A Geodesign Approach to Community Planning in Barrio Venezuela, Puerto Rico

Community-led design for housing and connectivity

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GEODZ - 596A - Individual Studies, Geodesign Capstone Proposal
What is Geodesign?

- The geodesign frameworks aims to tackle complex and significant design problems at a geographic level.
- It requires collaboration as a central principle.
- Stake holders or the people of the place are for whom a geodesign study is undertaken.
  - They establish the values, propose changes and make the final decision.
What is Geodesign?

At the center of the framework, along with the people of the place, are the six questions through which a geodesign study is conducted.

1. How should the study area be described?
2. How does the study area operate?
3. Is the current study area working well?
4. How might the study area be altered?
5. What differences might the changes cause?
6. How should the study area be changed?
What is Geodesign?

- Evaluations, change impacts and decisions will be made around 8 systems that represent activities in the AOI.

- Housing
- Transportation Infrastructure
- Energy Infrastructure
- Water Infrastructure
- Green Infrastructure
- Institutional
- Agriculture
- Commerce and Industry
A geodesign study for Barrio Venezuela

Representation Model

- Located in the Río Piedras Ward of San Juan, capital of the US Territory of Puerto Rico.
- First establish circa 1910 as a workers informal settlement.
- Covers an area of approximately 40 acres.
- Heist elevation point at 180 feet.
- Over the years the community was formalize by local residents upgrading of structures and the provision of utility services and infrastructure.
Process Model: Drivers for Decline

- Economic activities and growth attracted people to the AOI.

- Changing economic conditions, globalization, the end of Federal Tax Incentives, and changes in consumer values began a decline cycle visible in Census data from 2000 onwards.
Process Model: Drivers for Decline

Population change 1980 to 2017

- Puerto Rico
- San Juan
- Barrio Venezuela
Barrio Venezuela reflects the pattern of Puerto Rico’s significant loss of population, losing 31% of its population between the years 2010 and 2017, from 1,436 residents to 995.
Process Model: Drivers for Decline

Housing Occupancy change 1980 to 2010

- Puerto Rico
- San Juan
- Barrio Venezuela
Process Model

- Large parts of the AOI present vacancy rates greater than 20% of housing units.

<table>
<thead>
<tr>
<th>Year</th>
<th>Housing units</th>
<th>Occupied</th>
<th>Vacant</th>
<th>Percent Vacant</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>600</td>
<td>517</td>
<td>83</td>
<td>14%</td>
</tr>
<tr>
<td>2017</td>
<td>704</td>
<td>493</td>
<td>211</td>
<td>30%</td>
</tr>
</tbody>
</table>
Process Model: Drivers for Decline

- In 2017 Hurricane events compounded housing conditions problem in the AOI.
- After Hurricane María, 85 homes where severely damaged or completely destroyed
Evaluation Model

- An Evaluation Model will serve as a guide to locate the best areas for each design initiative.

- Evaluation of the 8 systems on this study will follow a five criteria scale to determine their geographic suitability in different within the AOI.

<table>
<thead>
<tr>
<th>System</th>
<th>Description of Evaluation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasible</td>
<td>Suitable</td>
</tr>
<tr>
<td>Category description</td>
<td>Category description</td>
</tr>
</tbody>
</table>
**Evaluation Model**

**System**: Housing

Description of Evaluation: Evaluation of areas regarding their housing vacancy, structure condition, accessibility, slope and flood risk

<table>
<thead>
<tr>
<th>Feasible</th>
<th>Suitable</th>
<th>Capable</th>
<th>Not Appropriate</th>
<th>Existing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areas of housing vacancy of more than 40%, poor existing housing conditions, excellent accessibility to transportation and services, moderate slopes and no flood risk.</td>
<td>Areas of housing vacancy of more than 35%, poor existing housing conditions, good accessibility to transportation and services, moderate slopes and no flood risk.</td>
<td>Areas of housing vacancy of more than 25%, fair existing housing conditions, moderate accessibility to transportation and services, moderate slopes and no flood risk.</td>
<td>Areas of housing vacancy of less than 25%, good existing housing conditions, limited accessibility to transportation and services, high slopes or in flood prone areas.</td>
<td>Areas of existing housing activities that are in adequate areas and in good conditions.</td>
</tr>
</tbody>
</table>
Change Model

Changes in the AOI are driven by the people of the place. The geodesign team can also guide this process and facilitate proposals.

**Housing**
- Demolition of vacant and deteriorated structures to repurpose lots into activities for other systems.
- Development of new housing units in new vacant lots.

**Green Infrastructure**
- Repurposing vacant lots into green infrastructure like parks and community garden.
- Development of rooftop garden.

**Energy Infrastructure**
- Development of new energy infrastructure on rooftops and vacant lots.
# Change Model

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Type</th>
<th>Position</th>
<th>Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>People of Venezuela</td>
<td>Community</td>
<td>Better quality of life</td>
<td>Weak</td>
</tr>
<tr>
<td>Municipality of San Juan</td>
<td>Local Government</td>
<td>Fiscal expenditures as a tool for electoral politics.</td>
<td>Strong</td>
</tr>
<tr>
<td>Puerto Rico Territorial Government</td>
<td>Government</td>
<td>Fiscal expenditures as a tool for electoral politics.</td>
<td>Strong</td>
</tr>
<tr>
<td>Community Board</td>
<td>Community / Private</td>
<td>Pressure for the development of a up to date development and rehabilitation plan for Rio Piedras and its communities.</td>
<td>Weak</td>
</tr>
<tr>
<td>Development Trust</td>
<td>Community / Private</td>
<td>Growing exposure to the trust for fund acquisition. Promoters of a quality of life program.</td>
<td>Weak</td>
</tr>
<tr>
<td>University of Puerto Rico</td>
<td>Government</td>
<td>Suffering financial crisis. Position regarding community and its development is unknown.</td>
<td>Weak</td>
</tr>
</tbody>
</table>
Impact Model

Impact models in a geodesign study are used to establish metrics and assess the benefits and cost of the proposed changes. These impacts can vary from study to study but would include some of the following areas:

- Programatic
- Functional
- Organizational
- Economic
- Environmental
- Social
- Cultural
- Legal
# Impact Model

**System:**

Description of impacts:

<table>
<thead>
<tr>
<th>Most Positive</th>
<th>Positive</th>
<th>Least Positive</th>
<th>Neutral</th>
<th>Negative</th>
<th>Most Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category description</td>
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</tr>
</tbody>
</table>
Outcomes

Outcomes of the study will include:

• Identifying areas where physical, decline or services condition make it not suitable for housing.
• Identifying of areas where physical, decline and/or services make it possible for new housing and other activities to be established.
• Identifying areas for physical connectivity between residents and areas of economic and ecosystem services.
Outcomes

Outcomes of the study will include:

• Capturing the people of the place’s vision about how these spaces should be reconfigured.
• Listing projects and policy proposals.
• Consensus building.
## Outcomes

<table>
<thead>
<tr>
<th>Comprehensive Planning Method</th>
<th>Geodesign Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of fast updating leading to fast obsolescence of plans</td>
<td>Opens system allowing for simultaneous inputs and outputs</td>
</tr>
<tr>
<td>Standardized methodology requiring an extensive inventory</td>
<td>Easily adapted method according to the study area reality</td>
</tr>
<tr>
<td>Little integration among planning phases and no feedback</td>
<td>Repeating iterations among phases of why, how, when and where to intervene</td>
</tr>
<tr>
<td>Time consuming and expensive: too much emphasis on diagnosis, little time for proposals</td>
<td>Simplified diagnosis reducing time and money consumption</td>
</tr>
<tr>
<td>Difficult community engagement on a voluntary basis for such a long period</td>
<td>Simultaneous and collaborative decision-making process with immediate evaluation of alternative solutions and their impacts</td>
</tr>
<tr>
<td>Little or no knowledge of goals or projects of a plan by the community</td>
<td>Transparency: ademocratization of the planning process</td>
</tr>
<tr>
<td>Final products: technical reports</td>
<td>Simple diagrams and easy to understand colorcoded maps</td>
</tr>
<tr>
<td>Final plan oriented</td>
<td>Decision making process oriented</td>
</tr>
</tbody>
</table>