DESIGN GUIDELINES FOR LOW INCOME HOUSING

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As an undergraduate student studying architecture, I constantly found myself interested in the urban connections, context and situation of my studio projects. After completing a research project on the housing complex *Quinta Monroy* by Elemental, I became increasingly focused on the design and planning of affordable housing projects. I read many books pertaining to successful housing design, and was excited by the passion and drive exhibited in these books. As I began to seek out designs that used these principles, I found that only a few were for low income residents. This realization became the foundations of my research, which was to identify strategies that recognized design as a factor in social and economic mobility.

In order for this research to be relevant, I felt it needed to be distributed. To reach designers of low income housing, I translated the research into this guidebook, to be referenced in the design of low income housing. The elements presented here are relevant to housing across income levels, yet often left out in low income developments.

This guidebook contains key design elements, case studies of existing low income housing projects and guidelines for new design. It can be used to design housing projects, to research best practices, to learn about existing projects or to locate reading relevant specifically to low income housing.
My undergraduate studies in architecture, urban design, housing and graphic design have provided me with the skills necessary to begin this guidebook. I do not intend for this to be the final version, however. Throughout my graduate and professional career, I intend to refine this book so it will provide a relevant and thorough approach to low income housing.

I hope that this guidebook helps you to see housing as an investment in the residents, and design as a tool for creating it. Housing for low income residents is already, and will become an even more pressing issue in the modern world. More than three billion people live in poverty today, and they deserve quality housing that can support their rise from poverty.
The guidelines and case studies presented in this guide focus specifically on housing projects for low income communities. It must be acknowledged that there are other, sometimes more successful, methods of housing low income residents, such as mixed use or mixed income developments. A wide array of design guidelines exist for those mixed use, mixed income developments already. However, development focused entirely on low income housing exists, and continues to be built. Very few guidelines exist for these types of developments, and this guide is a response to that need.

The elements presented here provide a guide to design successful housing for low income residents. Successful, as defined for this guide, is measured in the project’s ability to support residents’ rise from poverty while remaining integrated in the community. The elements presented were selected due to their direct ability to influence success, either to assist in a resident’s rise from poverty or to remain an integrated part of the community.

The first portion of this guide, “Elements”, identifies five design elements which can improve the success of a housing project: local amenities, density, public space, variety of space and ownership. Each element description includes a specific definition, analysis of it’s ability to increase success, methods of evaluation, relevant case studies and further reading.
In order to further guide designers, a list of essential considerations for design is included. When integrated in the process of designing and planning low income housing, this list will increase the ability for that project to be successful. As mentioned above, there is no one correct answer for the use of any element, however general guidelines for each element have been provided in this list.

The second portion of the guide, “Case Studies”, examines existing low income housing projects and their response to the identified elements. Each project is studied under the lens of each element, using the specific evaluation methods detailed. The selected projects exist around the globe, include variety in client, architect and context, and achieve varying levels of success. Details of how the project responds the elements is clearly defined in each case study, however the determination of the overall success is left up to the reader.

Needing acknowledgment is that by examining case studies around the globe, differences arise in what defines ‘low income’ housing. The definition of poverty, density relationships, proximity relationships and sense of ownership changes depending on the location. In the analysis of case studies, these differences are not focused on, however their variety is beneficial. By presenting case studies around the globe that satisfy different definitions, this guide becomes relevant on a global scale.

After the case studies portion of the guide, a comparative grid can be found. This grid translates the complexities of each project into a format which can be quickly understood and compared. Although there is not any correct answer for any element, this grid can be used to locate successful uses of each one. It can also be used to compare element use in varying contexts, and to provide precedent for designs.
The elements listed here are not meant to represent the entirety of elements that contribute to a successful social housing project. Rather, they are identified due to their direct influence on assisting residents’ rise from poverty while remaining integrated in the community [therefore: becoming successful]
LOCAL AMENITIES

PUBLIC SPACE

VARIETY OF SPACE

OWNERSHIP

DENSITY
LOCAL AMENITIES
LOCAL AMENITIES

How do LOCAL AMENITIES increase the success of a project?
Local amenities such as businesses, industry, shopping or entertainment complexes can provide employment to residents, directly supporting the rise from poverty. Having places of education nearby provides opportunity for residents to receive education conveniently. In a study completed by the National Assessment of Educational Progress, 40% of variation in average reading scores and 46% of variation in average math scores were directly associated with variation in child poverty rates. Income should not be a precursor to academic struggle, and housing projects have the opportunity to change that. Other amenities within walking or biking distance can provide opportunities not otherwise available to residents, and allow them access without transportation, reducing costs. Additionally, nearby transit locations can extend the range of residents without personal transportation, which can provide employment and education opportunities.

How does one evaluate LOCAL AMENITIES?
Identify the number of businesses, schools, and transit locations within a 1 mile radius of the site

Further reading:
Walkable City: How Downtown Can save America, One Step at a Time
Ten Principles for Developing Affordable Housing
The Contribution of Environmental Amenities to Low-Income Housing: A Comparative Study of Bangkok and Jakarta
Affordability of Housing and Accessibility of Public Services: Evaluation of Housing Programs in Beijing
How does PUBLIC SPACE increase the success of a project?
Public space, as defined by the Project for Public Space, is “the art and science of developing public spaces that attract people, build community by bringing people together, and create local identity”.6 By attracting people to a public space in the housing project, it allows residents the opportunity to form relationships with the surrounding environment and become integrated with the community. This network can then produce employment opportunities for example, which support the rise out of poverty. A recent study identified that an increased poverty level in urban areas resulted in an increased distance from park or green space,7 which further emphasizes the need of public space in housing projects, as it can disassociate poverty with a lack of public space. The inclusion of public space within housing projects is an important step toward ensuring these opportunities are available to all income levels.

How does one evaluate PUBLIC SPACE?
Identify the percentage of site available to non residents (public space)
Identify the public spaces created between housing project and surrounding environment

Further reading:
Project for Public Places6
MIT Department of Urban Studies and Planning site8
Do low income neighborhoods have the least green space? A cross-sectional study of Australia’s most populous cities.9
Public Green Space Use and Consequences on Urban Vitality: An Assessment of European Cities10
VARIETY OF SPACE
How does VARIETY OF SPACE increase the success of a project?
Providing multiple scales of living space allows residents to stay within the same community when experiencing lifestyle changes. A single resident in a typical housing project might need to move to a more expensive living situation when they find a partner, have children, or otherwise increase or decrease members to their household. In a space with scales of space, however, the option to move into a larger space is available in the same complex they currently reside. Not only does this provide cost savings, due to lower costs in a social housing project, but allows them to maintain their relationships within the site and in the community. The design should “provide for enough physical space to allow the families to grow, which is an exit out of poverty and a way into the middle class”.11 A variety in unit type (individual, family, group) is also a way of integrating the community in the project and providing a more integrated living situation. A variety of low income housing types within a project allows for a variety not found in typical low income housing projects.

How does one evaluate VARIETY OF SPACE?
Identify various unit types: Single (studio), family (multiple bedroom) or extended family/aging in place (multiple bedrooms, accessible living spaces for elderly or handicapped)

Further reading:
Quality of Life and Semipublic Spaces in High-Rise Mixed-Use Housing Complexes in South Korea12
Housing as if people mattered13
Fundamentals of Sustainable Neighbourhoods14
OWNERSHIP
How does OWNERSHIP increase the success of a project?
In addition to the ability for a resident to rent or own a unit, ownership can also be evaluated beyond the traditional financial notions. It can include other perceived ownership attributes such as safety, entrance type, and expansion ability. Under the lens of safety, ownership depends on how responsible each resident feels over the safety of the housing project. The greater number of residents that share an entrance, the less ownership they feel over it, and the harder it becomes to identify an intruder. Also related is the type of entrance used in the project, as it relates to the ability for residents to identify intruders, build relationships with other residents and allows observation of shared public spaces. The third element of ownership is personalization. A recent research article noted that “social housing can provide sturdy and sustainable shelter but its standardized design lacks individuality and compromises the experience of dwelling”. Personalization works to prevent this compromise, and allows a residence to become unique, and a reflection of the culture, place and time. Ownership in it’s many facets works to maintain integration as well as transform the housing into an investment cared for by its residents.

How does one evaluate OWNERSHIP?
Ability to own or rent
Average residents per entrance (full occupancy rate/number of entrances)
Types of unit access (single loaded corridor, double loaded corridor, vestibule)
Identify the percentage of expansion available (sq. ft. expansion/total sq. ft. of individual lot)

Further reading:
The Next Wave in Housing Personalization: Customized Residential Fit-Out
Defensible Space: Crime Prevention through Urban Design
DENSITY
How can DENSITY increase the success of a project?
In order for density to increase the success of a project, it must be responsive to its site. A response does not necessarily mean replication, however. In some cases, density that differs from the surrounding context provides a foundation for isolation and separation from the community, hindering success. In other cases, a differing density provides benefit to the community, such as lowering density to increase public space on a project, improving success. The choice of density must be made after careful evaluation and response to the surrounding conditions. However, the perceived density can be designed to appear different than actual density to work toward these goals as well. The use of vegetation, setting back the top floors of a building to obscure from street level views and varying facades are a few ways to manipulate the perceived density. The actual density of a project can increase success, for example by opening public space or ensuring a dense enough project to be cost efficient. Perceived density then increases the success by its ability to appear integrated and provide a desired living environment.

How does one evaluate DENSITY?
Identify the actual density (total dwelling units/site area)
Identify methods used to alter perceived density

Further reading:
Visualizing Density
Measuring Density: Working Definitions for Residential Density and Building Intensity
DESIGN GUIDE

These guidelines are provided to assist those in the process of designing housing for low income communities. Specific numeric values are not presented, as projects will need to respond to these elements differently depending on their context. Rather, questions relating to each element are put forth to be considered.

To use, identify which elements were implemented in the design of the housing project for low income residents.
LOCAL AMENITIES

☐ ☐ Are there sufficient amounts of businesses, schools and transit locations within a 1 mile radius of the project?

☐ ☐ Are there sufficient transit locations within a 1 mile radius that can expand resident’s transportation range?

PUBLIC SPACE

☐ ☐ Is there an appropriate amount of space on site available to non residents?

☐ ☐ Does the project create shared public space with the surrounding context?

VARIETY OF SPACE

☐ ☐ Can the project house a variety of household sizes?

☐ ☐ Are there a variety of unit types used? (Individual, family, group)

OWNERSHIP

☐ ☐ Is the average number of residents per entrance appropriate and manageable?

☐ ☐ Is there a variety of unit access types used?

☐ ☐ Can residents expand their unit?

DENSITY

☐ ☐ Does the actual density respond appropriately to context?

☐ ☐ Does the perceived density respond appropriately to context?
The case studies chosen were selected in order to demonstrate use of the key design elements, both successfully and un成功fully. The projects exist around the world and vary in scale, context and client. Each project is examined through the lens of the five elements, specifically using the methods of evaluation outlined for each element. Following the case studies is a comparative grid in which examples can be easily cross referenced and compared.
QUINTA MONROY
Sold Pedro Prado, Iquique, Tarapacá, Chile
Elemental
2003

LOCAL AMENITIES*

13 BUSINESSES
1 SCHOOL
4 TRANSIT STOPS

*within one mile of the project

PUBLIC SPACE

On site public space
Relationship with adjacent context

30% PUBLIC SPACE

Housing
Adjacent context
VARIETY OF SPACE

Type and number of units available

- **30** SINGLE
- **70** 1-3 BEDROOM
- **0** 4+ BEDROOM

Further exploration: Due to a lack of affordable housing, the number of bedrooms in a unit is not equivalent to the number of people in that unit. In the case of Quinta Monroy, entire families have shared a studio unit. Also important to note that the type and number of units of this project will change over time, as owners increase or decrease built space as needed.

OWNERSHIP

Financial ownership
- [ ] Rent
- [x] Own

Average number of residents per entrance

Types of unit access
- [x] Vestibule
- [x] Single loaded
- [ ] Double loaded

Expansion ability
- [x] Yes
- [ ] No

If yes, what percent? 50% Expansion
DENSITY

Actual density

\[
\frac{100 \text{ DWELLING UNITS}}{1.24 \text{ ACRES}} = 80.9 \text{ DWELLING UNITS/ACRE}
\]

Perceived density

- Facade articulation
- Building type variation
- Material variation
- Window variation
BROADWAY HOUSING

California, United States
Kevin Daly Architects
2012

LOCAL AMENITIES*

72 BUSINESSES
2 SCHOOLS
10 TRANSIT STOPS

*within one mile of the project

PUBLIC SPACE

On site public space

42% PUBLIC SPACE

Relationship with adjacent context

■ Housing  ■ Adjacent context  ■ Park
VARIETY OF SPACE

Type and number of units available

- **0** SINGLE
- **33** 1-3 BEDROOM
- **0** 4+ BEDROOM

OWNERSHIP

- **Financial ownership**
  - Rent
  - Own

- **Average number of residents per entrance**

  Further exploration: Single loaded corridors are located along the interior public space, how does this impact the safety and use of that space?

- **Types of unit access**
  - Vestibule
  - Single loaded
  - Double loaded

- **Expansion ability**
  - If yes, what percent?
  - Yes
  - No

0% EXPANSION
DENSITY

Actual density

33 DWELLING UNITS

1.5 ACRES = 22 DWELLING UNITS/ACRE

Perceived density

Window variation
Material variation
Human scale planters
Mid height vegetation
Change in ground material
Transparent facade
CARMEL PLACE
New York, United States
nARCHITECTS
2016

LOCAL AMENITIES*

113
BUSINESSES

3
SCHOOLS

16
TRANSIT STOPS

*within one mile of the project

PUBLIC SPACE

On site public space

15%
PUBLIC SPACE

Relationship with adjacent context

- Housing
- Adjacent context
- Park
VARIETY OF SPACE

Type and number of units available

- **55** SINGLE
- **0** 1-3 BEDROOM
- **0** 4+ BEDROOM

OWNERSHIP

Financial ownership
- Rent
- Own

Average number of residents per entrance

Types of unit access
- Vestibule
- Single loaded
- Double loaded

Expansion ability
- Yes
- No

If yes, what percent? 0%
Further exploration: The project was given many mayoral overrides, such as the one to allow such high density. How could code and law changes begin to allow affordable housing at an appropriate density?

Actual density

\[
\frac{55 \text{ DWELLING UNITS}}{.20 \text{ ACRES}} = 275 \text{ DWELLING UNITS/ACRE}
\]

Perceived density

- Setback upper floors
- Facade articulation
- Window variety
- Mid height vegetation
- Street setback
COMPARATIVE MATRIX

To quickly and easily compare case studies, this grid was created. Each project’s response to the five elements is listed, and can then be directly related to other projects around the globe.
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<tr>
<td># OF UNITS</td>
<td>100</td>
<td>33</td>
<td>55</td>
</tr>
</tbody>
</table>

**LOCAL AMENITIES**

| BUSINESSES | 13 | 72 | 113 |
| SCHOOLS    | 1  | 2  | 3   |
| TRANSIT STOPS | 4 | 10 | 16 |

**PUBLIC SPACE**

| ON SITE | 30% | 42% | 15% |

**VARIETY OF SPACE**

| SINGLE   | 30  | 0   | 55  |
| 1-3 BEDROOM | 70  | 33  | 0   |
| 4+ BEDROOM  | 0   | 0   | 0   |

**OWNERSHIP**

| OWN       | ✗   | ✗   |     |
| # RES./ENTRANCE | 2  | 2   | 1   |
| VESTIBULE ENT. | ✗  |     | ✗   |
| S. LOADED ENT. | ✗  | ✗   |     |
| D. LOADED ENT. |     |     |     |
| EXPANSION % | 50% | 0%  | 0%  |

**DENSITY**

| ACTUAL | 80.9 | 22  | 275 |
| PERCEIVED | Facade articulation and building type, material and window variation | Window, material and ground plane variation, human scale planters, mid height vegetation and transparent facade | Setback upper floors, facade articulation, window variation, mid height vegetation and street setback |
LOCAL AMENITIES

PUBLIC SPACE


VARIETY OF SPACE


PERSONALIZATION


DENSITY