Recycling Houston

between improving water safety, reducing energy consumption and reinforcing living quality in suburban

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Recyclable urban elements built-up areas or in other words to 'build the ci

inwards'. Here are the main urban elements tha

are considered with high potentials to be rec

Main research question

In the intensification process, how to recycle existing urban elements and integrate them with bayou systems to bring synergy between reducing energy consumption and reinforcing living quality in Houston suburban?

Sub questions & research processes

1 How to intensify the suburban area by transforming the bayous and urban structure to reduce flooding risk and provide alternatives for individual automo-

First, flooding condition and urban systems (water, transportation, amenities, lot patterns, etc.) are analyzed. Based on the analyses, recyclable urban elements (intensification potentials) are defined and further developed into strategic plan with elaborations from methods discussed in theoretical framework (reconstructing an automobile dependent city, sprawl repair: regional sector mapping)

2 How to transform the suburban neighborhoods into mixed-use centers that can reinforce the living qualities, provide water storage capacity and still preserve the community characters?

One of the intensification nodes is selected based on the diversity of urban elements and urgency of the water and social conditions. The analyses in this section focuses on understanding the spatial conditions. Then the project demonstrates the strategies on the selected community with design interventions.

3 What are the spatial principles that need to be applied and replace current urban development regulations in order to implement the interventions, and further developed into general principles for other suburban area?

In this section, the project zooms in to the community intervention and extracts three critical locations to elaborate the spatial principles and toolbox. The current restrictions of urban development and undesirable conditions are first discussed; and the water and urban form principles are introduced as the solutions for improvements.

Block scale

Three critical locations

Three critical locations are

zoomed-in in the following pages

to show the details of interventions. Spatial (building + water) principles are concluded as the essential rules to improve the current conditions created by urban development regulations. The three transformations between existing and intervention are: main street intersection/ intensification node, Hunting Bayou branch/ multi-function waterfront, and residential lot/ secondary greenway.

Water strategies

greenway, and further transported to the bayou system.

g system: lot & street prof

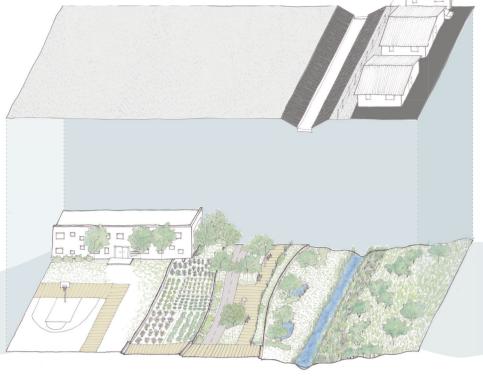
Add two layers to support current water system : Lot and street profile

The cause of flooding is the insufficient contain and channel capacity in the urban fabrics. Before stormwater can

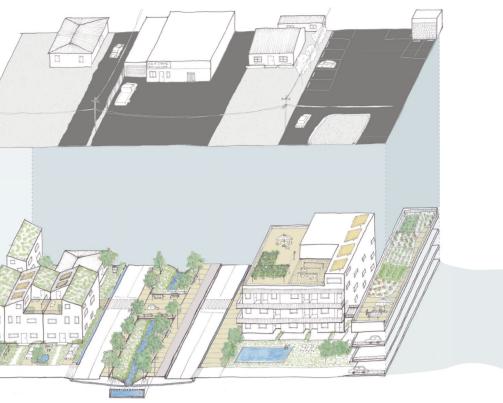
reach the bayou, the flooding occur. The strategy for improving this condition is to add two layers into the current water hierarchy. The layers are the street profile and private lot. In the project, the intervention on street profile

is referred as secondary greenway. It is considered as a supporting network for the current bayou greenway. The

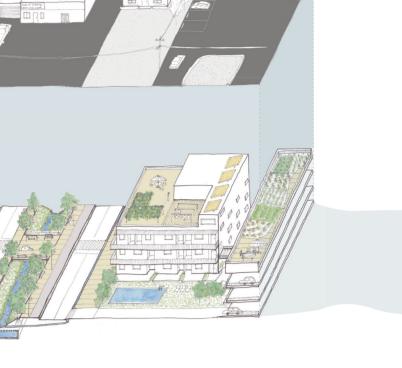
layer of private lot contains individual water storage and can be channeled with ditches and collected by secondary













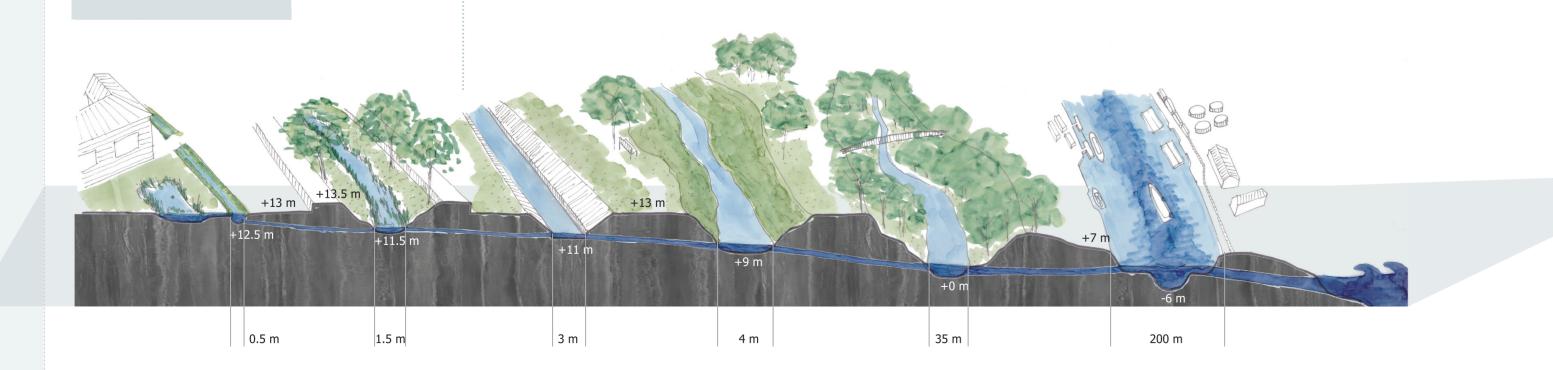


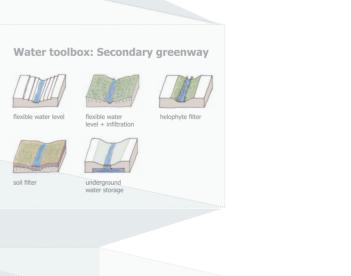












Water toolbox: Bayou

Community scale

Kashmere Garden

The site shows two types of block intensification: fully redevelopment and build within existing housing. Fully redevelopment is applyed at the in-between area of intensification axis and secondary greenway. This area provides higher density with apartment clusters. To build within existing housing, row houses are applied. By recycling and assemble over-size lots, small row houses can be located and increase the block density.

Along the intensification axis, ground floors are arranged with continuing commercial functions. They are developed with well-design sidewalks that provide comfortable walking condition and combine with biking and temporary parking needs.

Public facilities, such as schools and churches, are locat-Functions, such as agriculture and linear park, are designed with the different height levels.

Estimated quantitative outcomes

Strategies implementation on site:

- Recycle soil from waterfront

- Elevate and rebuild blocks

along densification axis

construction

ed between the center and waterfront to increase the connectivities and performance of open space. Along the bayou, elevation is designed with multi safety lines.

17400 m³

1400 m³

secondary greenway 4800 m³

individual storage 1000 m³

water square











Intensification strategies : red & green axis

Along the red axis, commercial amenities should be central-

ized into continuing zone. Public facilities (purple) and open space (green) are organized along green axis. In some

cases, green axis is used to divide over-size blocks into small-

er size that is suitable to increase street vitality. The crucial

strategy is to arrange the red (intensification) axis and green

tween area will be considered for high intensity developme



preserved area are the waterfront. The third step is defining the intensification center points. The fourth step considers current open space with the preserved area to establish green network: secondary greenway. The fifth step assembles and adjusts the intensification structure (red axis) with secondary greenway network (green axis) to accomplish the region-

current open space

Densification center

Regional structure developing steps



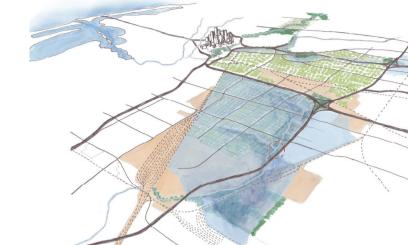


The regional structure developing steps are based on the reviewed theory: regional sector mapping (sprawl repair manual, Tachieva 2010). It is further elaborated according to the site conditions and including water strategies mentioned in the previous page. The first step points out the current amenities, which are along the main thoroughfares, as the potential axis to provide mixed-use development. The second step map the current open space and define preserved area. In this case, the

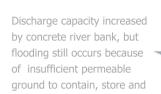


natural condition

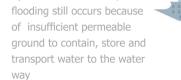






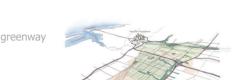












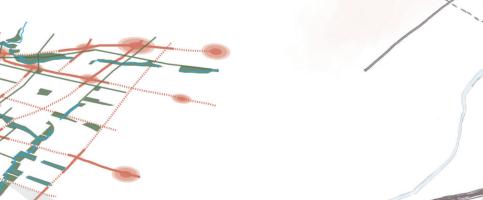
















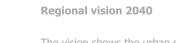












or town centers with hierarchy. The network between the centers are the backbones for the further development, and they can adopt different capacity of public transportation based on the population range. Green corridors are integrated with the intensified area connecting urban open space with the wa-

