Bart Bliek, 4684540



Problem Statement



Urban Inequality

Nieuw-West has seen a decrease in ratio of social housing units, from 76% in 2000, to 53% in 2016 (Nio et al., 2016, p. 19). State led gentrification has been associated with the displacement and exclusion of low-income households to the suburbs around the city (Hochstenbach & Musterd, 2021).



Material Waste

Construction and demolition waste (CDW) is responsible for over a third of all waste generated in the EU (Bilsen et al., 2018), and the Duch building sectors material use is responsible 11% of total carbon emissions (Hekma, 2021). With the challenge of building 100.000 homes a year, the Dutch construction industry will exceed its carbon budget for a 1,5-degree warming scenario by 2027 (Bosch et al., 2023).



Loss of Identity

Despite a complex and extensive system of heritage listings, most buildings outside the historic canal belt have very little concrete legal protections, and demolition and new construction remains the de facto method for urban renewal. This is leading to a loss of diversity and of unique identities of districts, causing the city to become increasingly homogenised.

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Introduction

Research Design

Research Aims

Understand why, despite broader recognition of value, demolition and new construction remains common in this context. Bridge the gap between theory and practice to proliferate conservation post-war heritage and revitalise deteriorating mass housing neighbourhoods.

Main Research Question

How can the post-war public housing heritage of Amsterdam Niew-West support sustainable urbanisation towards a social foundation while remaining within our planetary boundaries?

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Research Aims

Research Design

Part I: Mapping Urban Renewal What has been the effect of urban renewal on, the social foundation and ecological ceiling at the neighbourhood level, and what has the role of heritage been in this process?

Part II: Renovation Case Studies

How do different renewal strategies at the building level perform across these three dimensions, and what does this reveal about the challenges of re-using postwar flats?

Part III: Values Based Redesign

How can we overcome the main barriers to re-use of post war multifamily housing and demonstrate the potential of heritage conservation for socially and environmentally sustainable urbanisation?

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Methodology

Doughnut **Economics Model**

Doughnut Economics (Kate Raworth, 2017) Doughnut for Urban Development (Hill-Hansen, 2023)

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Theoretical Framework

The Heritage Environment

Beyond Good Intentions (Gonçalves, 2022)

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land setting ape place struction man-made a ments sites flora

Theoretical Framework

Analytical Framework

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		value	indicator		sour	ce / frame	work	
		Vulue		L	-		_`	
				doughnut for urban development (Hill-Hanse & Jensen, 2023)	ouilding passport for sustainable conservation (Gonçalves, 2023)	context specific attributes (Havinga et al. 2020)	ight to adequate nousing' dimensions (UN 1991)	Shearing Layers (Brand, 1994)
			parcellation					
	ge S		greenspace					
heritag value:	urban scale	building typologies						
		ground floor function						
			building height					
		affordable housing	% social housing					
			number of social housing					
			number of dwellings					
		hahitahle housing	m2 average floorspace per person					
e		nabitable nousing	% overcrowding					
sca	S	accesibible housing	% accessible units (GF or lift)					
ро	lue		% 0 stairs housing					
rho	l va		% senior housing					
noc	cia	citizen participation	Y/N citizens influenced decisions about					
ighl	so		neighbourbood activities / 1000					
nei			inhabitants					
			% vunerable people					
		social cohesion	SES score					
			migration backgrounds					
		diversity & equality	gini coefficient					
			number of original dwelilngs					
	ical	ro uco	m2 original floorspace					
	log alue	16-036	tonnes of original material					
	eco V		tonnes of original embodied carbon					
	-	energy efficiency	% energy label B or higher					

Methodology

Analytical Framework

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		value	indicator		sour	ce / frame	work	
				doughnut for urban development (Hill-Hansen & Jensen, 2023)	building passport for sustainable conservation (Gonçalves, 2023)	context specific attributes (Havinga et al. 2020)	right to adequate housing' dimensions (UN, 1991)	Shearing Layers (Brand, 1994)
			parcellation					
		ensemble scale	greenspace					
	values		building height					
		buildings scale	groundfloor fuction, closedness					
	age		façade: balconies					
	erite		façade: external insulation					
	he	J	window: fenestration					
e			window: pvc frames					
sca			Interior: plan					
ng		affordable housing	ownership and tenure					
ildi	nes		number of aweilings					
pr	val	habitable housing	thermal comfort					
	Cial	2000sibible bousing						
	soc	citizen participation	⁷ accessible nousing units citizens influenced decisions about urban					
		chizen participation	renewal					
	a		skin					
	gic	re-use	structure					
	olo valt		services					
	e e	energy efficiency	improvement of energy labels					

Methodology

Part I: Mapping Urban Renewal



Case Study: De Kolenkitbuurt



Areal photograph of the Kolenkitbuurt, Stadsarchief Amsterdam, June 17th 1983.

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Areal photograph of the Kolenkitbuurt, Stadsarchief Amsterdam, July 9th 1957.

	value
heritage values	urban scale
	affordable housing
	habitable housing
values	accesibible housing
social	citizen participation
	social cohesion
	diversity & equalitiy
ecological values	re-use
v	energy efficiency

indicator	2005	2022
parcellation (% space used by buildings)	12,2%	20,9%
greenspace m2	87213	67531
building typologies (% porch flats)	100,0%	47,6%
ground floor function (% closed facade)	86%	46%
building height m	14,43	16,52857
% social housing	100%	67%
number of social housing	2305	2017
number of dwellings	2305	2989
m2 average floorspace per person	21,48	30,01
% overcrowding	35,1%	19,8%
% accessible units (GF or lift)	22%	45,5%
% 0 stairs housing	8%	36%
% senior housing	0,8%	0,6%
Y/N citizens influenced decisions about		
urban renewal		
neighbournood activities / 1000	7,8	2,8
⁹ vunorable noonlo	10%	16%
[%] vullerable people	19%	10% 56
SES SCOLE	4,90	3,0 70%
migration backgrounds		79%
gini coencient number of original dwallings	0,254	U,201 1204
mumber of original dweilings	2303	1394
mz original hoorspace	132030	83900
tonnes of original material	1420/0	095ZZ
tonnes of original emodied carbon	45648	28648
% energy label B or higher	0%	63,80%

ratio	illustratior
71,0%	n
-22,6%	n
-52,4%	n
46,7%	n
14,5%	n
-33,0%	У
-12,5%	У
29,7%	У
39,7%	У
43,6%	У
103,6%	n
332,2%	n
-22,9%	n
25,0%	n
CA A O .	
-64,1%	n
-15,8%	n
13,1%	n
-5,9%	V
-3,0%	
-39,5%	V
-36,5%	y V
-37,3%	y
-37,2%	y
63,80%	y
	-

Renewal and Tenure

Source Data: Amsterdam Geo-Webservices





2023

original corporation housing converted to private rent converted to owner occupied new corporationhousing new private rent new owner occupied

Renewal and Number of Dwellings by Tenure

- **C** = corporation housing
- **O** = owner occupied
- P = private rental

C 2305

Source Data: Amsterdam Geo-Webservices & Manual Counting



ownership structure 2022 stock 2989

2017 C

555 O

417 P

Renewal and Total Floorspace by Dwelling Size

40-60 m2

60-80 m2

80-100 m3

Source Data: O&S Amsterdam & Manual Counting



total floor space by unit size 2023

Livability Index

Source Data: Leefbarometer.nl



2005

2020

very poor

poor

insufficient

sufficient

good

very good

Energy Label Below B

Source Data: EP-Online

B+

G

F E D

2022

Welfare Clients

Source Data: Regiomonitor Amsterdam



2021

>20%
15-20%
10-15%
5-10%
1-5%
<1%

1. Social Foundation

Densification & Diversification

Densification lead to significant expansion of housing stock. Diversification of dwelling types lead to increase average floor space per person.

Social Mix

Social mixing / desegregation policies, such as tenure conversion, are used to improve socio economic conditions, but there is no conclusive evidence that this works: renewal resulted in a higher 'livability' score, but little improvement in neighbourhood satisfaction, social cohesion and equality indicators.

Hightened Inequality

There is evidence suggesting that renewal has lead to hightened inequality at the block and building level. This phenomenon has been described in the literature as 'pockets of poverty', and may contribute to tensions between old and new residents.

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Conclusions | Part |

Material Flows

stock 142.700 t

inflow 211.482 t

*Calculation for existing based on modeling of typical building, new construction based on average figures for new construction of a comparable building (Bosch et al. 2023).





outlfow 101.789 t

stock 252.393 t

Embodied Carbon Flows

embedded

45.648 t CO2

inflow 46.285 t CO2



*Calculation based on generic figures using Granta Edupack data set

building activities 05-22

outflow 31.239 t CO2

embedded

64.287 t CO2

2. Ecological Ceiling

Poor Use of Material Resources

Extensive demolition and new construction leads to high envirionmental cost for relatively small expansion of housing stock. In this context re-use could have reduced material consumption by 48% and material based emissions by 67%.

Focus on Operational Emissions

Retrofits perform almost as good as new construction, at much lower embodied carbon. Resource consumption and impact of material based emissions are not considered. Corporations may be choosing demolition and new construction due to perceived risk and complexity of renovation and a lack of financial incentive.

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Conclusions | Part |

Flexibility of Construction

Source Data: Stadsarchief Amsterdam

fixed plan

free plan

free facade & plan

nap

1950-65

Demolition

Source Data: Data Amsterdam



2023

demolished

planned demolition

renovated

planned renovation

no data

3. Role of Heritage

Limited Adaptability

Retrofits were less effective at achieving densification and diversification of dwellings compared to new construction. Likely due to inflexible construction systems and limited load bearing capacity of foundations.

Tenure Conversion

Retrofits lead to tenure conversion more often than demolition and new construction: only 36% remained social housing compare to 60% of new construction. Argued to help with social mix, but is also be a convenient income generation method when posibility offset cost with additional dwellings is limited.

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Conclusions | Part |

Recommendations



1. Integral Approach to Circularity

Incorporate both social and ecological considerations, to mitigate negative social outcomes and ensure that the benefits of renewal are distributed in a more equitable way. Combining physical improvements to dwellings with socio economic interventions leads to the best physical, social and mental health outcomes for residents.



2. Participatory Design

Involving residents in the design and decision making process resulted in the successful preservation of social housing, heritage values and material resources. Participatory design is an imporant tool to ensure the needs of more diverse stakeholder groups are considered.



3. Mandatory Value Assessment

Conservation is seen as being more complicated and risky. Decisionmakers are manly driven by financial concerns and less by tentant health, environmental impact and heritage value. Requiring a multidimensional value assessment or LCA can help demonstrate the long term benefits of conservation and inform decision making.

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Conclusions | Part |

Part II: Renovation Case Studies

- 1. De Nieuwe Akbar
- 2. De Leeuw
- 3. De Verfdozen
- 4. Klarenstraat
- 5. Bakemabuurt
- 6. Dudok Haken
- 7. Seneca Flat
- 8. Koel Kit
- 9. Filosoof
- 10. Complex 50 en 117
- 11. Blomwijckerpad
- 12. Staalmanplein



Part II: Renovation Case Studies

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- 12. Staalmanplein



















Image source: Stadsarchief Amsterdam

Comparative Analysis

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		value	indicator					case studies				
			parcellation	4	4	3	4	4	4	4	4	7 6 7
	ensemble scale	ensemble scale	greenspace	7	4	4	3	3	3	4	6	6
	S		building height	4	1	4	3	4	3	4	4	7
	e value		window: fenestration	6	1	7	2	2	4	7	2	5
	heritag		façade: balconies	3	1	3	1	2	3	4	4	6
		buildings scale	façade: external insulation / cladding	4	1	4	4	4	3	4	3	6
			façade: groundfloor closedness	3	3	2	1	2	4	1	4	3
			typologies	4	1	1	2	4	З	4	Δ	6
<u>e</u>			interior: plan	3	3	3	2	3	4	3	3	6
ling sca		affordable bousing	% social housing	10,3%	100,0%	100,0%	0,0%	55,6%	50,0%	0,0%	53,5%	100,0%
builc	ú	anordable nousing	number of dwellings	102,9%	158,3%	96,8%	75,0%	100,0%	110,3%	136,4%	100,0%	100,0%
	l value:	habitable housing	% floorspace per unit	115,1%	118,8%	100,0%	133,3%	100,0%	115,4%	100,0%	100,0%	100,0%
	socia	accesibible housing	% accessible housing units (GF or lift)	100,0%	200,0%	197,0%	133,3%	100,0%	152,5%	200,0%	100,0%	100,0%
			% housing for vunerable groups (wibo/mibo)	100,0%	100,0%	134,4%	100,0%	100,0%	117,7%	100,0%	100,0%	100,0%
		citizen participation	Y/N inhabitants influenced decisionmaking				у				У	У
	sa	material re-use	structure	4	5	5	5	5	5	5	5	1
	al valu	inaterial re-use	skin	1	1	2	1	1	4	2	1	1
	ogic		services	2	2	2	2	1	3	2	2	1
	colc		space plan	3	3	4	2	1	4	3	4	1
	Ŭ	energy efficiency	energy labels	3	5	4	5	4	4	5	4	5
			heating source	5	5	5	3	3	5	3	5	5
			heritage values scale	1	2	3	4	5	6	7		

heritage values scale	1	2	3	4	5	6	7
compared to the original state this attribute was	completely changed	mostly changed	partially changed	neither changed or restored	partially restored	mostly restored	fully restored
social values scale	0%	33%	67%	100%	133%	167%	200%
change relative to starting situation	0x	x0,67	x0,33	x1	1,33x	1,67x	2x
re-use values scale		1	2	3	4	5	
this layer was		completely replaced	mostly replaced	around equal parts re-used and replaced	mostly re-used	fully re-used	
energy label scale		1	2	3	4	5	
		E or lower	D	С	В	А	
heating source scale			1	3	5		
			natural gas	no data	heating grid		

Results | Part II

Visualisation



1. Heritage Attributes

Limited Awareness

There is a general lack of awareness of heritage value at the building scale, leading to poor preservation of heritage attributes over the buildings life time.

Restoration Efforts

Some interventions make a concious effort art restoring valuable attributes to their orginal state, but there is not always room for this in the budget.



1. Heritage Attributes

Connection To Public Space

'Groundfloor facade closedness' was rated as a negative heritage attribute by experts (Havinga et al. 2020). All most all interventions recognise this and attempt to 'fix' this in some way.

2. Social Indicators

Diversification

Diversification of tenure & typologies was a theme in most interventions, but major restructuring was rare. This may be due to the additional cost requred to make major alteration to the structure.

Decrease in Social Housing

Just like in the neigbhourhood analysis, tenure conversion was common & often used as an income generation tool. The public housing sector is under a lot of pressure so further reduction in the social housing stock may not be desirable

2. Social Indicators

Accessibility

Improvements to accessibility by converting to gallery (deck) access or adding ground floor dwelling was common.

Housing for Vunerable Groups

A surprising number of projects include adapted housing for seniors or people with wheelchairs.

2. Social Indicators

Some Densification

Incrases to the number of dwellings were achieved in many cases. Either by more effective use of existing space, or by 'topping up' the building with one or two levels. Significant increases were not so common.

3. Ecological Indicators

Energy performance

All interventions made significant improvements to the energy performance through the addition of internal or external insulation, better glazing and connections tot the heating grid.

Re-use of Structure

Out of the shearing layers usually only the structure was re-used, which is fine as it holds the majority of the mass and environmental impact

Implications for Design Phase

1. Identify Existing Values Engage local stakeholders and identify the tangible, intangible and natural resources in the heritage environment and leverage them to increase the social and environmental contributions of the intervention.

2. Connect to Surroundings Redesign the ground floor to improve the connection with the public space, consider how the public space is used and how access can change how neighbours interact.

3. Diversify Typologies Adapt typologies to meet the needs of the new demographics in Nieuw-West; including large families, single households, students & seniors.

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4. Densify to Create Value Rather than relying on tenure conversion to generate income, densification can have the same effect while boosting the use value of the building.

5. Community Ownership Give residents and communities the ability to alter their environment through participatory design, bottom up projects like allotment gardens, or small front yards on the street.

6. Adaptability & Disassembly

Future proof deigns by improving the adaptability of existing structures during interventions. Consider how additions can be disassembled and re-used in the future.

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Conclusions | Part II

Part III: Values Based Redesign

Design Case: Confuciusplein Building

Schetstekening van het thans in uitvoering zijnde uitbreidingsplan Slotermeer, onderdeel van het Algemeen Uitbreidingsplan 1935 - een der 124 illustraties uit het boek, waar zij echter groter en fraaier is gereproduceerd.

Sketch of the expansionplan for Slotermeer, Stadsarchief Amsterdam, 1950.

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Areal photograph of the Confuciusbuurt, Stadsarchief Amsterdam, n.d.

Introduction | Part III

Design Case: Confuciusplein Building

Confuciusplein building, Stadsarchief Amsterdam, n.d.

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Original facade of Confuciusplein building, Jan Versnel/MAI, n.d.

Introduction | Part III

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Introduction | Part III

0. Existing Values

Green Structure

Functional Green

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Urban Space

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Social Infrastructure

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S.

Heritage Values

image source: Jan Versnel/MAI

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image source: Google Streetview

Challenges

image source: Google Streetview

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Existing Plans

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Design Concepts | Part III

References

einszueins architektur, collective housing

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Nicolas Laisné, office

Concept 1. Connect | Part III

Apartment Strategy

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Concept 1. Connect | Part III

2. Differentiate

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Design Concepts | Part III

References

Van Schagen Architecten, Klarenstraat

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Concept 2. Differentiate | Part III

Apartment Strategy

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Concept 2. Differentiate | Part III

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Design Concepts | Part III

References

Druot + Lacton & Vassal, Bordeaux social housing

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Concept 3. Densify | Part III

Apartment Strategy

Total Floorspace: 88 m²

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Concept 3. Densify | Part III

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Design Concepts | Part III

Future Steps

1. Stakeholder Engagement

Survey interview residents, housing corporation, business owners or create persona's to represent stakeholder interests and values.

2. Collective Housing Concepts

Alternative forms of collective housing such as a housing coop, community trust or collective of home owners which build communities for residents and can aid in the task of creating affordable housing in parallel to the existing corporations.

3. Building System for Adapting Post-War Housing Flats

Developing a system, or set of solutions for adapting post-war housing that can be applied at an industrial scale to upgrade and adapt the existing housing stock

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Graduation Plan | Part III

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