

Community Repair Through Informal Building Approaches

by

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ABSTRACT

Research is based on an analysis of successful approaches to building and urban design in both formal and informal settings, in Tijuana, Baja California, Mexico. In an attempted to repair Mexico's abandoned suburban developments - a government subsidized project, the design uses tactile material innovations. The test bed for the design is Cañadas del Florido and the symbiosis with the contrasting community, Los Laureles Canyon, an informal development. The project goal is to integrate the fabric of both formal and informal communities.

Areas of research include material exploration through urban and residential design. If successful, incremental building techniques will allow for strong social networks and community growth. The project attempts to show how a community can be repaired through the principles of participation and building in phases. The desired outcome is to successfully weave together both typologies to produce a neighbourhood rich with social capital.

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CHAPTER 1: INTRODUCTION

Mexico's Failing Affordable Housing Project

The research focuses on the comparison of building techniques in informal and formal communities throughout Tijuana. Tijuana is located in the Northern region in the Baja Peninsula of Mexico, situated just below San Diego. It is one of the fastest growing cities in Mexico, has been growing at a fast pace due to the available work in the many factories established in the past 30 years. Its proximity to the US makes it ideal for cost effective manufacturing for American and Canadian products. In addition to their manufacturing industry, the location also makes it ideal for drug trafficking, which has caused it to be listed as one of the most dangerous cities in the world.

Tijuana's mountainous landscape and rugged beachy coastline is home to a hodgepodge of architecture. The city is considered young compared to many Mexican cities, with 50% of the population living in informal housing communities.

In the early 2000's, former President Vicente Fox developed a project targeting home ownership for low to middle income citizens with a goal to house a 1/6th of Mexico (Marosi 2017). The approach to tackling the housing crisis was to develop neighborhoods of identical homes littered throughout Mexico, millions of one size fits all 9 ½ x 30 foot houses that reflect a top down approach to neighborhood development, similar to US suburbs, including being placed on the outskirts of the city. The houses were not designed with the vernacular approach to Latin American architecture that allows for incremental growth, to allow for adjustments that occur as the home grows economically or socially. Many of these communities have been poorly constructed or even incomplete, some are without basic necessities such as water and many have burnt down due to electrical fires. All this combined with harsh mortgage inflation rates has led to a surge of abandonment.

In order to figure which building techniques of the informal settlement were key to its success, the research compares one of the developments

with an informal neighborhood. With these communities in mind, the design research attempts to deconstruct the strengths of Los Laureles Canyon informal settlement. It then attempts to transpose these qualities into the struggling formal community, Cañadas del Florido.

The informal neighborhood has developed through the process of self-built homes using recycled materials. The community-built neighborhood has a strong social network based on the shared building approaches and urban layout developed over time by the residents, without the assistance of government infrastructure.

This comparison has led me to the question: How can the building techniques of informal settlements be inserted into struggling formal developments to increase social capital, and improve daily life?

Global Urban Concepts

Informal

A third of the world's population lives in an informal development and it continues to increase as people are leaving rural regions for opportunities in growing urban landscapes. An informal community is defined as urban development created without the assistance of government involvement, lacks formal roads, addresses, electricity along with other utilities (Zarate 2016.)

Often referred to as slums, favelas and in Mexico *colonias populares*, these ground up developments build up over time - through a series of tactile small gestures (Edward and El-Khoury 2002, 272). Lombard defines the characteristics of *Colonias populares* as "cheaply acquired land, inadequate infrastructure, and self-help dwelling construction" (Lombard 2014, 2), are often developed on former agricultural land, frequently rented land or undocumented purchases, which eventually often lead to eviction when the property is resold.

These accumulations over time turns into small cities with their own building style and social and economical networks. These networks that develop are strong and necessary. Systems of infrastructure and building exist through

community initiative; creativity is out of necessity, leading to inventive design techniques and a process of vernacular development of architecture. Due to lack of financial resources, recycled materials are a key component in the building process.

The speed of unplanned growth often exceeds any sort of census to calculate infrastructure requirements and with lack of this data in these areas, the populations are unknown making it harder to define what funding is needed to implement infrastructure. The lack of data on these communities may create the illusion of a low or non-existent population. Therefore, this is often the excuse used by government bodies to ignore and not provide infrastructure to these areas including concrete groundwork to acquire addresses such as paved roads. In some cases census data is collected, but the speed of informal development is so fast by the time funding is assigned and urban planning is implemented, the community has doubled or tripled in size making their attempt no longer useful to the community. At this point the community has often created its own system through grey markets and social networks.

Although informal settlements do exist in rural regions throughout the world and more specifically in Mexico and along the United States border, the communities discussed here are in reference to urban landscapes. These type of developments are generally located in city centers. Being in central locations reduces the need for an automobile, use of public transit and provides access to amenities. Although these informal areas are located in central areas, they suffer from social isolation, due to the perception created by society and how they are viewed and categorized within a class system. Aside from their lack of address, the public also socially dismisses them and naturally this affects the political landscape and how they are ignored in city funding.

As the houses grow and people create their own roads, paths and additional infrastructure, social mobility will occur whether it is long awaited for government action or just the process of community development and organic growth that allows for social growth.

Formal

Suburbia is a post World War II invention designed for the American upper class to fulfill the desire for a large house and yard with a white picket fence. The goal was to live in a low-density neighborhood away from the hustle and bustle of the city and factories but still be able to access the urban downtown. Before the war, a third of the US built their own homes and small contractors built another third, by 1950 two thirds were built by developers (Hanlon 2012, 14).

Suburban parts of the city can be divided in the inner and outer rings. The inner ring - can be defined as the oldest houses in the suburb or first tier (Hanlon 2012, 30). These homes border the city center. Two boundaries are shared - one with the city center and one with the outer ring suburbs (Hanlon 2012, 30).

Although some influence has come from Mexico's neighboring country, the United States of America (US) the defining attributes of a formal urban development in Latin America differ from the American post World War II suburban trend. Unlike the cycle of the suburban rings in the US, Mexico's urban rings are affected by the pre-existing *colonias populares* - informal communities developed through out the country previous to urbanization.

The communities outside the cities were created by informal building techniques by residents from rural regions, relocating to urban centers for work in the factories, part of the globalization of manufacturing that developed throughout Mexico and Latin America. As the cities were growing the idea of suburbs were too. In addition, the sense of community in traditional Latin American communities was not present (Herzog 2015, 130).

Part of suburban culture is isolating from crime and lower class, the suburban development in Mexico led to the destruction of developed *colonias populares* by evicting people from land they didn't own, to secure the new suburban ring.

This prototype created a desire for exclusion and privacy and led to the creation of "Mega Projects" (Herzog 2015,146). Herzog defines the projects as "*not merely gated communities, but, rather, "gated cities,"* giant developments of

30,000 and more inhabitants” (Herzog 2015, 146). These developments have become a trend throughout Latin America popping up in major cities throughout Brazil, Mexico and Chile.

CHAPTER 2: CONTEXT AND SITE ANALYSIS

Mexico

Mexico is an urban nation, with around 75% of its population living in urban areas (Lombard 2014, 4). The industrial age had a big effect on Mexico's urban landscape. As industrial and economic wealth grew so did the urban centers as people relocated from rural regions. The pace of movement was unprecedented, and the housing provision was unprepared to meet the demands of new urban residents. This demand led people to self build homes, creating *colonias populares* throughout the cities. Throughout the 1970s and 1980s self-built homes represented the main production of homes in Mexico's urban cores (Herzog 2015, 150).

As Mexico grows, so does the gap in equality. The speed of growth of its urban cores, maintains the continuous growth of informal developments. Currently 60% of Mexico's population resides in self-built informal settlements (Lombard 2014, 18).

After many attempts, the government is not able to keep up with adequate affordable housing options. Eventually federal agencies were created to help subsidize housing throughout Mexico, two of the most successful cases is The National Housing Fund (FOVI) National Institute for the Development of Workers' Housing (INFONAVIT). Together they built 1.8 million homes from 1970 - 1992. The attributes that led to the success of the projects included: their location - close to city centres, density, modernist style and amenities (Herzog 2015, 146). The projects were not enough to match the growth of the cities, and as the NAFTA agreement proceeded, the manufacturing industry was exploding in cities such as Tijuana.

A shift in policy occurred in the Mexican government, allowing those eligible to purchase homes with financing through INFONAVIT (Herzog 2015, 147). This opened doors for those who may not typically be able to finance a home. This combine with Vicente Foxes housing goals led to the private

development of millions of single family home on the outskirts of all major Mexican cities and Mexico's largest encounter with urban sprawl.

Herzog describes the development concept "What has unfolded in Mexico over the last two decades is unprecedented in the nation's history — a massive construction boom of master planned" (Herzog 2015, 145). The plan brought hope to many but it was too good to be true. The idea of a community built overnight was a strong contrast to the traditional incremental building systems of Latin America. Top down building approaches combined with corruption and organized crime has led to what is now millions of empty homes throughout Mexico.

Tijuana: Population and Urban Development

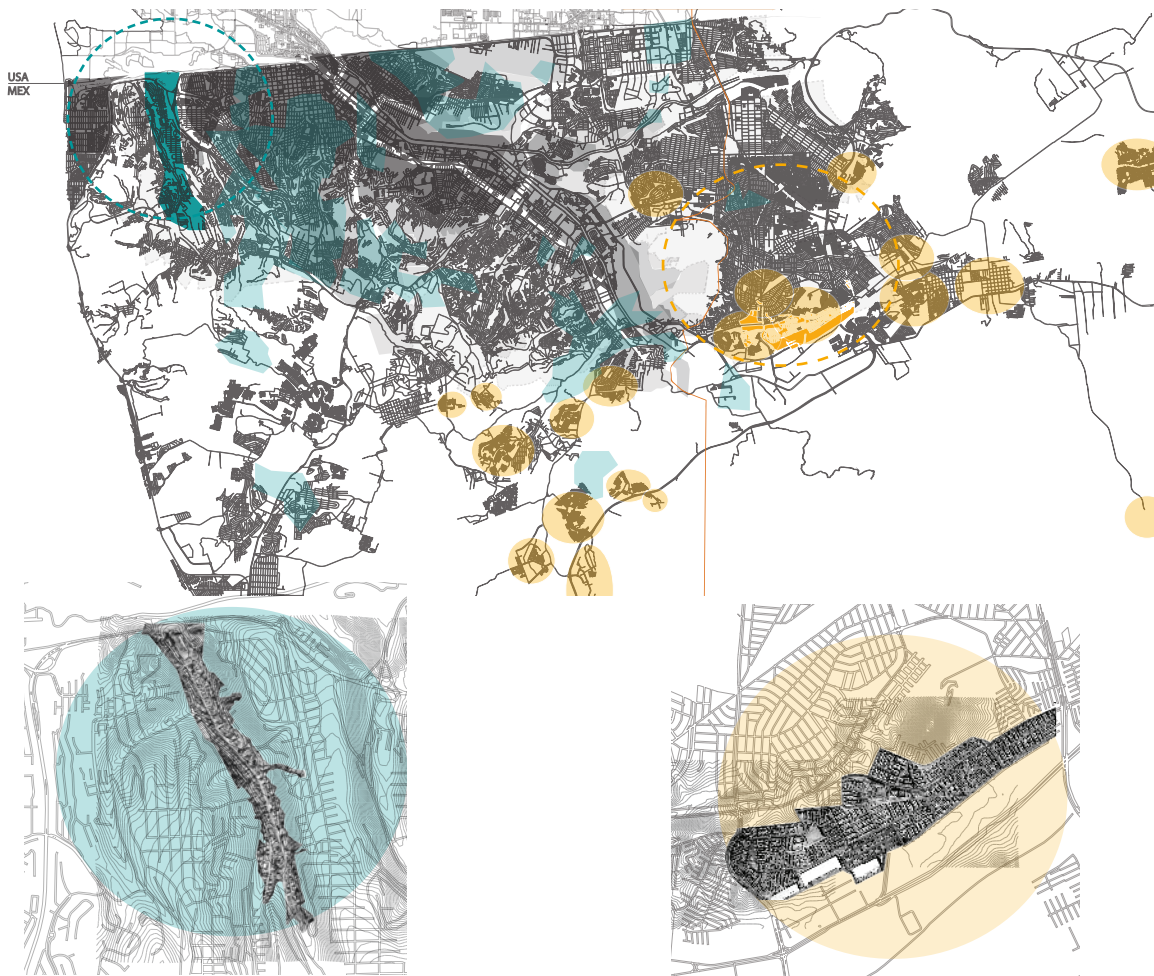
Before Las Vegas there was Tijuana, a city for drinking and gambling fro Southern California's elite (Reynolds 2007). During the 1920s and 1930s, Tijuana's economy was booming on casinos and hotels but when Nevada loosened its gambling and alcohol restrictions, Tijuana was left only entertaining San Diego's Naval force. The city still continued to grow. In 1950 the population of Tijuana was 60,000 people.

In 2017, the city suffered and estimate of 1700 homicides,(Dibble 2019); by comparison, Canada had 670 homicides in the same year(Statistics Canada 2018). Due to Tijuana's location to the United States, it made it an ideal location for drug and human smuggling.

The manufacturing industry (*maquiladoras*) began in the 1960's and with the North American Free Trade Agreement (NAFTA) in the 1990's. Tijuana's location to the US made it a prime location for exports and a competitor for China. Employment opportunities were created for Mexican citizens from all over the country. The population in 1990 grew to 1.2 million and has doubled, since the industry continues to grow. Therefore, the city grows an estimate of one urban block a day. Currently over half of residents are employed in relation to the manufacturing industry such as *maquiladoras*.

Informal Settlements In Tijuana

It is estimated of the 2 to possibly 3 million people in Tijuana, only 1.8 million are accounted for and 50% of the total population lives in informal settlements such as Los Laureles Canyon and Camino Verde. Typically residents are nuclear families with at least one parent (usually the mother) working in one of the near by factories and many more residents working in manual labor. Often grandparents and additional family members also live in the home. The home is built in a gradual process, as resources become available. Many of the community members have created their own building system over the years,



Map of Tijuana highlighting the two neighborhoods discussed. The blue indicates areas of known informal settlements and the orange indicates a government developed affordable housing neighborhood (Google Maps 2017).

using garage doors for walls and tires for retaining walls, recycled from San Diego. The other phases of the building process include the insertion of a block wall where the garage doors stand. At that point a layer of concrete is applied to the concrete block to seal the wall. This adds structural support and allows for the incremental building process to continue. Once the first storey of the home is built, the garage doors are removed and reassembled as a second storey.

What comes out of building one's own home? Pride, according to Melanie Lombard's research of placemaking in informal settlements in Mexico. She argues whether residents use contractors or do most of the work themselves, their dwellings reflect their own preferences to a certain degree, as the high level of resident participation in house building means that the design of the house is to the owner's particular tastes (Lombard 2014, 45).

Recycled materials are a key component in constructing a home in the fast growing informal settlements. Cardboard city was one of the early informal settlements in Tijuana, a whole neighborhood literally created out of cardboard. As innovative as it was, the weak material created vulnerability, which the government exploited in by uprooting the whole town. The unfortunate location allowed them to be easily targeted by their own government system, to rid the city of such a marginalized community, orders from the leaders opened flood gates onto the settlement and washed out the whole village and even



An example of how people build in informal settlements in Tijuana using recycled materials (Seliger 2011).



An example of how people build incrementally in informal settlements in Tijuana. (Google Maps 2015)

destroyed lives. Those that survive, rebuilt in a different location some located to Los Laureles Canyon and Camino Verde. Cardboard city is a true example of innovation and resilience that has lead to Tijuana's fast growing community lead projects in informal settlements throughout the city.

As with any fast growing city, people don't wait for political action, they build the city themselves and urban informal settlements are developed. Tijuana's ranch land is now inhabited by over a million people in homes that began with cardboard and garage doors and continue to be developed this way.

Los Laureles Canyon

A clear example of this is depicted in Los Laureles Canyon, an informal settlement that began in the 1970's and now inhabited by 100,000 people on a 4 mile long series of short streets. On the Canyon, visitors can witness all phases of construction from the new beginnings of garage door construction to 3 storey homes with wrap-around balconies painted in the most vibrant of colors. Those who come to the canyon stay, they would rather build where they have fought to keep their land and grow the home to be surrounded by family and neighbors they trust then move to the a suburb where they have to start their social capital from scratch.



Los Laureles Canyon

Government Subsidized Suburb Developments

There is a clear inspiration from the northern neighbor when designing typologies for housing in Mexican border cities. Tijuana's new history has grown fast and with that comes a lack of historical design precedent and culture. It does not have the rich history of architecture many other Mexican cities embraced (Franco and MacInnis 2018).

The speed of the population growth made it a victim of former President Fox's seductive affordable utopian model. In 2001 former President Fox introduced the largest housing development in Latin America - a proposal to build 7 million homes throughout Mexico in 12 years - enough to house about one sixth of Mexico's population. By 2010 a census was taken indicating hundreds of thousands and possibly millions of homes were abandoned (Marosi 2017). In 2017 there were still hundreds of neighborhoods incomplete and crumbling at the same time.

The developments were placed on the outer ring of the city, a ring yet not developed - cheap land far from the center. The houses depicted a resemblance to post WW II American suburbs, according to Teddy Cruz "as eastern growth seduced by the style and glamour of the master planned, gated communities of the US, and builds its own version - miniaturized replicas of typical suburban southern California tract homes, creating a vast landscape of homogeneity and division that at odds with this city's prevailing heterogeneous and organic metropolitan condition" (Robbins 2002, 265).

The size of the prototype homes were portrayed to buyers as larger than what was built, loans appeared reasonable and affordable, the gated "*privadas*" provided a sense of security and development around the properties was expected to grow. What wasn't clear was the inflation rates on the loans, the model homes were not exact replicas. Utilities were often not provided or maintained including road and water and development did not occur. Public transportation was not easily accessible, the topography made walking and biking a struggle and some project were left incomplete.

The list above lead to the first phase abandonment of many homes, when people realized they couldn't afford to make payments they just left everything. Poor construction often led to fires, lack of transportation led to a struggle to find work, small rooms lead to family disputes, poor water systems lead to disease. After the first decrease in occupancy occurred, crime began to seep into the abandoned properties. Drug use took place in the homes left and gangs began to claim public spaces and as the small pockets of organized crime grew, robbery and homicide increased. This lead to people refraining from leaving the home due to fear, women and children stopped daytime social activities and social capital and relations were lost throughout the community. Naturally more people fled the communities and again as they moved out, criminals moved in.

Cañadas del Florido

This epidemic is currently impacting an estimate of 15 communities throughout Tijuana, including Cañadas del Florido. 5 years ago 27% of the homes in Cañadas del Florido were abandoned (Martinez 2018). A suburb developed 20 minutes from downtown, surrounded by other similar developments suffers from high crime rates, garbage problems and a disconnect from neighboring communities. This thesis focuses on Cañadas del Florido as a test bed for revitalization, successful community development work that has taken place and proven affective, therefore the community efforts exist and are available as a tool for production.

The community is young and able, mainly employed through personal small businesses and neighboring factories. The homes lay in a valley along long streets with gates, the homes face inward. Modifications have been made to the homes to allow for more living space of attached businesses. There is no backyard as the houses come with a service rear porch that is fenced in with block walls. Amenities and shops run along a wide double lane northern street.

Comparing Two Neighborhoods: Top Down Vs. Bottom Up

The demographic in both Los Laureles Canyon and Cañadas del Florido are similar including age, family type, and employment. So why is one community stronger than the other? There are many factors to consider from urban scale down to street bench material and location. Both have the same employment rates and residents are mainly employed by factories. In the formal development's crime rates are much higher and its social networks are far weaker.

With these communities in mind, the design research attempts to deconstruct the strengths of Los Laureles Canyon informal settlement. It then attempts to transpose these qualities into the struggling formal community of Cañadas del Florido. In order to figure out which building techniques of the informal settlement were key, a comparison between the two neighborhoods was completed and the following depicts the discoveries.

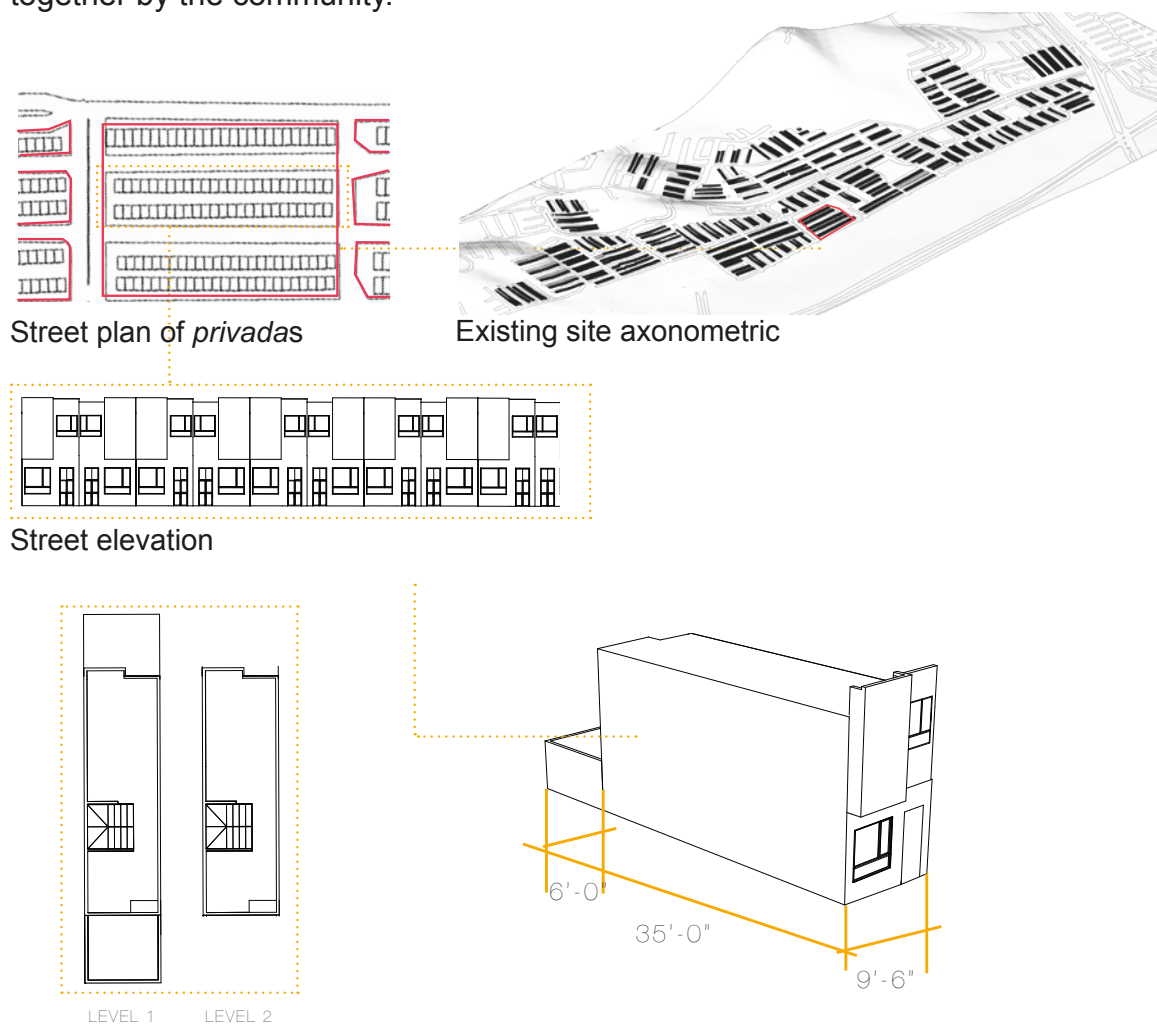
In the formal development, the streets are gated and completely surrounded by tall block walls. These long isolated streets referred to as *privadas* run as long as 50 houses, and because of the crime many people have built up high fences around the front of their homes to feel protected, creating additional



Cañadas del Florido

social isolation and no eyes on the street making the streets an operative place for crime. In the Informal settlement of the Canyon, the homes were built before the roads. Many of the residents do not own cars and walking paths are more common than streets allowing for casual interaction. The houses are built in clusters and houses face outwards, creating mini courtyards, areas for daily gathering.

The public spaces in the formal neighborhood have 2 big issues, 1 parks and streets are occupied by criminal gang making them no longer an accessible space. 2, one of the 2 green fields is filled with garbage due to lack of reliable garbage collection services. Residents just deposit their unwanted belongings on the side of the street. In the Informal, many of the homes and parks are made together by the community.



Floor plan and axonometric of typical home in Cañadas del Florida

In the formal the houses are so small people often use their car as an extension of the home because of the design of the home it does not allow for much incremental building. In the Informal, the homes are a variety of sizes and materials built using available means including recycled trailers from San Diego, garage doors, tires, and corrugated sheet products. The houses have exposed rebar to allow for future growth and some buildings reach as tall as 3 stories.

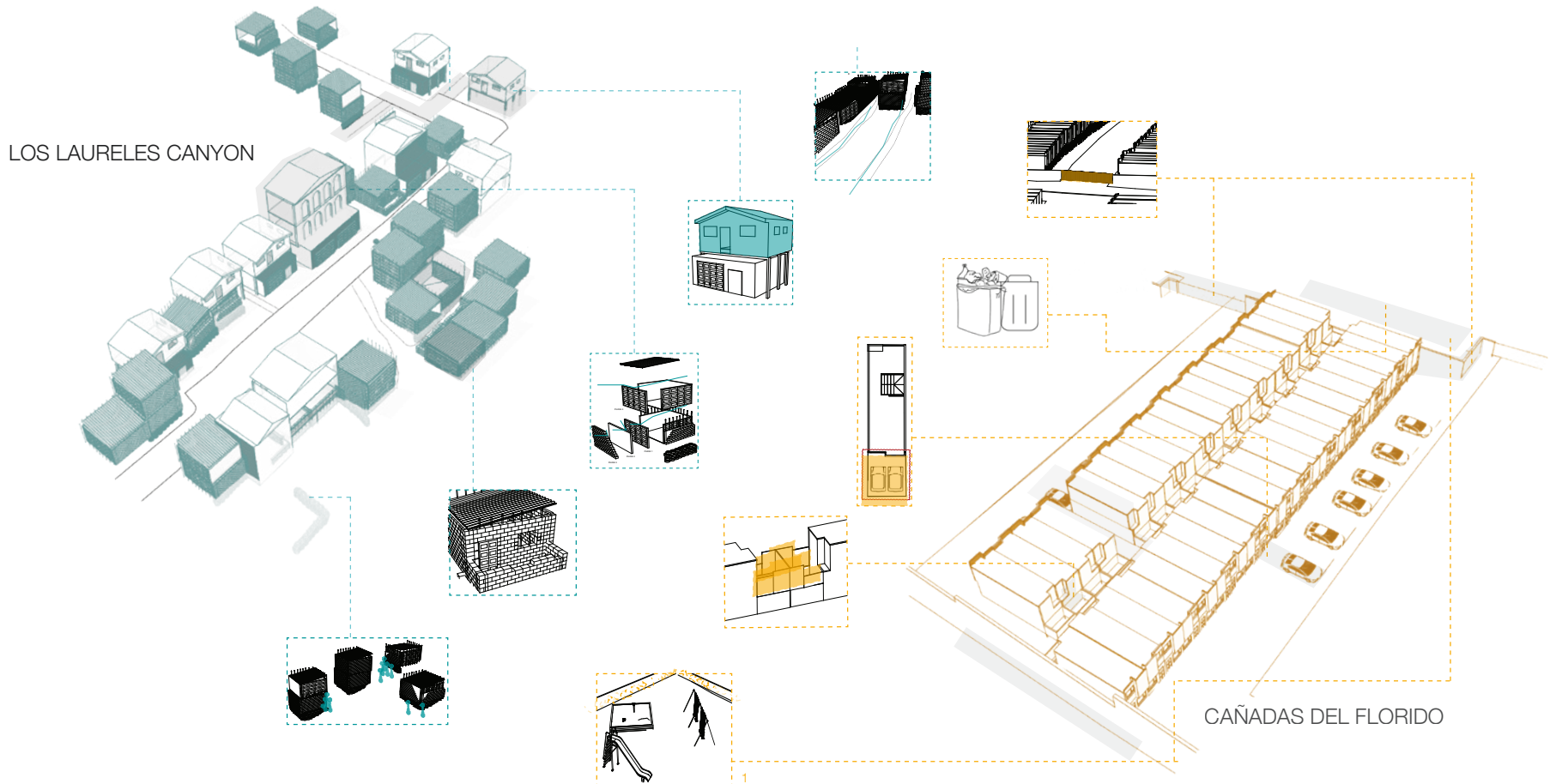
Throughout the neighborhood streets on the Informal, amenities are integrated with homes, and the traffic from the shops and services keep the streets lively meaning eyes on the street.

The small size of the home in the Formal community, necessitates that the service patio in the back of the house is repurposed as bedroom, walls have been added, blocking light and air from circulating. The Informal homes are designed with natural ventilation in mind. The roofs are angled slightly to allow for light and air to enter and the height of the opening does not become blocked because privacy is maintained.

Social Capital: Impacts Of Social Community Involvement

In Los Laureles Canyon, the small homes, narrow streets and paths create an urban environment that creates activation and community development. Based on Robert Putnam's research the wealth of social capital in lower income neighborhoods such as slums often have higher levels of social capital than the often desired suburban neighborhood where houses often focus on the back of the house and lots are much larger (Putnam 2009, 173).

Most of Latin America has been built incrementally, incremental building encourages community support. For example, to look at an informal techniques combined with a formal building design and construction, Esperanza - a non for profit building project exist based on neighbors and volunteers coming together to help build each other's homes. This creates strong social networks through developing trust and support. Lombard touches on this in her writing regarding



A street in both Los Laureles Canyon (blue) and Cañadas del Florido (orange.) The drawing exemplifies the cross comparison discussed, featuring the characteristics of each neighborhood.

the bond that happens in self-built communities, “Vicente of Moctezuma spoke of the ‘emotional bonds’ between residents that develop on the basis of living together through difficult conditions: We get along in unity: it’s more or less like in the [rural] villages, there’s more coexistence. People know each other better, and for that reason you get stronger emotional bonds than when you live in your apartment and sometimes you don’t know your neighbor’ This suggests that high levels of participation in establishing the colonia and obtaining services are both a social necessity and a contributing factor in building community” (Lombard 2014, 41).

The spatial and social dimensions are closely interlinked - including sharing resources in informal settlements. Los Laureles Canyon is a clear example of the close knit community that develops from the ground up building techniques. The neighborhood has a variety of homes, large and small, there is no clear “class” defined in the community. The strength in networks is a result of staying in a community and growing roots, people don’t move if their financial state changes to find a bigger home, they just grow their home. This means their neighbors stay the same and the relationships grow creating trust.

CHAPTER 3: PRE-DESIGN

Design Goals

What are the architectural seeds that can be planted in a suburb that is turning into a ghost town? How can we revitalize Tijuana's deserted suburbs through the insertion of the city's informal neighborhood building blocks techniques to allow for social cross-pollination and organic growth of social capital?

Design Principles

From this analysis I developed 5 design principles by combining the success of both building approaches:

- Material closed loop: Reducing waste through the process of recycling for building materials.
- Incremental building: Designing within the means of the owner to accommodate their current situation through building phases.
- Community Ownership: Shared building approach with the need for more space.
- Natural Climate considerations: The natural ventilation combined with social spaces.
- Safety: Providing a sense of security with the integration of neighbors.

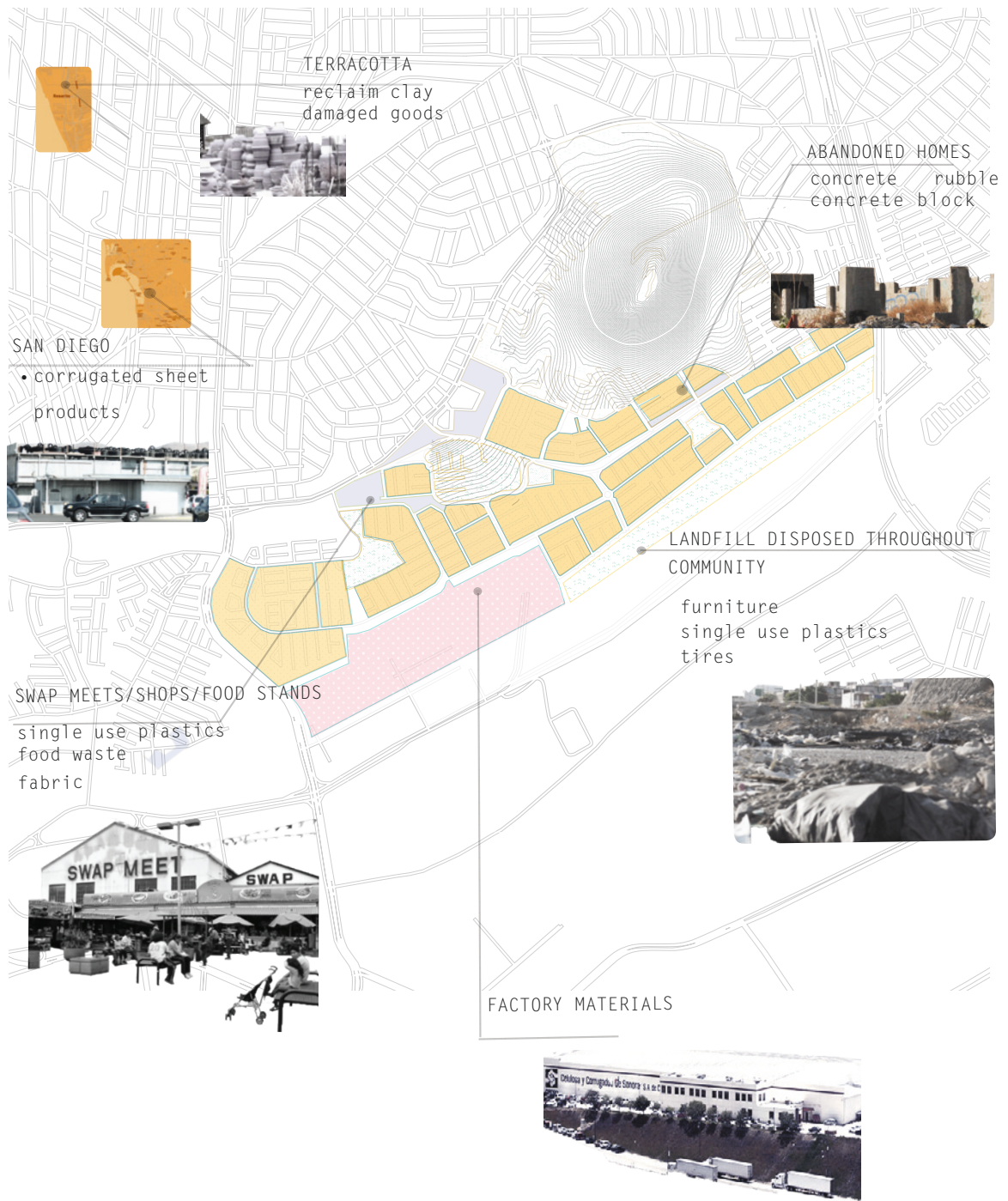
The next step is to apply these principles to the formal settlement of Cañadas del Florido. In the informal settlement, home owners build up their homes with what they can afford and have access to, in keeping with this concept, the design focused on materials that are readily available in the region, and what is being wasted.

Preliminary Design Explorations

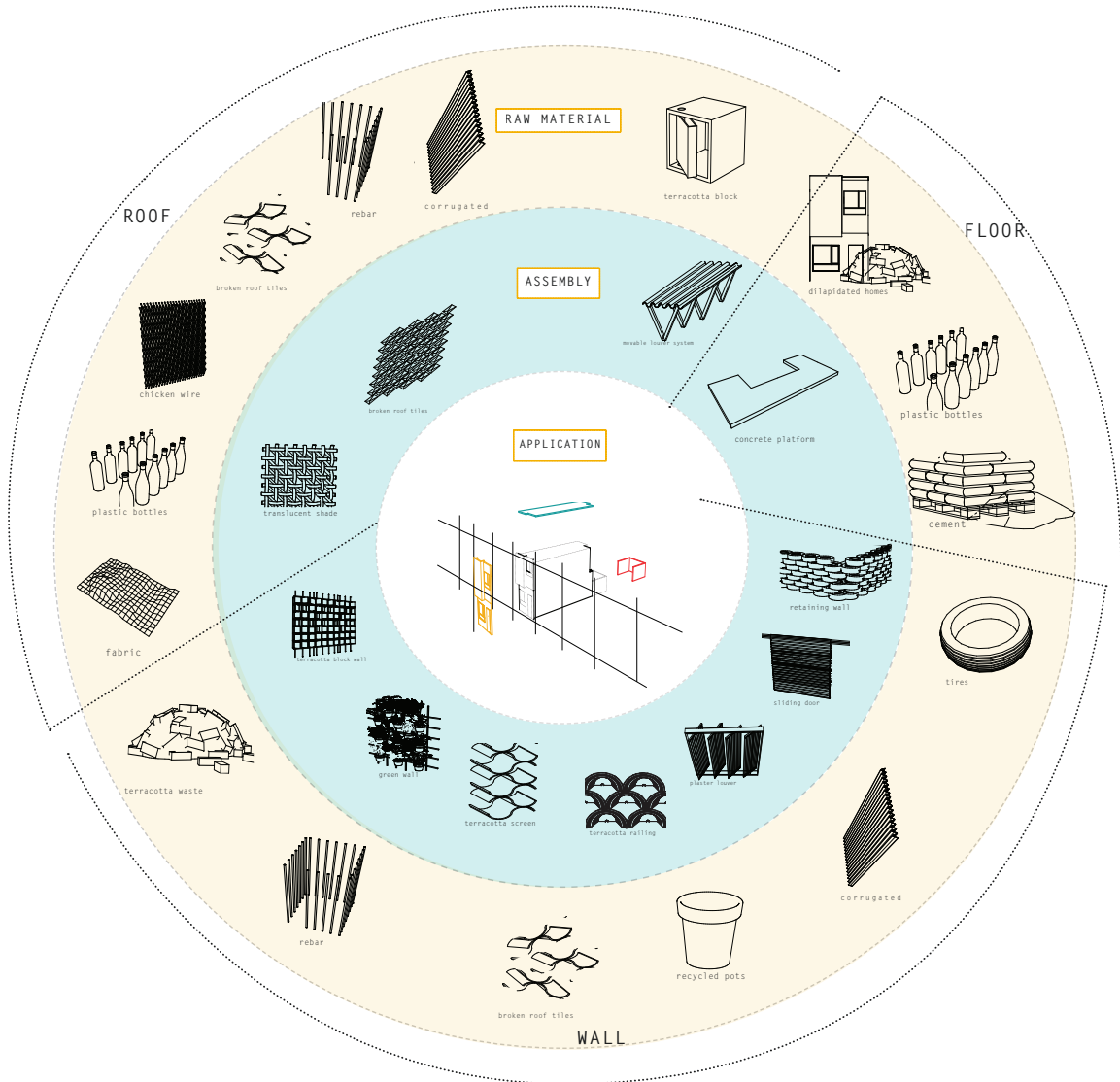
There are factories employing community members creating a black market of materials and products produced there. Due to poor waste collection system, people deposit their waste in green fields. Analyzing the garbage made me realize that there were many discarded materials to recycle. The piles of garbage separate waste from potentially recycled materials to see what could be re-purposed. Traditional to Tijuana Swap Meets occur every weekend where vegetables, household goods and prepared food are sold.

Terracotta clay is native to the region, it's accessible, inexpensive, strong and familiar. I looked at how this material could be used to build new forms, properties include: its strength, its heat retention capabilities and what gets wasted in the production process. Much of this was part of the material exploration. The use and reuse of these materials will naturally clean up the community. This led to the creation of a series of material experiments and resulted in a kit of parts that can be produced and assembled with the community in two phases.

The kit is designed to improve everyday life by creating a series of social places that lead to building a personalized extension of the home while considering climate and security. On one of my visits to Cañadas del Florido, I attended an organized event put on by a formal organization in which they created a contest for residents: whichever *privada* was able to clean up the most would win tools to maintain it. The excitement and enthusiasm of the winners was a clear indication that if they are given the opportunity for improvement they will take it.



Map of Cañadas del Florido: The map deconstructs the neighborhood, locating its available resources for building.



Kit of Parts: The outer ring highlights the resources found in the neighborhood and the inner ring depicts the new assemblies of those materials that can be applied to the 9'-6" wide walls in the home shown in the centre of the diagram.

CHAPTER 4: DESIGN

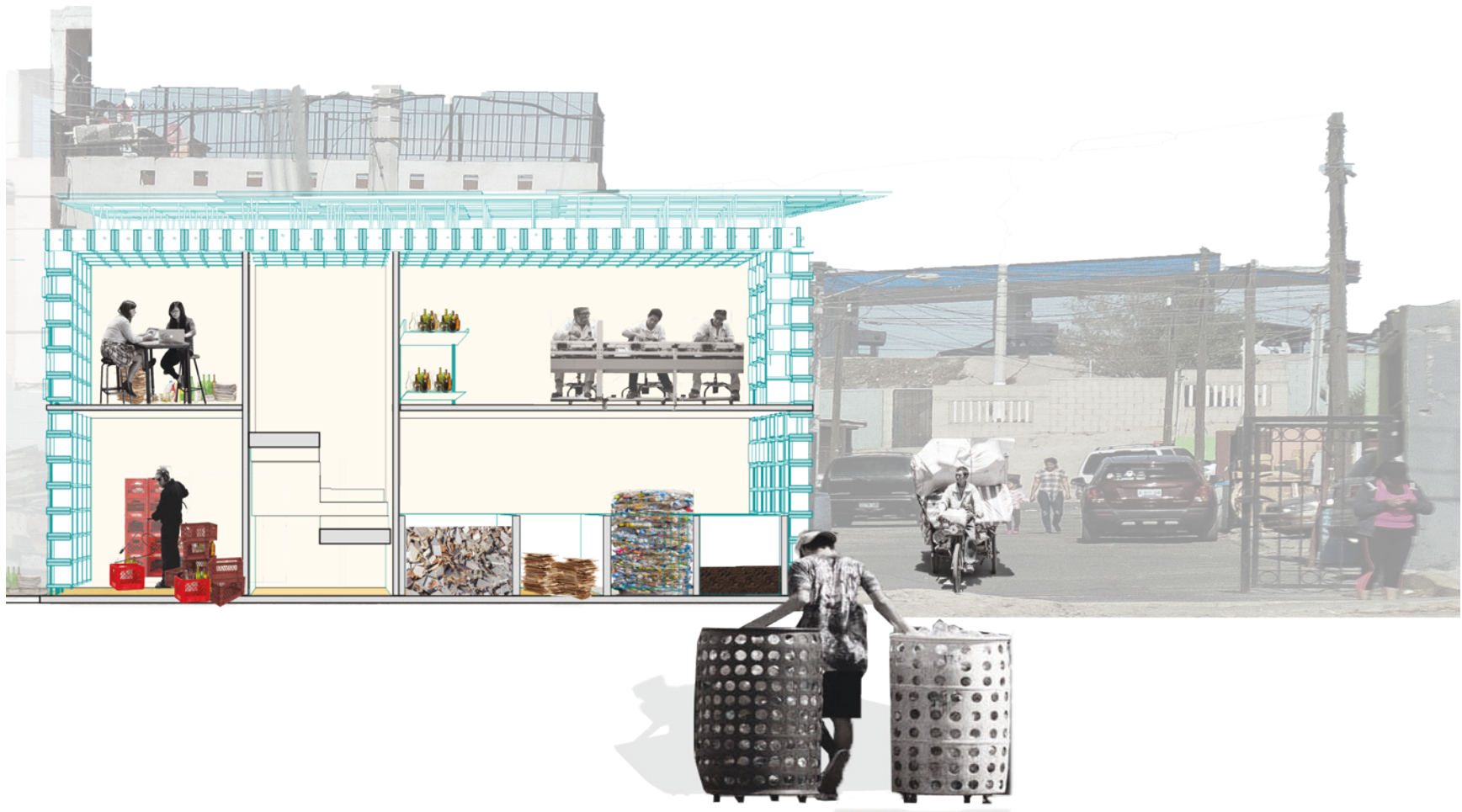
The design is broken into 2 phases. The first phase focuses on the public spaces and the second phases focus on private spaces. It is crucial to build in these increments for two reasons: 1, much of what is wrong with this housing project relates to the broad application of a top down roll out; and 2, the incremental building strategies on the informal settlements are highly in tuned with the traditional way of building in latin america where of ten 3 to 4 generations of family may live together in one home. Latin American households traditionally increase the size of their home as their economic state or family size changes. Because they do not move this helps maintain social networks within the community and strong social capita, naturally trust is gained over time.

For the first phase I focused on the potential abandoned homes, and developed a process of repairing the neighborhood that relies on what can be removed and added to create shared spaces and from there I moved to phase two focusing on improvements in the occupied homes. For phase 1 I stayed within the boundaries of he existing houses which is 9 ½' in width, a rebar grid is used to create a structure to work with, rebar is a common material in Mexico and is ideal for incremental building. A variety of building block materials that can be applied from the kit of parts to the grid have been developed through experimenting with the materials mentioned. Here is where the design becomes more personalized depending on the needs of the home owner depending on privacy and climate preferences and program.

Phase 1

Community Ownership

Through the strategic removal of walls and abandoned homes opportunities are created. For example, homes that have deteriorated can be removed, the land can be used to create public space - connecting the closed street to the rest of the neighborhood. By following the principles that include



Recycling centre section perspective, demonstrating its placement and use in the neighborhood. Not to scale

the reuse of material on site and utilizing existing and creating new skills, a maker space and recycling center can be inserted into the community. These programs will educate and grow knowledge on tactile approaches to building while simultaneously employing and cleaning the community, all generators of social capital. This system could be built up throughout the community in phases to allow for community participation, starting with garbage and recycling.

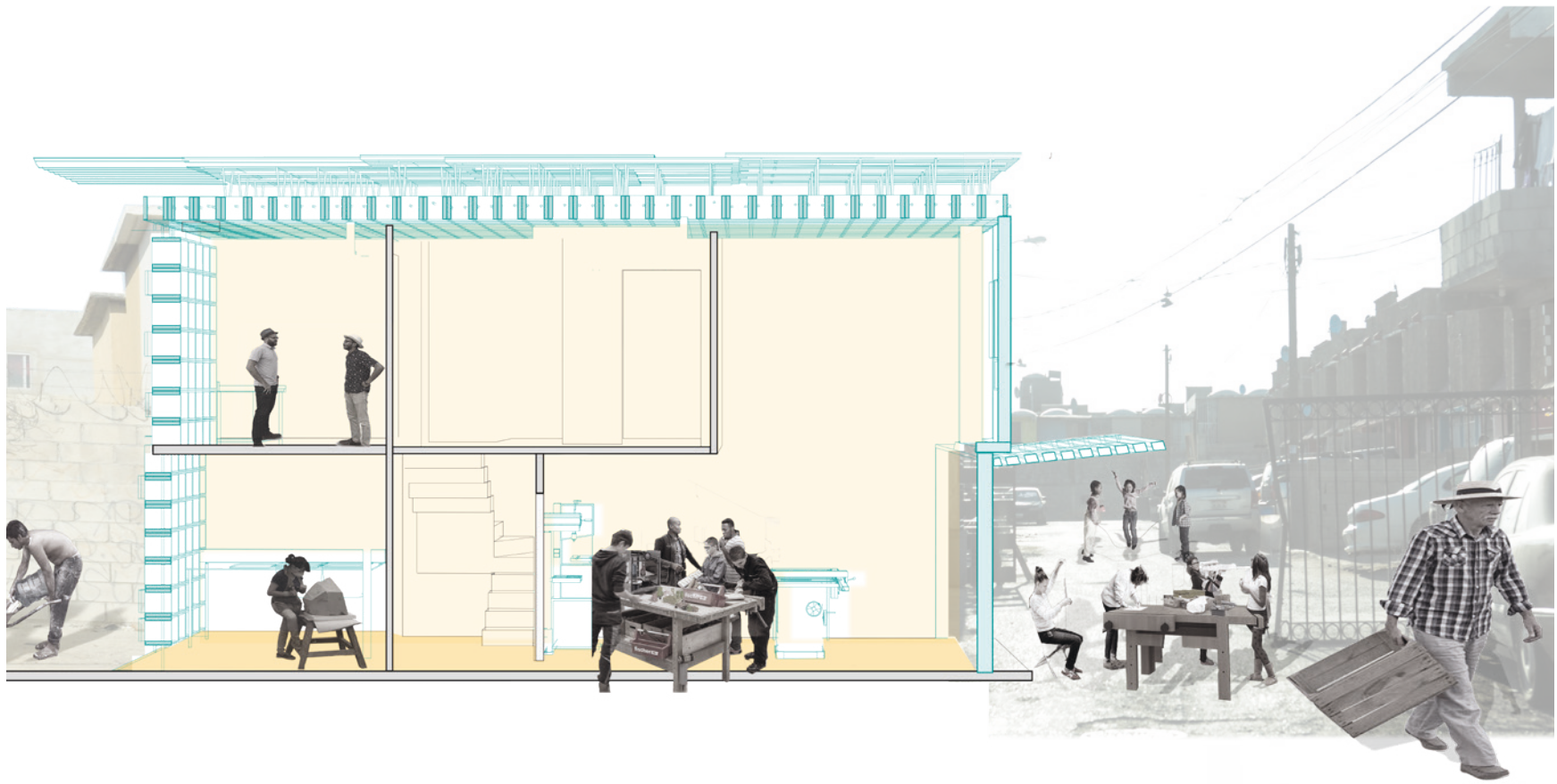
Phase 1 focuses on utilizing the abandoned homes scattered throughout the community, and turning them into recycling centers, maker spaces - building materials and markets. Ideally the spaces open into the streets and create more permeability through the block walls that isolate homes from the rest of the community. Ironically the walls intentions were to create a sense of safety they have created empty streets and the result is the opposite, this design approach creates street activity may have better results.

Recycling Centres

To reduce garbage in public spaces recycling centers are incorporated in the *privadas* where items could be collected, reorganize and, reused. This would provide knowledge of what materials are useful and which just land in landfill, neighbors could trade useful materials with each other. From here some of the materials could be brought to the maker space to be repurposed into building materials.

Maker Spaces

The maker spaces allow for community members to learn how to recycle and rebuild. In reviewing Esperanza's approach, a non for profit design build group that helps people throughout Tijuana build their homes starting with learning to make their own materials and creating a co-op-like program for labour support. The program cannot work without neighbors working together. The requirements include owning land within the proximity of at least one other member, building close to each other allows them to be able to help each other build. The natural outcome of this interaction is growth in social capital.



Maker space section perspective, demonstrating its placement and use in the neighborhood. Not to scale

Markets

The products produced for building in the maker space could be sold at the markets generating economy for the community. In addition, the kitchens within the homes are small, and there are sinks outside so what if the kitchen in the home was minimized and communal kitchens were inserted throughout the *privadas* where food could be prepared. In addition, a market space where food could be sold and enjoyed that sprawls into the street. This creates more street activation leading to eyes on the street.

Currently the swap meet that occurs in Cañadas del Florido is relocated every week and for no good reason, it is based on a permit issue so if there was a permanent spot for the markets more consistency would be supportive. Small entrepreneurial spaces could be established and shared using kiosks produced from the maker space that allow for daily adjustments within a space. These could be used through the maker space as well to create personal work stations. The program mentioned is based on community input collected (Martinez 2018). Here program spreads out within the viable abandoned homes, keeping the recycling centers at the ends of the streets so people can drop off as they come and go.

Phase 2

Home Additions

As people learn to build the materials, phase two can begin - home additions for living and for working. As Phase 1 focuses on street activation phase two ideally creates activation in the back of the home. This semi-private space is an alternative shared space to the public spaces that are no longer available. Security is created through the back walls of the homes, while providing freedom from the home.

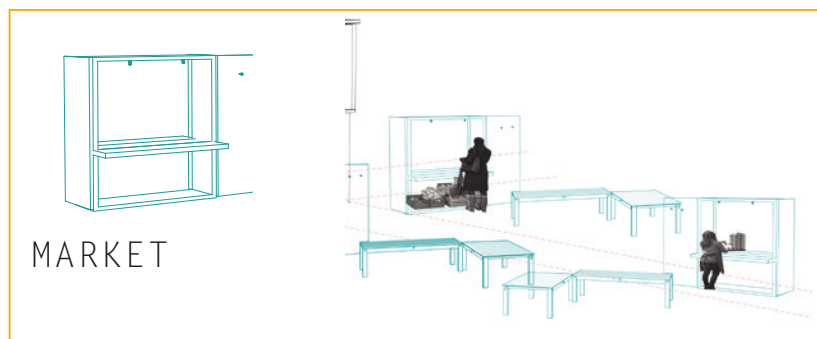
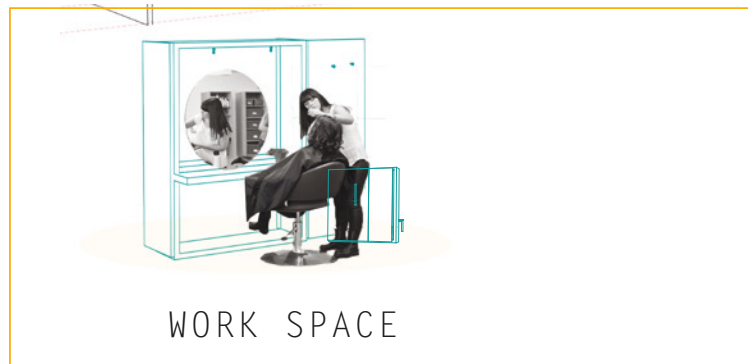
Here an analysis was completed on where space could be removed, added or redefined while maintaining the two shared structural walls. The original design did not have incremental building in mind, this is where the subtraction



Market section perspective, demonstrating its placement and use in the neighborhood. Not to scale



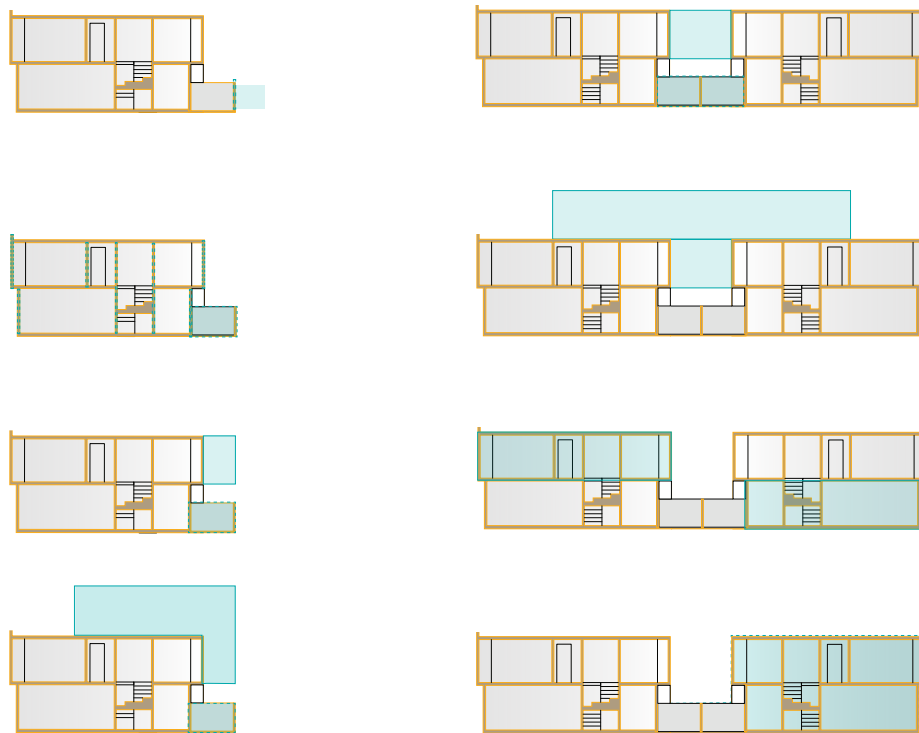
Privada (street), demonstrating street activation and placemaking through community focused programs.



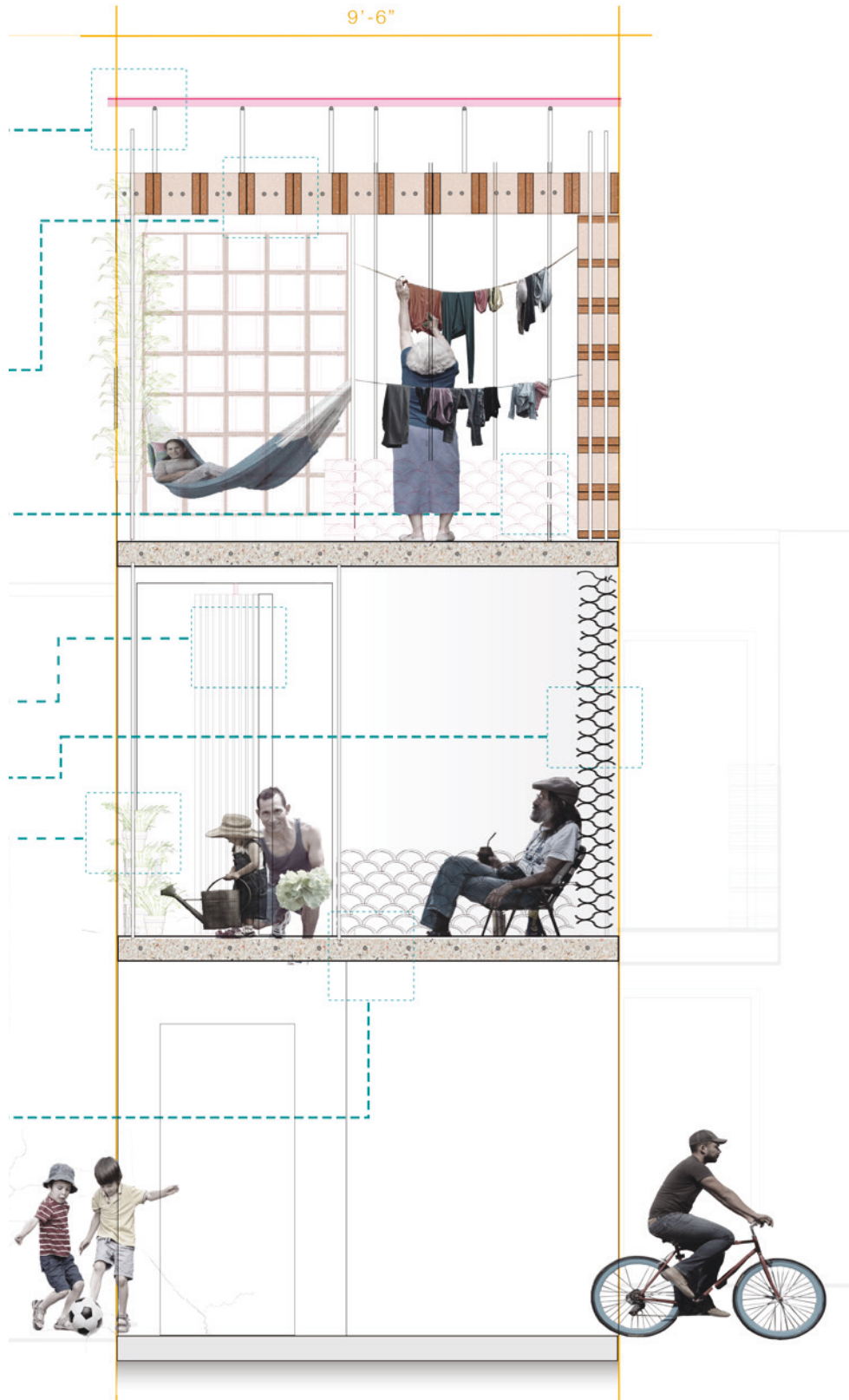
Kiosks for public spaces in use.

of parts of the building may be necessary. Reviewing the back of the home, suggested that this space could be reorganize to bring in natural ventilation and create security through a semi-private space.

Step 1 involves removing the service patio and inserting a C-shaped platform on the second floor. This new space is designed to be shared between 2 homes whether they be occupied by a solo family that has extended into an abandoned home or two friendly neighbors. The c-shape allows for light and air to enter the ground floor which is now opened up with the removal of the service patio to create a semi private a shared outdoor living room with space for children to play and an alternative route for cutting through the neighborhood by using the through way of the new community spaces. I imagine the existing utility sink area to be built up into a small outdoor cooking area - children could play while adults are prepping meals. The wall systems allows for consistent light and air entry while providing some privacy, and could replace the removed service patios below with a shared service patio.



Building addition and subtraction study diagram. The section views of the existing homes show where additions could be made (blue) and/or what parts of the home could be removed (yellow).

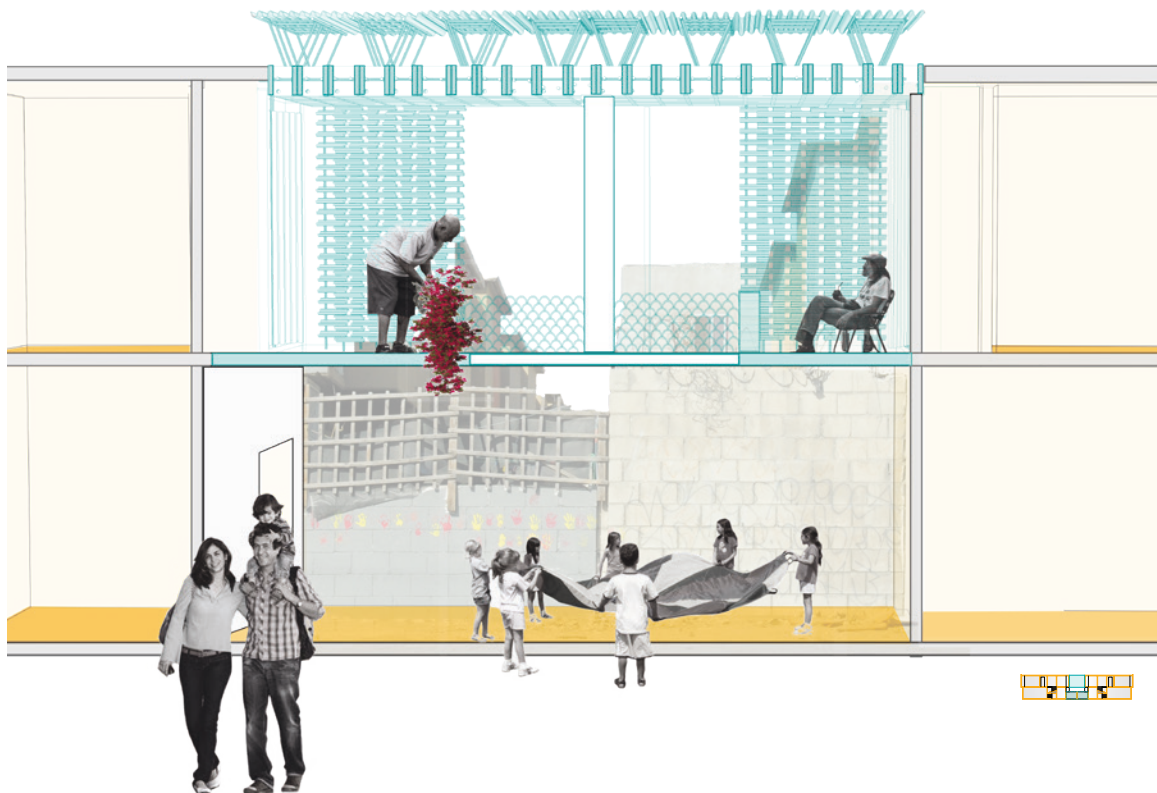


Typical short section through home with new addition, demonstrating step 3 application to existing home, this section shows how the material application occurs and allows for and space activation.

A roof could be added to this new joined space. The homeowner can determine the growth of the home. Eventually this roof could be removed and filled in to create a new floor to allow for an additional floor to the home where a private rooms such as additional bedrooms could be situated. The space can be divided between the houses or remain open. In addition, a private room with a secluded balcony on each home, accessible only by the homeowner through stairs added to the existing interior staircase.

The roof shown through the new spaces is designed with light and air in mind. The climate can be quite warm in summer months. The roof system consists of terracotta blocks, with rebar and corrugated plastic. The blocks absorbed the heats and the gap allows for air and light to enter while protecting the space from rain water.

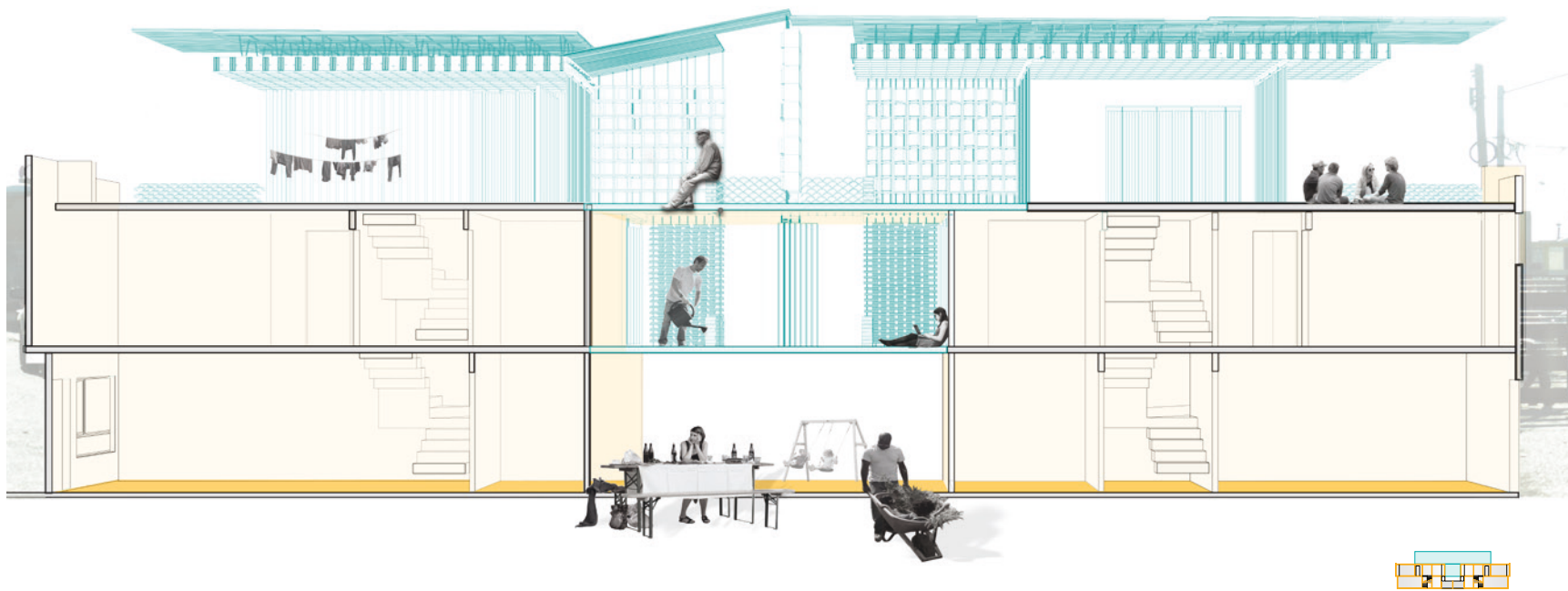
The steps are designed to allow for growth but each phase can function as is. The floors and platforms are developed from concrete, recycled plastic



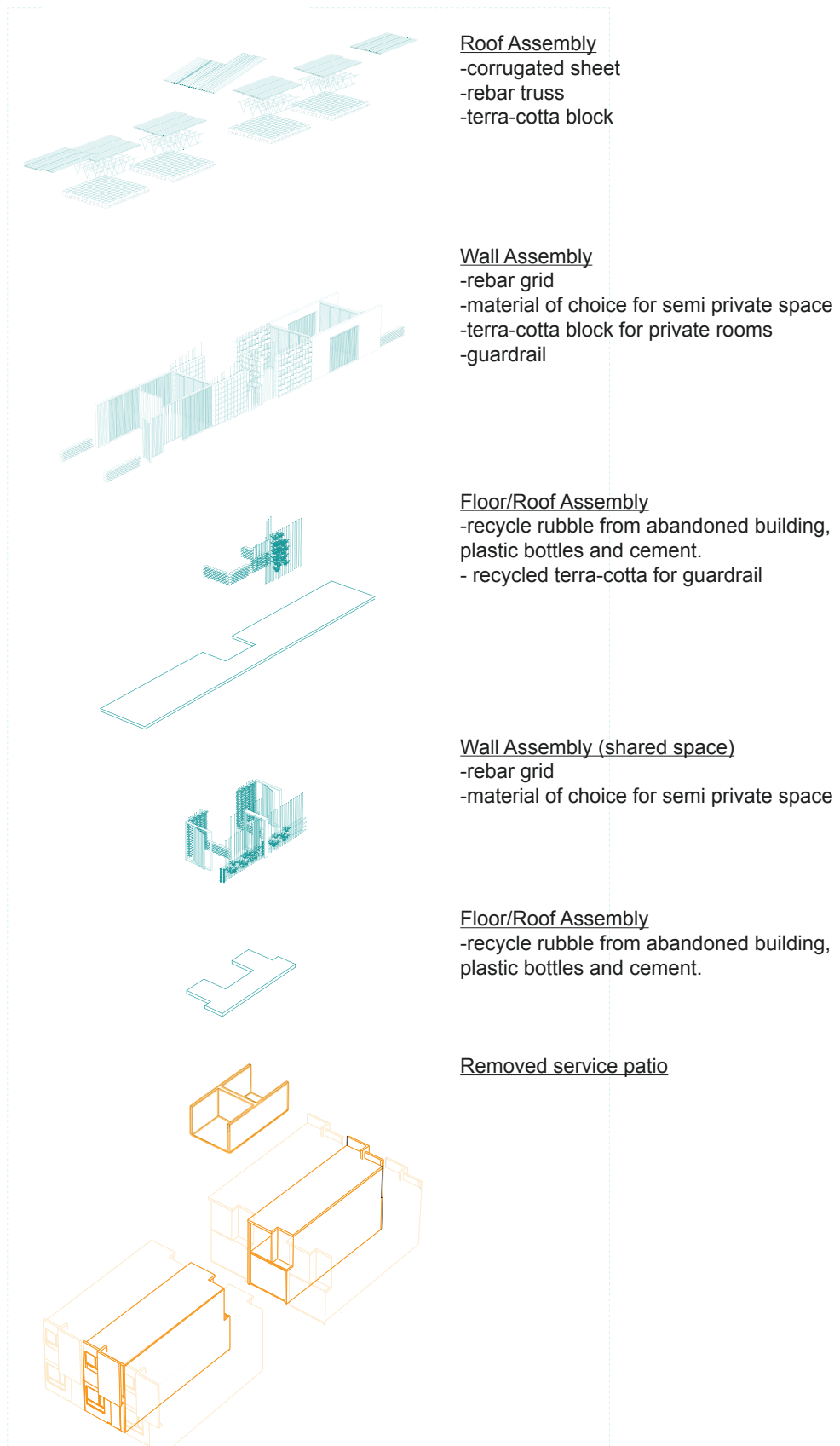
Phase 2, step 1. Blue lines indicate new construction and yellow is existing.



Phase 2, step 2. Blue lines indicate new construction and yellow is existing.



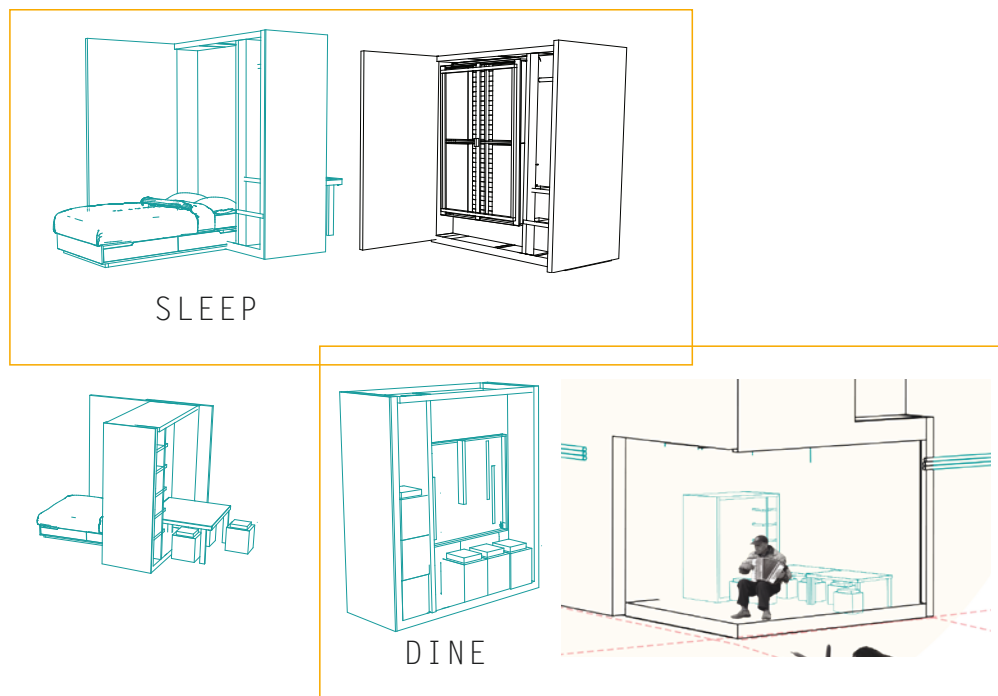
Phase 2, step 3. Blue lines indicate new construction and yellow shading is existing.



Exploded Axonometric drawing demonstrating an example of how all 3 steps could be applied to an existing home.

and rubble from the abandoned buildings, the plastic lightens the weight and the rubble acts as an aggregate. In this example, the rebar frame houses vegetation and light an air filter through broken roof tiles reassembled as wall. Vegetation is important, vertical gardens are more suitable because of the pollution in the grounds from the factories. Ideally the rebar creates the ability to extend the home and the kit of parts wall materials focus on permeability while allowing the home own to create their own identity through their space, the public programs mentioned in Phase 1 help support the home owner through this process.

In addition, similar to the kiosk mentioned in Phase 1, a kiosk can be produced in the maker space and used in the home. This allows for rooms to be more flexible spaces. For example, currently it is common for the living room to double as a bedroom; the kiosks shown below provides an option to maintain a living space during the day and used as a bedroom at night without having to use the sofa as a bed.



Kiosks and how they can be used within the home.



Backyard activation, a street perspective drawing showing how the new home additions and removal of the service patio at the back of the house could lead to an active semi-private space for residents.

CHAPTER 5: CONCLUSION

As mentioned there are many ways to approach building a community and depending on many factors some are more suitable than others. What conclusion we can reach is that the wide brush of a top down approach comes with many faults and requires flexibility, security and design that allows for growth. This document touches on attempts to build community in the past and ideally it considers Mexico's current history and approaches the repairing of the community of Cañadas del Florido with those considerations in the design.

A complete re-do of what exists was not the approach intended as it does not fit with how the countries urban areas have been successfully built up in the twentieth century. The approach considers the knowledge, willingness and accessibility of the residents and attempts to self-repair over time. It considers the successful attempts on building in the region, including *Tu + Yo's* access to materials and skill-building, *Esparenza's* community building, Tijuana's changing economic manufacturing climate and Latin Americas natural ability to form physical building through community networks.

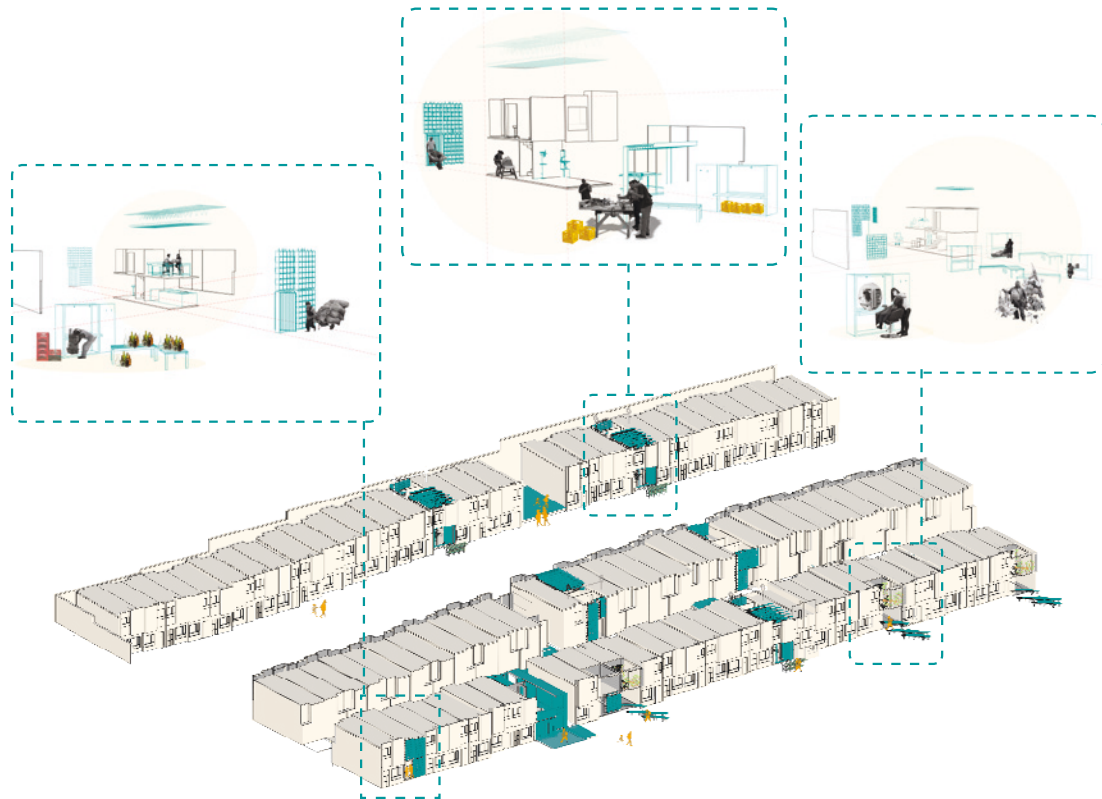
Ideally, the result of small tactile gestures add up to a stronger community network through a series of newly activated spaces. As each *privada* is redeveloped, activation of the front will create eyes on the street leading to awareness and security. A semi-private space will develop in the backyard allows for neighbours to gain trust amongst each other. Both activations will lead to a breakthrough in the community's sterile streets lines with gates and block walls.

Creating secure areas for walking woven through the community, natural ventilation through the expansion of the home, a cleaner street scape through the reuse of materials and natural social network to grow social capital through skill building spaces and newly activated public space. A sense of achievement is natural reaction to community building creating a sense of ownership..As each *privada* is redeveloped, the community opens up and security is created through community ownership.

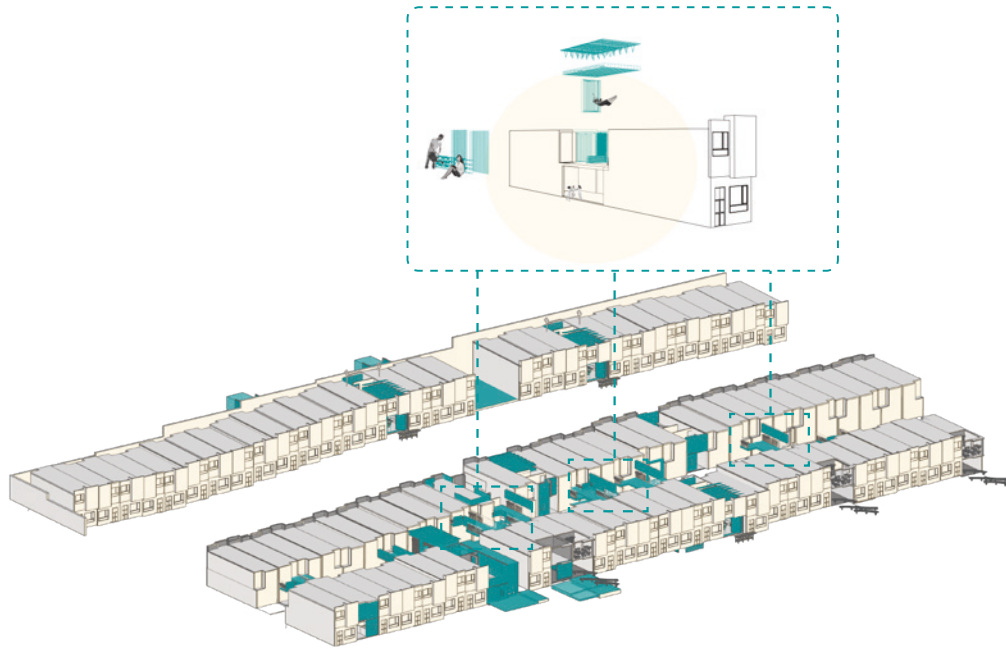


Site plan with plan view of streets layout, a series of *privadas* (streets) showing how the program activates the front and back of the home, creating more semi private and public spaces.(not to scale)

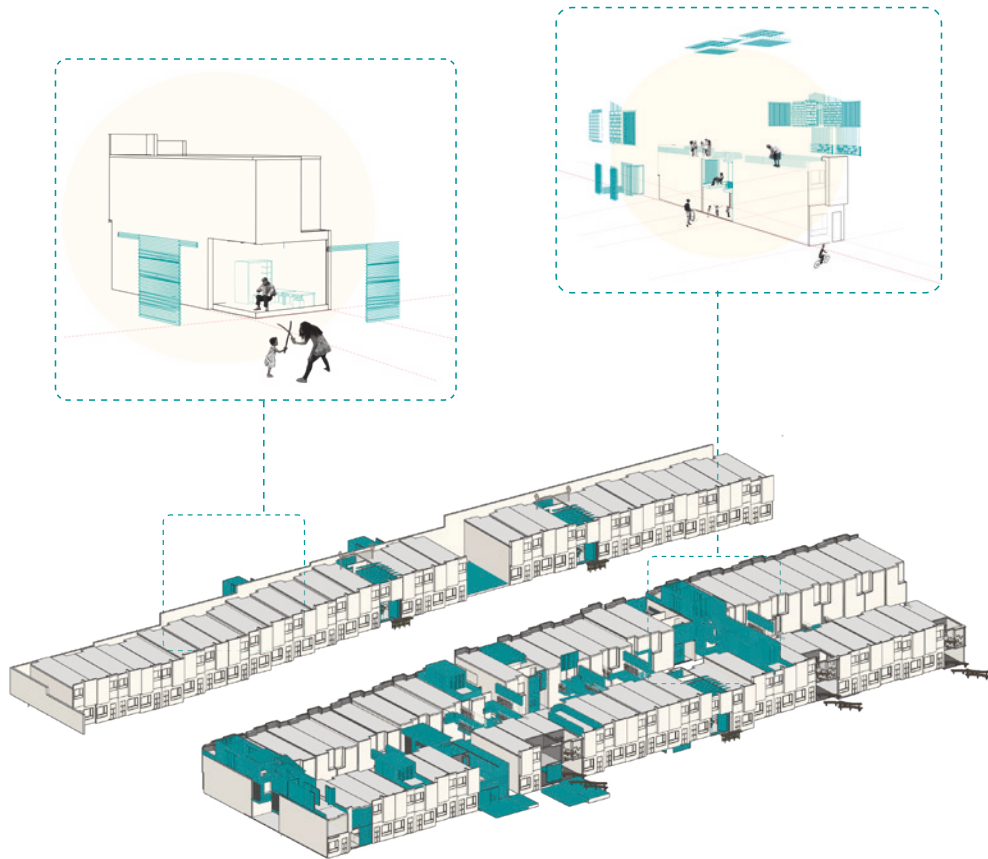
Although the project is rooted in bottom up approach and many of the specifics relate the neighbourhood, the design principles could be applied to the other 14 communities suffering from the same effects of top down overnight development.



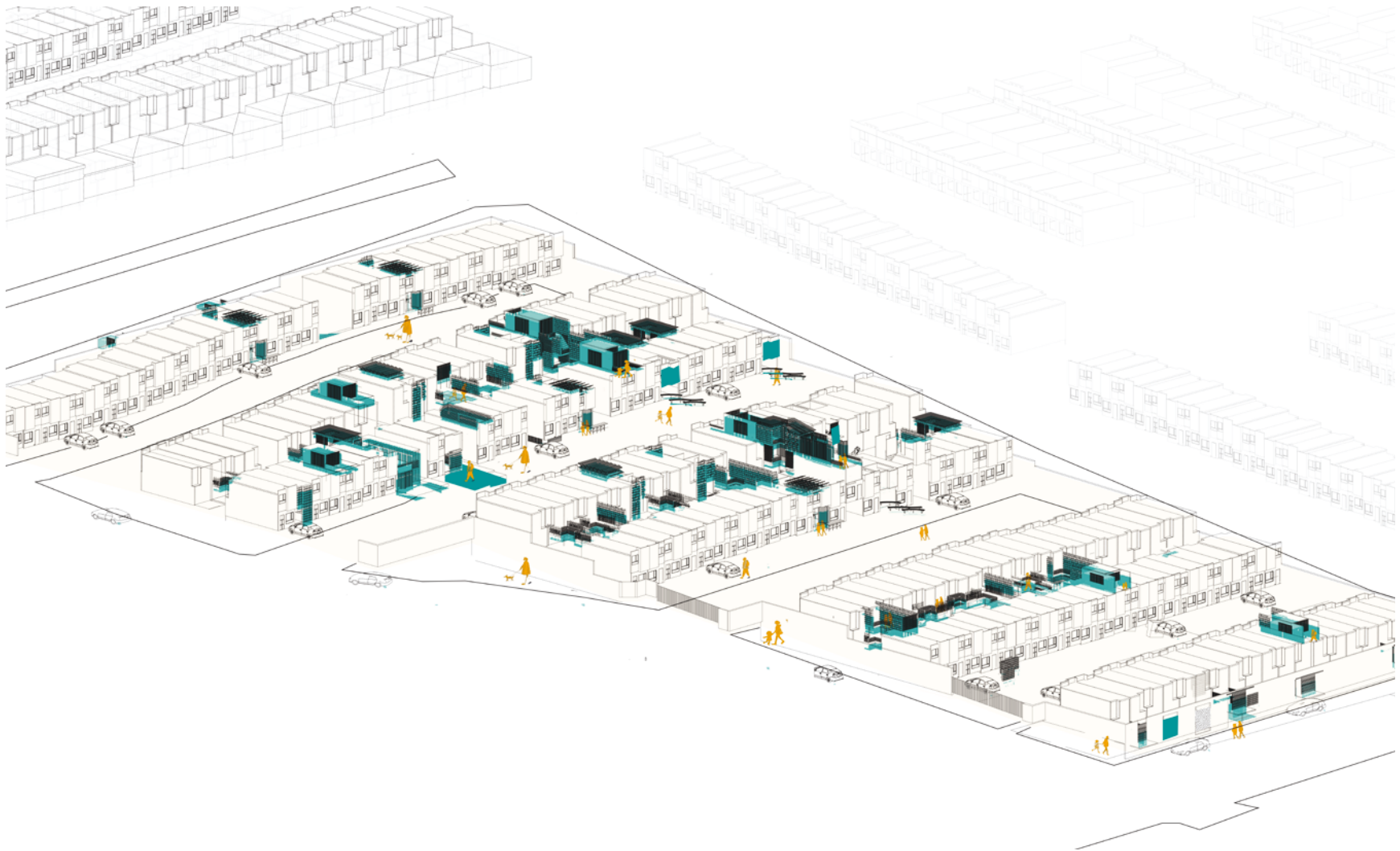
Phase 1: inserting community program into abandoned homes to activate the front of the street.



Phase 2, Step 1: Home additions begin to develop and phase 1 program has been established in the community.



Phase 2, Step 2: Home additions continue to grow incrementally over time.



An accumulative perspective of how the community would build up after several years of implementing the program and design principles.

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