infill vs sprawl

infill as a sustainable density

Charlotte Churchill

Msc4 Dwelling: At home in the city, Amsterdam
CONTENTS OF PRESENTATION

i. initial fascination

ii. problem statement & research question

iii. the site

iv theme research

v. masterplan

vi. block design strategy

vii. dwelling design strategy

viii. concept of growth and flexibility

viii. the structure

ix. visualisation
GOAL/INITIAL FASCINATION
AT HOME IN THE CITY

The aim of the graduation project was to respond to living desires in a highly dense urban situation which challenges traditional housing typologies in light of changing demographics.
PROBLEM STATEMENT AT HOME IN THE CITY
Cities are expanding to accommodate human desires for large living and outdoor spaces resulting in

**URBAN SPRAWL**

This is having a detrimental environmental, social and economic impact.
URBAN SPRAWL is the uncontrolled spread of urban areas into rural areas such as farmland, forests and coastal lands that lie on the outer edges of cities.
GLOBAL
“Half of the world’s population already live in urban centres. I70% by 2050.” (Detail Green 2013 p. 22).

EUROPE
‘75% of the European population live in urban areas’. (European environment agency, 2006)

AMSTERDAM
Amsterdam is expecting an additional 100,000 to 150,000 inhabitants between now and 2040. (CBS, 2013).
URBAN GROWTH & POPULATION DEVELOPMENT

1990-2000

Decrease of population density
- Population + < Urban +
- Population + < Urban ++
- Population ++ < Urban ++
- Population - < Urban +
- Population -- < Urban ++
Built-up area, road network and population increases, selected EEA countries

Note: Countries covered are: Belgium, Czech Republic, Denmark, France, Germany, Latvia, Lithuania, the Netherlands, Poland, Slovakia and Spain.

PATTERNS OF URBAN SPRAWL ACROSS EUROPE
DRIVERS OF URBAN SPRAWL

- Lifestyle Change
- Demographics
LIFESTYLE CHANGE

Individual housing preferences, increased mobility, commercial investment decisions, and the coherence and effectiveness of land use policies at all levels.

The areas with the most visible impacts of urban sprawl are in countries or regions with high population density and economic activity.
The average urban dweller has approximately 1/3 of the carbon footprint of the typical suburban dweller. (Ellen Dunham-Jones Retrofitting suburbia)
Space consumption has increased dramatically during the last century.

Population density

1880 - 570 inhabitants per hectare
2000 - 65

The growth of Amsterdam therefore determined as increase in spatial demands per person, only slightly due to population growth.
CHANGING DEMOGRAPHIC PATTERNS

The number of one-person households will grow and is anticipated to reach 3.8 million in 2060. This means that 44 percent of households in the Netherlands will be one-person households versus 37 percent today.

In 2025, 22% of the population will be aged 65 or over, compared with 16% in 2011.
RESEARCH QUESTIONS AT HOME IN THE CITY
What level of densification is necessary to counteract urban sprawl?

Can a new typology of shared living, provide a solution to a changing demographic and the issue of densification?
SITE KOP VAN WEESPERTREKVAART
KOP VAN WEESPERTREKVAART

A mixed urban area located within the ring and centrally located between Amsterdam city center, the Zuidas and the Centre Region Southeast.

Close to the city and green outskirts of the Amstelscheg. It represents the transition from the city to the area in South East.
The site is left fragmented
Wedged between 4 contrasting neighbourhoods.
Bordered by the canal and the train line.
THEME RESEARCH
MORPHOLOGY OF AMSTERDAM

17th century
19th century
1949-1960
1960’s and 70’s
Amsterdam urban architecture is founded on the concept of the block.
17th Century Canals

19th Century - De Pijp

Early 20th Century
- Amsterdam South - Berlage

Late 20th Century - Java Island
17th CENTURY

Individual house formed socio-economic unit
LATE 19TH CENTURY

- mixed use urban block
EARLY 20TH CENTURY

Urban blocks no longer included economic functions
LATE 20th CENTURY - JAVA ISLAND

Closed urban block has been revived
Exclusion of economic activities from the block caused problems

- Blocks degenerated and now are often marked by relative poverty (one sided approach)

The home, in which housing and work were once integrated had now become a monofunctional dwelling.
“Instead of collective realm, the contemporary Dutch urban block needs a differentiated public realm that welcomes all city dwellers and gives them space to develop” (Komossa, 2010).
To weave the existing site into the urban fabric, the existing block can be used as a base and re-interpreted.
MASTERPLAN KOP VAN WEESEPTREKVAART
Vistas

- Use the lines of existing neighbourhood

Riverwalk

- Two sides can interact and communicate with each other. One side can be active and busy, the other side can be more scenic.

Infrastructure

- Maintaining axis point of travel at the site
DIVISION OF SITE

existing block

lines from opposing neighbourhood

lines from existing infrastructure

formation of blocks based on intersecting lines
HIERARCHY OF STREETS
MAIN BOULEVARD

Along main axis through site
WOONERF

Access to carpark
PEDESTRIAN STREETS

Main linkage on site
RAISED PEDESTRIAN STREETS
* * *

The simple social intercourse created when people rub shoulders in public is one of the most essential kinds of social “glue” in society.
“the intensity of experience also is increased with reduced size ........It is nearly always more interesting to be in small spaces, where both the whole and the details can be seen - one has the best of both worlds”

jan gehl, life between buildings, page 91
Public, private & collective

- Collection of Blocks
- Train Buffer - Public Zones
  Commercial Program Activation
  Integrated to Housing
- Private Collective Zones -
  Accessed Only by
  Community Residents
- Public Collective Zones - Alive
  Through Public Program. Collective
  Private Ownership
DESIGN CONCEPT
KOP VAN WEESPERTREKVAART
BLOCK PROPOSAL

closed block

closed block with internal program

semi-closed block with internal program
COMPOSITION OF BLOCKS
PROGRAM
MASTERPLAN PROGRAM DIVISION

- community garden
- cultural precinct
- sports facilities
- purely residential
- office/dwellings
network of public space
space related to the urban flows and functions

formal routes of travel

informal routes of travel

main squares and meeting places
GREENHOUSE ACTS AS A SCREEN IN FRONT OF THE HOUSES TO REDUCE TRAIN NOISE. CONTAINS A CAFE AND FOOD PRODUCTION.
BLOCK DESIGN STRATEGY  KOP VAN WEESPERTREKVAART
SELECTED BLOCKS KOP VAN WEESPERTREKVAART
SELECTED BLOCK
3300M2

PROGRAM - HOUSING AND WORKSHOPS/ATELIERS
DIVISION OF THE BLOCK

Block

3300m²

50m

60m
Block

3300m²

50m

60m

Divided using lines of axis
Block

3300m²

50m

60m

Divided using lines of axis

Grid 5.4 x 5.4
Divided using lines of axis

Block

Grid 5.4 x 5.4

Residential program at the edges to define the block
Divided using lines of axis

Grid 5.4 x 5.4

Negative space forms public space flows through the core of the building creating informal access paths

Residential program at the edges to define the block
Divided using lines of axis

Grid 5.4 x 5.4

Residential program at the edges to define the block

Cultural program (workshops)

Negative space forms public space flows through the core of the building creating informal access paths
DENSIFICATION

75 dwellings per hectare

75 dwellings per hectare

75 dwellings per hectare
Buildings that create negative, leftover space . . .
buildings that create positive outdoor space.
Positive spaces are partly enclosed, at least to the extent that their areas seem bounded (even though they are not, in fact, because there are always paths leading out, even whole sides open), and the "virtual" area which seems to exist is convex. Negative spaces are so poorly defined that you cannot really tell where their boundaries are, and to the extent that you can tell, the shapes are nonconvex.
16.5 x 16.5 block

divided into nine components

shared outdoor space

outdoor space is drawn into a semi-private space

breakup of the blocks
shared outdoor room/entrance

outdoor room wraps into the housing creating increased privacy

blocks are oriented toward the green space, however the setback of the housing creates increased privacy. The orientation gives the illusion that the garden is larger

blocks are stacked to create density and privacy

The upper floors are oriented toward roof terraces.

MODULE DESIGN
Shared outdoor room
Semi private outdoor space
roof terraces
LAYERS OF PRIVACY

Typical block


SEMI-PRIVATE - Front entrance
Each house is accessed through a shared court, the sequence of entering a home.

SEMI-PUBLIC - The division between the street and house is not always designed as a recognised threshold. The in-between spaces are belonging to either the private or the public, accessible to both sides
perspective view of the collective entry
GROWTH & FLEXIBILITY AT HOME IN THE CITY
‘designing for the unknown, the unpredictable is the new challenge facing architects today’

1960’s movement towards flexible housing, produced programmatically neutral and characterless buildings.

John Habraken argued that the support system should be provided giving people the freedom to build their own houses. The support systems were the responsibility of the community, while the house itself was a result of the process of dwelling.

Highlighted 3 ways to deal with time and uncertainty

- Polyvalancy (multi purpose)
- Part Permanent and Part Changeable
- Semi-permanent buildings “industrial, flexible and demountable”.
Flexible housing

TOOLBOX

plot of land

building plot

basic module

entrance gallery module
Flexible housing

HOUSE TYPES

5x4 20M2
4x10 40M2
60M2
50M2
70M2
70M2
95M2
95M2
entrance gallery module
flexible housing
COMBINATION OF TYPES
Flexible housing
Flexible housing with additional program

Attached workshop

80 sq/m  96 sq/m  64 sq/m  80 sq/m
staircase - opportunities for flexibility
example dwelling floor plans

stage 1 - minimum dwelling
stage 4
STRUCTURE AT HOME IN THE CITY
A skeleton frame with rigid nodes was selected to provide greater flexibility of dwelling arrangements and future use.
STRUCTURAL PRINCIPLES
LOAD BEARING STRUCTURE

“it is the unchangeable that creates conditions for changeability, the permanent that frees the temporary”.

Bernard Leupen, Frame and generic space, p 23
OPEN NODE DESIGN
NODE CONNECTION TO TIMBER
Rainwater storage tank

Ground Temperature
1m deep
+7°C

Outside air intake at ground level

102
CLIMATE DESIGN
WINTER SITUATION

Outside air intake at ground level

Rainwater storage tank

Ground Temperature
1m deep
+7°C
FACADE
MATERIALITY

PEDESTRIAN STREET PAVING  TIMBER GLULAM COLUMNS  TIMBER BATTENS  EXPOSED PLYWOOD  PINE FLOORING
perspective view of the front entrance