm

includes
[public facility]
47,000 sqm_6.9%
[social housing]
105,000 sqm_15.6%
=1,760 households
*60sqm/unit =
/ 4,400 dwellers
[private market]
526,800 sqm_77.5%
Conclusions

social contexts
1 Transform the non-developed urban void into an integrative place re-linking the fragments.
2 a multi-scalar public space system, considering landscape, slow local street and semi public space, for integrating the urban form and functions.
THANK YOU

QUESTIONS?