



FANTASY ISLAND
Karen M'Closkey



Image by Luke Van Tol

This book is a collection of select projects that were completed in 2017-18 in the department of landscape architecture at the University of Pennsylvania. The studio, guided by Karen M'Closkey, focused in and around Puerto Baquerizo Moreno on San Cristóbal Island, the Galápagos Islands, Ecuador. Together, the projects offer a landscape-based framework for future development as the island continues its rapid population growth.

Book Designer: Zhexuan Liao + Yang An + Dorothy Jacobs

ACKNOWLEDGMENTS

Though only eight projects are included here, this studio benefited from the efforts and inspiring work of each and every student who took part in the studio. I am grateful to them and to all of those in Ecuador who shared their time with us on our studio trips. In particular, I would like to thank: Michael Weisberg, who first invited us to work in the Galápagos; Ernesto Vaca, our intrepid guide; Fausto Rodriguez and Bonnie Arcos from Galápagos Best. This studio was supported by funding from a Penn Global Grant, a Penn Making a Difference Grant, and Penn's Program in Environmental Humanities. Many thanks are also owed to the Dean's Office at the Stuart Weitzman School of Design. Our adventurous travels would not be possible without this support. I would also like to thank Dorothy Jacobs, Toni Rinaldi, and Keith VanDerSys for collating and distilling the studio work into the drawings that precede the individual student projects.

CONTEXT

Instead of asking what capitalism does to nature, we may begin to ask how nature works for capitalism.¹



Image by Zhexuan Liao

The “Galápagos Paradox”

Ecotourism employs capitalist mechanisms to address problems of capitalist development itself.²

Islands hold a special place in the imagination, perhaps none more so than the Galápagos Islands, Ecuador, a place long considered a “natural laboratory” and “secular pilgrimage site” ever since it provided the locus for Charles Darwin to develop his theory of evolution by natural selection. Named a UNESCO World Heritage site in 1979, the archipelago is considered scientifically significant due to its high rates of endemism. Given the absence of an indigenous population and the late arrival of humans—settlement did not begin until the early to mid-nineteenth century—the archipelago remained relatively untouched by people, giving scientists a window through which to witness and study evolutionary processes free of human “disturbance.” Ninety-seven percent of the land is conserved by the Galápagos National Park (est. 1959), and another 50,000 square miles are protected in the Galápagos Marine Reserve (est. 1998). No one, including residents, can enter most of these areas without a paid guide and thus many residents do not spend time in this “97%.” In an attempt to protect the biodiversity of the islands, immigration was banned in 1998, yet population continues to grow from births as well as migration of mainland Ecuadorians in search of jobs. Tourism, the archipelago’s biggest industry, is threatening the very nature it was meant to preserve. Though ninety-five percent of the islands’ pre-human biodiversity remains intact, due to how the islands have been managed this relatively pristine natural environment faces challenges, as do the island’s human inhabitants.

When Charles Darwin first set foot on San Cristóbal Island in 1835, there were only a few hundred inhabitants in the Galápagos (a penal colony on Floreana Island). Today, there are at least 30,000 residents living on four islands (Santa Cruz, San Cristóbal, Isabela, and Floreana). Most of this growth has occurred in the last forty years due in large part to the creation of a market for ecotourism as a means to preserve the Galápagos. This has resulted in what is referred to as the “Galápagos Paradox.” The islands are promoted as a pristine place to visit, thereby increasing the flow of goods and tourists, which introduces new species and requires an increasing population to supply labor. Conversely, tourist-generated revenues provide much of the funding to protect and maintain the national park. The cycle continues. There is no simple “fix” for the Galápagos Paradox—there are divergent ideologies at play in how nature is valued, what nature is valued, and for whom.

In 1969, the Galápagos Islands were the first place in the world to be designed an ecotourism destination.³ The archipelago was imagined as an example to the rest of the world—or at least to the western imagination—as a place where one

could step back in time and experience the bounty of an untouched landscape. This proved to be very popular, and profitable. Between 1990-2009, the number of tourists rose from 40,000 to over 160,000 per year. In 2007, UNESCO declared the Galápagos Islands a World Heritage Site at Risk—the following year tourist numbers increased. Current estimates put annual tourist visits at over 200,000.

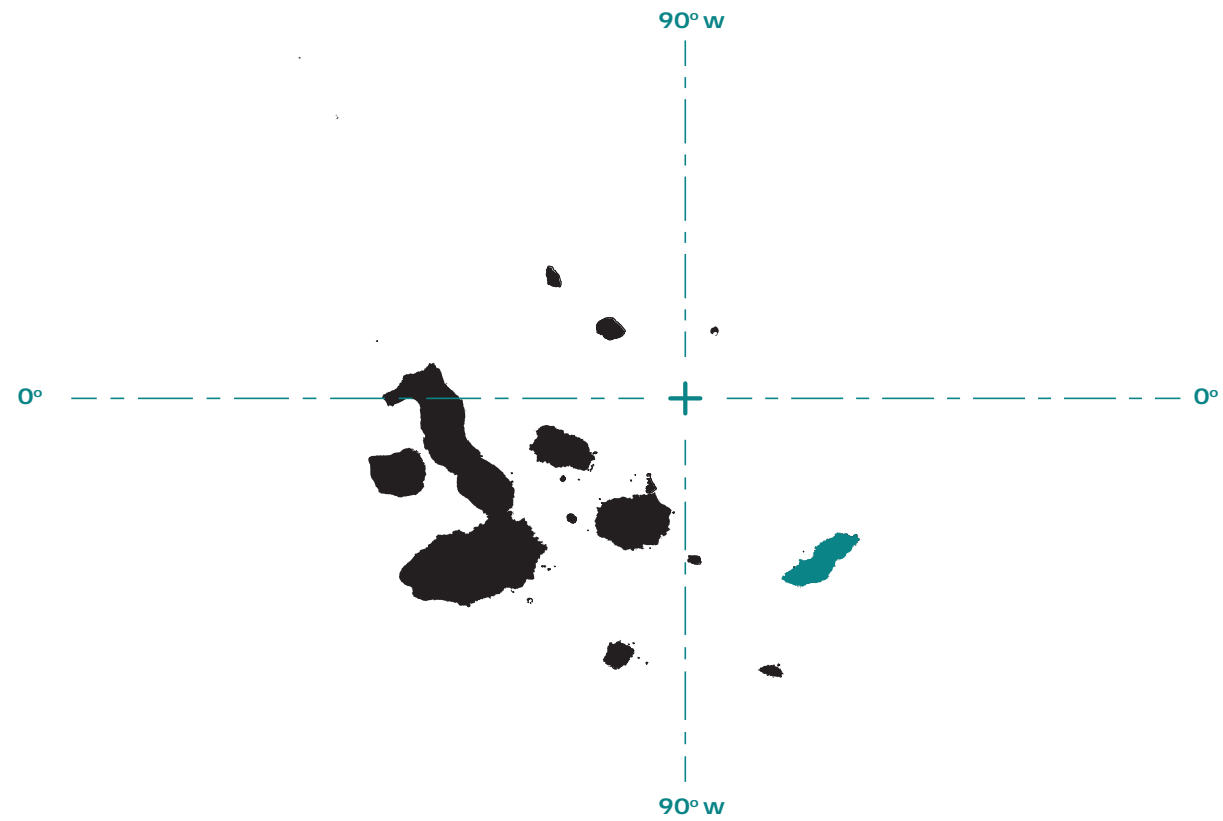
As a means to minimize impact on the terrestrial ecosystems, tourism was initially water-based. Visitors stayed on “boat-hotels” where all food and amenities were supplied. The problem was that this did not benefit Galápagos’ residents who were not directly involved in tourism. This has changed in the last two decades or so—recent estimates put land-based tourist visits at 45% [55% remain water-based, which is much more expensive]. And though tourism accounts for 65%-70% of the islands’ GDP, some estimate that the amount retained in the archipelago is only between 7-15%. Whether land or water-based, workers are needed to support the increase in tourism. Population growth rates are at least triple what they are on mainland Ecuador. Immigration to the islands (other than through marriage) was banned in 1998, while tourism growth has not been successfully limited even though the pressures on the local environment and people originate from developing the Galápagos as a tourism destination. In addition to lack of controls on tourism, several obstacles to preventing further habitat degradation and pollution have been cited: abandoned farmland, which has higher rates of invasive species; exploitation of resources for short-term profit; limited knowledge by residents—especially those who were not born there—about the uniqueness of the Galápagos; and decision-making that is based in mainland Ecuador and at the hands of internationally-based NGOs, which have failed to politically engage Galapagueños. This last condition is rooted in a mind-set that has long seen science and conservation as politically neutral.

The Islands provide a concentrated place to consider the tension between biodiversity conservation and economics rooted in the cross-section between the global discourse of “ecotourism” and the local livelihoods that have been left out of conversations about prohibitions on island activities. By rooting the problems in the 3% unprotected area, a binary between nature and society—conservation and people—is reinforced; it is a line that ignores the permeability between these spheres. In this studio, students were asked to operate on these lines of demarcation in order to locate conceptual, material, and programmatic areas of permeability.

¹ Jason W. Moore, *Capitalism in the Web of Life* (2015), 12.

² Robert Fletcher and Katja Neves, “Contradictions in Tourism: the Promise and Pitfalls of Ecotourism as a Manifold Capitalist Fix,” *Environment and Society: Advances in Research* 3 (2012): 60.

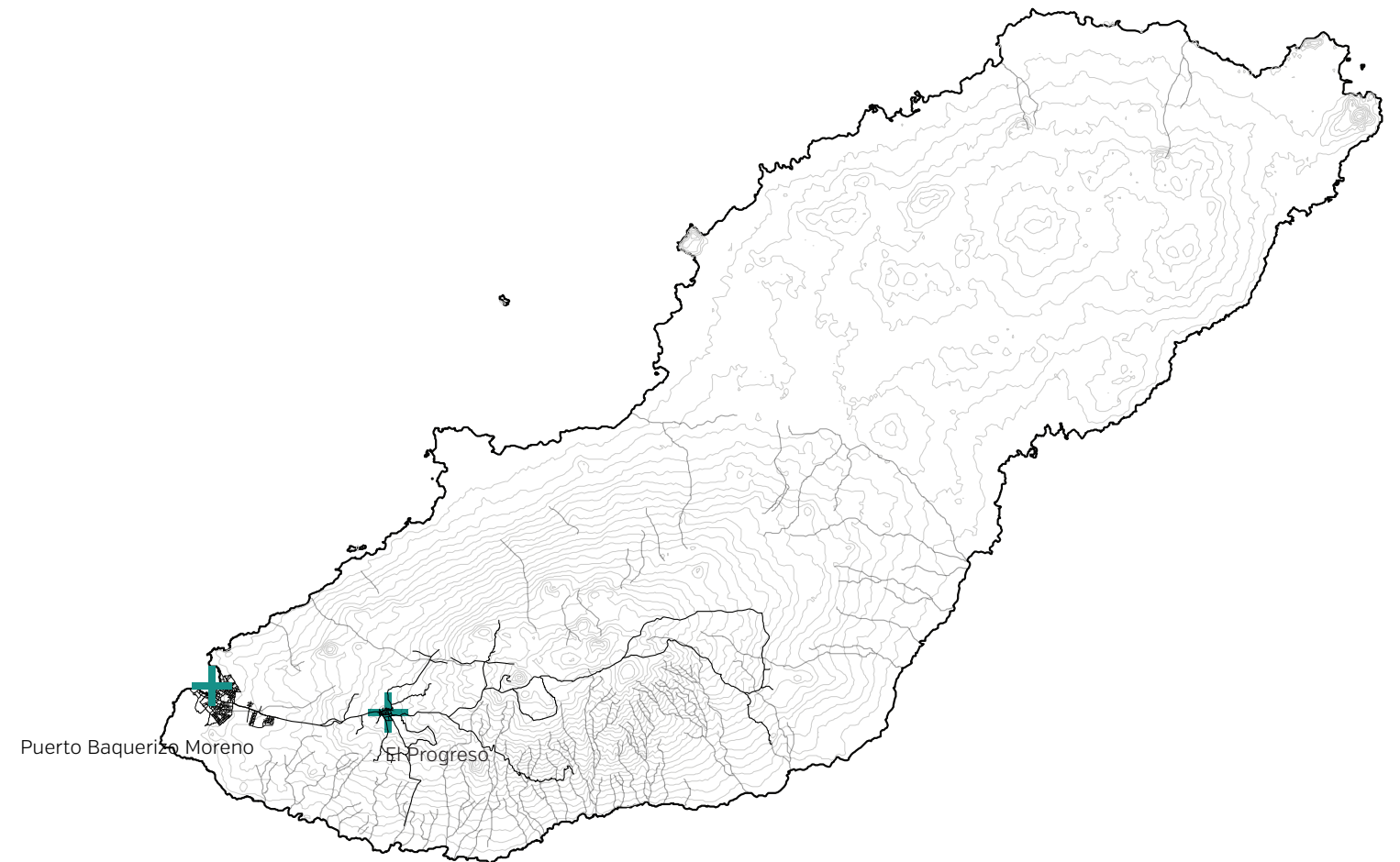
³ Filippo Celata and Venere Stefania Sanna, “The post-political ecology of protected areas: nature, social justice and political conflicts in the Galápagos Islands,” *Local Environment* 17: 9 (October 2012): 981.



SAN CRISTÓBAL ISLAND

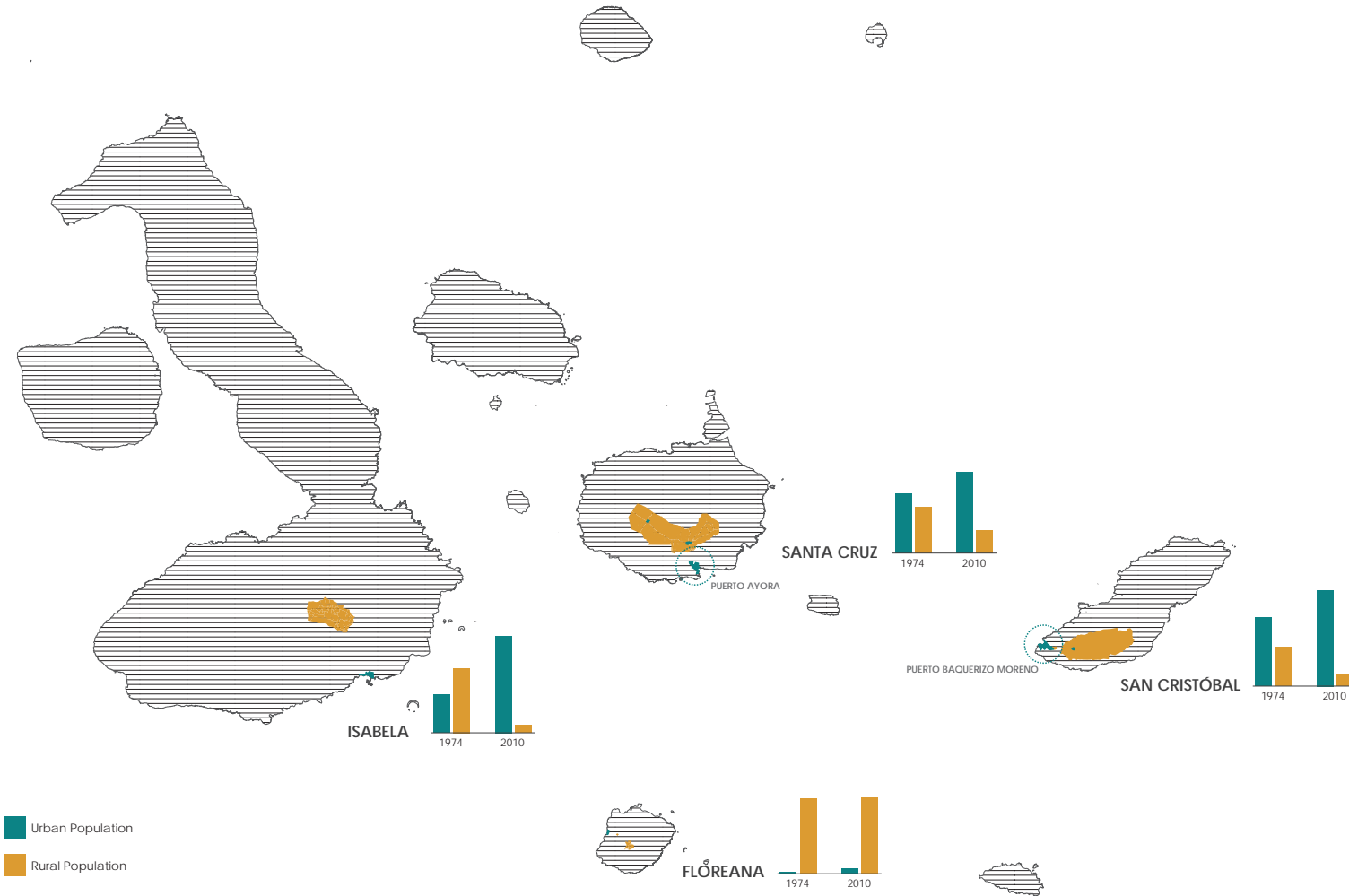
San Cristóbal is the easternmost island in the Galápagos archipelago, as well as one of the oldest geologically. It is administratively part of San Cristóbal Canton, Ecuador.

San Cristóbal Island is roughly 215 square miles with a peak elevation of 2,400 feet. It is the second most populous island in the archipelago, after Santa Cruz. Puerto Baquerizo Moreno, a town of at least 8,000 residents, is located at the south-western tip of San Cristóbal.

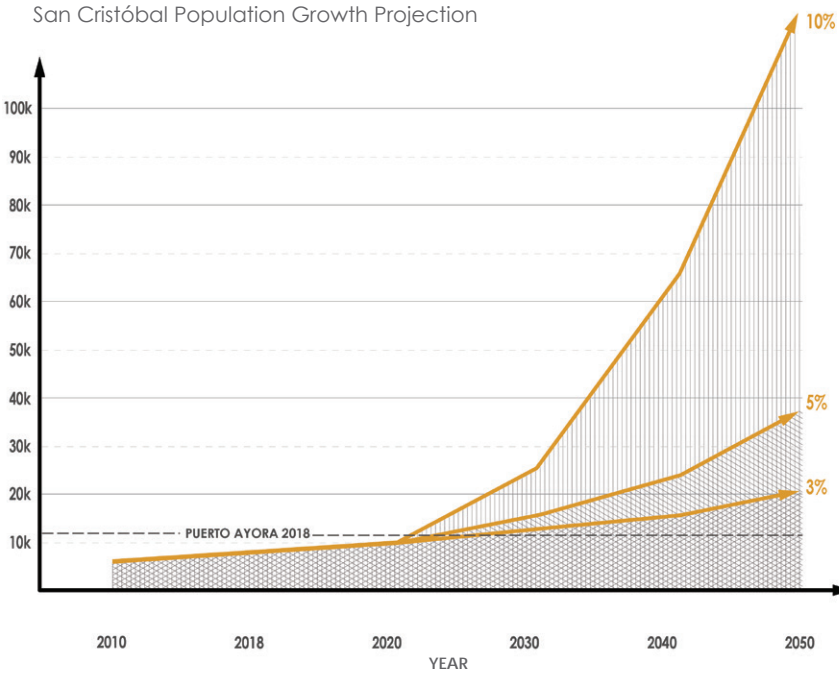
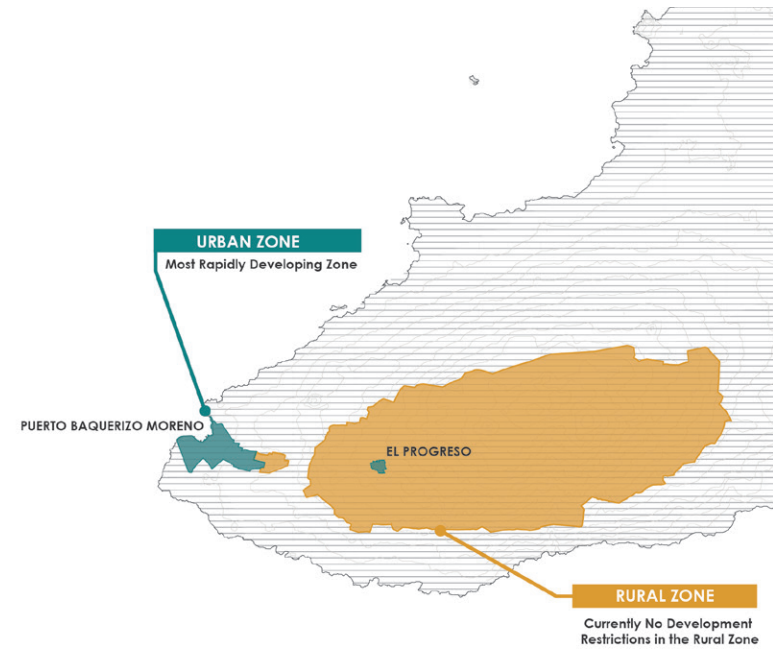


Galápagos Town Growth

Due to the growth of tourism, rural residents gradually move to the towns. While the urban areas remain the same physical size, the urban population density has increased dramatically during the past 30 years.

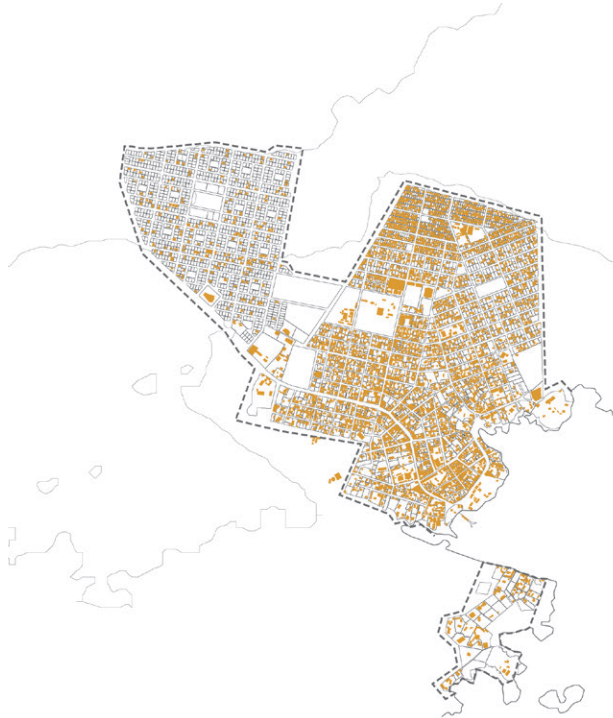


San Cristóbal Town Growth

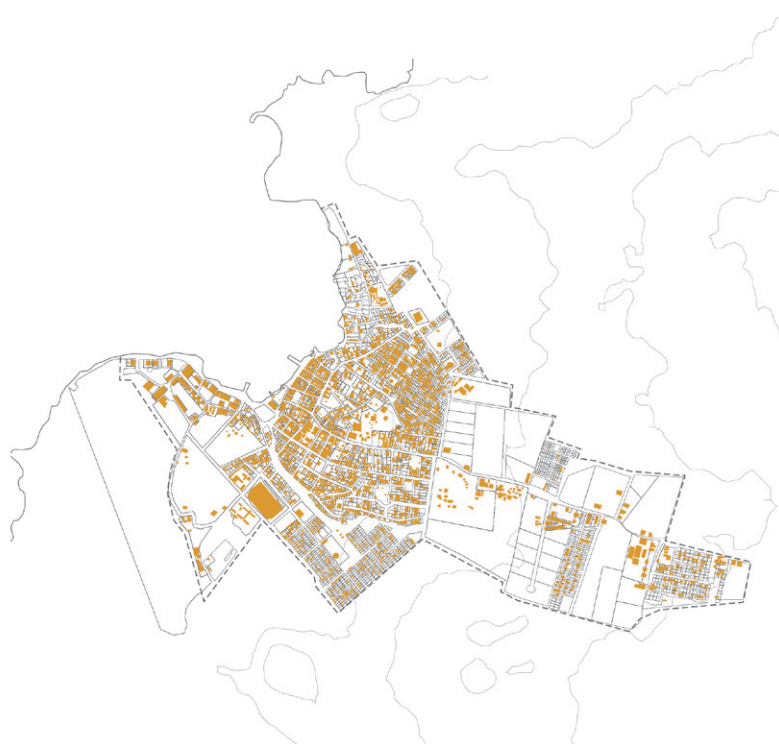


Puerto Ayora - Puerto Baquerizo Moreno Comparison

PUERTO AYORA - 2018
 Estimated Population: +/- 20,000



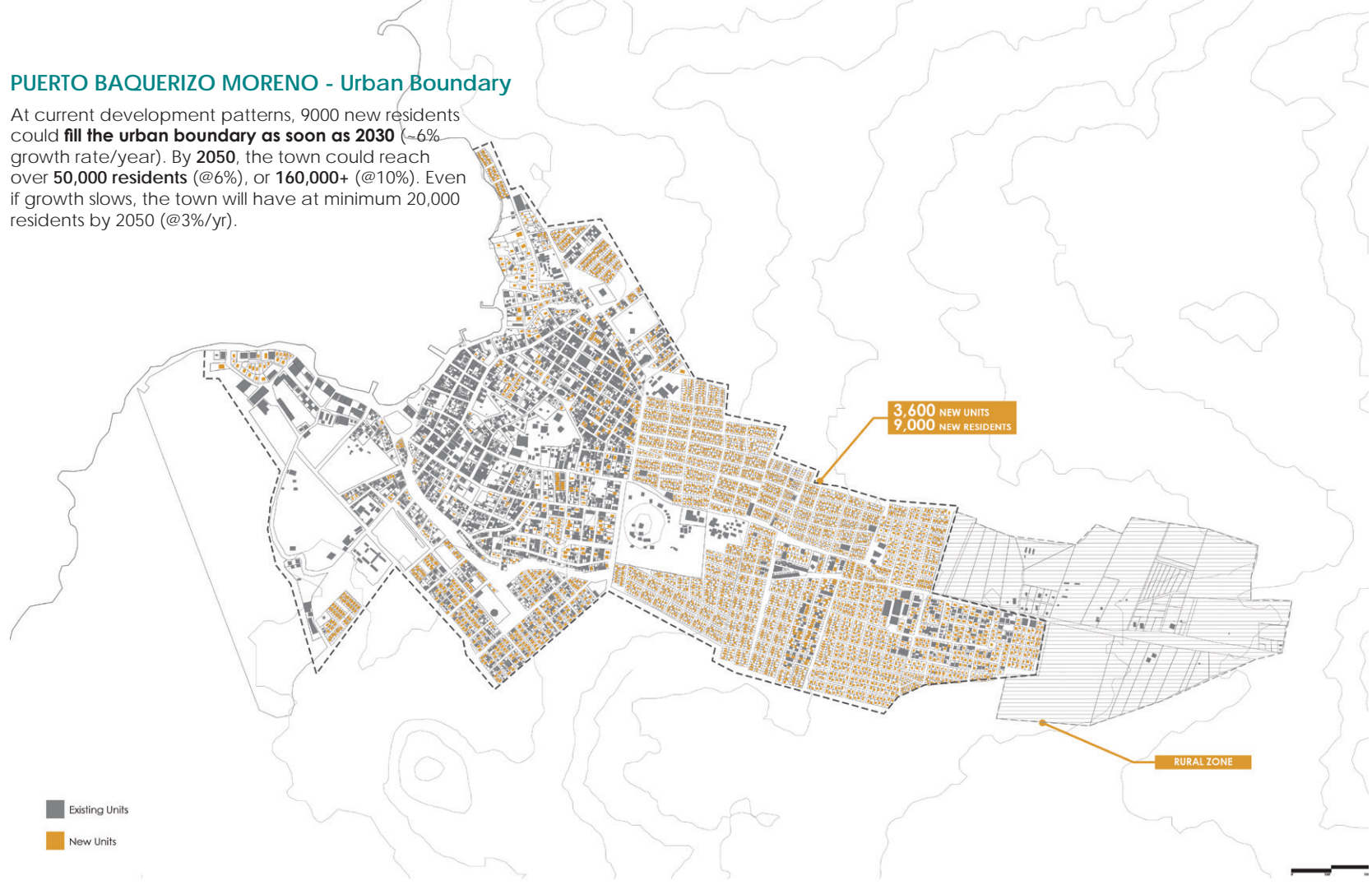
PUERTO BAQUERIZO MORENO - 2018
 Estimated Population: +/- 8,000



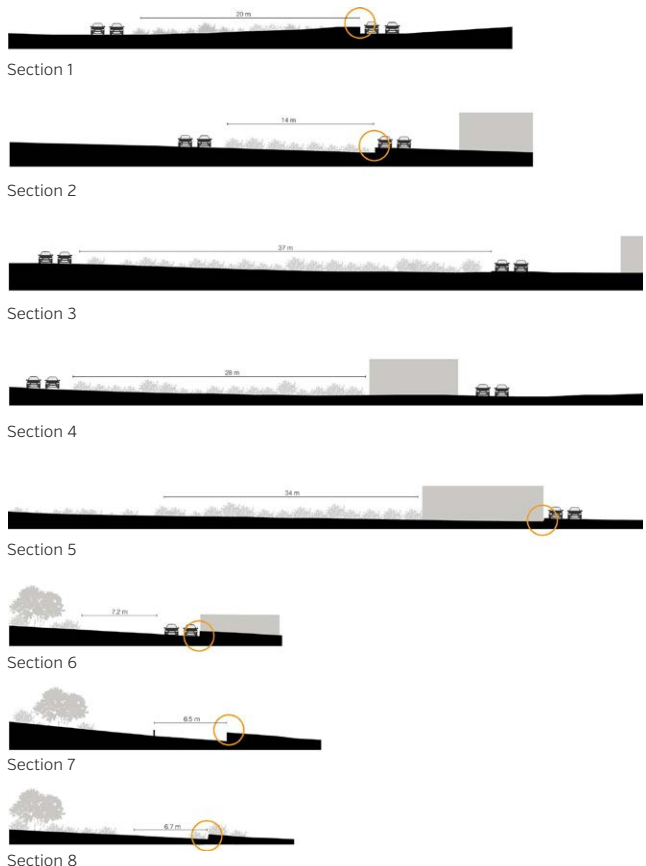
Puerto Baquerizo Moreno - Current Development Trend

PUERTO BAQUERIZO MORENO - Urban Boundary

At current development patterns, 9000 new residents could **fill the urban boundary as soon as 2030** (~6% growth rate/year). By 2050, the town could reach over **50,000 residents** (@6%), or **160,000+** (@10%). Even if growth slows, the town will have at minimum 20,000 residents by 2050 (@3%/yr).



Ravines

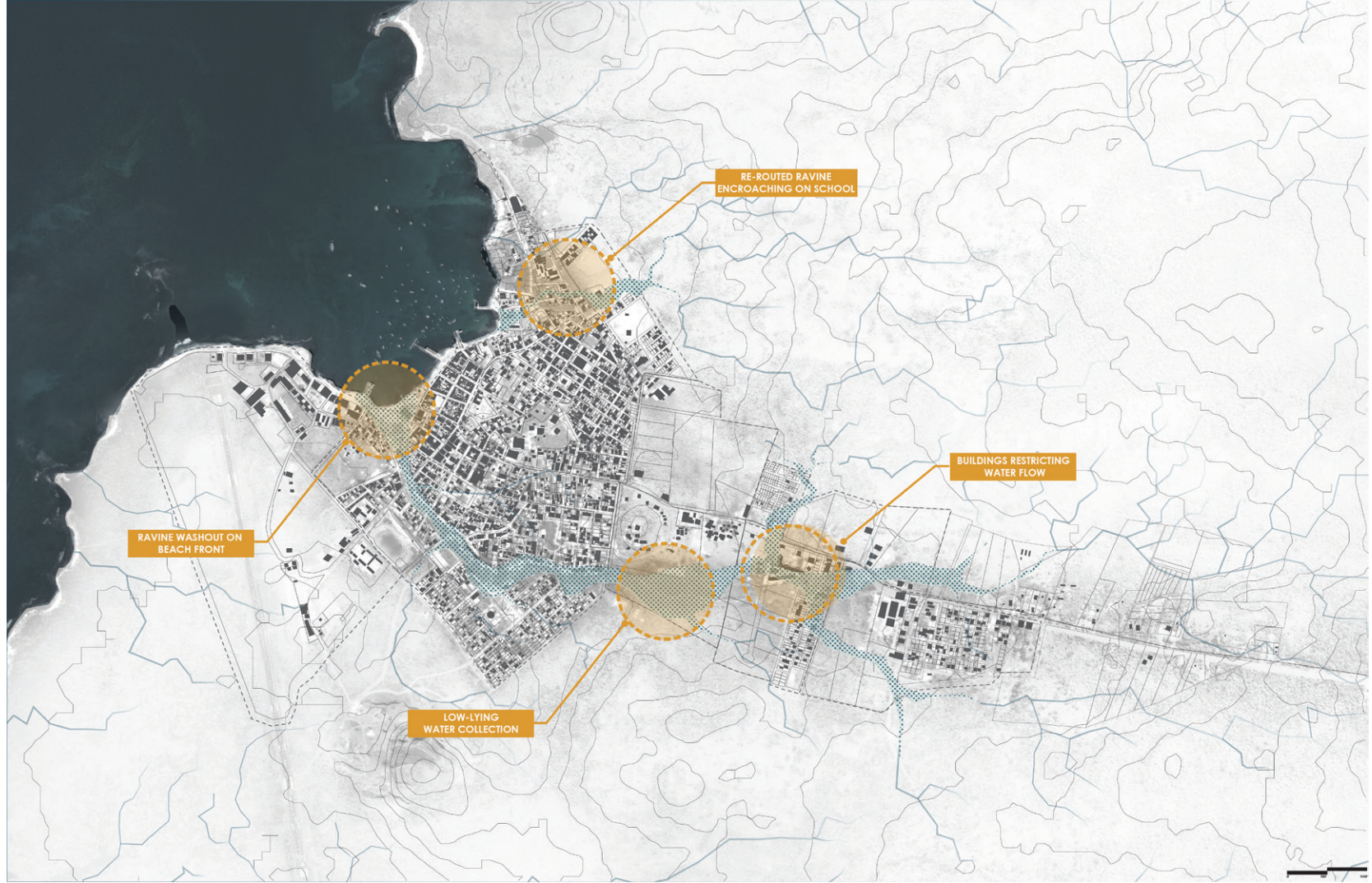


Development close to Ravine

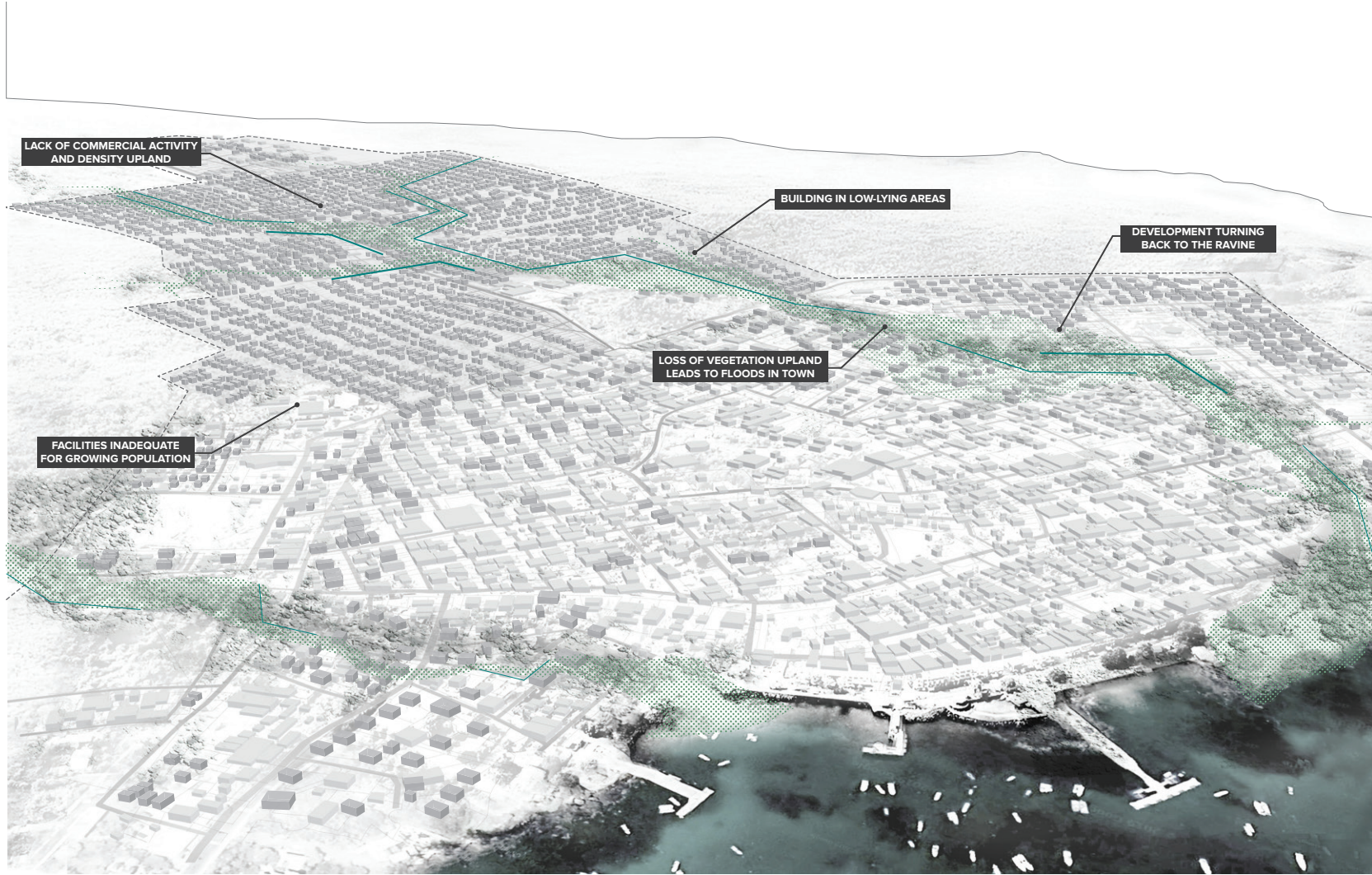


Ravine & Road Intersection

Ravines Threatened by Construction Upland



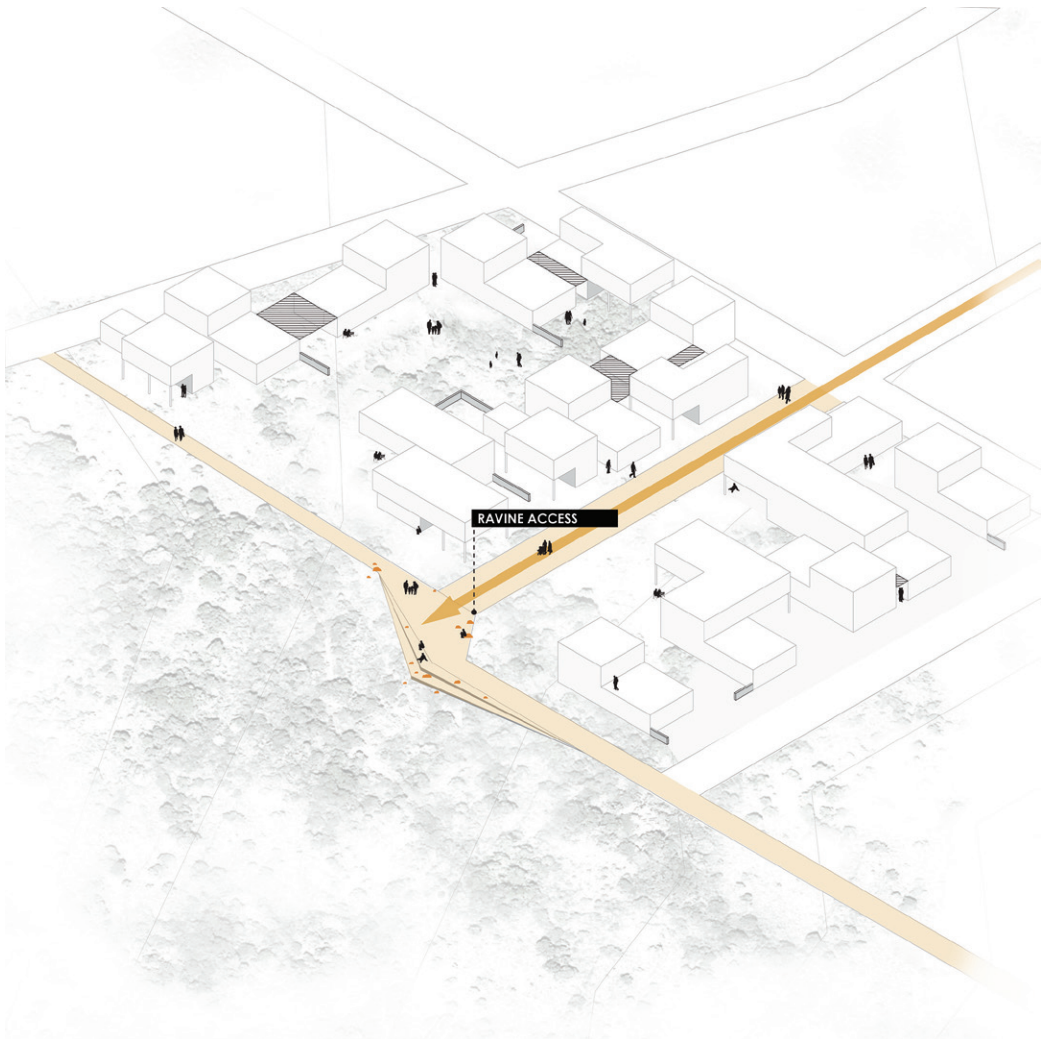
Puerto Baquerizo Moreno - Current Development Trend



Potential Development Strategies

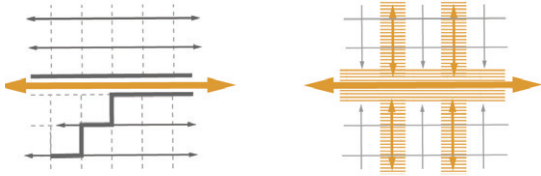


Establish the Ravine as Public Space and Create Local Access Points



Current: Construction in the Ravine and other Collection Points

Proposed: Preserve the Ravine as Public Space with Community Access

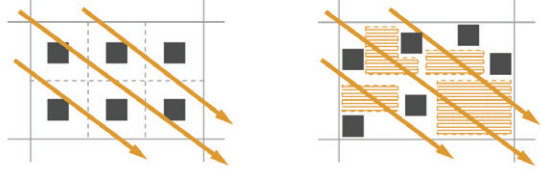


Current: Development Turning Back to the Ravine

Proposed: Design Streets to Maintain Access to the Ravine

Because roads have been constructed to run parallel to the ravines, residents tend to construct their homes along these main roads, facing away from the ravine. This blocks access to the ravines and causes them to be perceived as abandoned spaces rather than shared assets. Enforcing building setbacks and providing continual access to the ravines will help transform people's perception of them as shared public space.

Protect Low-lying Areas and Vegetation

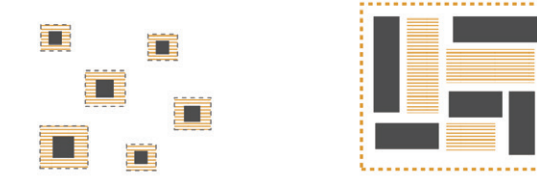
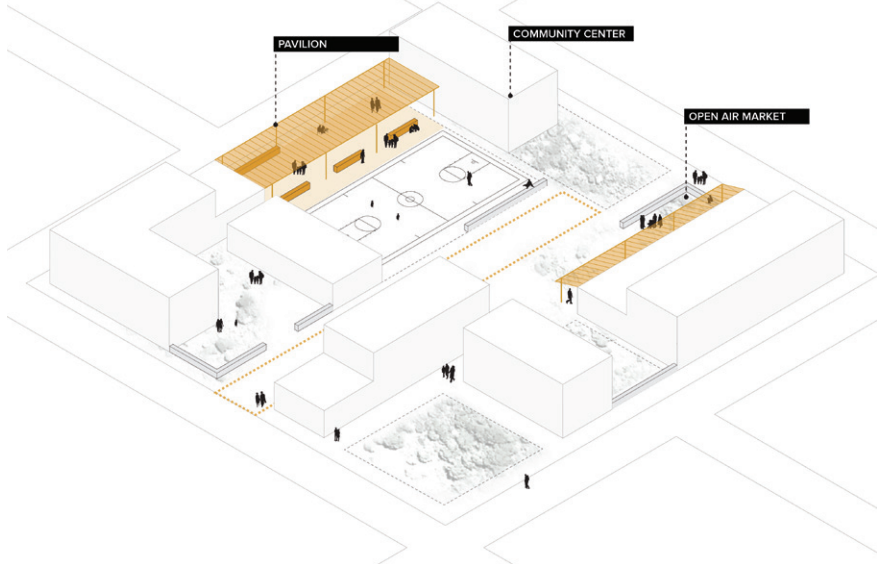
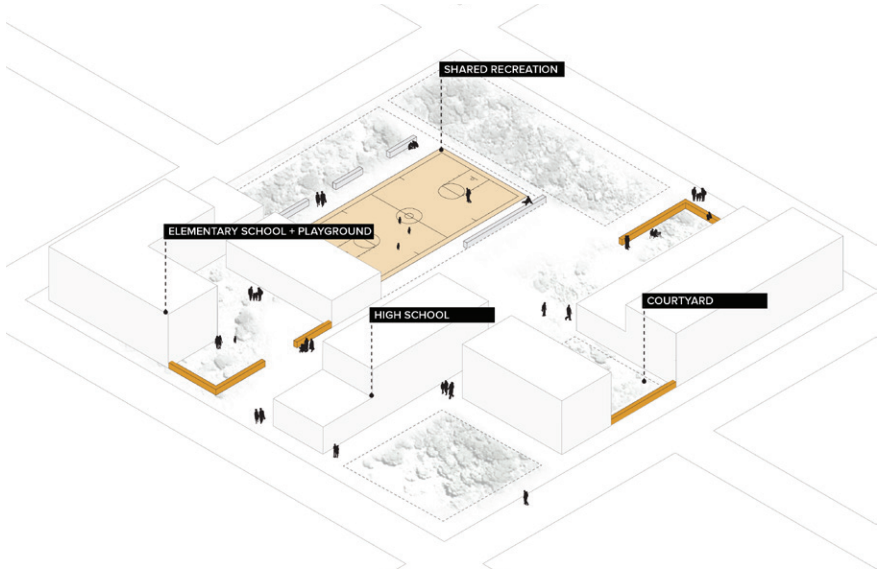


Current: Development Grid Ignores Water Flow and Mature Vegetation

Proposed: Shift Development to Accommodate Water Flows

The majority of land that is likely to be developed outside of the town center is covered with vegetation, which acts as a filter that slows down the water flow from the highlands before it reaches the ravines in town. Completely stripping this area of its existing vegetation for new development would greatly exacerbate the flooding in town. However, this impact can be lessened by creating areas within the new developments that accommodate local flows and preserve the existing vegetation. These areas can become public spaces that form a larger network to connect different neighborhoods.

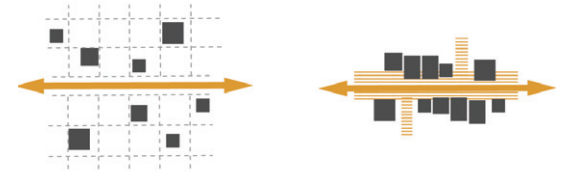
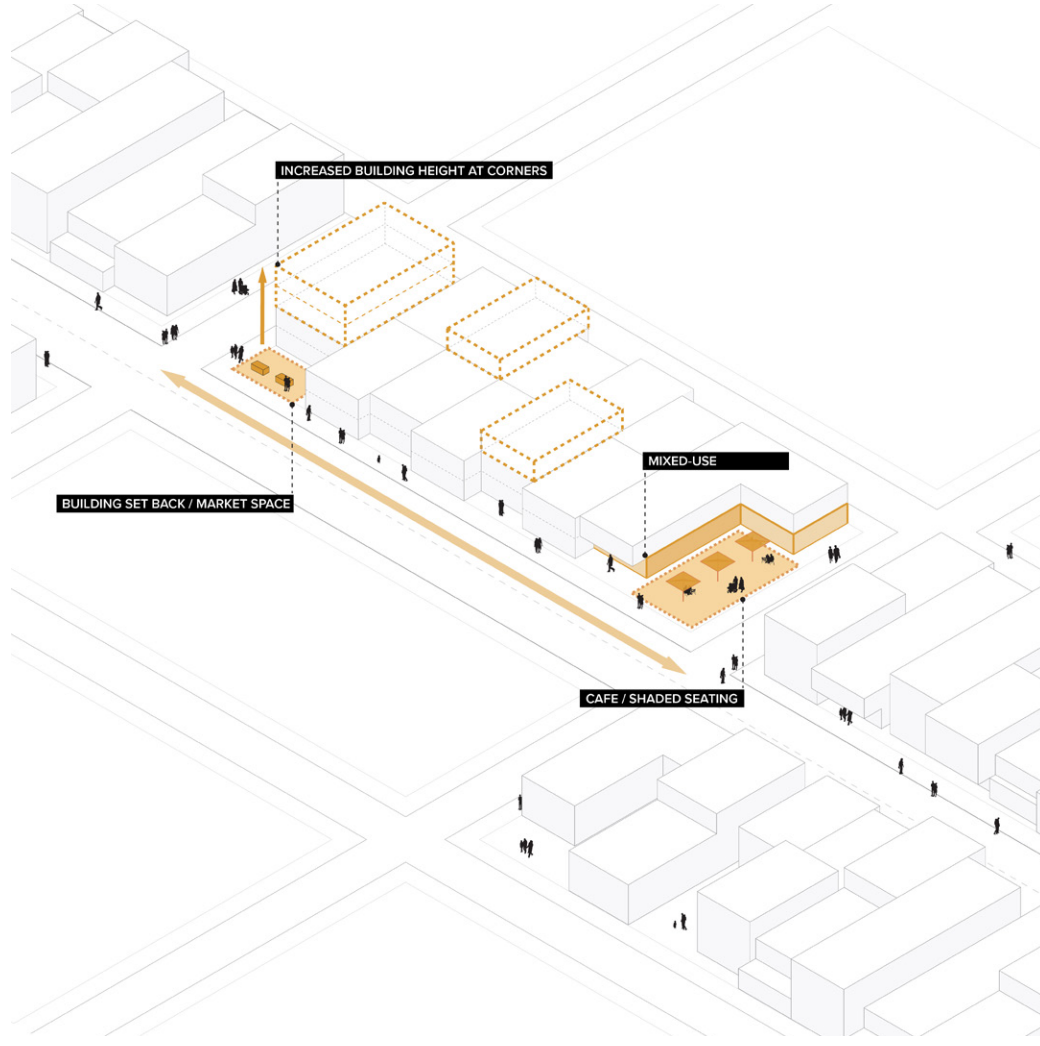
Create Shared Community Facilities



Current: Facilities Inadequate for Growing Population **Proposed: Create Shared Community Facilities to Accommodate Growing**

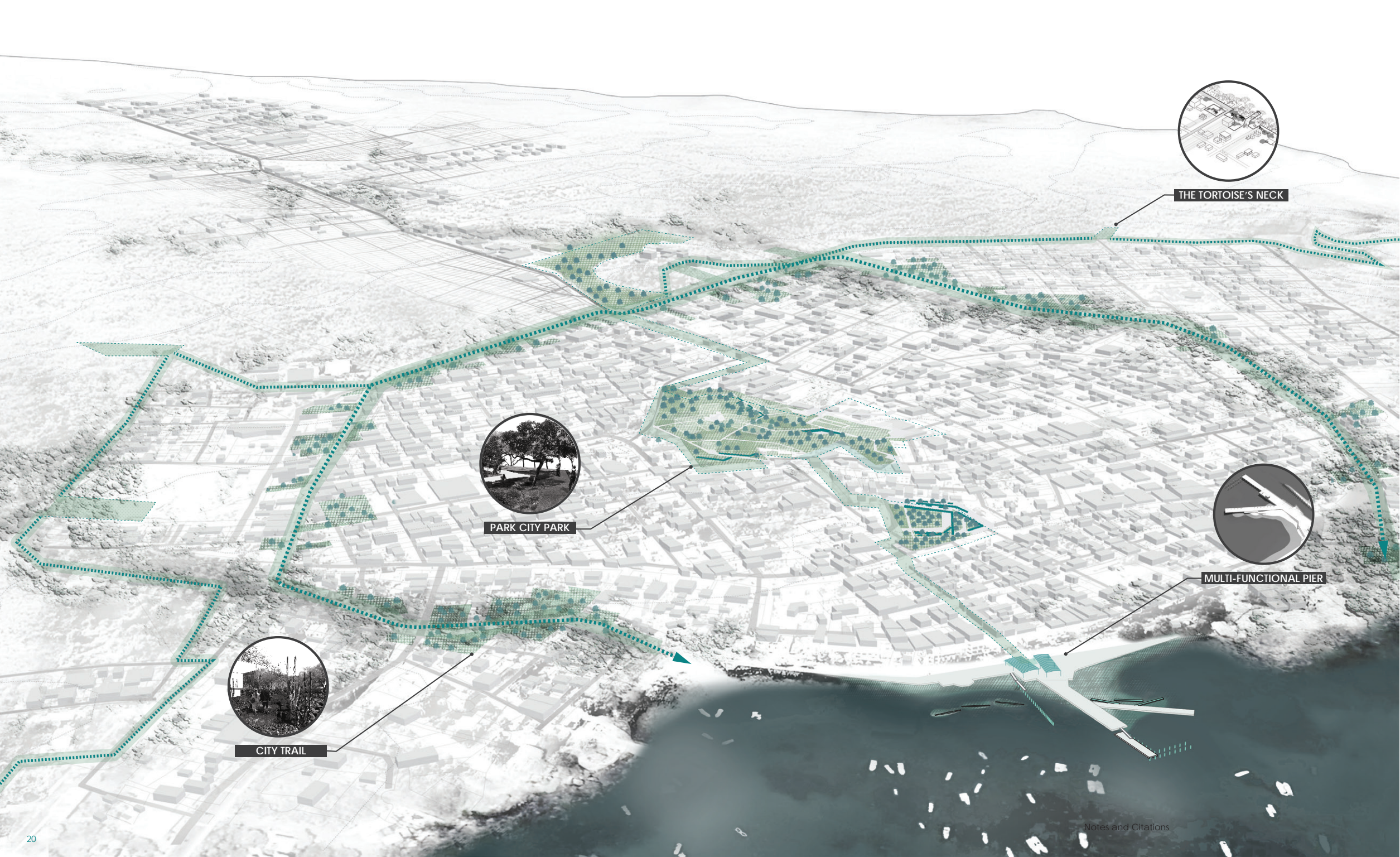
In order to accommodate the growing population, the island will need to create several new schools and other community facilities. Creating larger shared facilities would transform these places into community hubs that are designed to perform a number of different functions for residents.

Densify Corridor



Current: Evenly Dispersed Development Accelerates Loss of Land **Proposed: Continue Mixed-Use development patterns; consider adjusting height restrictions on select streets**

Currently, the only area with relative density in Puerto Baquerizo Moreno is along the waterfront. In contrast, more recent developments are following a pattern of single-use residential buildings that are centered in the middle of a lot. Continuing mixed-use development further upland would create opportunities for other businesses. In addition, it is vital to strategically plan areas of denser development to help preserve land for public amenities and to respond to topography and water flow.



STUDIO WORK

METHOD

How might students engage the apparent dualisms arising from how the archipelago has been understood and managed, which is based on the construction of many oppositions and boundaries? In order to address this question, the studio began with assignments focused on several exploratory tracks that assisted students in the formation of their designs.

+ Borderlines

Exchanges + Crossings

Though well-intentioned and having provided many positive aspects in terms of wildlife conservation, the boundaries constructed through the management of the Galápagos Islands have sometimes had negative consequences that undermine the very reasons they were devised in the first place. Potential borderlines for investigation included:

- Land and Water: Coastline
- Rural and Urban: Highlands/Lowlands
- Three-percent and 97%: urban/rural v. national park
- Mainland and archipelago: autonomy v. dependence

+ Manifold Structures

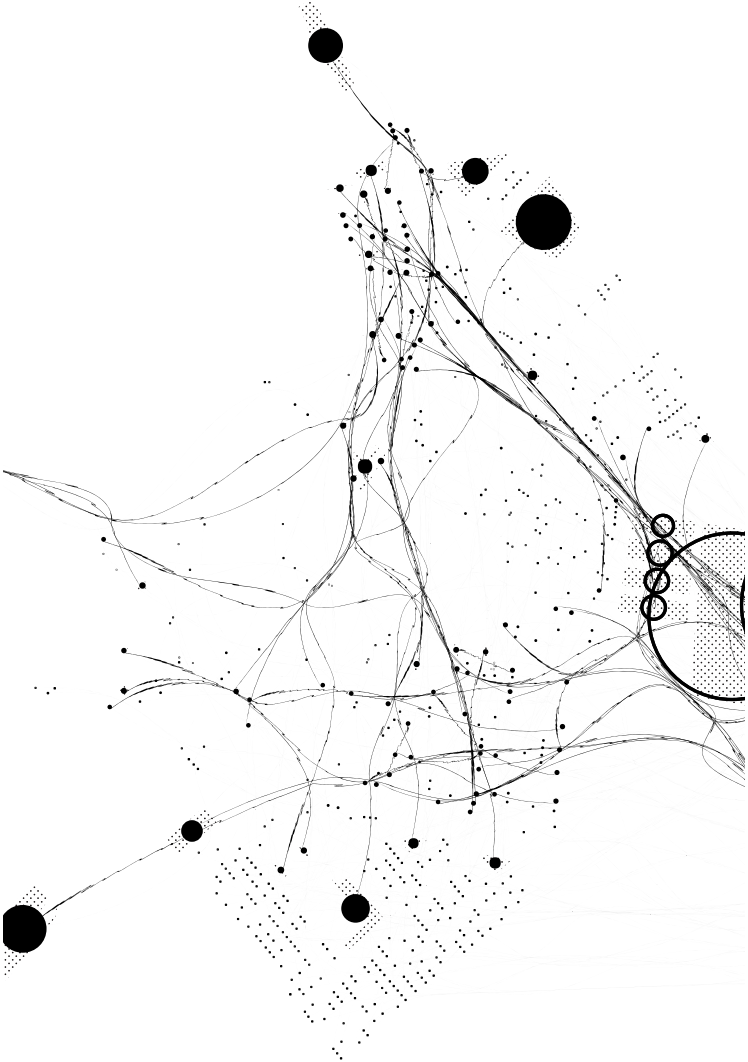
Connections + Overlaps

Students identified existing lines in the landscape, such as hard infrastructure or political boundaries, which provided the basis upon which to build a multiplicity of lines, intersections, and overlaps. They developed drawing methods that enabled them to operate on these physical and legal lines of demarcation, in order to locate conceptual, material, and programmatic areas of permeability. The goal was to identify the potential for hybrid spaces and programs that serve multiple functions—environmental, social, recreational, educational, etc.

+ Liminal Zones

Gradients + Timeframes

In addition to understanding physical, legal, or programmatic interconnections (i.e manifold structures), students were asked to explore their sites in time by visualizing the forces and flows that constitute it under multiple conditions, whether looking at seasonal and cyclical changes, projections pertaining to population growth or climate change, or both.



Drawing by Zhexuan Liao

FOCUS AREAS

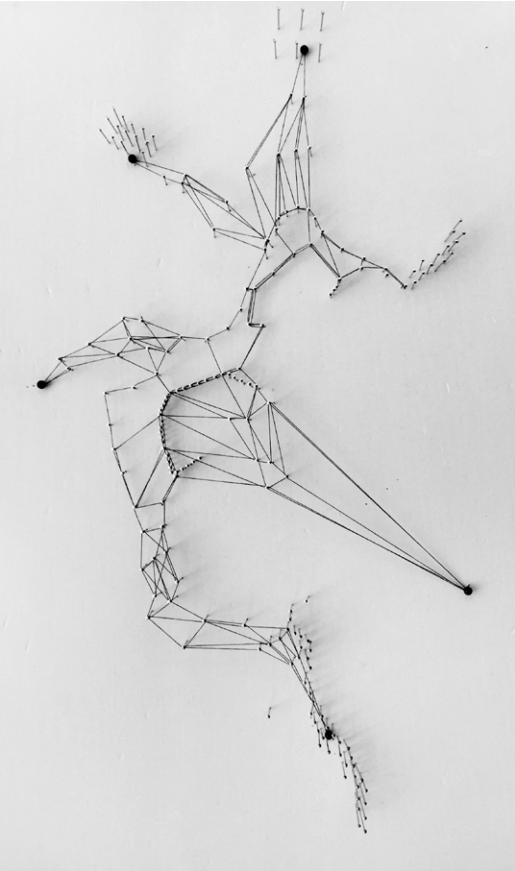
The Galápagos Islands are volcanic, sitting on a continually eastward moving tectonic plate called the Nazca—the islands furthest to the east and south are the oldest and have no volcanic activity while those to the west are active, with new formations still occurring. At least three and a half million years separate the youngest and oldest islands, thus creating vast differences among them. The Galápagos are unique among other islands and archipelagos due to their location—they are equatorial (sitting between one-degree latitude north and south) but are heavily influenced by cool ocean currents, resulting in a mixture of tropical and temperate environments.

+ San Cristóbal Island

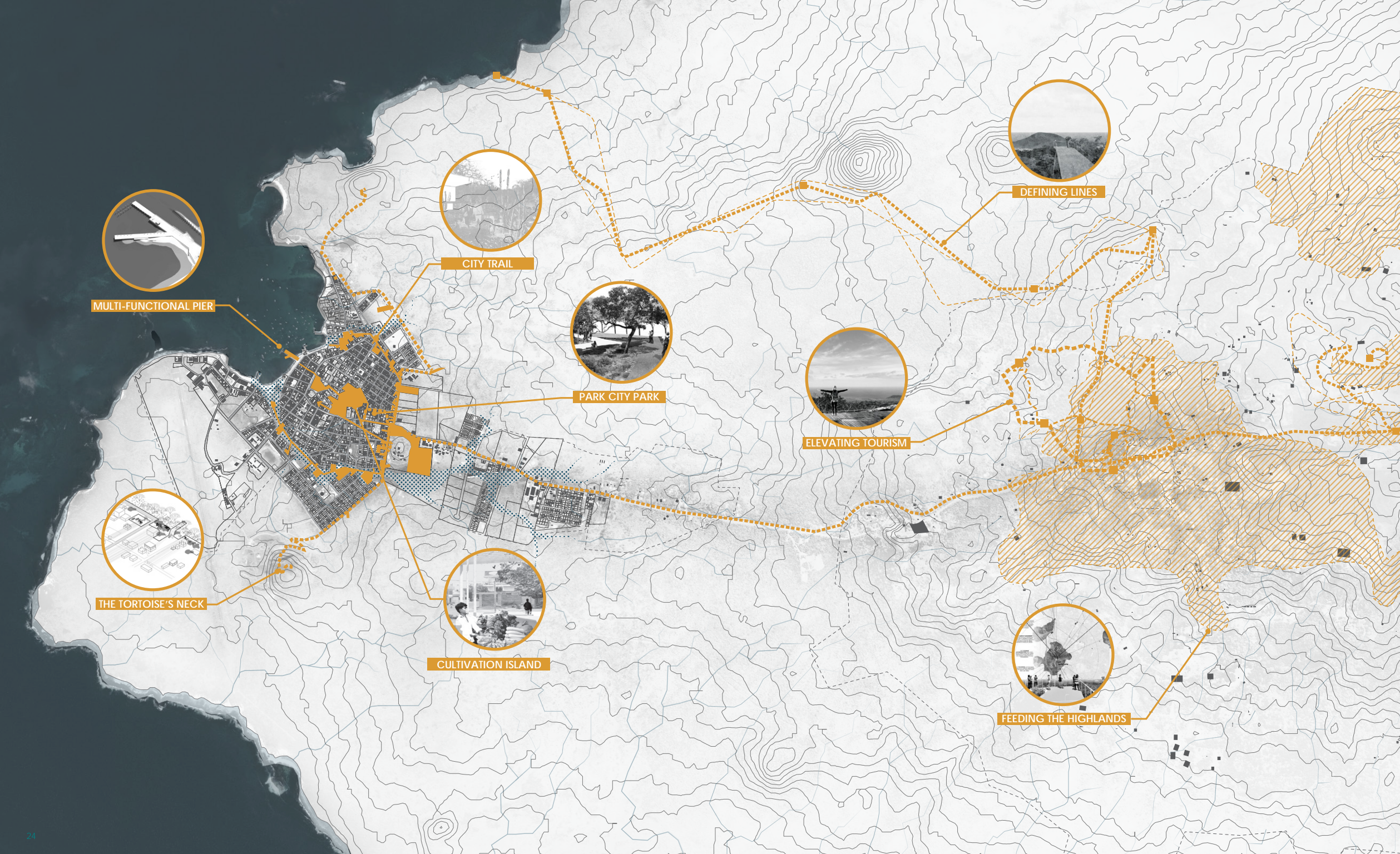
San Cristóbal Island—the famed site of Charles Darwin’s first landing spot—is the eastern most island in the Galápagos and the second most populous in the archipelago. It is the most fertile island in terms of arable land and the only one with a fresh water source. Subsistence agriculture has declined but there are some small farms in the highlands that grow cash crops, including coffee and plantains, as well as cattle for beef exports. El Progreso (established in 1869, pop. 500), a town in the highlands of San Cristóbal, remains the oldest surviving settlement in the Galápagos; however, the largest population on San Cristóbal resides in Puerto Baquerizo Moreno, which now numbers at least 8,000 residents. As a port town, it is the site of introduction of many exotic and sometimes invasive species.

The enormous amount of attention that has been paid to the natural environment of the Galápagos has not been extended to the developable areas. There is little to no urban planning and residents suffer from lack of clean water and limited health care facilities. While some concerns are beyond the scope of our studio, there are pressing issues where landscape visualization and design can play an important role: with an economy dependent almost solely on water-based activities—tourism and fishing—sea-level rise could adversely impact waterfront use and access, and more volatile weather patterns will have wide-ranging effects on the flora and fauna. The coastal areas must be designed to adapt to such changes and benefit both human and animal residents. A more immediately pressing issue is to consider where an increasing population will live. At a current growth rate of 6.4%/year, compared to 2% on the mainland, San Cristóbal’s population will double in just over ten years, and development is already butting up against the National Park border. Lastly, development of public space amenities are focused primarily on the waterfront, frequented by tourists, and constructed with a seawall that removed the mangrove and beaches along most of the town. Though residents can use this waterfront and remaining beaches, the town is lacking other forms of public space, and recreational areas tend to be mono-functional or underutilized.

Our task was not to provide single solutions to problems; rather, the projects are speculations that are grounded in the realities of the Galápagos and hold together complex and conflicting positions, using visualization and design as a means to negotiate among them. Each proposal was developed in response to one or more of the issues outlined above, and its specific location and programming were based on what students discovered in the first four weeks of the semester and studio trip. Throughout the studio, students were asked to “test” their position and proposal with different assumptions (of which they had no control, such as population trends or climate change), and, within those scenarios, they had to continually to ask who or what benefited from any proposed changes.



Model by Bo Dong



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