

**Bridging Isolation: Closing the Socio-spatial Gap
in Port-of-Spain, Trinidad through Retroactive
Infrastructure**

by

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Dalhousie University is located in Mi'kmaq'i,
the ancestral and unceded territory of the Mi'kmaq.
We are all Treaty people.

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In hopeful anticipation for the future of Port-of-Spain.

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Abstract

The central business district in the original downtown core of Port-of-Spain (POS), Trinidad and Tobago, is experiencing the effects of urban decay, further exacerbated by spatial segregation between itself and the informal area of Laventille in East POS. The urban decay can be reversed through public and residential development. However, this thesis focuses on the development of public space implemented through a retroactive design framework, to bridge the socio-spatial gap between the low-income community of Laventille and the central business district. This retroactive approach in the context of POS entails developing Prince Street into a creative farm for design skills learning, with a costume design trade school, and the subsidiary program of a sports and recreation hub. Together, these programs will spatially connect East POS to the downtown core while providing new public space for creative expression and education, and sports and leisure.

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Chapter 1: Introduction

The goal of this thesis was to study and highlight the impact that colonialization has had on the status of land within Port-of-Spain, Trinidad and Tobago, and how this association of high or low status has perpetuated cycles of development or under-development. This thesis provides design strategies to re-connect East Port-of-Spain with downtown, as well as to its roots of being the trailblazers for Trinbagonian carnival through their initial involvement in the creative arts.

This thesis starts by explaining the history of Port-of-Spain in terms of why some districts have higher status and better perceptions than other districts. Understanding this sets the context in which the present issues of urban decay, flooding and water inconsistency, and violence against women exist. These topics all need to be addressed in relation to the urban development nature of this thesis. Having a good understanding of socio-cultural conditions is important to the success of the proposed architectural urban design strategy.

This thesis also discusses how the hard edge of the East Dry River acts to reinforce feelings of unsafety between Laventille (informal city) and the rest of Port-of-Spain (formal city). The formal city is characterized by a grid street layout and the informal city is characterized by winding streets and the lack of a clear perception of a structured layout.

The final part of this thesis shows the proposed urban design strategies of a Creative Farm Pedestrian Axis on Prince Street with the nodes of a sports and recreation hub, and a costume design trade school in Laventille. The rationale behind the design choices will also be presented.

The last chapter, the conclusion, reflects on the limitations of public infrastructure, and puts forward that for any public or community space to be well utilized general feelings of safety must be commonplace.

Chapter 2: History of Port-of-Spain

Status Associated with Districts

The status of towns on the outskirts of Port-of-Spain is directly related to their colonial history as positive or negative stereotypes that were attributed to plantation owners or slaves, blacks or whites, and haves or have-nots, have transcended through time and influenced the typologies and socio-political attributes that are associated with these places today. These existing stereotypes have created a positive feedback loop whereby issues or successes continue to repeat themselves under existing negative or positive general perceptions.

Trinidad is the southernmost Caribbean Island, and its capital city Port-of-Spain (POS) sits on the east coast, on low-lying plains in front of The Northern Range (Figures 1 and 2). POS can be divided into Uptown, Downtown, East, West, and its Port Area (Fig 3). Social status tends to increase towards the West and decrease towards the East and this



Figure 1. Location of Trinidad and Tobago

phenomenon can be attributed to Trinidad's colonial history (Fig 4). POS was established by Trinidad's second Spanish Governor José Maria Chacon in 1784 after all administrative and royal personnel were relocated to POS (then called Puerto de Espana) from Trinidad's first capital city, San José (Stewart 1998, 11). Trinidad and Tobago was later (culturally) colonized by the French from 1776 and 1783 following the Cedula de Población (Decree of Population) which encouraged French settlers from neighboring islands to immigrate to Trinidad to boost economic growth. This resulted in an influx of hundreds of French upper-class planters and enslaved Africans, establishing POS as a slavery-based sugar plantation francophone town (Stewart 1998, 11). The colonial socio-economic landscape created by the Spanish and French settlers set the stage for the spatial segregation within downtown POS today.



Figure 2. Location of Port of Spain

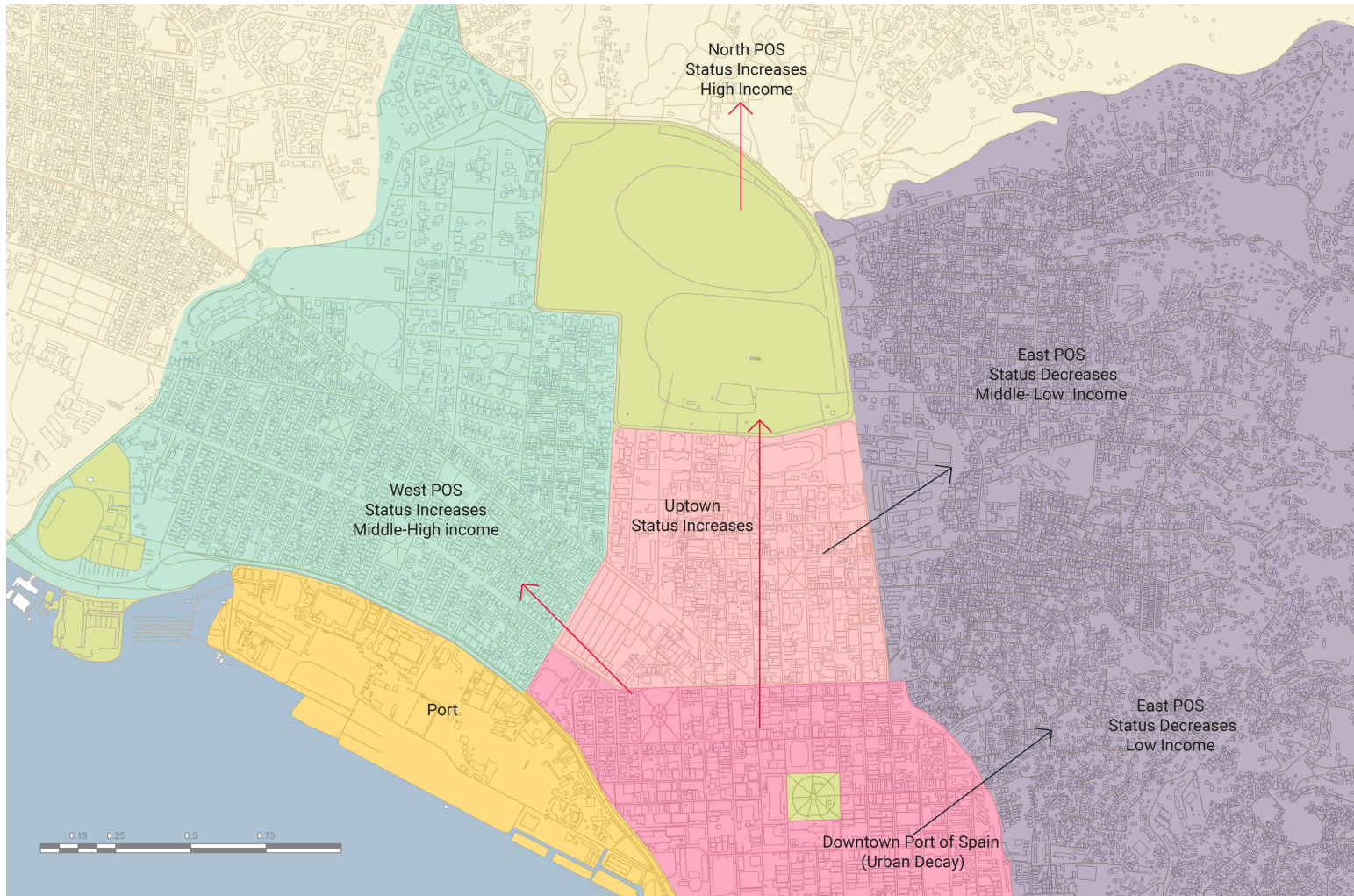


Figure 3. Districts of Port-of-Spain and status changes throughout the city.

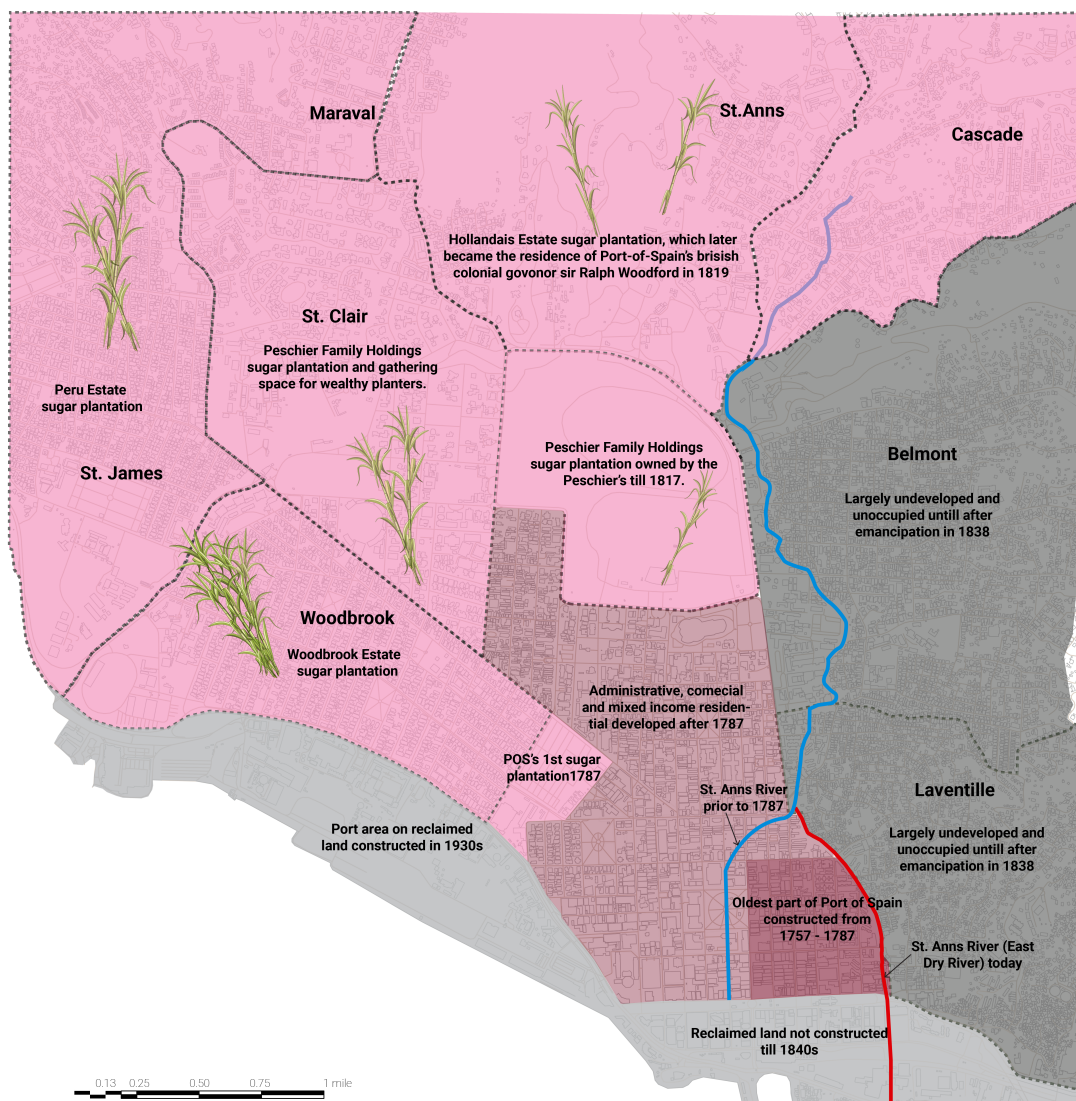


Figure 4. Showing where sugar plantations were located. When compared to figure 3 notice that the location of the plantations line up with the areas of higher status today.

The wide-spanning, low-lying land of POS in the foothills of the Northern Range served as an ideal location for growing sugar cane. The gridiron layout that facilitated the buildings and sugar plantations was implemented in fulfillment of the “Laws of The Indies,” a manual for how new Spanish settlements should be laid out. (Stewart 1998, 17). This grid is characteristic of the ‘Formal City’ of downtown and uptown POS today. After the emancipation of slaves in 1838, property prices were raised by the British government to discourage ex-slaves from living in established communities. 2400 ex-slaves were thus forced to live on the outskirts of Port-of-Spain due to high property costs in the Western and central portions of the city (Stewart 1998, 55). The then unoccupied eastern northern range foothills which they settled, is today called Laventille (Fig 4). This community is separated from downtown by a large aqueduct called The East Dry River, and Piccadilly Street, used by motorists to exit POS to get onto the highway (Stewart 1998, 10).

Historian Stephen Stuempfle in his 2018 book *Port of Spain: The Construction of a Caribbean City, 1888-1962* noted that:

In general, the buildings on the eastern side of the city were older and more dilapidated and their occupants more impoverished. Residents of other parts of the city generally perceived this eastern area as chaotic, unsanitary, dangerous, and morally inferior... Migrants continued to crowd into limited housing units. (Stuempfle 2018, 96)

North of Laventille, Belmont was subjected to similar but less harsh views and there is a bigger middle-class population living there today.

Continuing in an anti-clockwise direction from downtown POS lies St. Ann’s, Cascade, and Maraval in that order. These towns are situated to the north of the Queen’s Park Savannah in the narrow valleys of the Northern Range and

are middle to high-income. Cascade is a mostly high-income residential community getting its positive reputation from being near the botanical gardens and the President's house. This land was established in 1819 after being purchased by the Cabildo, Trinidad's British governing body (Besson 2011). Maraval was first settled by French Families during the colonial period (Discover Trinidad and Tobago 2007).

St. Clair was a sugar estate called Peschier Family Holdings during the colonial period. It was also a meeting place for rich planters known as the St. Clair Club. Today it is home to expats some of whom work in the Canadian, British, and French embassies that are also located here. Many of the homes and mansions in St. Clair today have maintained their French colonial style (Bissessarsingh 2013).

St. James was once a sugar plantation called Peru Estate, and in Woodbrook nearby (originally called Woodbrook Estate) there was a large 367-acre sugar plantation that extended from the Lapeyrouse Cemetery to St James. In the location of The Lapeyrouse Cemetery, Port-of-Spain's first sugar plantation was established in 1787 (Stewart 1998, 17). These areas have since been converted to housing following emancipation, and many of the houses/buildings still maintain French colonial style, and are owned by middle to high-income people (Besson 2011).

There is a clear correlation between French planter land ownership in the colonial period and positive, high status being associated with the same land today. Likewise, there is a correlation between predominantly black-owned land in the colonial period and negative, lower status being associated with the same land today. For spatial segregation and urban decay to be eliminated from Port of Spain, there

needs to be a reassociation of positive status with historically lower-status communities, like Laventille, without erasing the unique positive features that make up their identity.

Port-of-Spain Today

Urban Decay

Reworking the social fabric to redistribute positive status to undervalued areas like Laventille must be done within the context of a city experiencing the effects of urban decay which manifests itself in Trinidad and Tobago through building dilapidation, violence against women and general feelings of unsafety, flooding, and water insecurity. Attempts to combat socio-spatial segregation will fall short without addressing these bigger issues that affect not only Laventille but all of Post of Spain and most of Trinidad and Tobago.

The exact beginning of urban decay in POS is difficult to pinpoint, but the first accounts of dissatisfaction with the downtown urban fabric, referenced the barrack yards where most of the urban poor such as the ex-slaves, working-class migrants, and indentured laborers lived. These barrack yards were single-story narrow wooden shacks with adjoining rooms on the interior of city blocks where many of the working population lived in the early 1900s (Stuempfle 2018, 143). By 1937 half the working population of POS, 42820 people, lived in these overcrowded and unsanitary yards (Stuempfle 2018, 253) The upper and middle class described the barracks, to their disapproval, as unsanitary densely packed areas where lewdness, loudness, and criminal activities prevailed, (this was their perception). They argued that the barracks depreciated the value of nearby properties. Thus, those businesses and individuals who could afford it, moved uptown or to Woodbrook in the

West or Belmont in the North-East in search of better living conditions or to escape the negative connotation that was associated with barrack proximity. For instance, the first cinemas to be introduced to Port of Spain during the advent of motion picture and a boom in the entertainment industry avoided the barracks of downtown. The London Electric Cinema which opened in 1911 was in Woodbrook, West of downtown, and the Olympic Theatre which opened in 1916 was located to the northeast of downtown in Belmont in the vicinity of the highly glorified Queens Park Savannah (Stuempfle 2018, 214). The Metro Cinema (later renamed The Globe) which opened in 1933 was located on the corner of Park and St Vincent Streets near the downtown core and barracks. Although it was a success and was frequented by people from various classes in society, critics argued that the grandeur of the cinema deserved a better background and that it would have been more suitable to locate Metro in the western or northern parts of the city (Stuempfle 2018, 219). Stuempfle mentioned that the social columnist of The Guardian newspaper asserted:

The noble lines of the building are not given sufficient background as they would have been if the theatre had been built near where the Princess Building now stands. (Stuempfle 2018, 219)

The Princess Theatre was adjacent to the QPS and had a clear view of it. Port of Spain in the 100 years following emancipation up till the 1930s, maintained the distinct social class divisions and stigmas associated with each, to a point where infrastructural development such as the entertainment industry avoided the downtown core and was perceived as being more luxurious if there were located elsewhere. This lack of investment by the private sector in the entertainment industry contributed to the slowing of the development of

downtown POS in relation to its surroundings and opened the doors for dilapidation, crime, and vagrancy to move in as very few new and high-profile private investments in the entertainment industry were made post emancipation. This is especially true nearer Piccadilly Street in East POS, the area closest to the first settlement of ex-slaves and immigrants in POS in the mid to late 1800s. It is clear that the areas heavily invested in during the colonial period, continue to secure further investment today, and areas that received little to no private investment in the colonial period in POS, continue to receive little to no private investment today, which has ultimately led to their decay.

Flooding and Water Inconsistency

In addition to the urban decay because of negative stigmas and lack of investment in the downtown area, POS perpetually struggles with insufficient potable water and flooding, and this could be further contributing to the lack of investment today. Port of Spain has had a history of water struggles. The St. Anns River flooded its banks after periods of heavy rain in the 1800s and early 1900s and continues to flood today even though it has now been canalized. In 1903 the water riots in Woodford Square ensued because the colonial government proposed taxation of water for residents of Port of Spain. Water taxation was proposed due to water shortages because of water wastage (Stuempfle 2018, 155). Water insecurity issues persist today because of insufficient maintenance of water distribution facilities and the lack of creation of new water distribution facilities (Lindo 2021). Flooding issues persist today because of increased surface runoff due to increased urbanization, as well as garbage accumulation in drains, and construction on low-lying floodplains. It is not uncommon for flash flooding to

occur after torrential rains, and serious flooding to occur during heavy prolonged rain. Any new construction in POS must be designed considering the conditions of water insecurity and flooding.

Violence Against Women

Understanding the public challenges that women and girls in Trinidad face is important for designing inclusive public spaces. High instances of domestic violence positively correlate to high incidences of public offenses. In the 2016 *National Crime and Victimization Survey*, 47.7% of citizens reported that they recently experienced intimate partner domestic violence, and in East POS this number was slightly higher at 51.6% (Citizen Security Programme Ministry of National Security 2016, 3). Research has shown that there is a positive correlation between domestic violence and the display of all other forms of crime in the public sphere from less severe like robbery, to murder and terrorism (Duvvury 2022). It is therefore important to make space for women and girls in the public realm to combat the violence and/or isolation that some of them may experience in the home. The CVS showed that 5.2% of residents of East POS were victims of serious crime within the prior 12 months of the survey, and this percentage was 3 times higher than the national average (Citizen Security Programme Ministry of National Security 2016, 19). William Whyte, an American urbanist who wrote *The Social Life of Small Urban Spaces*, spoke in depth about this issue of public space becoming overrun by the troublemakers of society, whom he refers to as “the undesirables.” He argued that public spaces with high criminal activities and stragglers are so, because from their inception they lacked proper lighting, visibility, seating, and overall attractiveness which discouraged productive

people from using the space for the reason it was intended, usually for leisure, while simultaneously encouraging “the undesirables” to take up residence because of the inconspicuous nature of the site (Whyte 1980, 60). His strategy for keeping these people away from public spaces was to simply design those spaces so well that they can be used to their maximum capacity by all other (productive) members of society like students and the working class, among others (Whyte 1980, 63) Troublemakers will naturally gravitate away from populated places because they prefer not to stand out. However, poorly designed public spaces tend to attract lingerers looking for an inconspicuous location to carry out business that is illegal and socially unacceptable. Even in cases where crime does not occur and the area simply remains void of any social life for most of the day, the lack of activity can increase the perception of unsafety due to the lack of ‘eyes on the street’ (Jane Jacobs 1961, 62).

This thesis will on focus ways to deter and mitigate the occurrence and impact of crime through design methods like dense programming, sufficient lighting and visibility, wayfinding, and use of color to increase the perception of safety.

Chapter 3: The Formal City

Woodford Square

Woodford Square's history is of extreme importance for understanding what the square has meant to the people of Port-of-Spain and the socio-political roles that the square has facilitated (Fig 7). The St. Anns River used to flow where the square is now located. It was diverted in 1787 to expand POS westward (Fig 4). During Trinidad's colonial period, it went by different names. At the onset of the rediscovery of Trinidad, the area was called "Place of Souls" by indigenous people after a bloody battle that took place between the local indigenous community and invaders (Stewart 1998, 16). In 1917 it was renamed Brunswick Square because it was used by soldiers from Brunswick, Germany as a training camp. It was then changed to Woodford Square, after Trinidad's 4th British Governor Sir Ralph Woodford who served the Government of Trinidad from 1813-1828. In the 1900s Woodford Square became the site for discussing public affairs. The water riots of 1903 were one such historical affair that ended with The Red House, Trinidad, and Tobago's House of Parliament, adjacent to Woodford Square being set on fire (Lovelace 2017). In the 1920s it was a major location for street carnival celebrations. Masqueraders in the thousands came out in sailor and devil costumes. During the lead-up to Independence (1956-1962), Dr. Eric Williams who was the head of the People's National Movement, one of Trinidad and Tobago's first political movements, used Woodford Square for his public rallies. It became known as the University of Woodford Square because Dr. Eric Williams held public lectures on world history, slavery, democracy, and philosophy (Lovelace 2017). During the 1970 Black



Figure 5. Crowd Gathers during the reopening of The Red House (Parliament House) (Ministry of Tourism, Culture and the Arts Trinidad & Tobago 2020)



Figure 6. 1970 black power movement gathering (Lovelace 2017)

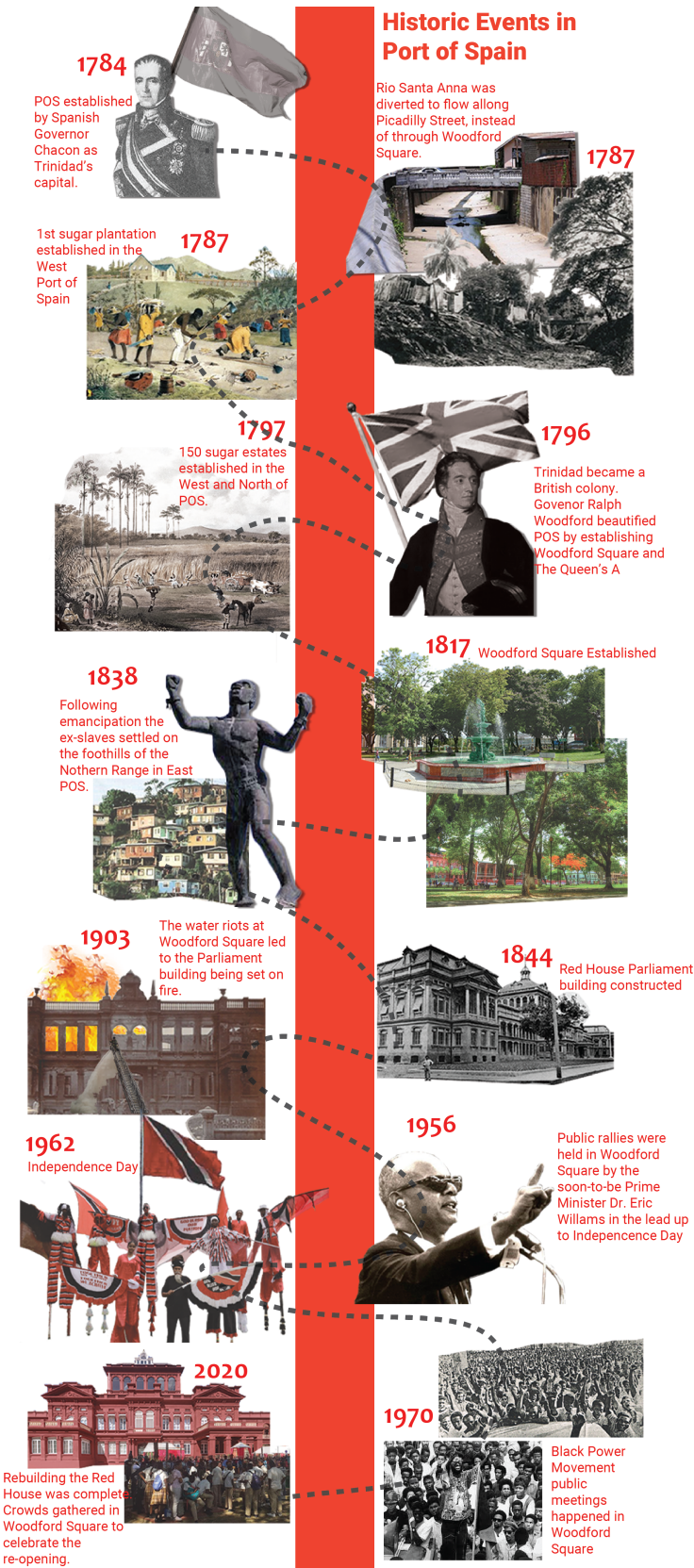


Figure 7. Timeline showing history of events that occurred in Port of Spain in the vicinity of Woodford Square/

Power Movement (Fig 6) the square was called the People's Parliament and lectures on similar topics were led by various well-known public speakers (Stewart 1998, 16). It is clear that Woodford Square has been the epicenter of large social engagement involving social activism, celebration, and learning since the early 1900s.

In aiming to bridge Isolation and close the socio-spatial gap through retroactive infrastructure (the title of this thesis), there needs to be a heartbeat of the city to which Laventille can be connected both programmatically and visually. This should be Woodford Square, evident through its rich history and ability to continuously draw crowds over generations (Fig 5 and 7).

Danish Architect Gehl in his 2010 book *Cities for People* argued that a good city is one in which people stay for leisure reasons rather than out of necessity and one that prioritizes the pedestrian over the motor vehicle. He stated:

From city-to-city space and down to tiny nooks and crannies, spatial relationships and size have a decisive influence on our experience of place and our desire to move about and stay in just that spot. (Gehl 2010,162)

He associates a lack of 'staying' with a lack of comfortable and safe public space. Gehl discussed a list of criteria that renders any public space desirable: catering to the human scale at 5 km/h which caters to our immediate senses of seeing, hearing, and touching, suitable seating for groups of families or friends, using suitable materials and widths for walking paths to make walking or rolling safe and easy, and designing to induce optimal microclimates which in Trinidad's case means sufficient shading, easily do-able by adding trees. These should be implemented along Prince Street, as an extension from the foresty Woodford Square.

Typologies of the Downtown Core

Referring to figure 8, the downtown core is made up mostly of civic buildings (in red), small commercial businesses (in purple), and professional services such as lawyers, doctors, and financial services in pink. Many car parks are scattered throughout the city (in grey). The streets are very narrow and can only accommodate one-way traffic. Two types of Low-income housing exist to the East of the city. These are multi-story apartment-style units (in green) to the left of Piccadilly Street and small single-family houses (in dark purple) to the right on the Laventille hills. The area where the multi-story apartments are located between Nelson Street and Piccadilly Street (Fig 11) was the first area to be developed by the Spanish colonists in the 18th century (Fig 4). It is the oldest part of the city. In 1761 Ducan Street and Nelson Street were the first streets to be laid and the governor's residence was on Piccadilly Street (Stewart 1998, 16). Ironically, today this area experiences the highest incidence of dilapidated, underused, and abandoned structures (Fig 11). A 2018 article from Loop TT News titled *Moving Vendors to George St will alleviate crime* asserted:

Many would look at George Street and its environs and say that they are hopeless places that have gone too far to return to a place of positivity. (Loop TT News 2018)

POS has been decaying for decades due to challenges like low private sector investment since more entertainment and leisure industries are being developed in Port of Spain's outskirt towns like Woodbrook and environs. With this lack of private sector development came depopulation and abandonment which has led to decrepit infrastructure. There is also a high incidence of unemployment, destitution, and crime (Javeed 2020).



Figure 8. Map of Port-of-Spain's downtown core showing land use typologies. The typologies from West to East go from tourism, to civic, to commercial, and then to poorly maintained housing and dilapidated buildings and vacant and unerused lots, to Laventille.



Figure 9. One of many dilapidated buildings on the east side of downtown POS (Google Maps 2024)

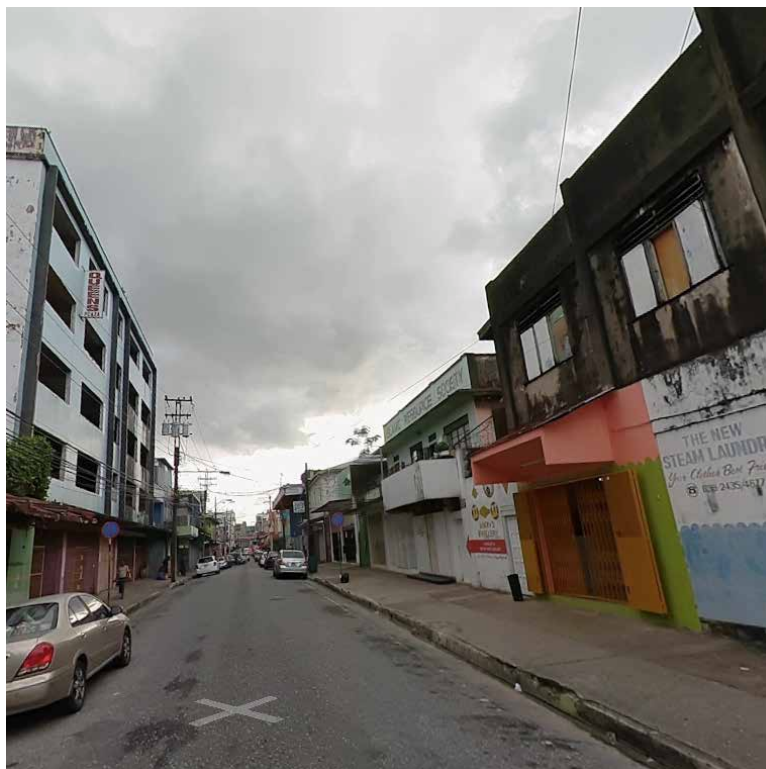


Figure 10. Multiple dilapidated buildings run along the East Side of downtown POS (Google Maps 2024)

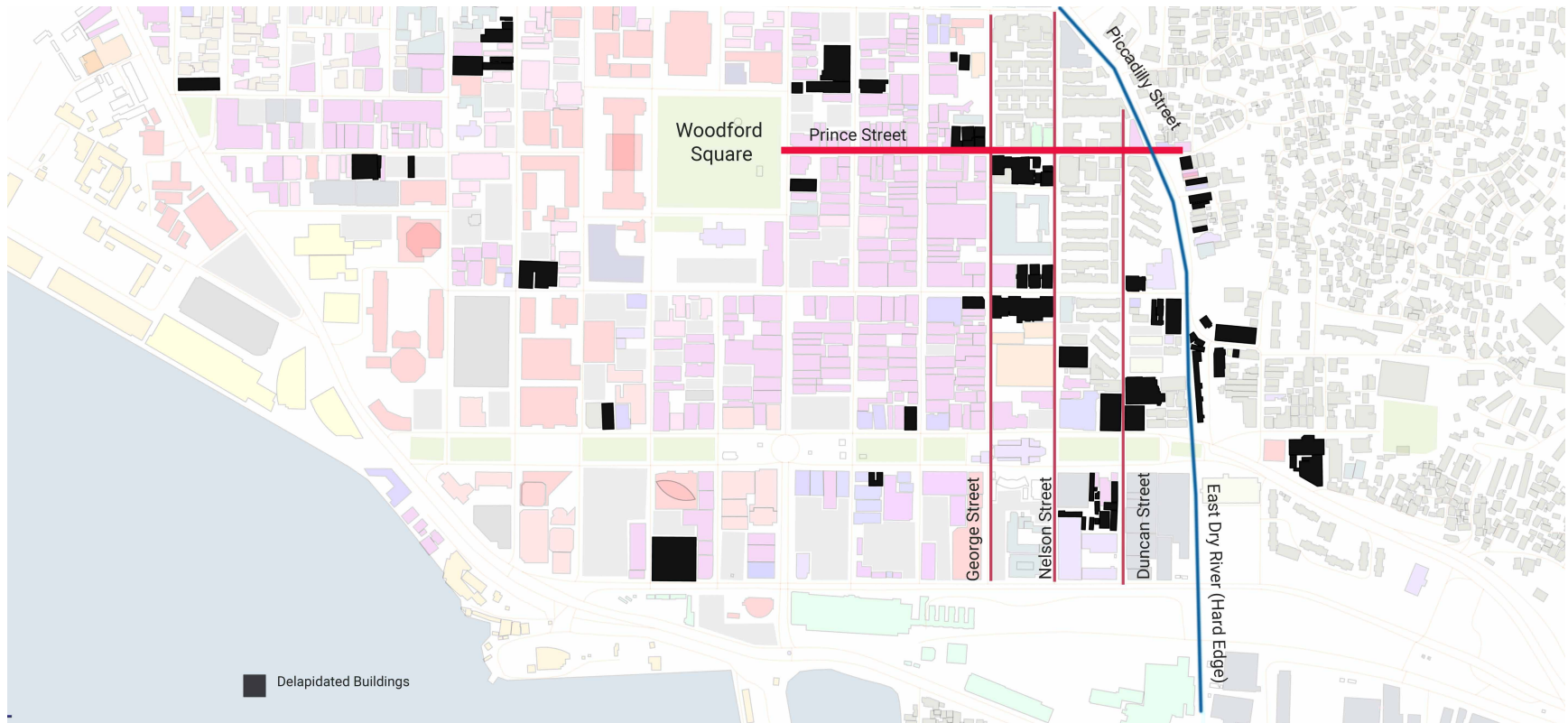


Figure 11. Map of Port-of-Spain's downtown core showing urban decay which was identified by extreme building underuse, dilapidation and/or abandonment.

Chapter 4: Spatial Segregation and The Hard Edge

The East Dry River and Piccadilly Street

Urban decay is further exacerbated by spatial segregation between downtown POS and Laventille in East Port of Spain, by a Hard Edge. Edges mark the boundaries between two areas, they tend to lack a directional quality, are visually prominent, and are highly restrictive of cross-movement; the strongest edges are impenetrable (Lynch 1960, 62). Thus strong, or hard edges can act to reinforce isolation between communities in a disruptive manner. The East Dry River and Piccadilly Street aggressively separate the hills of Laventille from the low-lying business and shopping district creating uninviting walls on either side of the street and river, making the area very underused, bringing a feeling of unsafety (Figure 12). Some bridges allow cars to cross over but there is no programmatic reason for anyone who is not from Laventille to stay or linger. The bridges to Piccadilly Street simply provide fast access to the highway, south of Piccadilly.



Figure 12. Showing walls on either side of The East Dry River and Piccadilly Street causing an isolated feeling (Google Maps 2024).

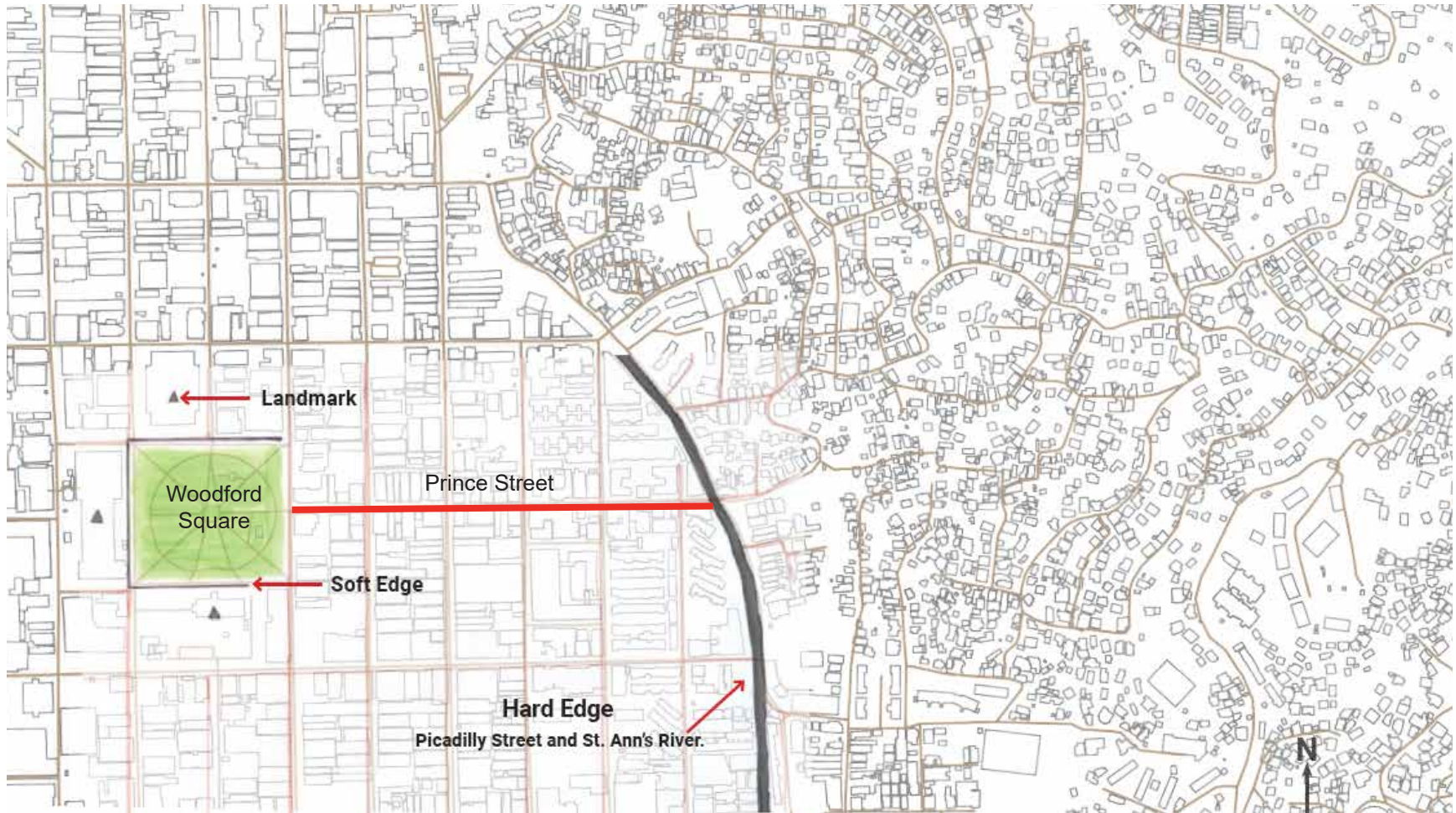


Figure 13. Showing location of the hard edge.

The East Dry River, originally called the St. Ann's River, flowed through Woodford Square but it was diverted in the 18th century to where it is today to accommodate the expansion of the town to the West and North without natural disruptions and the risk of flooding. The river's movement was mandated by Governor Chacon and was completed in 1787 after four years of intensive slave labor. 638 enslaved and 405 free colored people were needed to complete the project, which allowed for seven extra streets to be added to the west of Nelson Street, and four to the north (Fig 4) (Stuempfle 2018). Today the way that people interact with the East Dry River is sharply different from the way it was used when it was first diverted (Bissessarsingh 2013). It was paved over in the 1930s to address the risk of erosion to the adjacent properties and Piccadilly Street and has since been an isolating hard edge (Figs 12 and 13). Before it was paved over it was a social gathering place where children played in and around the trees lining the banks, and women washed clothes in the upper part of the stream (Fig 14). Thus, the old EDR proved that edges can have a unifying aspect to them. Special activities or local services that bring people together allow edges to act as unifying features rather than harsh divisive lines (Lynch 1960, 65). Unfortunately, over



Figure 14. East Dry River in the 1890s before it was paved over (National Archives of Trinidad and Tobago 2020)



Figure 15. Showing the East Dry River today, 2023 (Triniview n.d.)

time garbage and sewage in the river slowed the washing and playing activities, and the paving changed the hydrology and attractiveness of the river significantly (Bissessarsingh 2013). Although the East Dry River is today isolating, it once had a unifying ability, and therefore it is possible that unity can become a reality again once the threat of flooding is addressed.

The river does not burst its banks often since the depth of its channel is usually enough to hold all the runoff after precipitation. There have however been occasions where intense flooding at Piccadilly Street has occurred: in 1933 following a Category 1 hurricane, then again in August 2018 and August 2021 following heavy rain. Fig 16 shows the East Dry River during a flood event. POS has struggled with flood management from its inception since it lies in the flood plain of the East Dry River to the east and the Maraval River to the west. Flood management infrastructure has been slow to adopt due to a lack of finances. In the meantime, adaptation and preparedness are of utmost importance. Encouraging activity in the channel like cycling, roller skating, and lounging by providing the necessary ramp access and decking infrastructure could help slow the incidence of garbage being dumped that contributes to flooding events.



Figure 16. Showing a 2008 flood where the East Dry River broke its banks at Piccadilly Street (Hosein 2021)

Chapter 5: The Informal City

Community Voices and Resource Statistics

In a news article published in September 2023 following a meeting with residents from the Laventille community, complaints of an absence of sports and educational programs for youth to “release their frustration,” as well as a lack of training avenues for the unemployed, were voiced (Douglas 2023). Currently, water security is an issue that both POS and Laventille face, but traditionally Laventille has seen a lower incidence of water security and sanitation facilities. Data taken during the 2006 census showed that only 0.5% of households in the city of Port of Spain were without access to clean drinking water, versus 4.7% of households in San Juan/Laventille. And 6.8% of households were without access to improved sanitation facilities in the City of Port of Spain versus 13.8% in San Juan/Laventille (Central Statistical Office, 2006) (Image18 and 19). There has since been a sanitation project that improved the number of domestic sanitation facilities, but recent water scarcity concerns have made such facilities obsolete for both Laventille and POS. A reliable water storage facility nearby

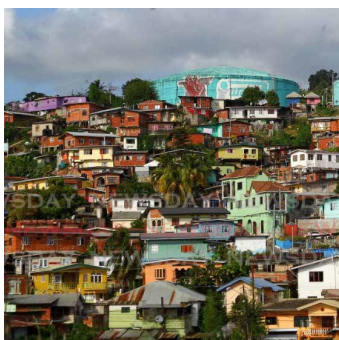


Figure 17. Showing homes of Laventille on the foothills of the Northern Range (Springer 2021).

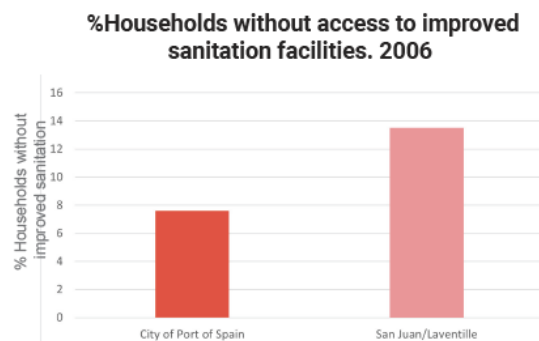
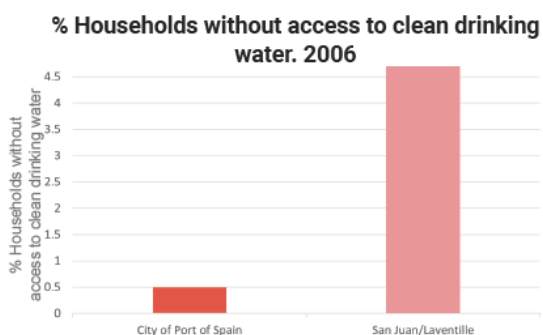


Figure 18 and Figure 19 . Showing Laventille vs Port of Spain Stats (Central Statistical Office Ministry of Planning and Development 2006)

to both areas can provide residents with water-relief when necessary.

Case Study- Imagining a Sanitation Hub

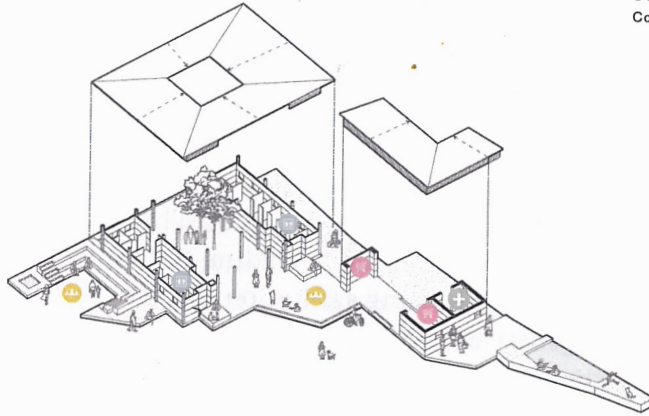
Rahul Mehrotra in collaboration with The Society for the Promotion of Area Resource Centres initiated a project to provide safe and sanitary public bathrooms for those living in the informal settlements of Mumbai. Their work explored how sanitation facilities could be integrated into other mainstream services rather than remaining a mono-functional project. In their research, mono-functional facilities such as stand-alone toilets were marginally successful and failed to integrate the informal community into its wider surroundings. Rahul explained that for infrastructure to be a shared facility through which members of a wider society can relate to each other, the programming of the infrastructure must be strong and broad enough that it would be widely utilized by people of different needs, meaning multigenerational and multi-class. The idea was to integrate daily essential services, alongside the sanitation infrastructure. These included health, retail, and social programs such as spaces



Figure 20. Retail, sanitation, health, and social under one roof (Mehotra 2022, 66)

The programmes for the Sanitation Hub are dependent on the surrounding building and land use. The hub acts as a civic centre itself with street facing retail outlets, health centre and plazas as social hubs for the community.

Courtesy: Architecture Foundation, India



Designed at the threshold between the formal and informal parts of the city, it is hoped in the next 5-10 years the Sanitation Hub will become a neutral ground for neighbouring communities and residents to come together around a shared piece of infrastructure. The spaces and building envelope are designed to allow for inorganic growth that stems from the needs of the community.

Courtesy: Architecture Foundation, India

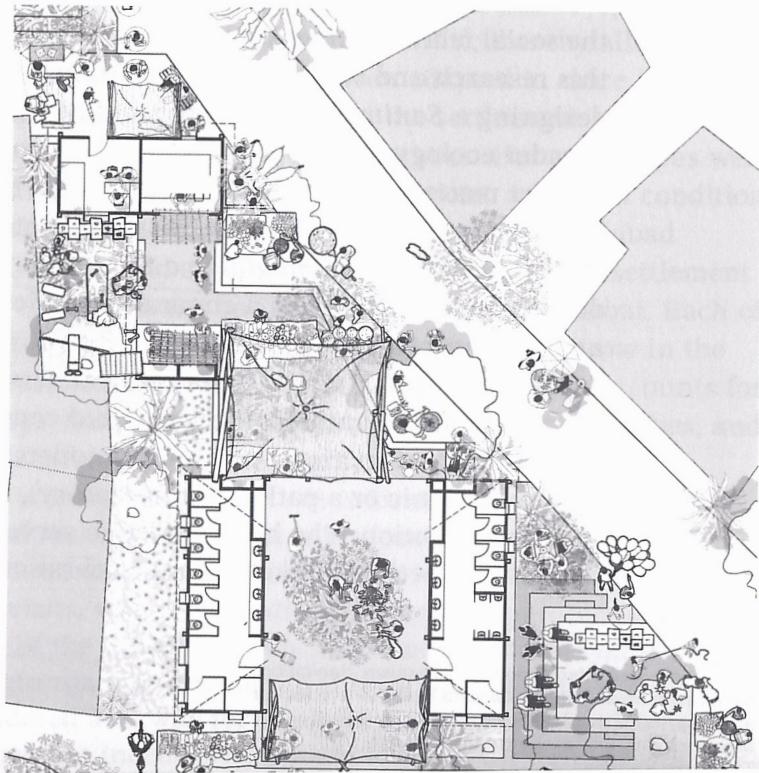


Image 21. Description of hub. Images show indoor and outdoor spaces being used for play and gathering, with sanitation as its anchoring point (Mehotra 2022, 67).

for hosting festival celebrations, and weddings, a study space for children, and weekend markets. Safety through nighttime lighting was also implemented.

Case Study- Discovering the Rivers

The Architecture firm Solo Arquitetos in Curitiba, Brazil, proposed a series of design strategies for unearthing and reintroducing Curitiba's canalized urban rivers. This case study is important because it provides an example of what designing along or within a river like the East Dry River, could look like. The well-being and quality of life of urban dwellers are greatly influenced by the presence and quality of natural features. To push urban rivers to the fringes of a city, or underground is to dismiss the benefits of leisure activities that they have the potential to provide. Solo Arquitetos recognized the global shift from communities settling nearby to rivers for the food, fresh water, and transport that they provided in the post-urbanization era, to their canalization and burial today. This was largely to separate the stench of the raw sewage and garbage that began polluting rivers globally as cities began to grow and sanitation of personal dwellings became a priority. However, the absence of these rivers today erases a large part of the cultural identity that connects to the historical development of urban space. Such has been the case with the East Dry River which was a sight that brought the community together through play, relaxation, and washing of clothes, all of which were erased following its pollution and then canalization. Solo Arquitetos explores ways in which hidden urban rivers can become visible and highly utilized focal points for the enjoyment of Curitiba's urban population through programming the river channels with sports, canoeing, swimming, yoga, multisport

courts, skateboarding, multipurpose stages, exhibition areas, gardens, and grandstands (Fig 22 - 24).



Figure 22.(Solo Arquitectos, 2017)



Figure 23.(Solo Arquitectos, 2017)

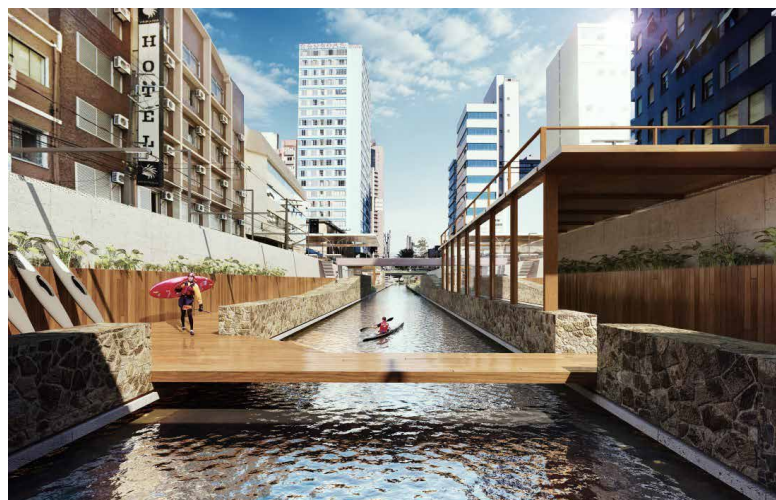


Figure 24.(Solo Arquitectos, 2017)

Chapter 5: Design Outcome- Retroactive Infrastructure in Port- of-Spain

What is Retroactive Infrastructure?

Globally, there are areas in, and around urban centers characterized by derelict public spaces, insufficient utilities, unreliable or non-existent public transport, and a high displaced migrant, and/or low-income population (Reguera and Ambrosi 2022, 9). Referred to as the “broken city,” the social interactions that occur within are inextricably linked to the area’s spatial parameters (Reguera and Ambrosi 2022, 10). Thus, public design solutions that intrinsically alter negative spatial conditions by catering to community needs that have not yet been met, have a high likelihood of reconciling their sense of belonging and spatial dignity (Reguera and Ambrosi 2022, 10). These urban-surgical projects designed at the hyper-localized scale in response to specific physical and social issues are named retroactive infrastructures. Retroactive infrastructures have been successful because they extend the idea of the commons into the built-public realm. Public spaces of high value and usability to a wide range of people can join communities of different incomes and statuses through common needs lacking in both, be it sanitation, transport, or recreation space. Usually designed in abandoned or derelict zones, these new public hubs benefit from lower levels of crime due to increased “eyes on the street,” and from an increased sense of pride from people living in and around the rejuvenated zone (Reguera and Ambrosi 2022, 10).

Hypothesis

Providing new public space for creative expression and education, and sports and leisure, along the Prince Street axis that connects the low-status area of Laventille to the higher status heart of Downtown Port of Spain, Woodford Square, will blur the socio-spatial segregation between the two areas and heal the urban decay which Downtown Port of Spain has been suffering with for a decade. This socio-spatial segregation was brought on by lack of investment and worsened by the presence of the hard edge. The public infrastructure and urban design strategies proposed in this thesis aim to reduce the impact of the hard edge and add investment into Laventille that not only benefits Laventille , but secures the future of the creative industry in carnival for Trinidad and Tobago.

Prince Street Creative Farm Pedestrian Axis

Currently Prince Street has various levels of liveliness and feelings of safety. The street conditions nearer to the highly acclaimed Woodford Square are more bustling; there are more shops so many people are walking around shopping and running errands. As one approaches the East Dry River, this energy starts to fade away. To extend this outdoor liveliness further East to connect to the lesser appreciated area of Laventille, the streetscape must be programed with activities or businesses that the public can interact with, and infrastructure must be upgraded to accommodate the intricacy of urban life and the need for safe and environmentally comfortable outdoor spaces.

Like the sanitation hub, the design outcome of this thesis intends to use multifunctional programming centered around one main program, to bring the areas on either side

of the hard edge, together, through shared infrastructure. In the case study example, the main program was sanitation. In the case of Downtown POS and Laventille this central program is art, in the form of costume design and crafts making that will be scattered in nodes along a pedestrian axis created on Prince Street, forming a creative farm. It will be a reintroduction of costume design and other skills such as carpentry, woodworking, and blacksmithing into Laventille and by extension East Port of Spain. The creative farm will reconnect East POS with its history of Trinibagonian carnival creation, carnival costume creation and carnival instrument creation (the steel pan). It will provide Laventille and East POS with access to learning the trades in the creative industry which will help with the community's underemployment issue while simultaneously filling the labour shortage for costume designers in Trinidad and Tobago. The sports and recreation hub with its ability to impact a wider range of people due to its broader programming, will be the subsidiary program helping to blur the physically divisive East Dry River by designing within the canal itself to create a connection to the water.

The programming discussed in the paragraph above was inspired by a September 2023 town hall meeting with residents from Laventille and district leaders. Residents expressed disdain surrounding the lack of trade schools, sports and recreation facilities, and insufficient designated space for the selling of goods (Douglas 2023). Thus, the first retroactive infrastructure node will be a costume design trade school and market located in Laventille itself, towards the base of the hill (Fig 25). The second node, located along the East Dry River, will be a sports and recreation hub with a multipurpose room for creative art learning (Fig 25). These

2 nodes will be connected along a pedestrian axis on Prince Street that will have pockets of creative design outlets to activate the street level (Fig 25 and 26). Other design strategies to be implemented along the axis are: wider sidewalks, sanitation, paving with street tiles, vegetation, outdoor seating, street lights, and baulstrades (Fig 27). These features will give Prince Street more prominence, and the clear endpoints at Woodford Square and the costume design trade school will contribute to a stronger, more positive public image of downtown POS and Laventille. The area in the vicinity of Woodford Square has been used for this thesis because of its historical significance. However, similar strategies of connecting less appreciated areas to more appreciated areas through shared public infrastructure can be implemented at various scales along any hard edge to alleviate isolation between those areas. Figure 28 shows a master section of the design proposal.

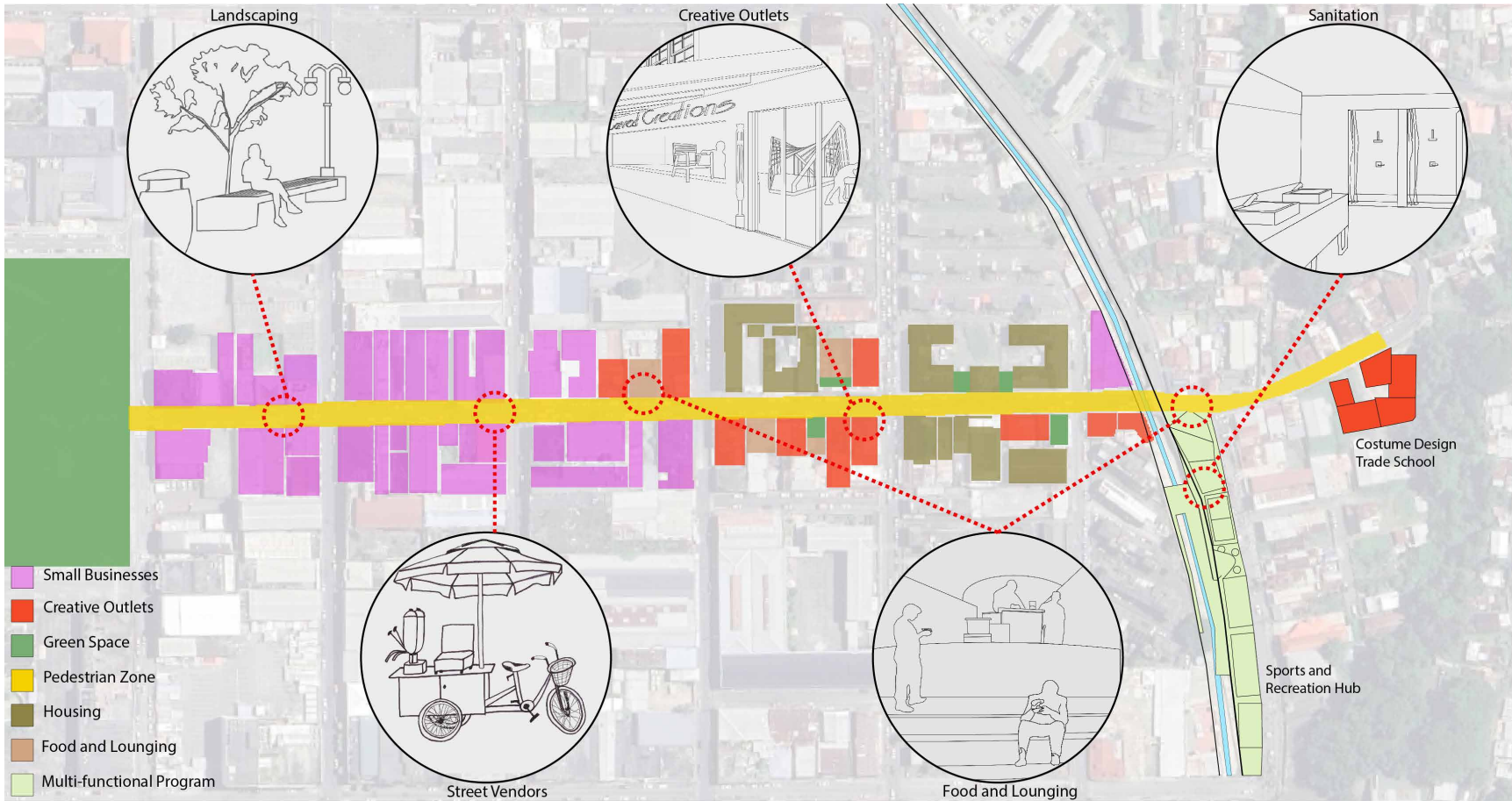


Figure 25. Showing the Master Plan for the Prince Street Creative Farm Pedestrian Axis



Figure 26. Section showing the proposed street condition for Prince Street. The ground floor area of buildings provide spaces to learn different craft skills like carpentry, metal work and wirebending.

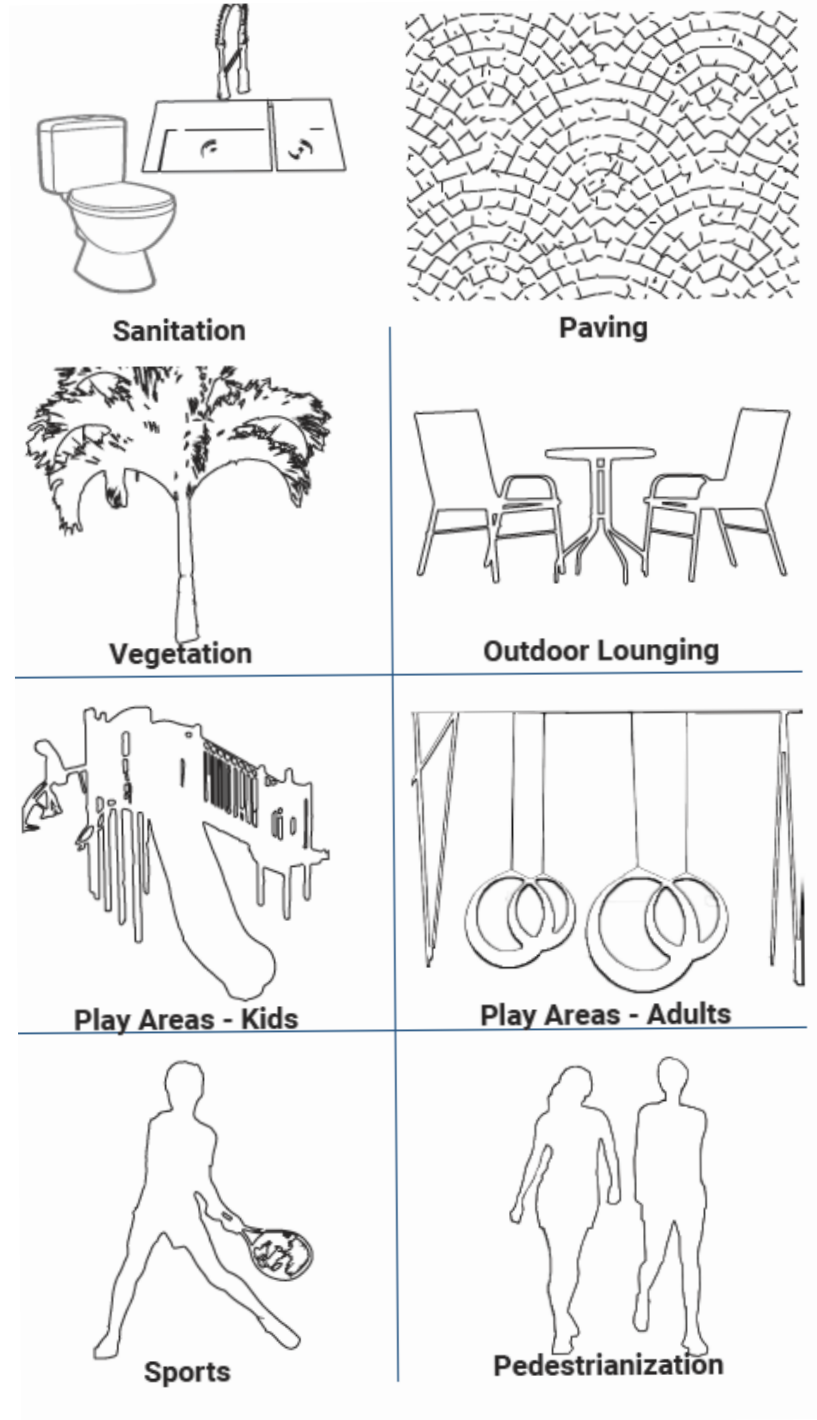


Figure 27 Showing some of the design strategies to be implemented along the Creative Farm Pedestrian Axis, and Sports and Recreation Hub.

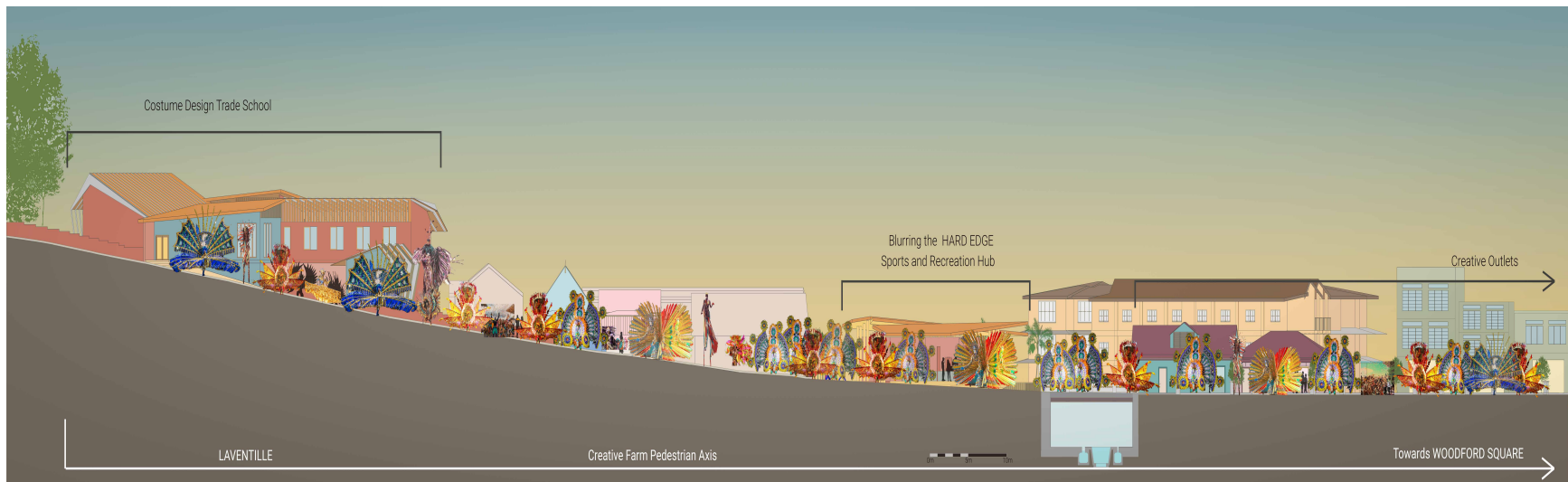


Figure 28: Master Section of the design proposal showing the costume design trade school, sports and recreation hub and the beginning of the prince street pedestrian axis (reading left to right). This scene shows a carnival celebration happening along Prince Street and up to the costume design trade school.

Chapter 6: Design Proposal

Sports and Recreation Hub

Sports and Recreation is a multi-program strategy that can cater to multiple ages and genders, making it an excellent strategy for bridging the spatial segregation currently present along the East Dry River and Piccadilly Street, referred to hereafter as the hard edge. The nearest large outdoor area for exercise and recreation for residents living along the hard edge is the Queen's Park Savannah (QPS), which is further away from their dwellings, and lacking in specific programming since it is mostly just an open field. The main daily physical activity at the QPS is running or jogging along its perimeter, varied forms of exercise or play are not common (this thesis does not suggest that the QPS should be upgraded to add playgrounds etc. the QPS is spectacular in its own right). Thus, the hard edge is well-situated to fill this need for varied forms of exercise and play. During the September 2023 town hall meeting a Laventille resident expressed the need for sports and educational programs to help with anger management and the frustration of youth in particular (Dogulas 2023).

There is a lot of evidence that confirms that sports or exercise reduces feelings of anxiety, stress, and anger by burning off pent-up energy and releasing endorphins which alleviate pain and stress and thus improve mood. Some may argue that the presence of a sports and recreation hub does not mean that people will use it. Currently, there are two small to medium-sized trees and park benches in a narrow strip of grass between Piccadilly Street and the EDR. The area is usually unused. Perhaps this is because lively places attract

people and activities, while dull places repel life (Jacobs 1961,90).

By creating direct access to the mid-rise housing adjacent to the river, creating activities within the river canal itself to diffuse its harsh line, and making the programmatic and architectural connection to the Costume Design Trade school, and creative outlets on Prince Street, this hub could attract people. While the relocation of the EDR granted POS the freedom to grow westward it has since been largely underused and under-appreciated for its sacrifice. Its linear, paved nature gives it the properties of a street but its submerged nature and tendency to accumulate garbage renders it unusable. The East Dry River has a strong physical presence, not because of people having a relationship with the water but because of its strong divisive nature. The first option for closing this spatial gap is to simply put the river underground and build over it with amenities and public space. However, to do this would mean to erase the history behind the EDR as well as rob it of the opportunity to be a gathering space like it once was. There has been much research conducted on the cultural, and mental positive effects of urban rivers that justify making them a focal point to be invested into and appreciated and interacted with by the public for the betterment of their well-being. Blue spaces like rivers, lakes, and oceans have the same psychological stress-reducing calming effects as green spaces, and add to the intricacy of the urban environment.

The Sports and Recreation Hub will have indoor and outdoor portions to it that both have access to free wifi (Fig 29). The interior portion will have showers, lockers, and toilets, a cafeteria selling local street foods, and a multipurpose room for multi-media art classes. By inhabiting

the river, there will be more space for inhabitation and play, especially during the dry season from January to May. During the rainy season from June to December, the canal can be less inhibited if there is a risk of flooding. However, water management infrastructure higher up the river can help to minimize extreme changes in water level and help to maintain a more consistent flow. A concrete deck at the base of the river will allow space for rest and play (Fig 30). Vegetation and lighting lining either side of the river will allow for sports activities to continue at night due to the sense of safety that these bring. This area will need regular cleaning and will require minimum closure times for maintenance. The outdoor portion will have play areas with swings sized to fit adults as well as children, circular lounge seating, and tennis, volleyball, and open play courts which can be used for an assortment of activities like skipping, jogging, body-weight exercises, football etc. Trees in-between the courts will provide shading and the circular hanging lounge seating units in the play area will each have their own covering to protect loungers from the sun. The ramps leading into the river canal on either side will provide access to the water so that people can lounge and play at the water's edge. A water level control system of some sort, like a fluke gate system, will need to be incorporated higher up the river canal to regulate the control of the water level to allow for a consistent water flow for the majority of the year rather than the immense fluctuations in water level that are present currently, from a small trickle in the very center of the river, to flooding (Fig 31 and 32).

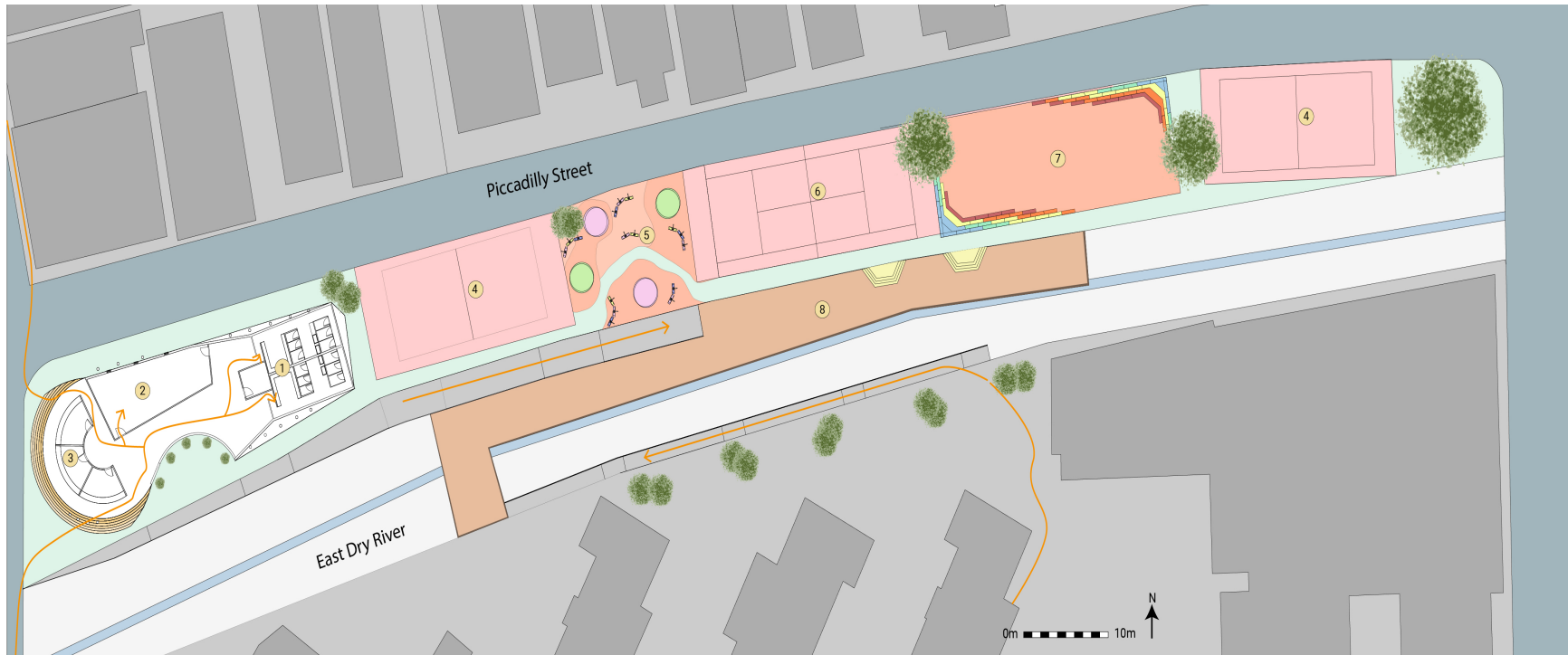


Figure 29: Sports and Recreation Hub floor plan. The orange arrows show the circulation paths throughout the indoor area, and the ramps leading into the river channel.

Program:

1. Change room with toilets, showers, and lockers
2. Multipurpose Room
3. Cafeteria
4. Volleyball Courts
5. Swing and Lounge Area.
6. Tennis Court
7. Open Play Court
8. Play and Lounge Area in river channel.

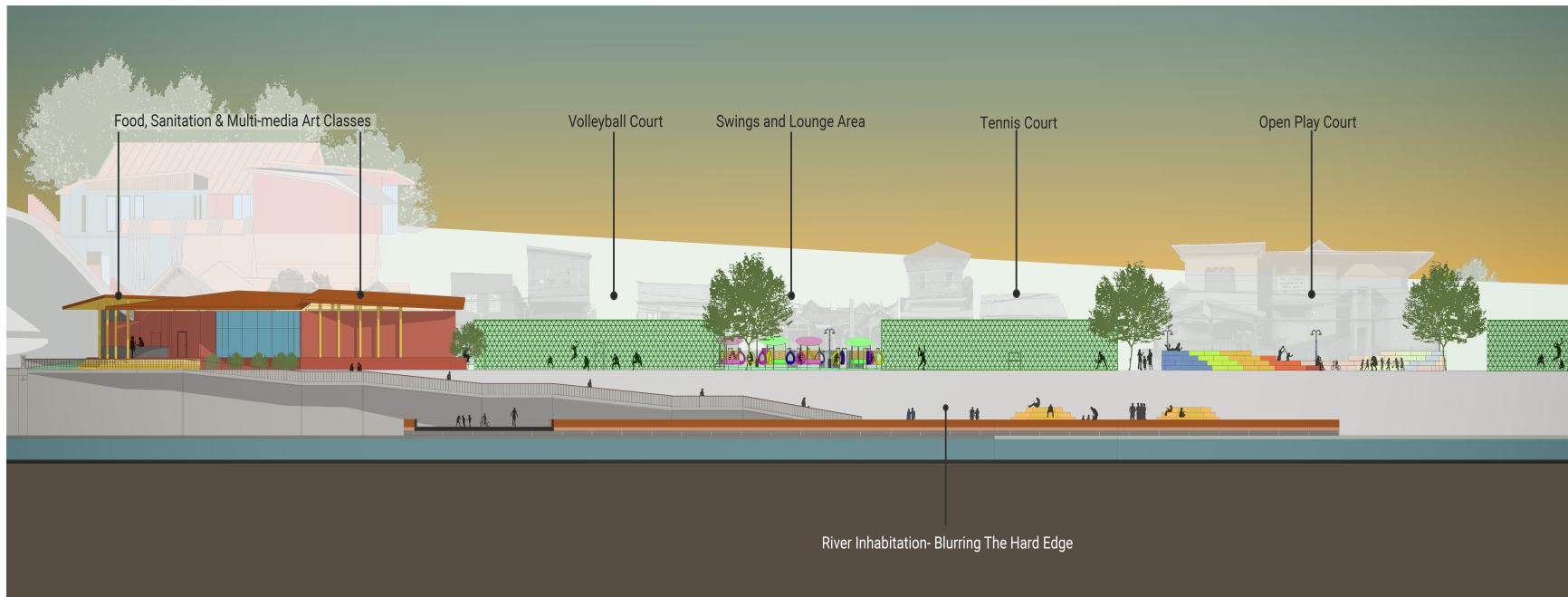


Figure 30: Activities and infrastructure occurring along the east dry river. As illustrated, the concrete deck within the channel is suitable for recreational activities like bike riding and skating.

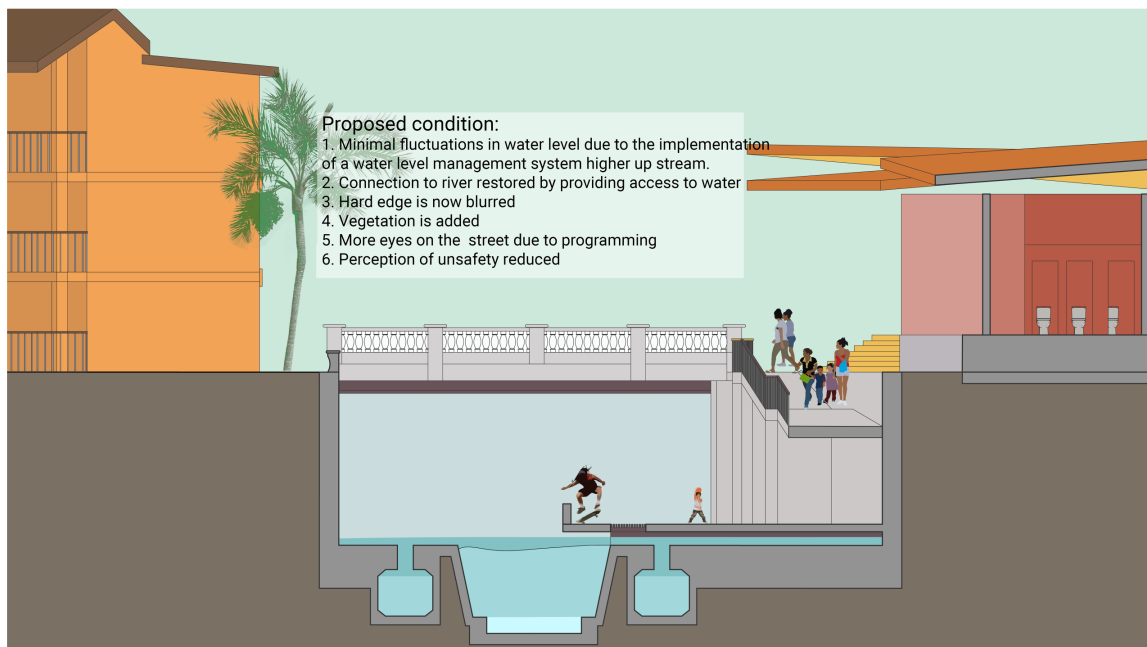
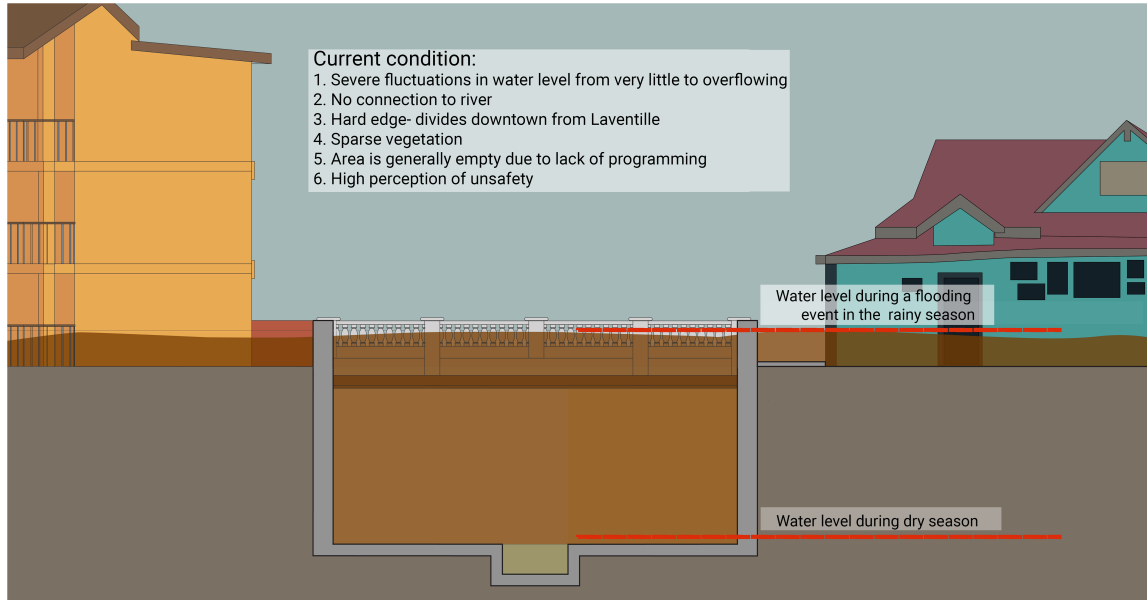


Figure 31 and 32: Current river condition and proposed river condition

Designing for Women and Girls

The Sports and Recreation hub will consider the social barriers women and girls face in public outdoor spaces, and how thoughtful design in architecture can help create spaces for them. Trinidad has a history of violence against women and the hard edge is an area stereotypically associated with unsafety since it marks the beginning of Laventille which has had a history of higher crime rates. Therefore, any public programming in this area must prioritize safety, especially that of women. In 2022 the United Nations Development Program published an article called *Cities Alive: Designing Cities That Work for Women* that began by emphasizing the fact that designing with women in mind not only benefits women but positively enhances the experiences of everyone interacting in public spaces and should therefore be implemented into any design strategy involving the public realm (UNDP 2022, 7). Most urban planners, policymakers, and architects who designed many of the cities that exist today were men. Thus, many cities reflect their biases in transportation routes and structures, public amenities, and recreational facilities. There is a need for diverse and flexible use of public space, inclusive play, and access to high-quality safe, and clean washrooms. Flexible space addresses the need to collaborate and socialize in groups and alter the layout to suit personal need. The second point highlights the concerning statistic that after the age of eight, boys use parks 4 times as much as girls (Walker and Clarke 2023, 4). These parks although not designed to favor a certain gender, are over-dominated by men and boys making them intimidating for everyone else. Introducing mixed-used outdoor spaces that cater to different forms of play, like swinging for example and open play courts where

a variety of activities can happen, increases outdoor usage to a wider range of people.

Figure 33 shows an example of public spaces that girls and women would prefer to use, that encourage communication, collaboration, and fun. It is based on community-based research that architect Susannah Walker conducted in the UK and elsewhere (Walker and Clarke n.d.) Circular seating arrangements allow groups of people to talk facing one another more comfortably than linear park-bench style seating (Walker and Clarke n.d) Adult-size swings encourage rest and play for adults, something that many adults no longer prioritize, but can greatly increase our feelings of well-being. These small moves implemented in the outdoor landscape at the sports and recreation hub will enhance user experience and overall feelings of happiness and well-being (Fig 34).



Figure 33. Circular swinging seating. Research by Make Space for Girls.

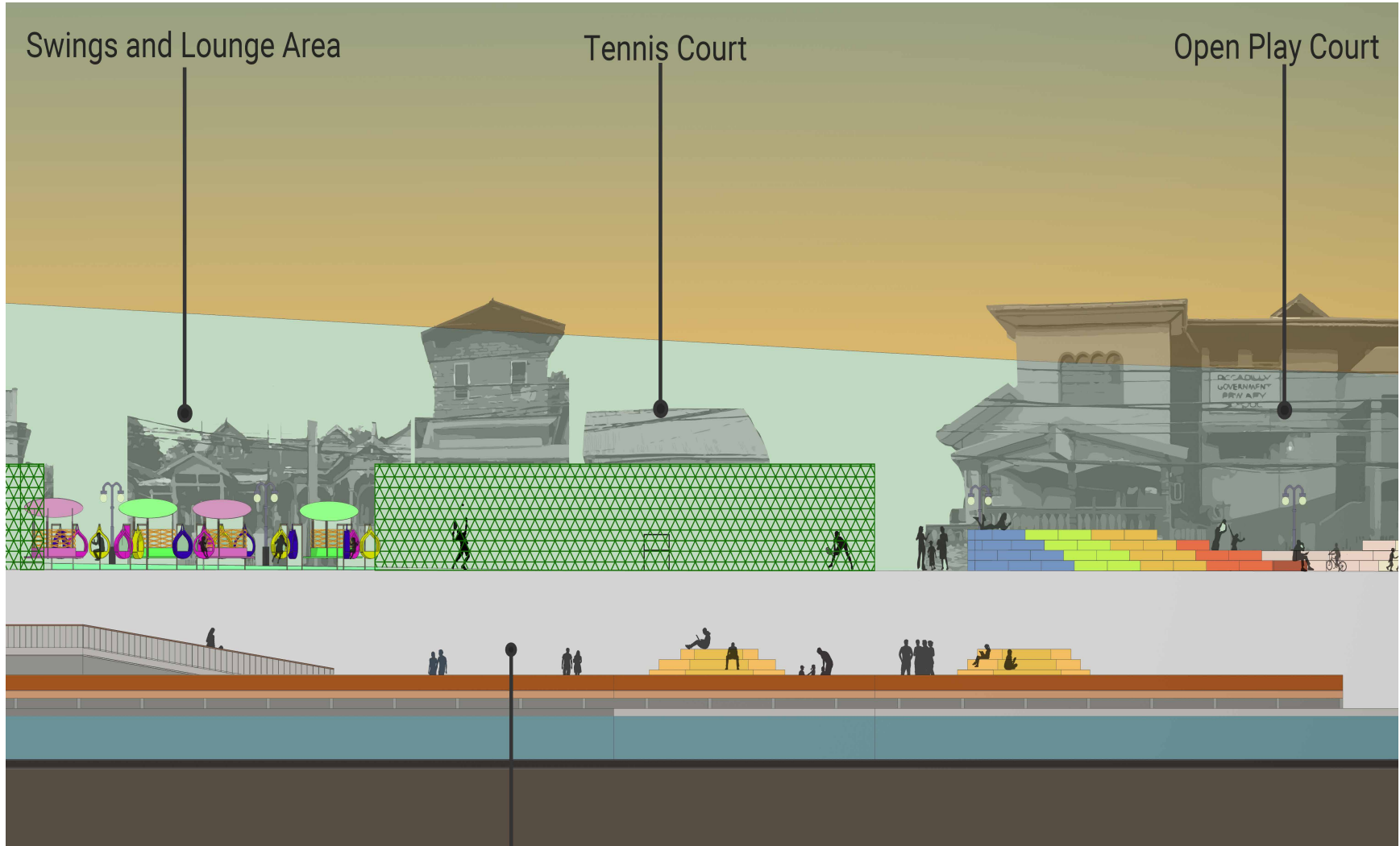


Figure 34: Zoomed in section showing swings, circular lounge seating and open play court at the sports and recreation hub.

Costume Design Trade School

Carnival in Trinidad and Tobago was birthed in East Port of Spain in the hilly towns of Belmont and Laventille. The original metal work for costumes and the globally acclaimed steel pan instrument were borne from these impoverished towns of ex-enslaved and free coloreds. Costume design and the public street performances of revelers in costumes are part of a local art where stories of past and present socio-political events are portrayed, fantasies are brought to life, and collective joy is ignited. The traditional art of costume creation is a dying craft that is at risk of being lost from Trinbagonian culture because not enough avenues for passing on this knowledge is being created. Residents in Laventille have pleaded for more trade schools to help with the unemployment issue, one resident lamented that the Morris Marshall community center had been dormant for years when once it had trained people in trades (Dogulas 2023).

Considering that Laventille alongside Belmont was the birthplace of carnival and all the costumes and traditions associated with carnival, Laventille is a suitable location to locate a costume design trade school to fill the need for sustaining the lucrative traditional craft of costume design. There were several well-renowned costume makers in East POS during the 1930s and 1940s such as the self-taught copper master Ken Morris and mas (costume band) designer Wayne Berkeley. Morris was famous for treating costume design as fine art creating realistically rendered metalwork, and repoussing, an art whereby metal sheets are heated into curvilinear or spherical shapes (NALIS n.d.). Wayne Berkeley produced 18 mas bands, meaning he designed and created the themes and costumes for

masqueraders from 18 different bands (NALIS n.d.). He was also awarded the highly prestigious national award, the Humming Bird Gold Medal, for his contribution to the development of Carnival (NALIS n.d.). The steelpan, the most played and enjoyed instrument during carnival, was created in East Port of Spain in Laventille in the 1930s when locals who typically hit scrap metal drums cans, and tins with sticks as percussion instruments noticed that the scrap metal developed new pitches or sounds after being repeatedly struck (BBC News 2012). While East POS has been the creative catalyst that drove carnival forward and gave it its popularity, the costume design techniques unique to Trinbagonian Carnival are being lost as the wire-bending knowledge is not being passed down quickly enough leading to labor shortages which is forcing band leaders to look elsewhere for costumes in countries with cheaper labor like China (Kong Soo 2023). The lack of documentation on how to wire bend is also a culprit (Noel 2015, 357). Swami Jeffers, a wire bender of over 20 years, expressed the urgency for a wire bending center in East POS for artistic and creative youths, stating that this was necessary to secure the future of traditional costume design in Trinidad (Fraser 2011). Without a large skilled labor force skilled in wire bending Trinidad and Tobago's carnival traditions will be lost to globalization and standardization. Trinidad and Tobago's carnival would risk losing its uniqueness, becoming less and less distinct from carnival celebrations elsewhere. The King and Queen of the Bands competition in particular would greatly lose its significance since the large 20ft or higher costumes largely use traditional/local design techniques and are highly symbolic of local craft and ideas, thus cheap production abroad would not be very feasible.

Knowledge sharing of local costume design techniques is therefore necessary for sustaining the historical culture and uniqueness of Trinidad Carnival, and there is also the opportunity to create more jobs for artistic locals. This brief synopsis of the contribution of East POS and Laventille to Trinidad Carnival, and the need for knowledge sharing in costume design justifies the proposal for a costume design trade school to be in Laventille East POS.

A costume design trade school in Laventille would be a retroactive approach because it addresses the community's need to have spaces for further learning, and this further learning fills the costume design labor gap in Trinbagonian culture, a gap that ties directly back to the history of Laventille.

Figure 35 shows a section through the proposed trade school, figures 36 and 37 show the layout of program, and figure 38 shows the building's form. The upper level, level 1 (Fig 37), will consist of two costume design studios (Fig 40) with material storage areas, a kitchen and lounge area with access to a garden, and a collaborative workshop space that can also function as a meeting room. Level 1 would be private and accessible only to students and mentors. The ground level below, would be more public (Fig 36). The courtyard will be the gathering spot for display showcases of student's costume designs and will function as a stage (Fig 39). Fold-out chairs can be erected in the courtyard to comfortably seat a crowd of people during such events, but onlookers can also view displays from the balcony on level 1, the terraced courtyard seating, or the street. The ground level will have water storage tanks, to help make up for water shortages. All other spaces on the ground floor can be tailored to the needs of the users at any given

point in time. There will also be a fitting room and rehearsal space that will be used as a community space, and a shed that local vendors can use during weekend markets to sell their produce and crafts (Fig 41). The building materials are steel, wood, and concrete. The steel fins that make up part of the roof and frame the exterior walls in a slanted and bent manner were inspired by the wire bending art while still being simple and easily buildable. The wooden slats to the top of the walls allow for cross-ventilation across the interior spaces and add texture and warmth. These materials and forms will be repeated at the Sports and Recreation Hub so that visually the two nodes read as different portions of the same project in an architectural way-finding manner.

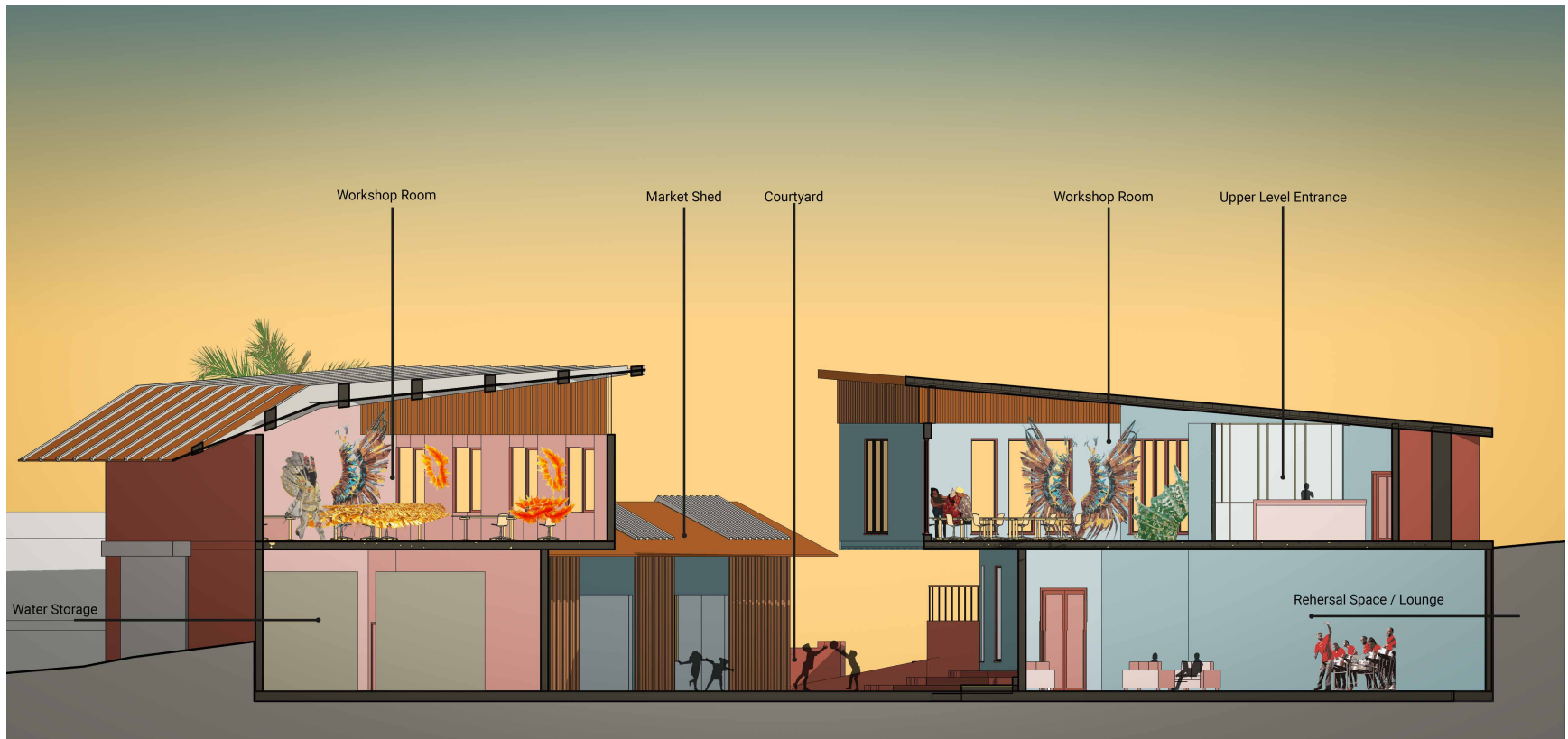


Figure 35: Section through the Costume Design Trade School in Laventille.



Figure 36: Costume Design Trade School ground floor plan. The yellow arrows show circulation paths throughout the site and the red arrow highlights the openness of the courtyard to the street.

Ground Floor Program:

1. Bathrooms
2. Courtyard/Stage
3. Storage Room
4. Water Tank Storage
5. Market Shed
6. Fitting Room and Rehearsal Space
7. Community Space



Figure 37: Costume Design Trade School Level 1 floor plan. The yellow arrows show circulation paths throughout the site.

Level 1 Program:

1. Bathroom
2. Kitchenette and Lounge
3. Design Studio
4. Collaborative workshop space/meeting room
5. Garden

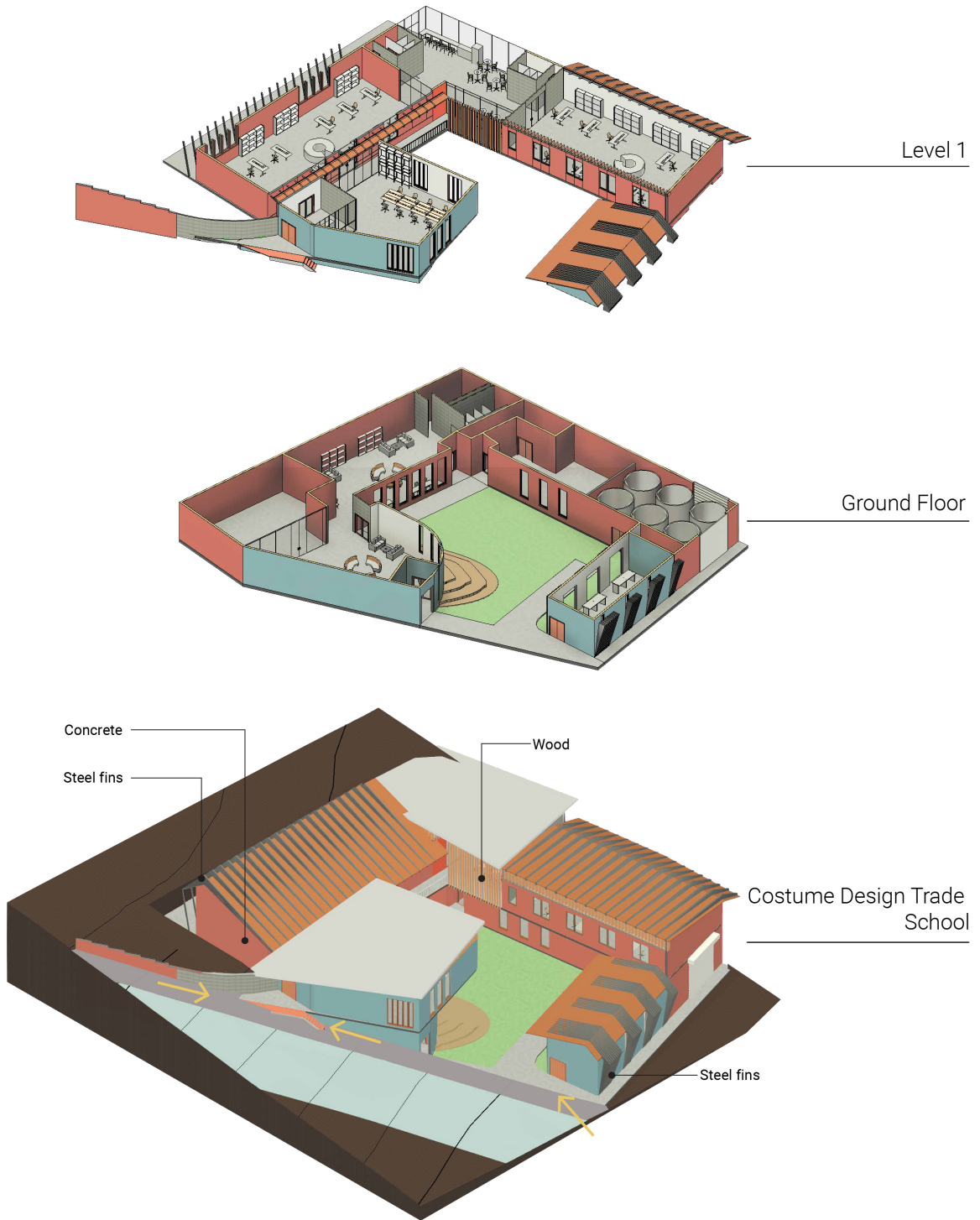


Figure 38: Exploded axonometric of the Costume Design Trade School showing the building's form. The yellow arrows show how one would enter the building.



Figure 39: Display showcase event of students' work in the courtyard.



Figure 40: Student creating costume in the design studio.



Figure 41: Vendors selling goods from the market shed.

Chapter 7: Conclusion

New public infrastructure like the ones proposed in this thesis can only truly be successful if the existing social fabric is one that exudes safety, and respect for individuals. The 2016 National Crime and Victimization Survey reported that nationwide, most people feel most unsafe on the streets of their community at night. However, this number reduced during daytime hours (only 13.3% of people felt unsafe during the day), but for some areas like East Port-of-Spain feelings of unsafety are more commonplace at any time throughout the day (27.8% of people felt unsafe during the day) (Citizen Security Programme Ministry of National Security 2016, 31). The most common behavioral strategies to reduce the probability of exposure to crime due to fear were limiting shopping (7.1 % of the nation) and limiting recreation activities (7.4% of the nation) (Citizen Security Programme Ministry of National Security 2016, 33). The point here is that community engagement in public spaces will always be limited and below maximum capacity if the public does not feel safe. Architecture and urban design strategies such as the ones discussed in this thesis have a role to play in making public spaces feel more inviting, but architecture and infrastructure alone cannot eliminate all the ills of society. Intervention at the domestic and governmental levels is needed to create outdoor spaces and community spaces that are occupied, utilized, and appreciated in their fullest capacity.

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