Port of Tallinn Redevelopment Strategies

DES 3353: Advanced Seminar in City Form: Designing for Multimodal Mobility

Harvard University, Graduate School of Design

Prof. Andres Sevtsuk

December 2016

Content

Introduction	**3**
Purpose	3
People	4
Literatures	5

Case Study Analysis	**6**
Kalasatama, Helsinki	6
HafenCity, Hamburg	26
Marina Bay, Singapore	38
Boston Waterfront District	68
Vacouver Harbour	86
Nordhavnen, Copenhagen	183

Redevelopment Strategies	**221**
Builtform and Land Uses	221
Public Transit Networks	241
Walkability and Public Space	273
Real Estate Potential	284
Cars, Roads, and Parking	308

Introduction

The Advanced Seminar in City Form in the fall of 2016 at the Harvard Graduate School of Design explored redevelopment strategies for Tallinn Harbor. Our attention was primarily focused on multi-modal mobility, exploring ways in which the relatively heavy presence of large steamships and port related passanger movements could seamlessly co-exist with place-based pedestrian, vehicular and public transit movements. We recognize that the redevelopment of the harbor presents a unique opportunity for the city to implement a more pedestrian and transit oriented, mixed use and mixed income urban environment than many of the city's new developments in the past two decades have been able to achieve. And while moving passangers and vehicles has been a cornerstone of the economic productivity of the port in 20th century, a more diverse program of activities, including port operations, but also live, work, play and recreational spaces for all income groups and demographics in Tallinn will be strategically important for the next phase of a service-oriented technology and enterpreneusrhip economy that the city and the country are transitioning towards.

The seminar consisted of three parts. First, students examined a series of readings on urban mobility and urban design, particularly exploring strategies and tacties that other cities have used to improve their public transit and pedestrian mobility choices. This reading list is presented below. We then analyzed a series of case-studies in water-front redevelopmen in other cities, including Boston Waterfront District, Vancouver Harbor, Helsinki's Kalastama, Copenhagens Nordhaven, Singapore's Marina Bay and Hamburg's Hafen City. In addition to critical analysis of their urban designs schemes, the students also performed quantitative spatial network analysis of both public transit and pedestrian accessibility in in each these recent redevelopment projets.

Finally, the students organized into five teams to examine different and complementary redevelopment questions for the Tallinn Harbor. Given the academic context of the study, we decided to take a long-term view of the port and assumed that current truck and vehicle passangers will be moved from the Old harbor to the Port of Muuga in the future. This important shift would drastically reduce the unpleasant presence of traffic in the port area and opens up large swaths of extra space for urban regeneration. Furthermore, the elimination of vehicle and truck passangers from the Old Harbor makes it possible to move all ferry piers from the current enclosed bay to the northern part of the site, next to the current cruise terminals. Such as shift would open up major opportunities to redevelop the entire waterfront edge around the current passanger ferry piers, tying Tallinn's city center with water in a direct and impactful manner.

Under such a scenario, the examination of redevelopment case-studies from other cities suggested that in the long run, it would also be possible to implement a new bridge over the eastern edge of the inner harbor, connecting the northern harbor with the tip of kadrior. This has positive benefits for people's movement around the area, enabling access to relocated ferry piers from both sides of the city. At the same time, a loop around the inner harbor would also present Tallinn with a historic opportunity to have a continuos waterfront from Pirita to Noblesser, with amazing views of the Old Town and the rest of the city center from the newly opened inner harbor.

The first group of students focused on built form and land use strategies, poviding an overall spatial framework for the site that all the other groups could reference. The scond group dealt with public transportation questions and focused primarily on how to best connect the port area with the rest of the city center and beyond using the tramway system. The third group focused on walkability and public spaces and studies which types of pedestiran uses and connections could best integrate the port area with the surroundding urban environment. The fourth group examined the real-estate potential of the site, investigateing the current development market in Tallinn, potential vallue propositions presented by residential, office and retail projects as well as their potetial absobtion times. Given the size of the site in the context of Tallinn, we envision a 25-year or even longer absorption period for newly built space in the port. Finally, the fifth group focused on the role of cars and parking. Particular attention was focused on assessing the options for bus and taxi pick-ups in the relocated northern harbor, where steamships with pedestrian passengers arrive, and on the feasibility of multy-story shared parking structures as part of public-private partnerships around the commercial corridors of the site.

These site investigations were developed in the last five weeks of the semester and do not reflect full-fledged and throuroughly detailed proposals for the port. However, they are intended as schematic studies, revealing both the civic and economic potential that the future of the harbor holds for Tallinn in the 21st century.

Andres Sevtsuk

People

Instructor

Andres Sevtsuk
Assistant Professor of Urban Planning
Contact: asevtsuk@gsd.harvard.edu

Teaching Assistant

Hao Ding
Master of Design Year 2

Students

Antara Tandon
Master of Urban Planning Year 2

Betty Vuong
Master of Design Studies Year 1

Cesar Castro
Master of Urban Planning Year 2

Fan Wang
Master of Architecture Year 3

George (Djuro) Bartulica
Master of Design Studies Year 2

Longfeng Wu
Doctor of Design studies Candidate Year 3

Maria Gloria Robalino
Master of Landscape Architecture Year 3

Ramon Gras Aloma
Master of Design Engineering Year 1

Yonghui Chen
Master of Design Studies Year 1

YungHyun Woo
Doctor of Design Studies Candidate Year 3

Yuyun Yin
Master of Architecture Year 4

Course collaborator

Ahto Ader
Business Manager, Real Estate development in Old City Harbour. Tallinn, Estonia.

Literature

Cervero, R. (1998). *The Transit Metropolis. A Global Inquiry.* Island Press. Chapter 3: Public Policies and the Sustainable Transit Metropolis. pp. 62-105

Cervero, R. (1998). *The Transit Metropolis. A Global Inquiry.* Island Press. Chapter 5: The hand-shaped metropolis. Copenhagen, Denmark. pp. 132-153

Cervero, R. (1998). *The Transit Metropolis. A Global Inquiry*. Island Press. Chapter 6: The masterplanned transit metropolis. Singapore. pp. 155-180

Cervero, R. (1998). *The Transit Metropolis. A Global Inquiry.* Island Press. Chapter 11: Creating first-class transit with transit-first policies. Zurich. pp. 299-317

Cervero, R. (1998). *The Transit Metropolis. A Global Inquiry.* Island Press. Chapter 12: Trams, trains and central city revitalization. Melbourne. Pp. 319-339.

Cervero, R. (1998). *The Transit Metropolis. A Global Inquiry.* Island Press. Chapter 16: Drawing lessons and debunking myths. Pp. 402-414.

Downs, A. (2004). *Still Stuck in Traffic. Coping with Peak-Hour Congestion.* Washington, D.C.: Brookings Institution Press. Chapter 11: Demand Side Behavioural Tactics. pp. 180-199.

Downs, A. (2004). *Still Stuck in Traffic. Coping with Peak-Hour Congestion.* Washington, D.C.: Brookings Institution Press. Chapter 12 Remedies that Increase Densities. Pp. 200-227.

Gehl, J. (1987). *Life between buildings: using public space.* New York, Van Nostrand Reinhold. Places for Walking, Places for Staying. pp. 129-196.

Sadik-Kahn, J., Solmonow, S. (2016). *Street Fight. Handbook for an Urban Revolution.* Viking Press. Chapter 3, Setting the Agenda. Pp. 33-45.

Sadik-Kahn, J., Solmonow, S. (2016). *Street Fight. Handbook for an Urban Revolution*. Viking Press. Chapter 4, How toRread the Street. Pp. 47-71

Speck, J. (2013). *Walkable City. How downtown can save America one step at a time.* North Point Press. Part 2: Ten steps of walkability. pp. 65-159

Walker. J. (2011). *Human Transit: How Clearer Thinking about Public Transit Can Enrich Our Communities and Our Lives.* 1St Edition. Island Press. 256p. Chapter 5, Touching the City: Stops and Stations. pp. 59-71.

Case Studies Analysis

Kalasatama | Helsinki

Antara Tandon | Betty Vuong

Introduction



Facts about Helsinki City

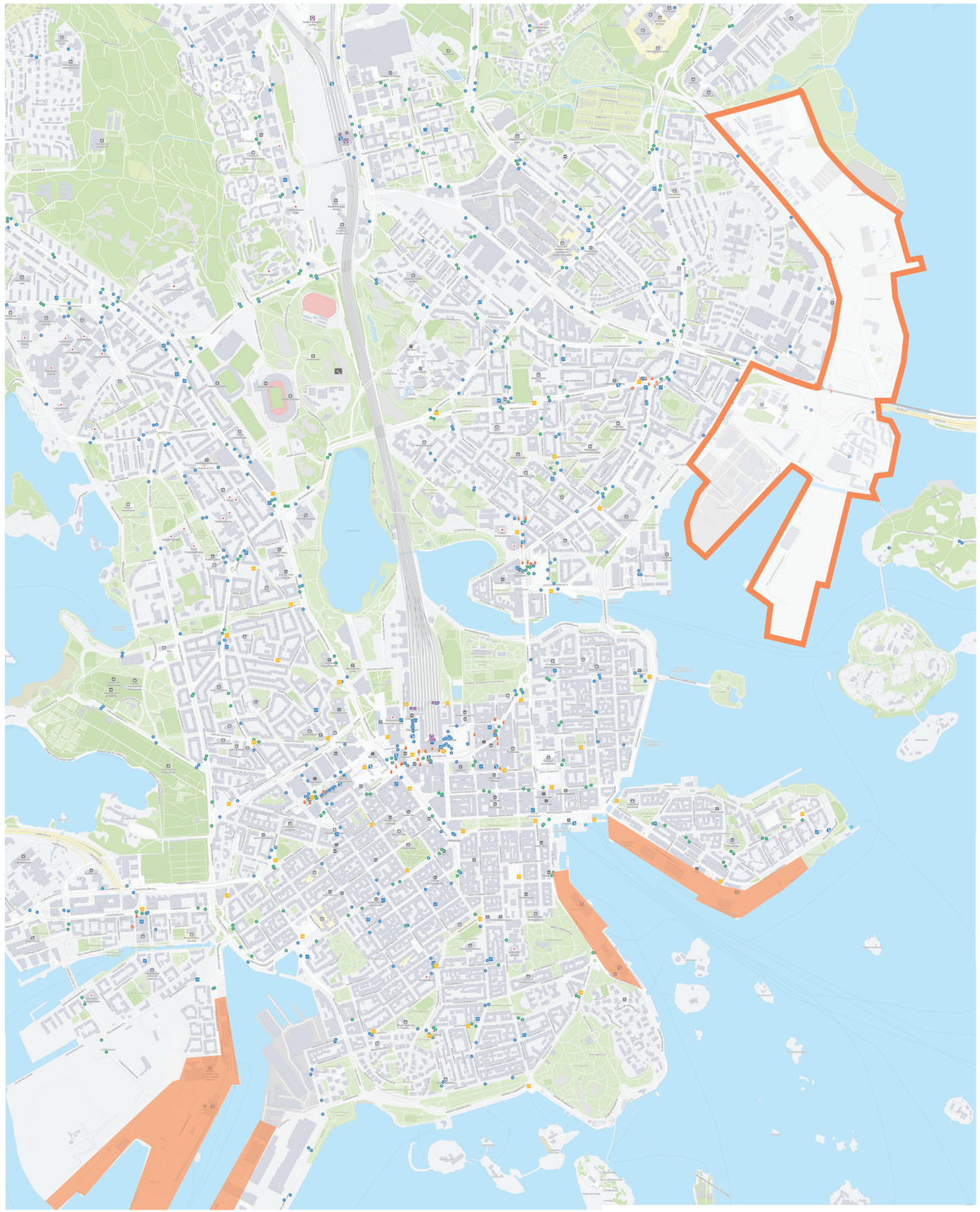
Capital of **Finland**

Area **715.49 sqkm**

Population **629,512**

Urban density **1,460.7/ sqkm**

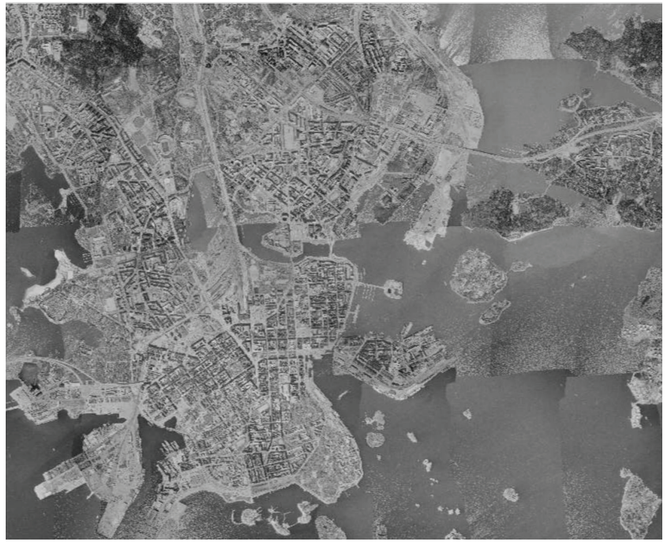
Helsinki City has primarily three modes of public transport- metro, bus and tram.



Historic Evolution of Waterfront Area



1943



1969



1988

The site has over the years been developed by filling land into the sea. Currently, the area is zoned mostly for industrial purposes and is largely under-developed.

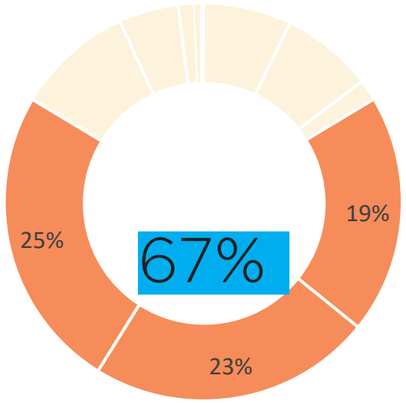


2001

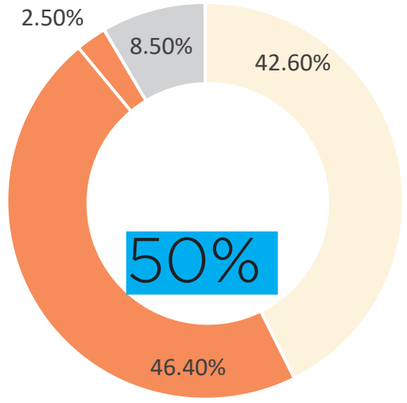


2015

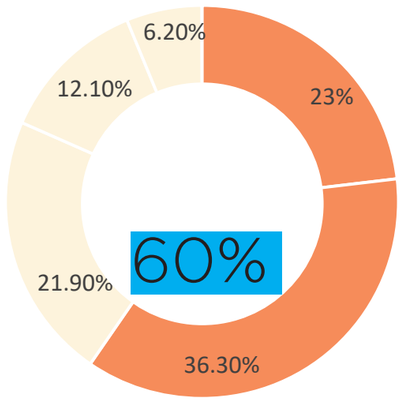
POPULATION



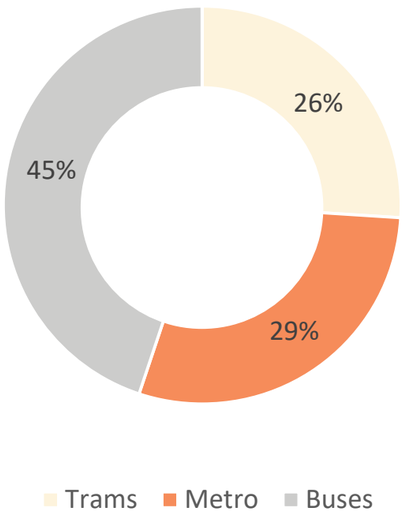
TENURE



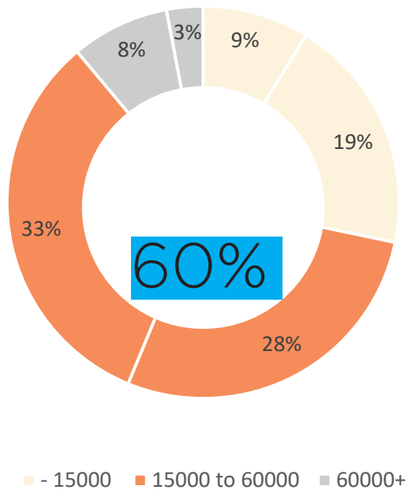
DWELLING UNIT



PUBLIC TRANSIT MODE SHARE



INCOME



Geographic Context

Regular route traffic from Helsinki to Stockholm, Tallinn, and St. Petersburg. Over 300 cruise ships and 360,000 cruise passengers visit Helsinki annually.

Helsinki is the second busiest passenger port in Europe with approximately 11 million passengers in 2013

The port of Kalasatama has been a long-standing forerunner in development of Helsinki. In the 1800s, Helsinki was only a small city of a few thousand inhabitants situated within woodlands. As such, it became a safe haven for factories, which led to the need for a port. Kalasatama was poised with good sea routes, and a close proximity to industrial quarters. In 1874, the port of Kalasatama was founded. In effect, the port boosted the economy and gave birth to other suburban housing districts, including Kallio and Hermanni. Port operations ended in 2008, just prior to the start of construction on the new housing development in 2009.









KEY STATISTICS

Land Area **177 ha**

Floor Area **1,350,000 sqm**

Shoreline **5 km**

Residents **18,000**

Jobs **8000**

Construction Years **2009-2035**

Planning

The City of Helsinki introduced their most recent planning ambitions “Helsinki 2030,” as a remodelling campaign within the confines of its own city limits. It figures prominently design consultancy and citizen involvement, especially within the city’s new seaside developments.

Significantly, the city plan runs integrally with its “smart cities” programme, Fiksu kaupunki. The Finnish Funding Agency for Technology and Innovation challenged Finnish cities and enterprises to develop new solutions for smart urban environments in the “smart cities” programme. Together they make up a comprehensive commitment to incorporate innovation in design, delivery method, and construction processes.



Heights

Residential 4-6 floors

Commercial 10-32 floors

Gross FAR **0.8**

Block FAR **1.8**

Density **10,170 persons/ sqkm**

Also important to note is that the Kalasatama development is designed with multiple housings types, from floating houses on concrete pontoons to terrace houses. It will also consequently offer multiple modes of living with a variety of ownership structures, including private ownership, student housing and co-housing.



Network

Roads & Sidewalks

Metro

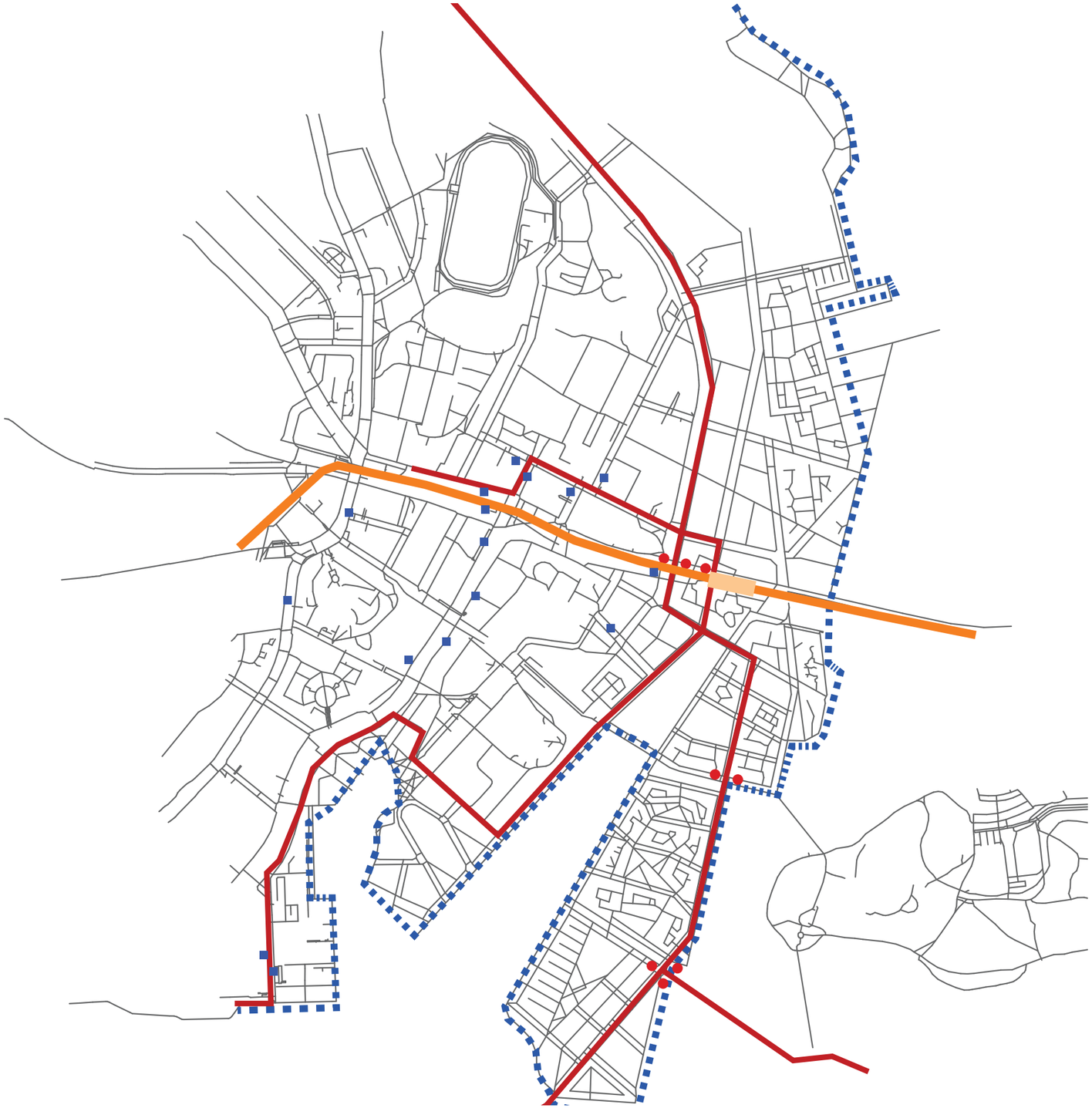
Kalasatama City Center

Tram

North- South

Bus

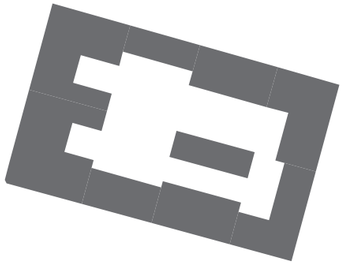
Shoreline



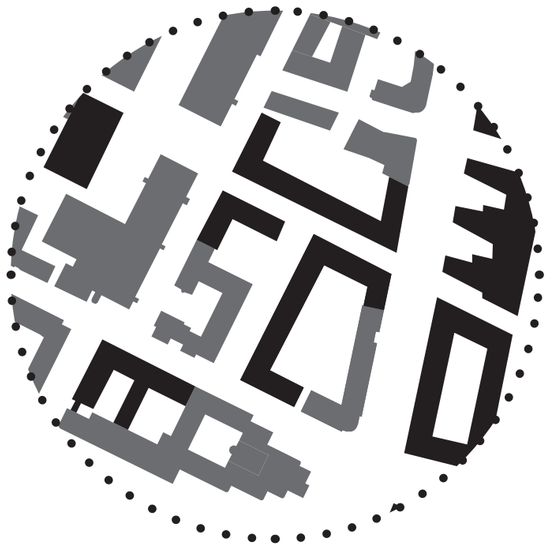
Block Size and Density



Existing



65 m X 110 m



In-fill



75 m X 130 m



Proposed



55 m X 100 m

Transit Points



Metro

Tram

Bus

Proposed Buildings with Centroids

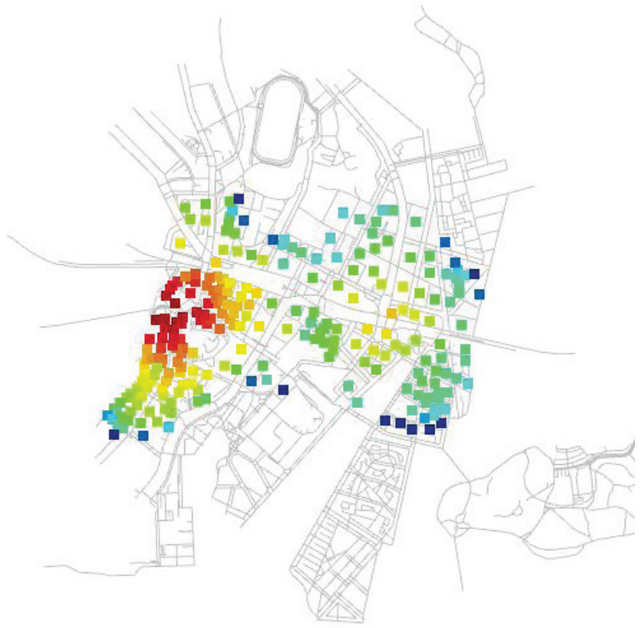


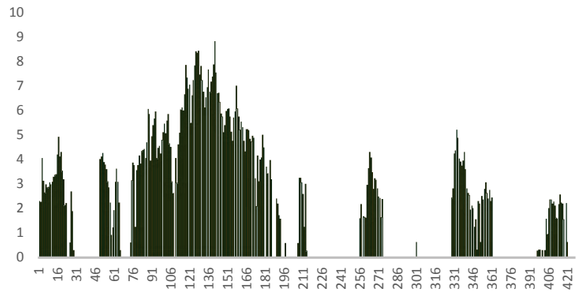
GRAVITY ANALYSIS

Metro

Metro serves the regional demands of Helsinki and brings people into the Kalasatama City Center at a 600 m walking radius

Greater gravity is seen near the existing, older part of town as compared to the new proposed development

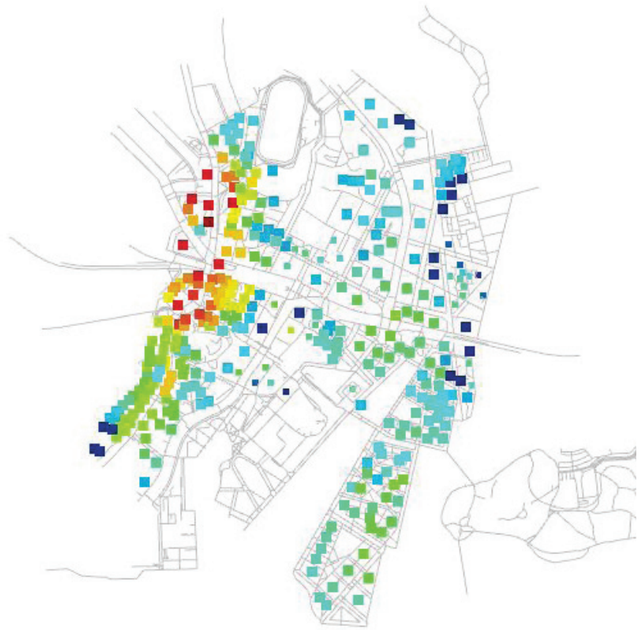


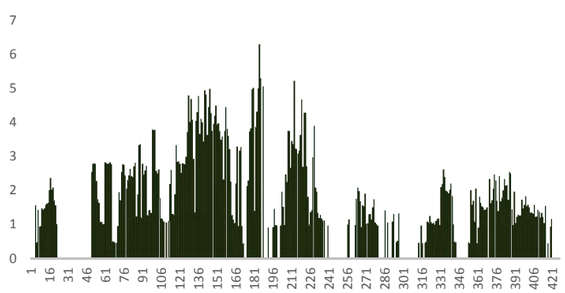


Tram

Tram serves the North-South axis of the Kalasatama peninsula connecting the City Center to the residential areas at a 200 m walking radius

Greater gravity is seen near the existing, older part of town as compared to the new proposed development

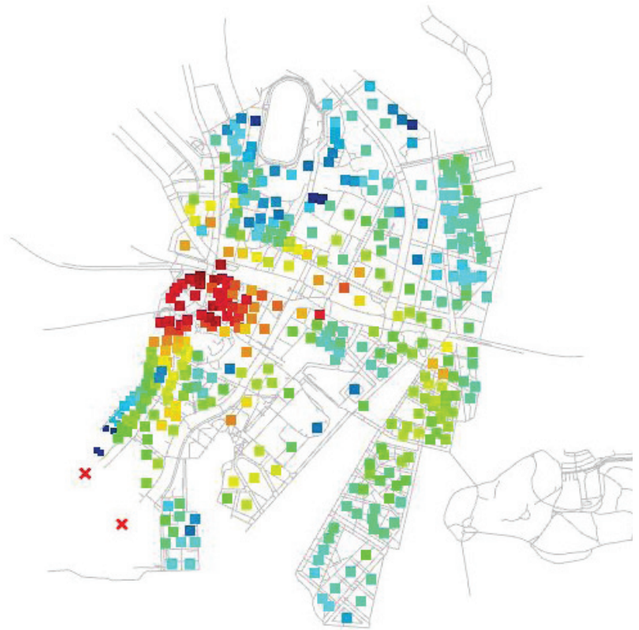


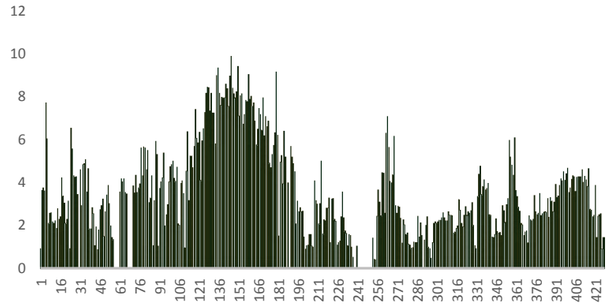


Bus

The bus network extensively reaches all the development of Kalasatama at a 100 m walking radius

Greater gravity is seen near the existing, older part of town as compared to the new proposed development





GRAVITY ANALYSIS

All Public Modes

Weights:

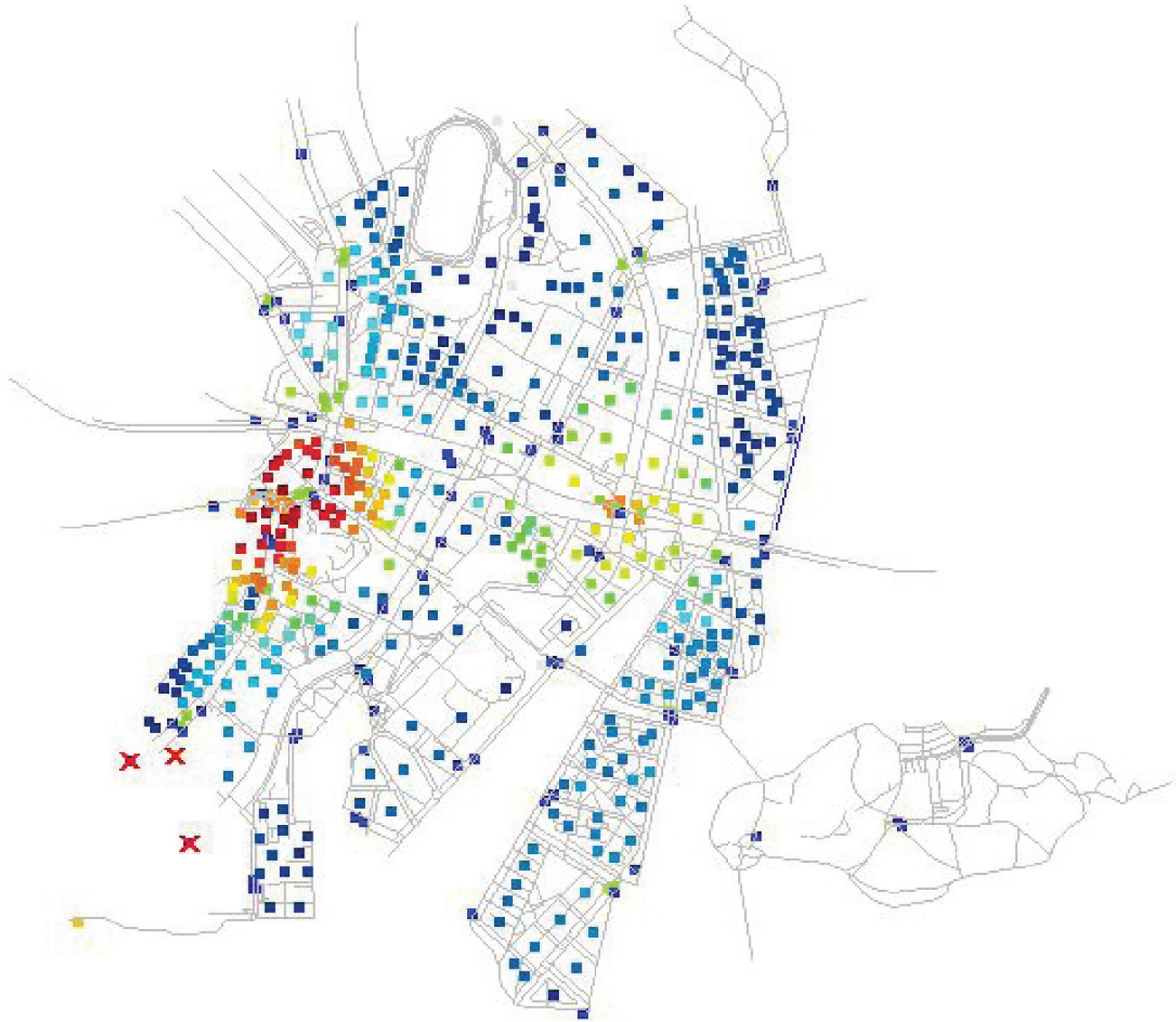
Bike: 20

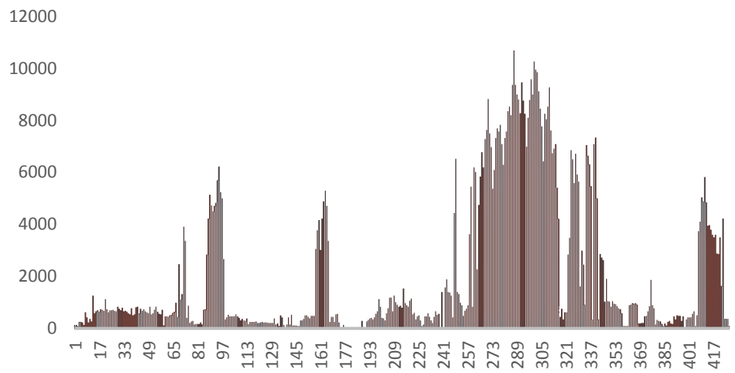
Bus: 100

Tram: 200

Metro: 1000

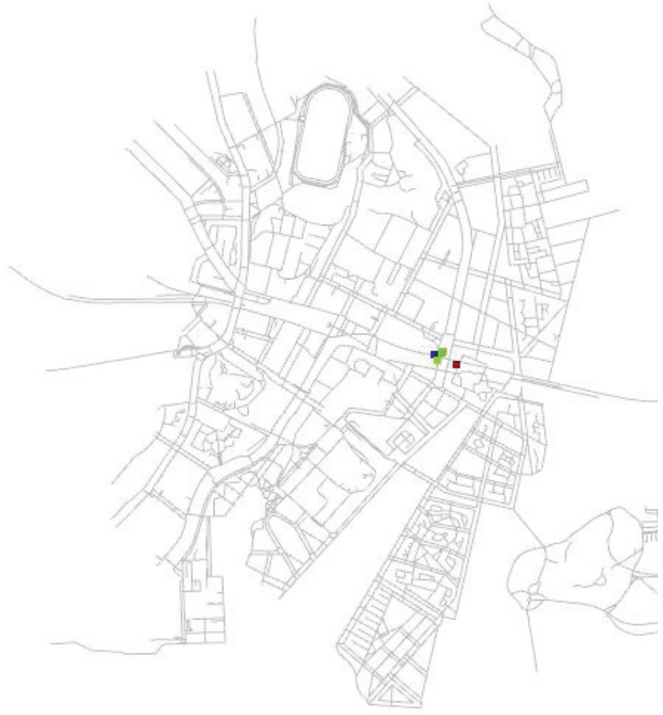
Greater gravity is seen near the existing, older part of town as compared to the new proposed development

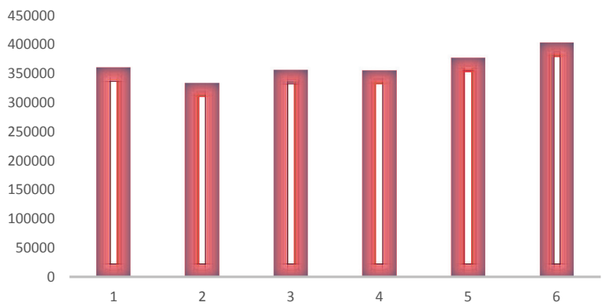




Metro GFA Capture

The only metro stop in Kalasatama City Center captures a high GFA

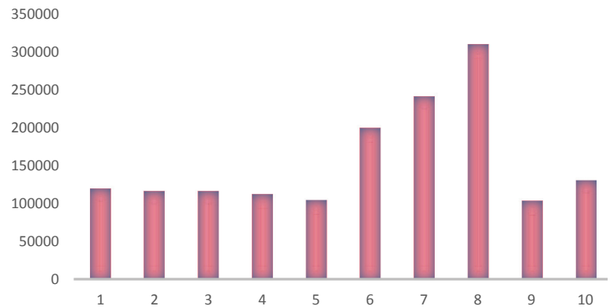




Tram GFA Capture

The tram stops, as expected captures a greater GFA near the City Center as compared to its stops in the lower density residential development

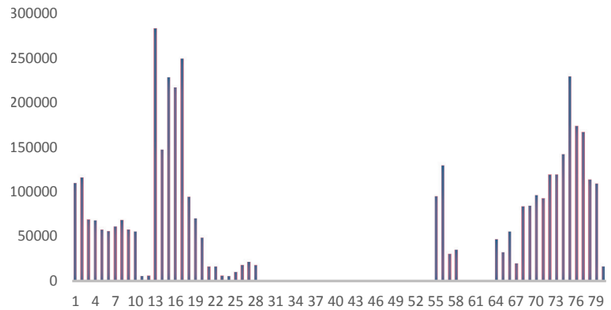




Bus GFA Capture

The bus stops near the city center capture maximum GFA followed by the residential developed in the proposed part





BETWEENNESS ANALYSIS

Metro

The main streets leading to the metro station are along the central open space

Tram

Some of the smaller residential network gets highlighted for tram access

Bus

A larger network of streets give access to the bus stops



Betweeness
origin: buildings
destination: bus station + stops
weight: # of people (GFA/1.8 sqm)
detour ratio: 1
search: nearest

with observer points

User Profile 1

Origin



Live in a **2-room** dwelling unit

25 to 35 years

Euro 100,000 each

Takes public transit





Origin



400 m Service Area



400 m Walkshed



1 km Walkshed

User Profile 2

Origin

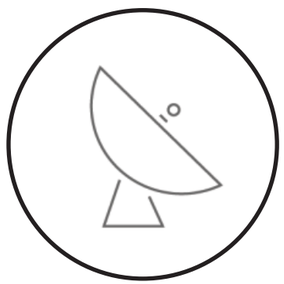


Live in a **1-room** dwelling unit

20 to 25 years

Euro 40,000

Takes public transit





Origin



400 m Service Area



400 m Walkshed

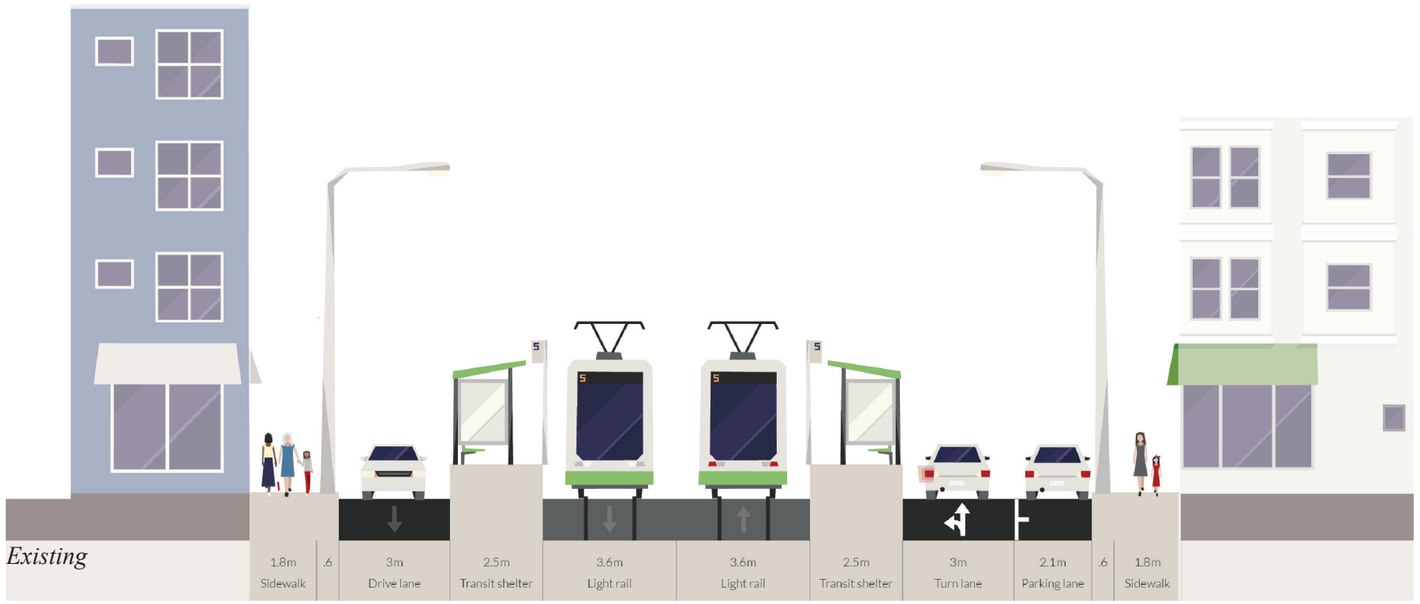


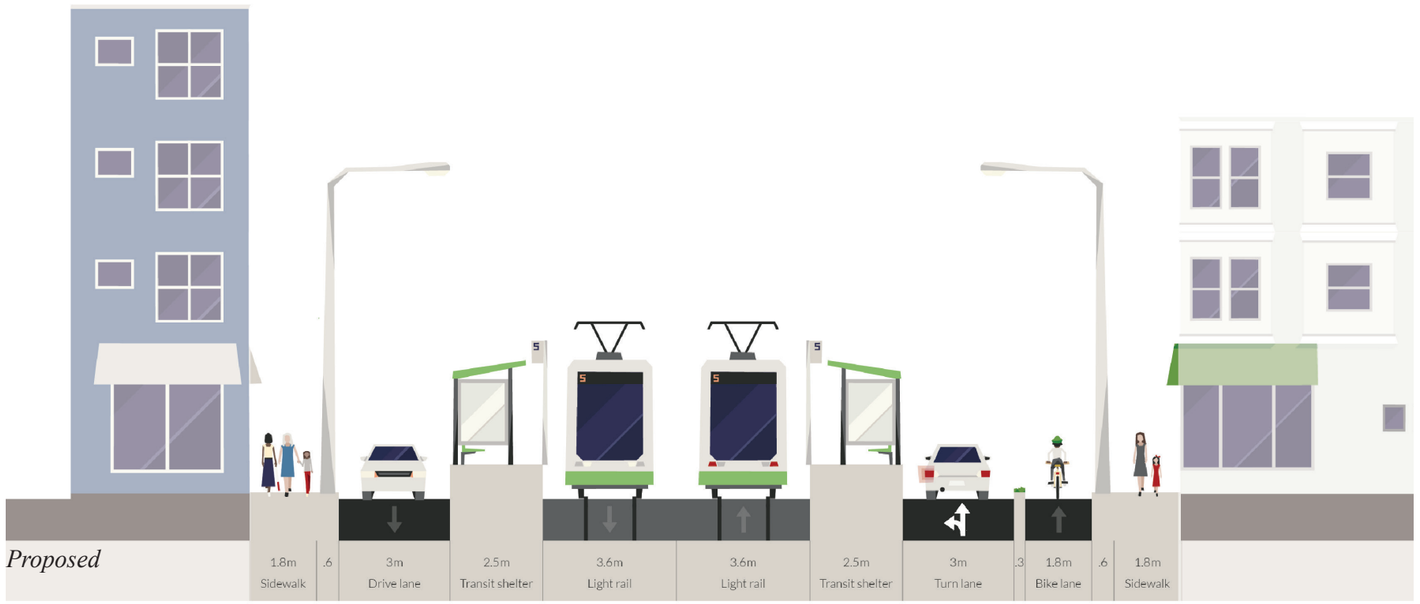
1 km Walkshed

Street Section

24 m Right of Way



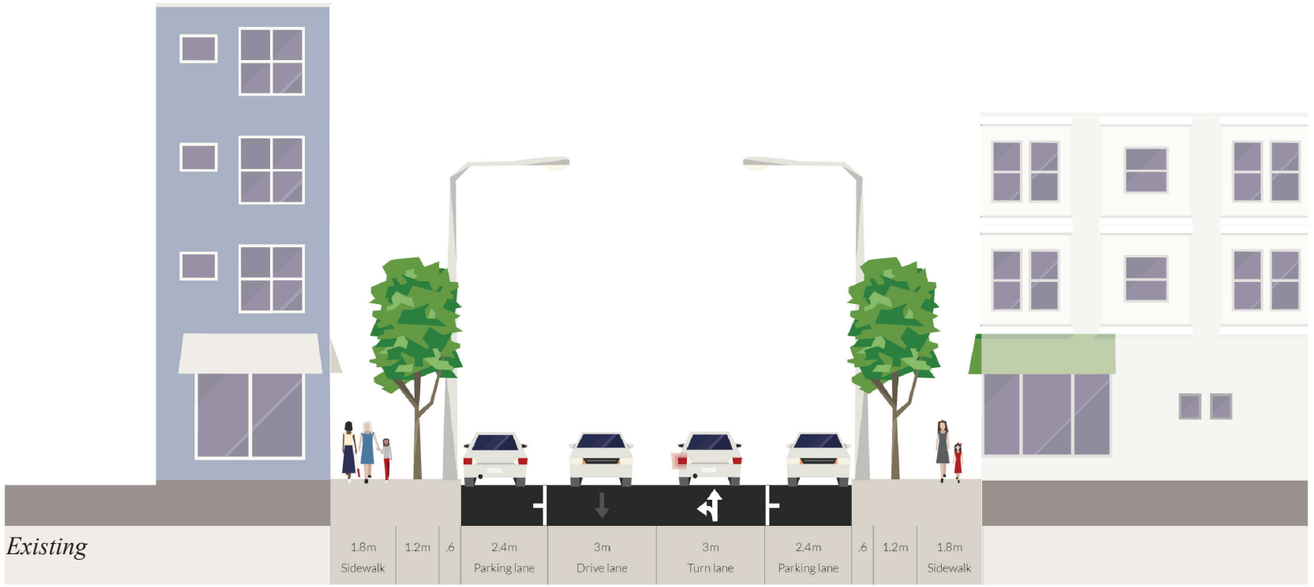


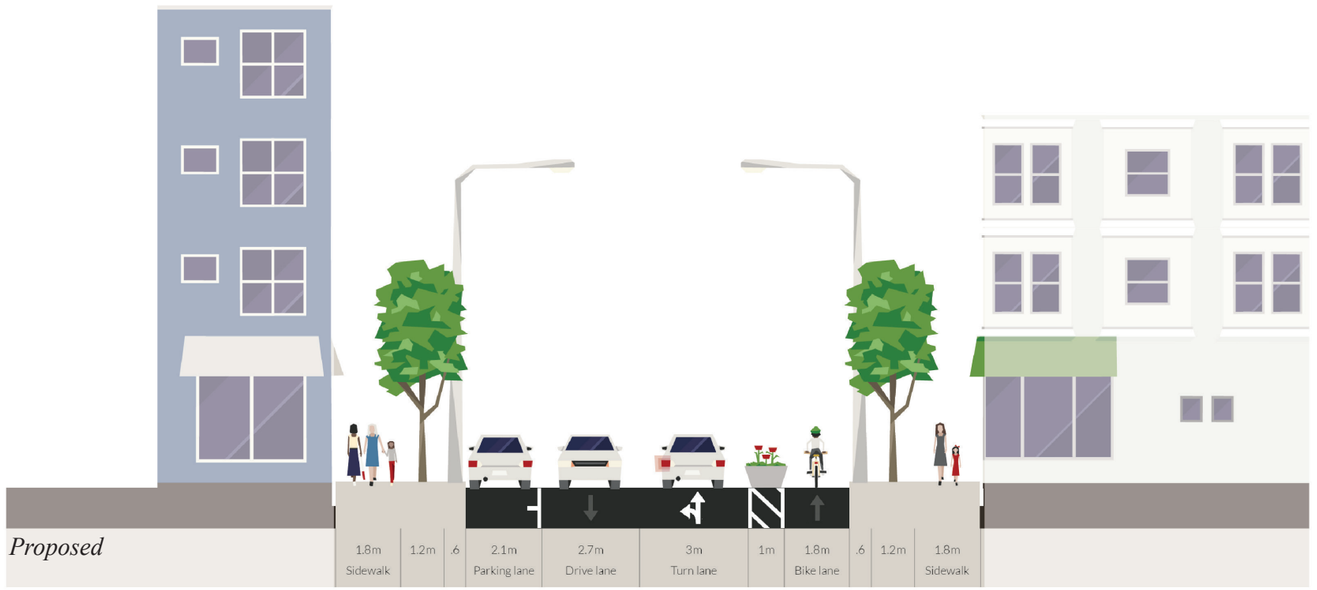


Street Section

18 m Right of Way







Lessions Learnt

Helsinki Case Study

Pros

- Smaller block sizes that respond to the human scale. A smaller block means shorter distances and makes the space more pedestrian and bike friendly
- Bus access along the harborfront allows it to develop as a public space with transit access
- Clear hierarchy of transit connections and catchment
- Metro > Tram > Bus > Pedestrian

Cons

- Linear configuration makes the ends less accessible without anchor points. Development seems concentrated in the center
- No amenities or mixed uses in the residential portions of the development hamper activity

Jan Gehl- Cities for people

1. Design for the human scale

Designing at the street scale is important to enhance the qualitative aspects of public spaces. Large, under-designed plazas or roadways are often void of any comfort or activity that attracts people. Walkable block sizes, clear sight lines and hierarchy of spaces create interesting and attractive spaces.

2. Ensure variety in the open spaces for different activities and audiences

Design spaces for comfort (spaces to sit, stand and engage in conversation), protection (from adverse climate, crime and unpleasant experiences) and delight (spaces for recreation and leisure). Wheeled access and other factors are crucial to ensure equal access in public spaces.

3. Focus on the details

Without well executed detail design, even great planning ideas can fail. Building edges, street furniture, canopies and accessible paths can transform the urban space and attract activity.

Trams, trains & central city revitalization: Melbourne

4. Leverage existing transit network

Instead of writing off Melbourne's tram network as obsolete, it was improved and expanded upon. Existing tram vehicles and station shelters were upgraded, routes extended, and travel times made more efficient and coordinated via improved technology. Today, it is the top ten largest rail network in the world, and an essential cultural identifier to Melbourne.

5. Strong political leadership

The steadfast campaign to improve Melbourne's existing tram network was made possible through strong political leadership from multiple agencies who held full authority over the planning of its city.

6. Attract investment

In order to activate the city center and achieve a critical mass, it must first acquire qualities that will attract and meet market needs. In the case of Melbourne, this was done through housing and commercial-retail investments. First, the city facilitated pedestrian accessibility via its streetscape and free-fare transit zone through its entire CBD. Second, a variety of housing options and ownership structures were developed to encourage a mixed income population. This created a highly attractive market for commercial investment, which ultimately created one of the top grossing retail corridors in the world.

Helsinki Case Study

7. Anchor the end points

With harbor-front developments, the end points can often be detached and less accessible from the mainland. Anchoring the end points with communal/ public facilities will ensure activated edges

8. Bus loop

An important planning tool that enables the entire water peninsula development to remain highly accessible is to off-shoot a rapid-transit-line or bus route from a major metro station that will be within 5 minutes from all edges of the site.



HafenCity Hamburg

Fan Wang

HafenCity Overview

Hafencity Hamburg is one of the biggest urban projects in Europe and Hamburg's' one of the most important development project. The conversion of the former industrial harbour area to a modern city district will last until 2025-2030

In 2000 the City decided to transform part of the former Harbour area into a new residential, office and retail area. A master plan was made for "HafenCity" with the aim to build an attractive living environment in the heart of the city closely connected to the water. The task is to define a new city sector in both planning and architectural terms.

HafenCity is a highly mixed urban development with residential, offices and services, cultural institutions, educational facilities and other mixed used projects. It encompass an area of 157 hector port and industrial lands. The development will expand Hamburg city centre by 40 percent at a density from 3.7 to 6.1 FAR. The investment mostly comes from private section with 8.5 billion euros, and 2.4 billion euros from public sector. The site has been divided into 10 quarters according to 2010 revised master plan. The first master plan was carried out on 2000.

Hafencity is situated South of Hamburg City centre. It is an extension of the already existed centre area of Hamburg and as a link to the Elbe River. It is also a connection between the city centre and the south industrial harbour area. Hanfencity is linked to the regional train station as well as the national road.

In 2009, Am Sandtorkai/Dalmannkai led the way as the first completed neighbourhood in HafenCity's development. It is also the site of the Elbphilharmonie Concert Hall, designed by Herzog & de Meuron, which sits atop the historic Kaispeicher warehouse building.

The new Hamburg landmark accommodating two concert auditoria, a five-star hotel and around 45 apartments, is scheduled to open to audiences in January 2017 in the wake of considerable delays. Close by, completion of the second large neighbourhood, Am Sandtorpark/Grasbrook, popular with many young families, followed at the beginning of 2011. A primary school with nursery and kindergarten offering all-day supervision opened in 2009. In 2013, popular Grasbrook park was opened, with its play and leisure facilities for children and grown-ups – primary school kids were also involved in the design.

Development of HafenCity is essentially based on a master plan approved by the Hamburg Senate on February 29, 2000, which was developed further for the eastern section of HafenCity after wide-ranging public discussions in 2010. For the previous ten years the master plan, with its concept for an urban horizontal and vertical mix of uses and its flexible basic



framework, served as a good point of departure for development of old port sites south of the city centre. However it initially lacked an adequately detailed planning basis for the three eastern neighbourhoods, Oberhafen, Baakenhafen and Elbbrücken.

The underlying circumstances have also changed during the past decade. Initially, eastern HafenCity was regarded almost as suburban, yet now – partly due to new subway connections – it is seen as very much part of the new city core. Redefinition of the master plan was led by HafenCity Hamburg GmbH in conjunction with the Hamburg Urban Development and Environment Ministry as well as the principal authors of the original master plan, Kees Christiaanse, with ASTOC. At the same time there was intensive public discussion, with a program of more than 40 events. Since then the reworked draft has been honed increasingly in further phases (urban design competitions, open space competitions, zoning plans and architectural competitions).

Particular political legitimation for the removal of the HafenCity area from the Port of Hamburg was provided by the simultaneous establishment of a special fund under public law to hold “city and port” assets, public land in the ownership of the Free and Hanseatic City of Hamburg. The burden of financing the new, state-of-the-art container terminal at Altenwerder was also transferred to this special fund; the original intention was that this should also be financed out of the proceeds of sales of land. Thus, the HafenCity development and the special fund under public law were to finance not only the inner-city HafenCity project and its accompanying infrastructure, but also the modern port facility at Altenwerder, for which no funds were set aside in the city budget. This also provided the political legitimation for removing the HafenCity area from the confines of port territory, without coming into conflict with the port industry.

An urban planning ideas competition (draft master plan) for HafenCity was launched at the end of April 1999 and, after intensive initial studies in 1997 and 1998 carried out by Hamburg authorities and GHS (Gesellschaft für Hafen und Standortentwicklung), the decision was announced on October 2, 1999. The winner, declared by an international jury, was Hamburgplan, a Dutch-German team with Kees Christiaanse / ASTOC. The master plan, which amounted to the formulation of the urban redevelopment plan for HafenCity, was then approved by the Hamburg Senate on February 29, 2000. The master plan was subsequently opened up to public discussion through a series of exhibitions and other events.

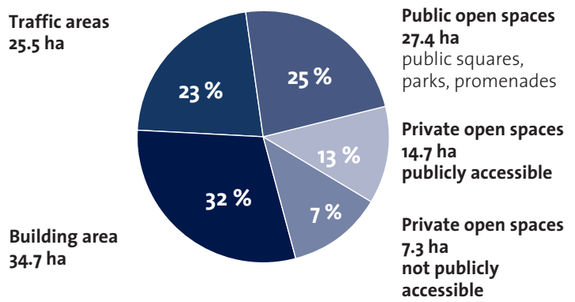
The overall plan intends to create an urban space which should be able to provide housing function, employments and public attractions. Furthermore the design should support and strengthen the inner city of Hamburg. The open space is the key to carry out the plan. Besides the major green corridor, a series of small parks and courtyards was planned for the residents and visitors.

Already set in stone in the master plan was the intensive interaction between existing and new buildings and the water, the elevation of buildings as a flood protection concept, the public character of many ground-floor uses, and the fine-grained mix of uses. . The Masterplan also enunciated the goal of making HafenCity the figurehead for a new business, social, cultural and urban economic breakthrough: what took shape in HafenCity would leave its stamp on Hamburg’s city centre for many decades - not to mention the coming century. The new city district therefore not only had to be futuristic, it was also to develop as a model for the European inner city of the 21st century.



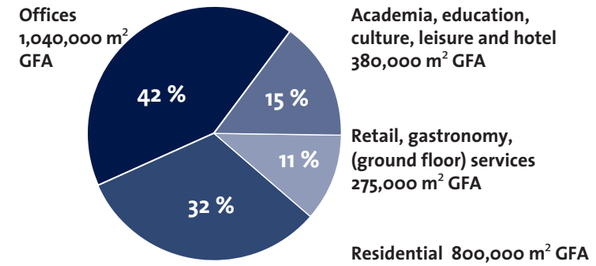
Distribution of land areas in HafenCity*

Total: 127 ha



Distribution of building space

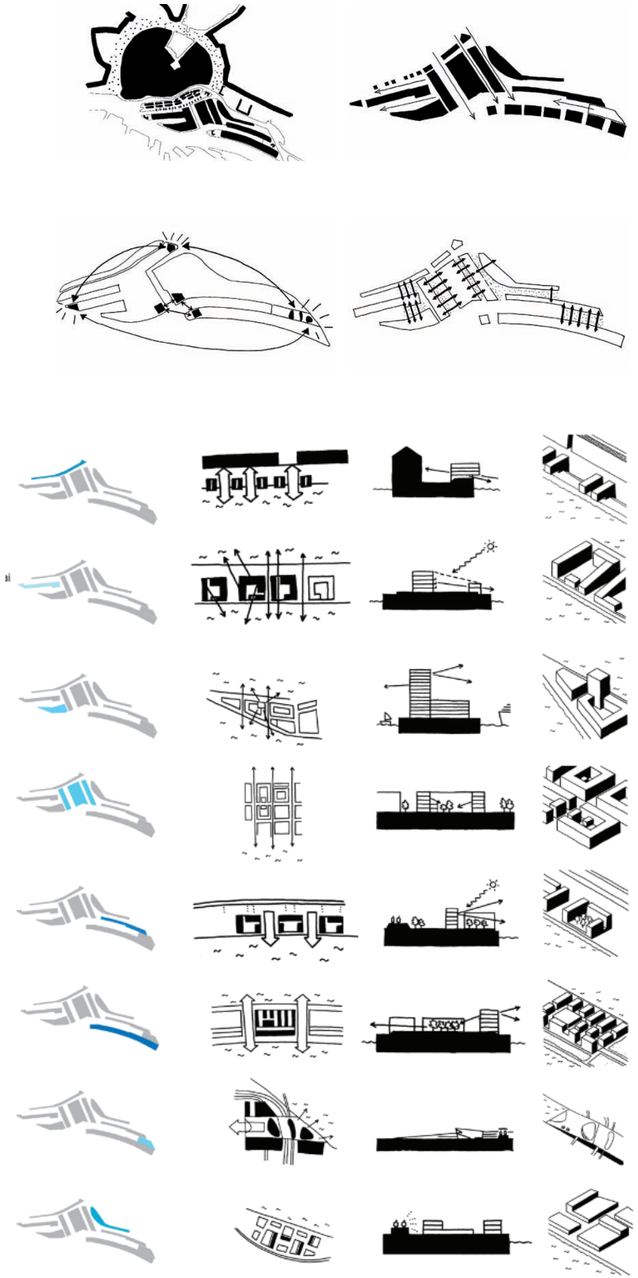
Total: 2.4 million m² GFA





Masterplan





Concept



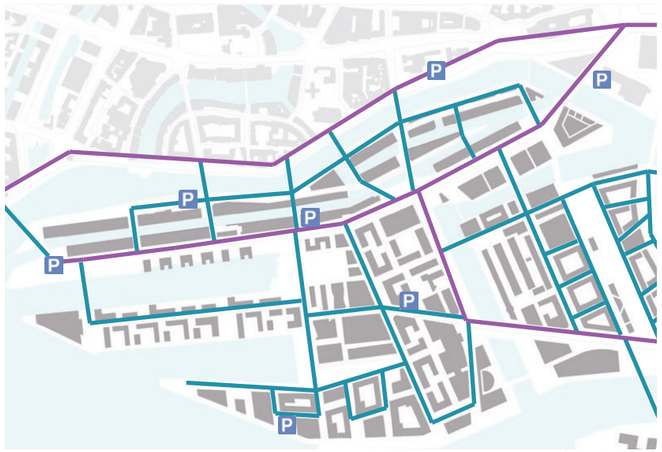
The design continuous three axis of existing city centre. The experience highlighted architectural master piece like HafenCity University and the concert hall. Ten quarters differs in its typologies and urban structures.

For example, the Brooktorkai/Ericus neighbourhood has a really maritime feel: it is framed by the historic brick buildings of the Speicherstadt, by Brooktorhafen basin, and the water passage linking Holländisch-brookfleet canal.

While Am Lohsepark is an attractive urban space emerging in central HafenCity – at its heart its green core, Lohsepark. Since all of the buildings adjoin the green space to the west and east, this continues Hamburg's town planning tradition of planting large parks amid residential and working neighbourhoods.



Green Space



Road Network



Transport



Open spaces in the Hafencity Hamburg are a vital part to link the different quarters to each other. Furthermore they are the connecting point for people within the quarter

Additionally there are also many backyards within the housing and office blocks to provide private space to the inhabitants and employees.

The private transportation system is marked by one arterial road, coming from the city centre to the northwest end of the Hafencity Hamburg. It is split in the central part to serve the southeastern part of the Hafencity areal and to connect to the highway, which starts near the east end of Hafencity. Minor streets branch off the main road to lead to housing and office buildings. Parking plots are mainly based on underground parking lots.



Transport



levation South 1, 1:10000

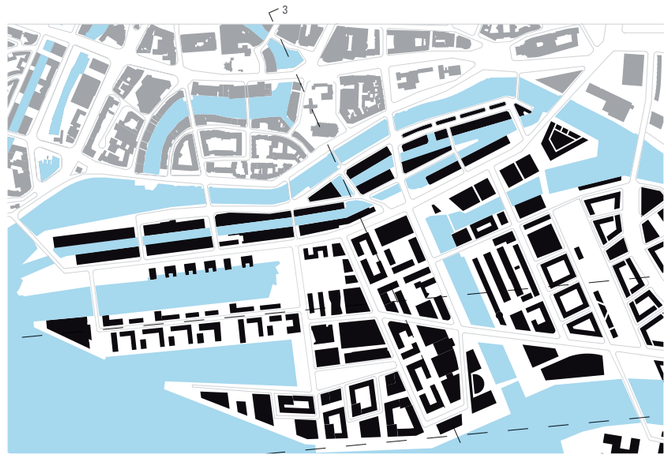


ection 2, 1:10000



ection 3, 1:10000

Sections



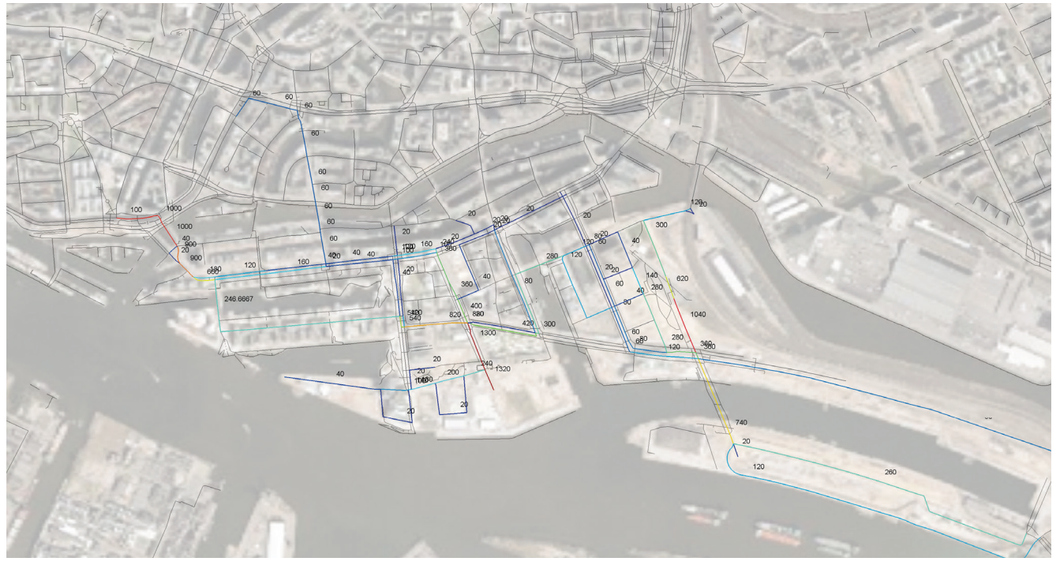
Topological Diagram



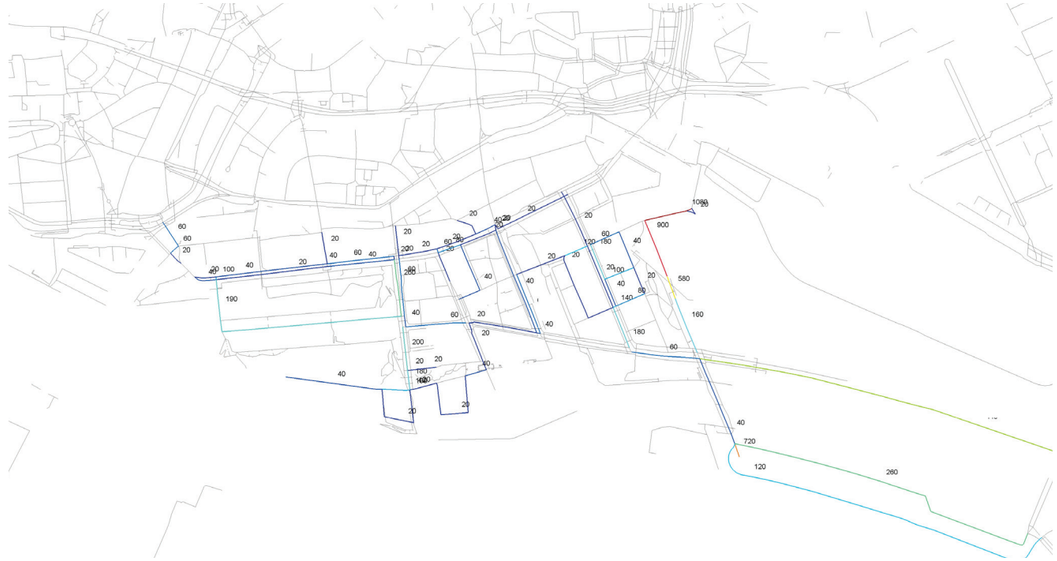
The Hafencity Hamburg is mainly characterized by an urban atmosphere of high density. In the west there are housing clusters with less office buildings. The centre mainly exists of office buildings and public attraction. It serves as an attractor for exterior visitors and as a central area of inhabitants and employees. For the Hamburg Cruise Terminal, a science centre and the Hafencity University are located in the centre south as you can see from the picture. The centre area is the most activated part of the Hafencity.

Even though there is a high variety of urban space, the urban structure of the Hafencity mostly follows modern guidelines. Compared to the already existing buildings of the city centre the buildings are scaled larger. The Skyline of the new urban district is mostly regulated by the already existing Ware house district.

HafenCity Analysis



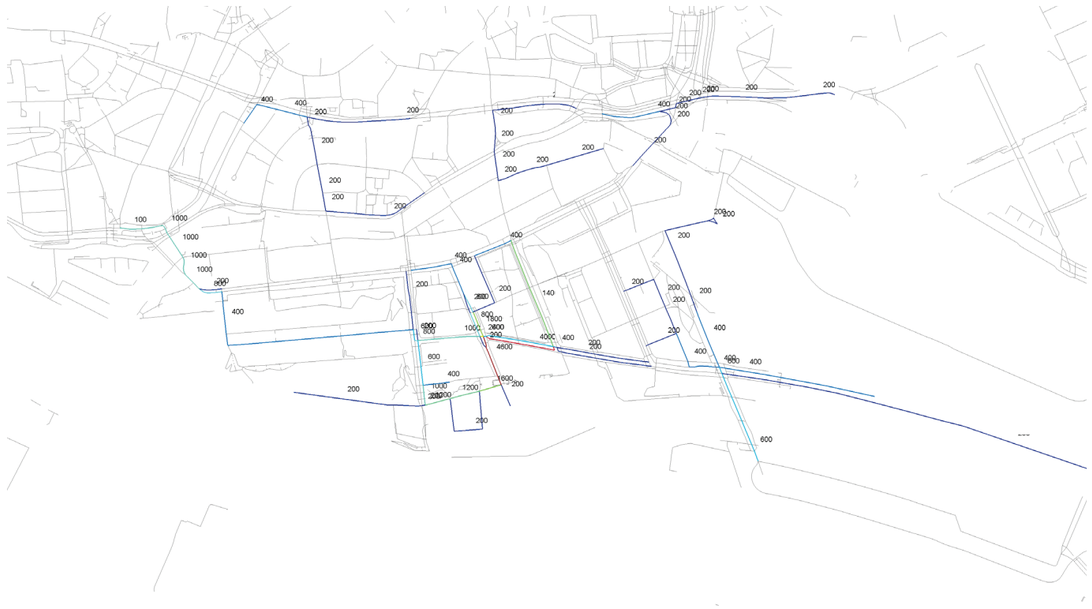
Residents to Subway Station



Residents to Bus Stop



Jobs to Subway Station



Detour Ratio: 1
Weight: People

Jobs to Subway Station



Bus Stop Reach



Bus Stop Gravity



Subway Stop Reach



Beta: 0.04
Weight: People
Subway Stop Gravity



Lessons Learnt

1. In the Zurich transit case, large scale infrastructure investment has to go through a referendum held by the general public. The referendum ensures the interest of the majority public. Can we introduce similar strategy for the Tallinn case where the residence will vote for large infrastructure investment?

2. Advanced technologies to ensure accurate time schedule and public transit priority while provide more transit options for the residents.

3. The ZVV is a good example of a regional transportation authority. It sets up the basic standard for transit operation while cooperate with private transport corporations to maximize efficiency. Can Tallinn implement similar transit authority?

4. In the HafenCity case, an upscale development can be integrated with easy access public space/facility to maximize the benefits of the development. Not only the development can accommodate the rich but at the same time, public space can serve the city.

5. The design strategy allows very easy access to the waterfront physically and mentally. By locating architectural highlights at the edge, the design draws people to the waterfront. A walkable streetscape with an easily accessible transit network to ensure active waterfront.



Singapore Marina Bay

JungHyun Woo I Longfeng Wu

The Pedestrian Network Plan inbetween Birdeyeview and Perspective-view

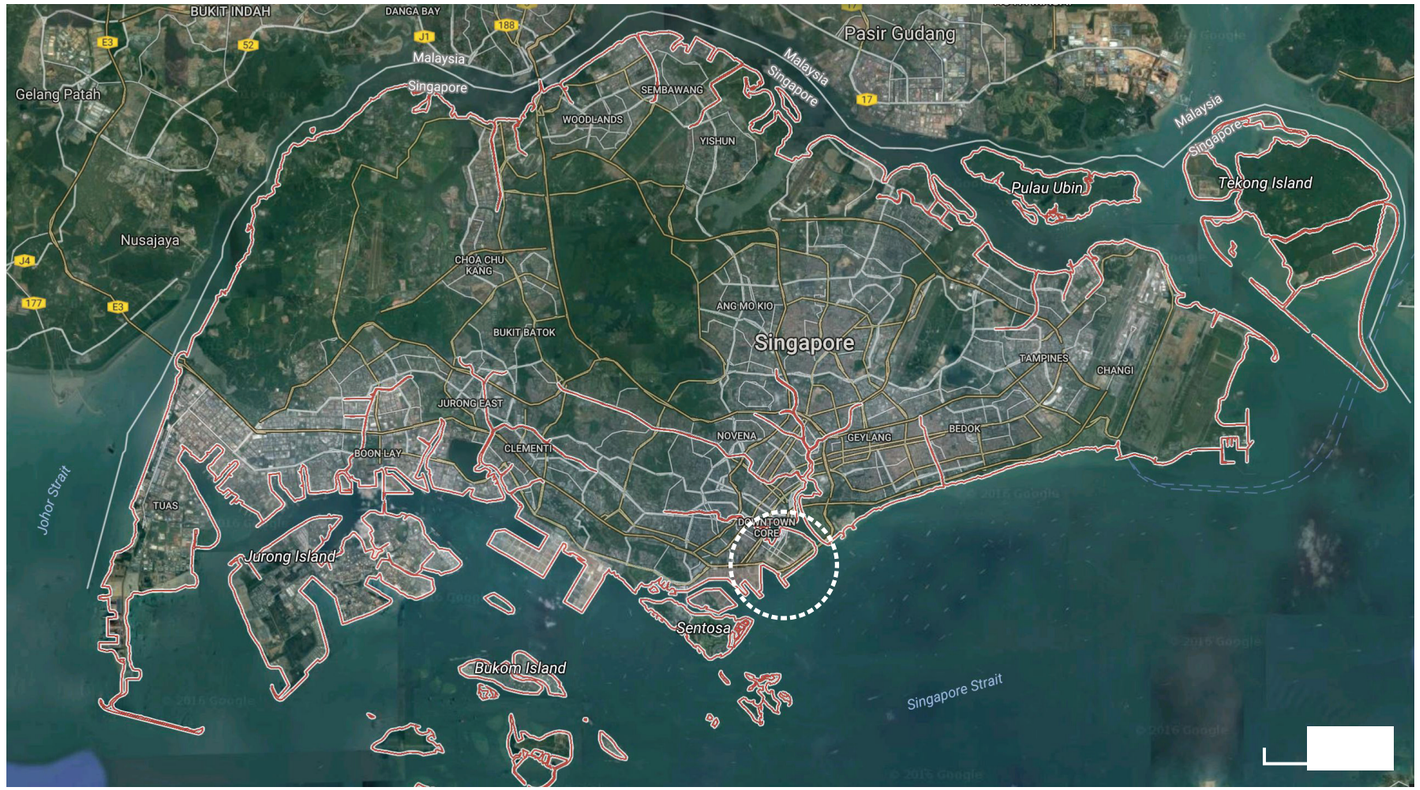


Image 2

Image 1

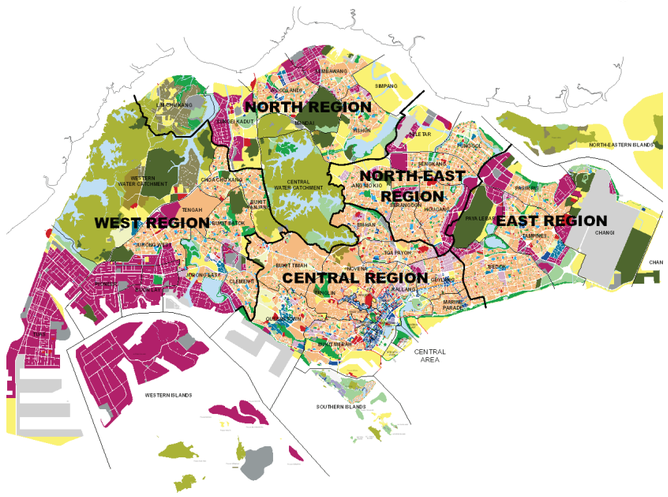
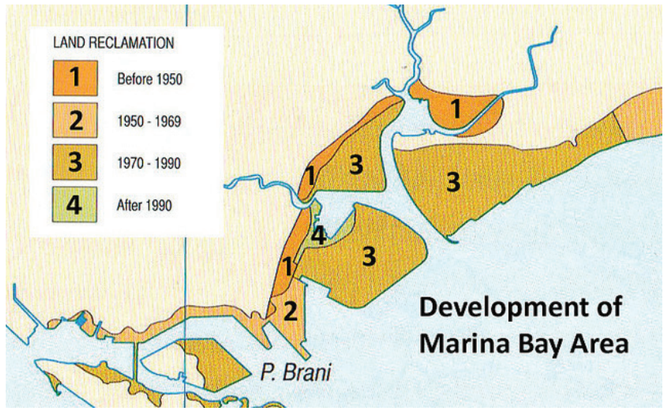


Image 3



Introduction

Singapore is divided by five different regions and Marina Bay is located in the Southern part of Singapore called Central Region. Marina Bay has modern and stylish architectural environments and is a destination of dining restaurants and enjoying leisure sports both for locals and tourists. Marina Bay has been developed with long-term planning. At the same time, the whole Marina Bay area has rapidly transformed controlled by the cosmopolitan city state.

In the 1970s and 1908s, due to the need of growth of the city center, land reclamation began and created 360 hectares (3.6 sq km) of prime waterfront area at Marina Bay. The land forms was completed in 1992.[1]

The Urban Redevelopment Authority (URA) planned to extend the current Central Business District (CBD) and provide more houses and leisure places to the newly built area along the southern waterfront. The area will support the city-state's continuing growth as an international business center and financial hub. It is also planned to create a vibrant, mixed-use district with round-the-clock activities along the waterfront line based on sustainable development strategies.[2]

`

1 https://en.wikipedia.org/wiki/Marina_Bay,_Singapore
2 https://www.ura.gov.sg/uol



Image 4



Image 5

There are popular places that already built and opened to public. - Gardens by the Bay is a huge park in the bay area of Singapore. The famous Supertree structures offer a skywalk over the gardens and over-sized seashell-shaped greenhouses recreate chilly climates and there are hundreds of trees and plants. The top of Marina Bay Sand opens to people and provides a great city view.

The ArtScience Museum locates on the waterfront next to Marina Bay Sands - shaped like a bunch of bananas and provides the city for entertaining and educational explorations about art and science.

It is a part of dam - Marina Barrage is a multi-purpose attraction. It works for aiding water storage and flood control for Singapore. Additionally Marina Barrage is a place of recreation, picnics, kite flying, and sunset views on the green grass roof.

Image 6



Image 1. Singapore Google Map

Image 2. Singapore Region Map

Image 3. History of Land Reclamation in Marina Bay Area

Image 4. Gardens by Bay

Image 5. Art Science Museum

Image 6. Marina Barrage

Site

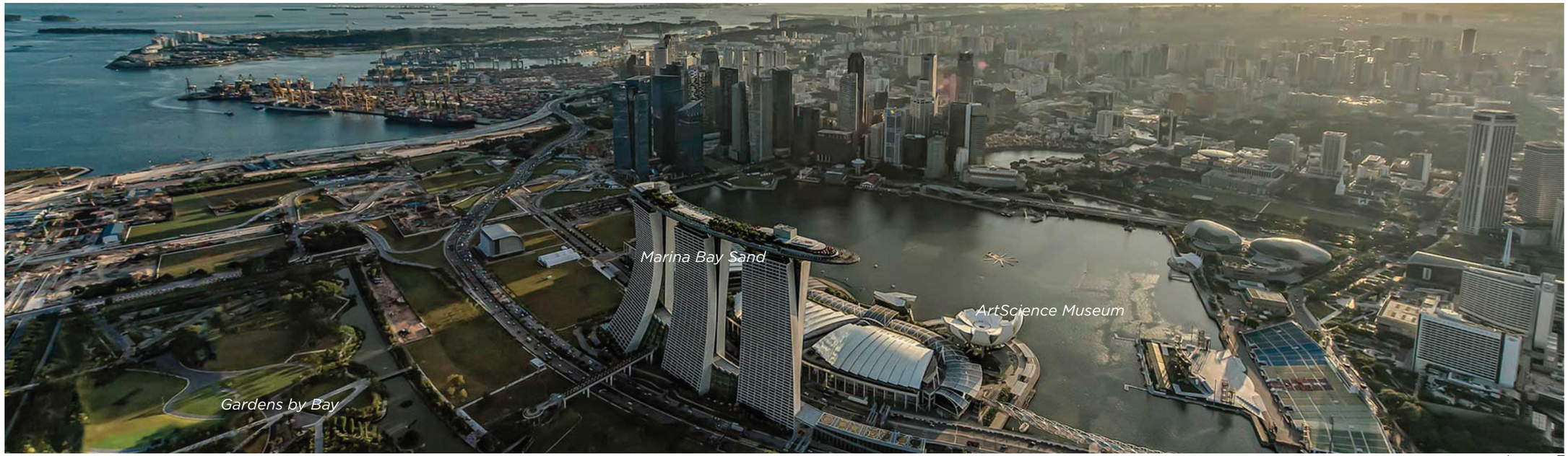


Image 7

Image 8



Image 9



The research site is surrounded by the perimeter of four other planning areas, the Downtown Core, Marina East, Marina South and Straits View. The area surrounding the bay itself that is the extension to the adjacent Central Business District.

The site is a part of the waterfront development planning from the Urban Redevelopment Authority (URA) that will provide an opportunity to create a new waterfront city. The new land will integrate with the current downtown and surrounding housing and businesses near the city. It could be built up for new housings, commercials, cultural and entertainment facilities, to promote Singapore as a world-class city.[1]

The extension project is still under construction and main roads are complete in the site. However, as google street views show, its pedestrian environments are very poor and unfriendly to walk.

1 https://www.ura.gov.sg/uol



Image 10

Image 7. Marina Bay View

Image 8. Marina Bay Zoning

Image 9. Marina Bay Extension Planning Diagram

Image 10. Marina Bay Google Map - Research Boundary

Image 11. Google street view - East side of Gardens by Bay

Image 12. Google street view - Behind Marina Bay Sand

Image 11



Image 12



Landuse

Image 13

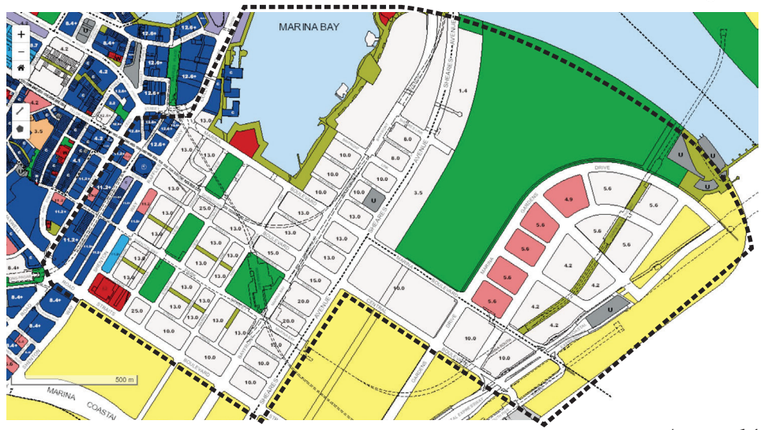


Image 14

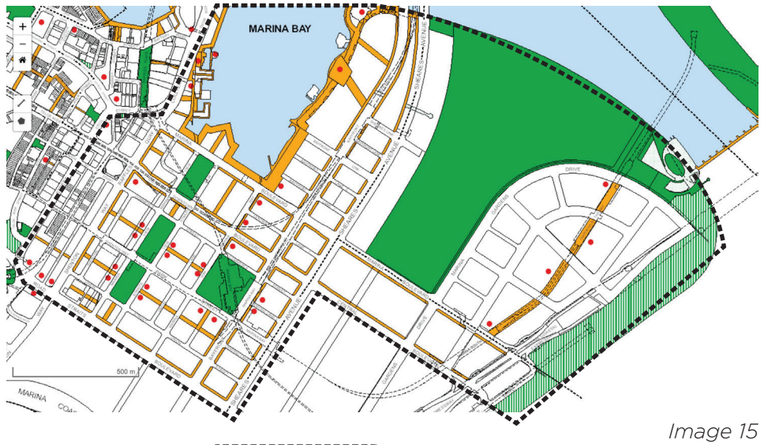
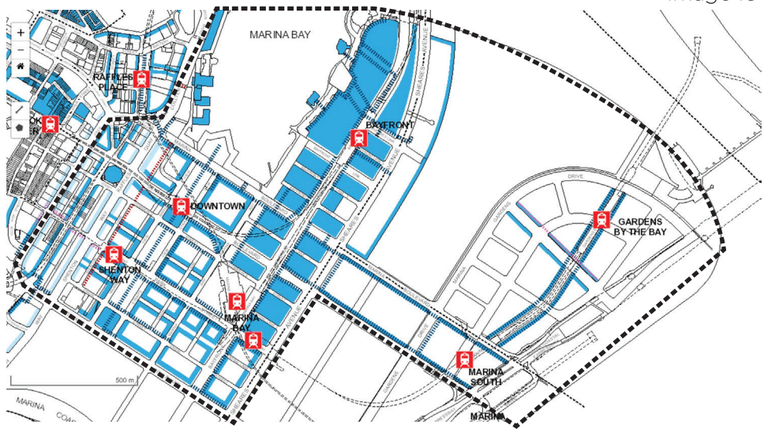


Image 15


MARINA BAY
RAFFLES PLACE
EXPRESS
EXPRESS
DOWNTOWN
EXPRESS
EXPRESS
EXPRESS

The Street Block Plan guides the layout or form of development and provide special Urban Design guidelines to coordinate with the long-term planning intention and ensure integration of old and new developments.

The Building Height Plan control special height zones according to the development control guidelines.1

1 https://www.ura.gov.sg/uol/master-plan

Image 16

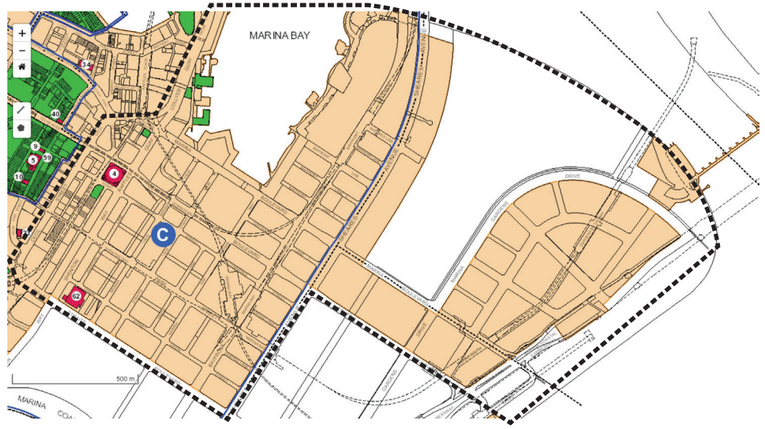
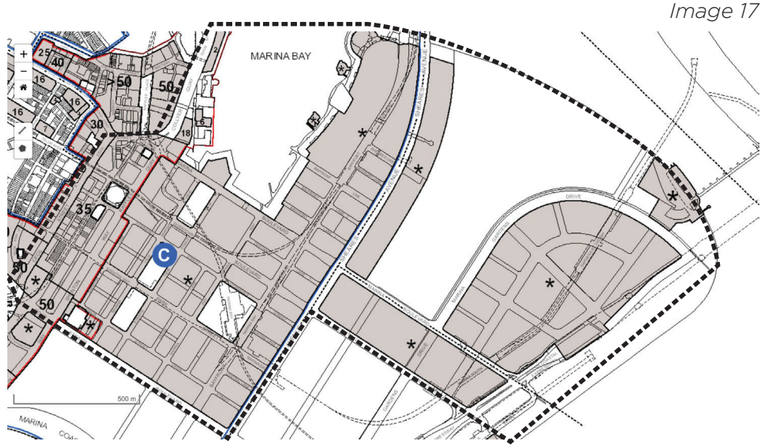


Image 17



STREET BLOCK PLAN, URBAN DESIGN AREA, CONSERVATION AREAS & MONUMENTS PLAN

URBAN DESIGN AREA

URBAN DESIGN PLANS & GUIDELINES FOR DESIGNATED AREA

For details of guidelines, please refer to :

- A Orchard Planning Area (Circular no. URA/PB/2013/15-CUDG)
- B Bras Basah.Bugis (Part Rochor / Part Museum Planning Area) (Circular no. URA/PB/2013/16-CUDG)
- C Downtown Core Planning Area (Circular no. URA/PB/2013/14-CUDG)
- D Singapore River Planning Area (Circular no. URA/PB/2013/17-CUDG)

CONSERVATION AREA

For details of conservation areas, please refer to http://www.ura.gov.sg/uol/conservation.aspx?p1 =view-maps-area#

For details of conservation guidelines on shophouses and bungalows, please refer to http://www.ura.gov.sg/uol/ guidelines/conservation/Conservation%20Guidelines.aspx

1 **MONUMENT**

Gazetted as at 28 August 2013

Building Height Plan

20 **BUILDING HEIGHT CONTROL (NUMBER OF STOREYS)**

250m **BUILDING HEIGHT CONTROL (METRES AMSL)**

* **BUILDING HEIGHT CONTROL (SUBJECT TO DETAILED CONTROL)**

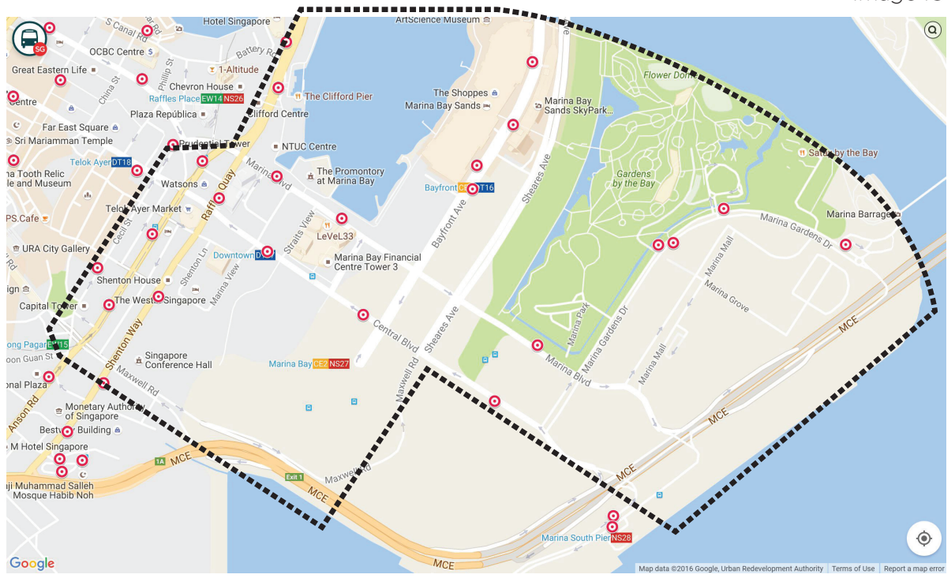
AREA WHERE RELAXATION OF RESIDENTIAL BUILDING HEIGHTS APPLY
(Circular no. URA/PB/2006/13-CUDD)

Image 16. Street Block Plan, Urban Design Area, Conservation Areas & Monuments Plan

Image 17. Building Height Plan

Transportation

Image 18



Here shows the spatial layouts of different transits and mobility systems in and around the site. There is the plan to further enhance intra-city and island-wide connectivity. For example, the MRT network will be doubled and improve the commuter journey. In the next 10 years, the Central Area will be reachable within a 5-minute on foot, on average, from an MRT station or a bus stop.

Even though the plan will be able to decrease the walking distance to public transits, if the current pedestrian environments don't upgrade it cannot give a guarantee to promote pedestrian networks.

Image 18. Bus Stations

Image 19. Cycling Paths

Image 20. Mass Rapid Transit (MRT) Stations and Lines

Image 21. Master Plan of the site and MRT

Image 19

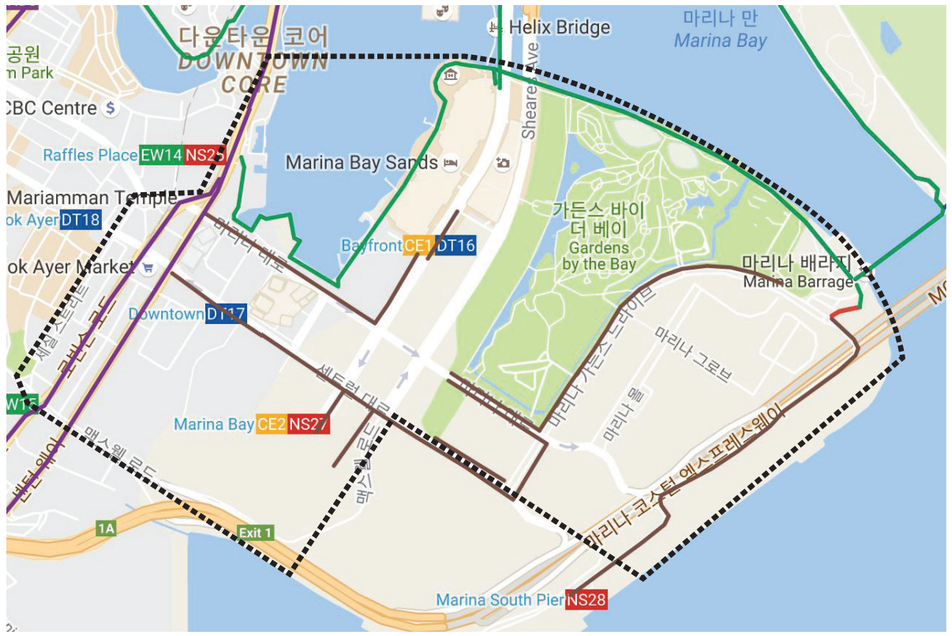


Image 20

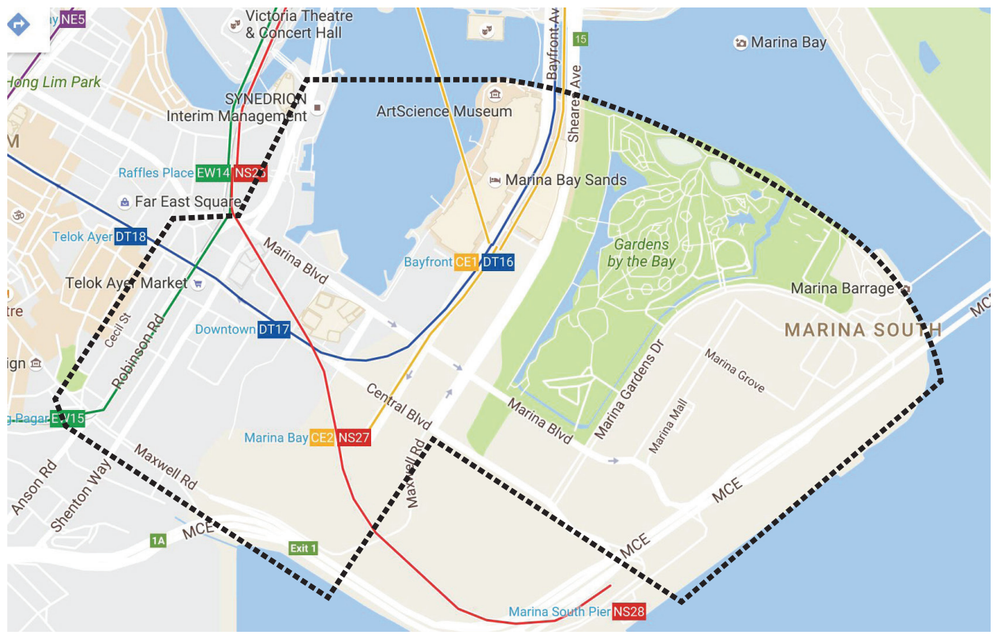


Image 21



Mass Rapid Transit Lines Linking Marina Bay to the rest of the city

Marina South

Image 22



Image 23



Image 22. Marina South Birdeye-view

Image 23. Marina South Plan

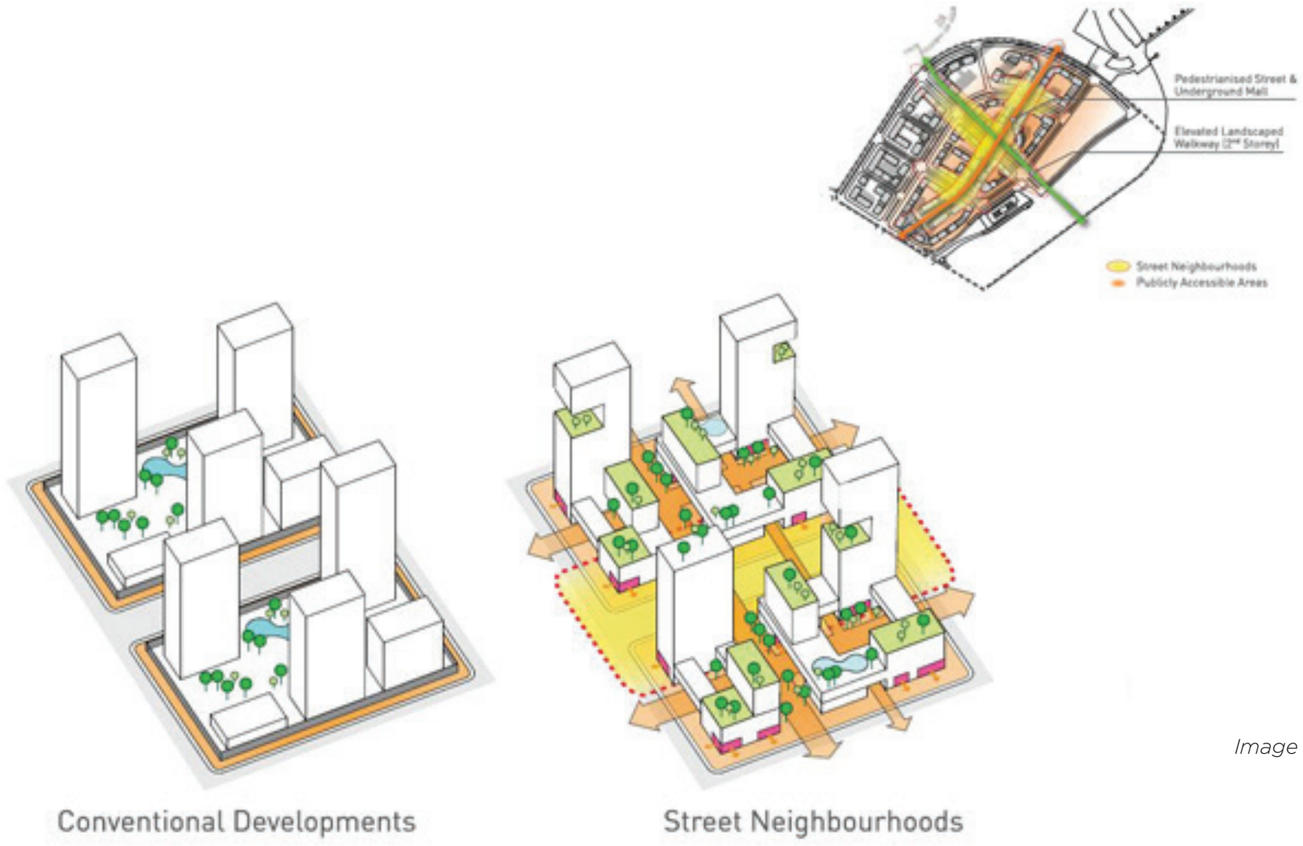


Image 24

Image 25



Marina South, which is located next to Bay South Garden and the Straits of Singapore, will bring a new standard for sustainable urban living in Singapore.

According to the masterplan, it will provide a lively mixed-use residential district that is green, walkable and cycle-Friendly area. It will create lively streets with better transport connectivity.

These opening podium design will help community for a variety of uses, creating street neighbourhoods that are welcoming to public and lively space.

The strong bicycle paths will invite more bike users and the development of basement space liked with MRT stations will improve underground pedestrian environments.

Image 24. Marina South Proposed Building Typology

Image 25. Bicycle Paths and MRT stations link basement space

Marina Bay

Image 26



The Marina Bay's waterfront affords opportunities to create different waterfront districts including Bayfront Subzone, Straits View, Central Subzone with unique characters and experiences. These areas are located next to the CBD and under construction now.

The CBD will continue to be re-generate diverse mix of uses such as residentials, hotels, and retails in the new developments. New retails and entertainments will be developed along Bayfront Avenue in Marina Bay added entertainment diversities to the city.

Image 26. Marina Bay Birdeye-view

Image 27. Marina Bay Plan

Image 27



Accessibility Analysis

1. Origins

Centrality Analysis:

- All entrances of current buildings
- All entrances of planned buildings.

Betweeness Analysis:

- All entrances of planned buildings

2. Destinations

Centrality Analysis:

- Bus stops
- Mass Rapid Transit (MRT) entrances

Betweeness Analysis:

- Bus stops
- Mass Rapid Transit (MRT) entrances
- Commercial Buildings Entrances.

3. Weight

Centrality Analysis:

- Number of Bus lines
- Number of MRT lines.

Betweeness Analysis:

- Number of Bus lines
- Number of MRT lines
- Estimated Population of each planned buildings' entrances

4. FAR and Population

- FAR x Block Area = GFA
- GFA / 20 sq M = Population
- Population/Number of Entrance=Number Population of Each entrance
- 20 sq M is a appropriate area per person for multipurpose/mixeduse building

Image 26

	A	B	C	D	E	F
1	__GUID	FAR	Block Area	GFA	POP	no of Block
2	b008d5e7-96e4-4db2-8d41-f11915f15e5d	5.6	4846	27138	1357	1
3	790741e1-8228-48f0-802b-05f4ee41c605	5.6	4846	27138	1357	1
4	585ae267-cb4c-4966-9e0c-8e2d11073f96	5.6	4846	27138	1357	1
5	e283e295-1cfb-45fa-8aad-1ff019c94fc4	5.6	4846	27138	1357	1
6	714b93b6-942a-483b-be19-18b37c1a36e8	5.6	4846	27138	1357	1
7	19c8a9d8-3863-4d1c-9618-b6e19adc7fe6	5.6	4846	27138	1357	1
8	a7de3bde-a633-4cca-a3df-e4262441ba75	5.6	4846	27138	1357	1
9	f5ed4ca8-4f08-4da8-9bb2-7654a4e4d499	5.6	4846	27138	1357	1
10	9fb40347-f2ad-444c-9c39-0cbe4cbf1cfb	5.6	4846	27138	1357	1
11	e1c2cd9b-fb16-4b47-8468-af7483f28e4f	5.6	4846	27138	1357	1
12	5c28b3fb-912f-44f8-ad46-8cb4c7e52236	5.6	4846	27138	1357	1
13	cda2807f-3877-4f97-941f-2de2eafea5fa	5.6	4846	27138	1357	1
14	fbefabd9-3aab-4236-b54e-c766b78142b3	5.6	4846	27138	1357	1

Image 27

	__GUID	line MRT
2	0065dd7b-2f97-4cc1-91a5-a6a4fc34ee59	2
3	31da6019-5300-40cb-9e45-d26c96908dfc	2
4	f641ef63-d83e-45e8-bcb2-38b3ff6ac617	2
5	de46f669-1e94-4ab8-b00a-20385edfe328	1
6	8820e19e-65db-499c-8c32-f4fd33375024	1
7	dd5e527d-128d-481b-9273-31af433f8ade	1
8	ff2b9aa4-24f9-4e06-9f44-9f9dc363396a	1
9	a68c0e42-ab3d-492c-8620-b2f97955c30b	2
10	cbdb9bd2-4a5a-4f6e-bf11-06de53539dab	1
11	9f55a877-4247-4070-a940-f29aa02c0a99	2
12	80daa2a8-9b3b-4c9e-b853-72e3a36b7fb7	2
13	ca4b4bd3-5712-4f51-86ee-c70364a81995	2
14	1c8812e3-1135-4bb9-bf25-4da4162db50d	2
15	c1038c6e-a8b4-4dff-aba2-6f5c0268b3f0	2

Image 28

	A	B
1	__GUID	weight no. of buslines
2	35fa0c66-ae93-49e0-922a-786305e8a93b	0
3	a73c8b1a-2852-4926-a63f-f17fa7fad9e6	9
4	8de61fab-9b3b-479a-b991-79fc13411197	11
5	9a87c100-e552-4db6-aff6-d96e52aa66ab	2
6	325906e5-1fac-4b32-9fd6-574fcb997aed	2
7	3b2d3db4-d7b4-477f-9f56-3fe243e33aeb	7
8	c36b7d76-1e65-4c09-ac6a-663711acfd6b	9
9	e315d216-5064-4ca1-9c2f-391b85ceafab	2
10	76c9ee76-e100-4cbf-b01f-dcf0437ccc6d	11
11	7d228294-95fa-4922-91e3-c914e2f90512	9
12	ae081541-3622-477b-8780-1c77a51fccda	9
13	8ecc990c-8a0b-4775-90a1-8b5ea1b0c4d3	7
14	df54ee98-92fd-4717-ae23-361d1498ceb9	15
15	4a45bc7e-f9cf-441c-8719-6b0e7d18da0b	21
16	0b8c0d14-f96b-4e1a-a995-7597de425ed1	2
17	1f908c89-92de-4dfa-b0b6-c78c7f57a501	2
18	1cc38e17-6bdc-48b6-932c-27f68eb7a5c2	2
19	ed63c763-5210-4306-b02f-37dbac725146	0
20	6f5d31da-b86d-4d71-94f5-4af35d0ad2c5	3
21	c2092e61-c231-48e3-a321-25fcffe9e4be	3
22	9ad2f267-6cd5-40ca-9283-41225fbff604	20
23	e4eb51e4-fcea-4cb7-b239-a50246a07c07	19
24	56681745-ff91-443b-b9f2-f41211bd76c5	11
25	4fb06dfb-b426-4b00-b7b5-632a729c1415	30

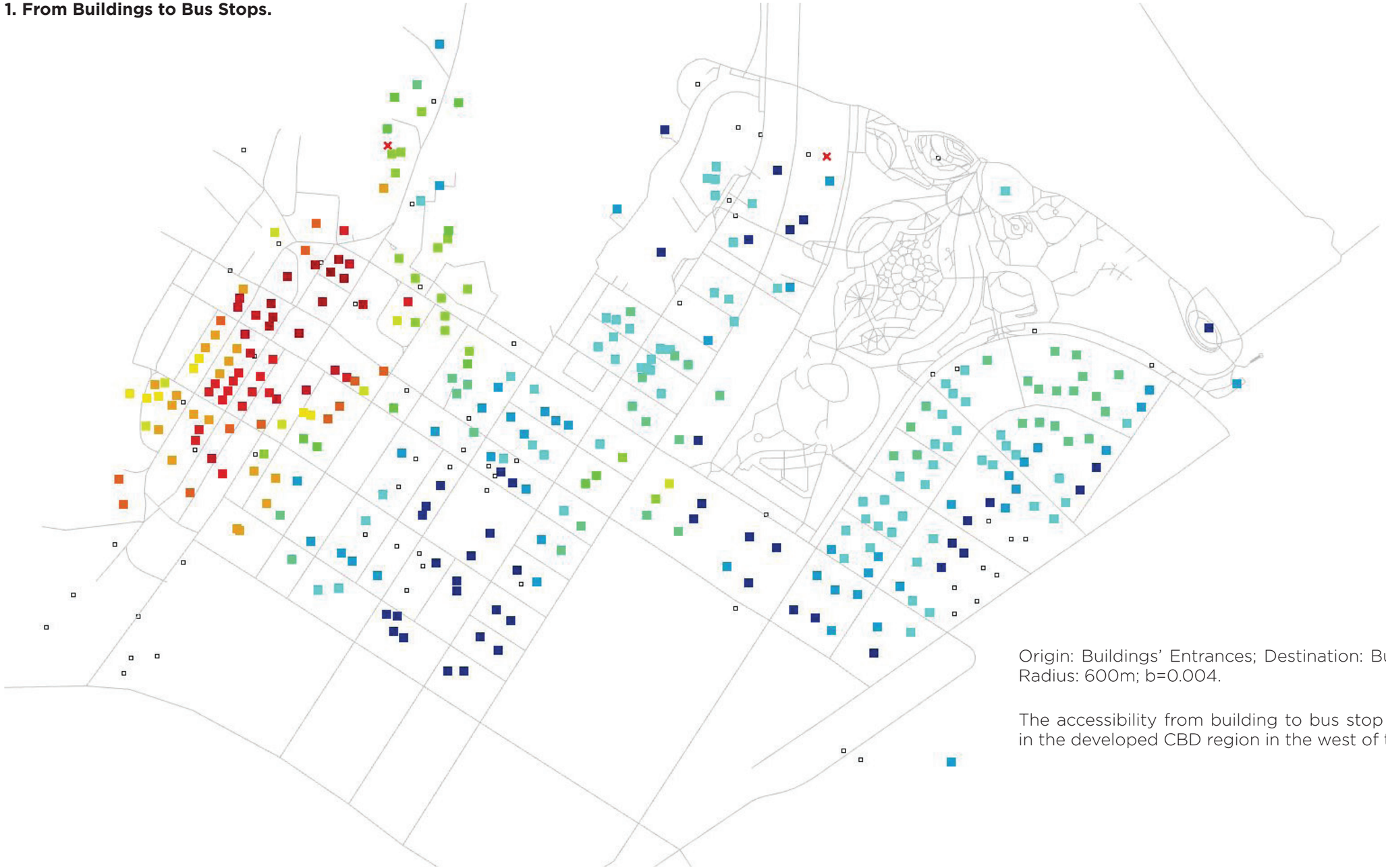
Image 26. Estimated Population of each planned buildings' entrances

Image 27. Number of MRT lines

Image 28. Number of Bus lines

Centrality Analysis

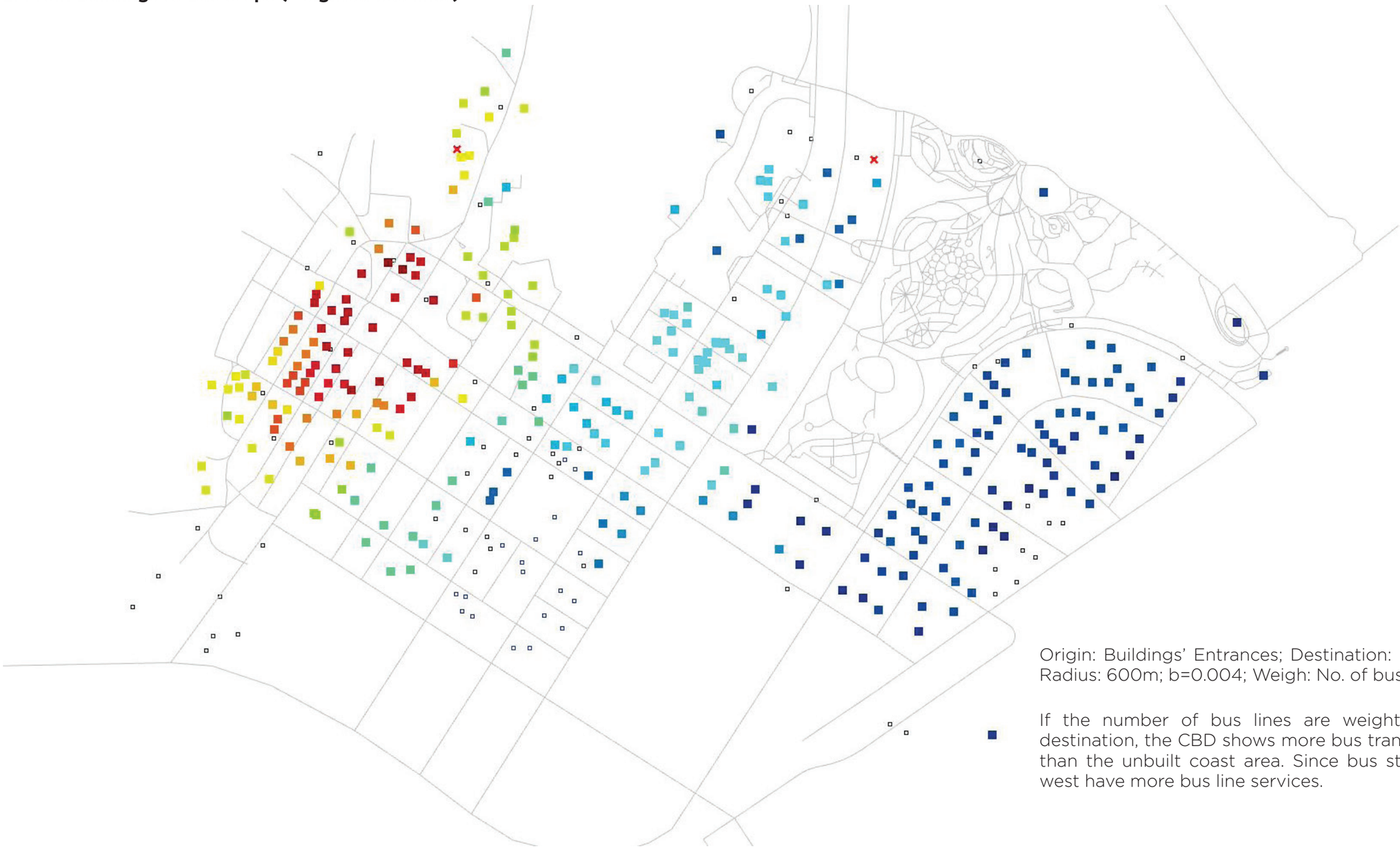
1. From Buildings to Bus Stops.



Origin: Buildings' Entrances; Destination: Bus Stops; Radius: 600m; b=0.004.

The accessibility from building to bus stop is better in the developed CBD region in the west of the site.

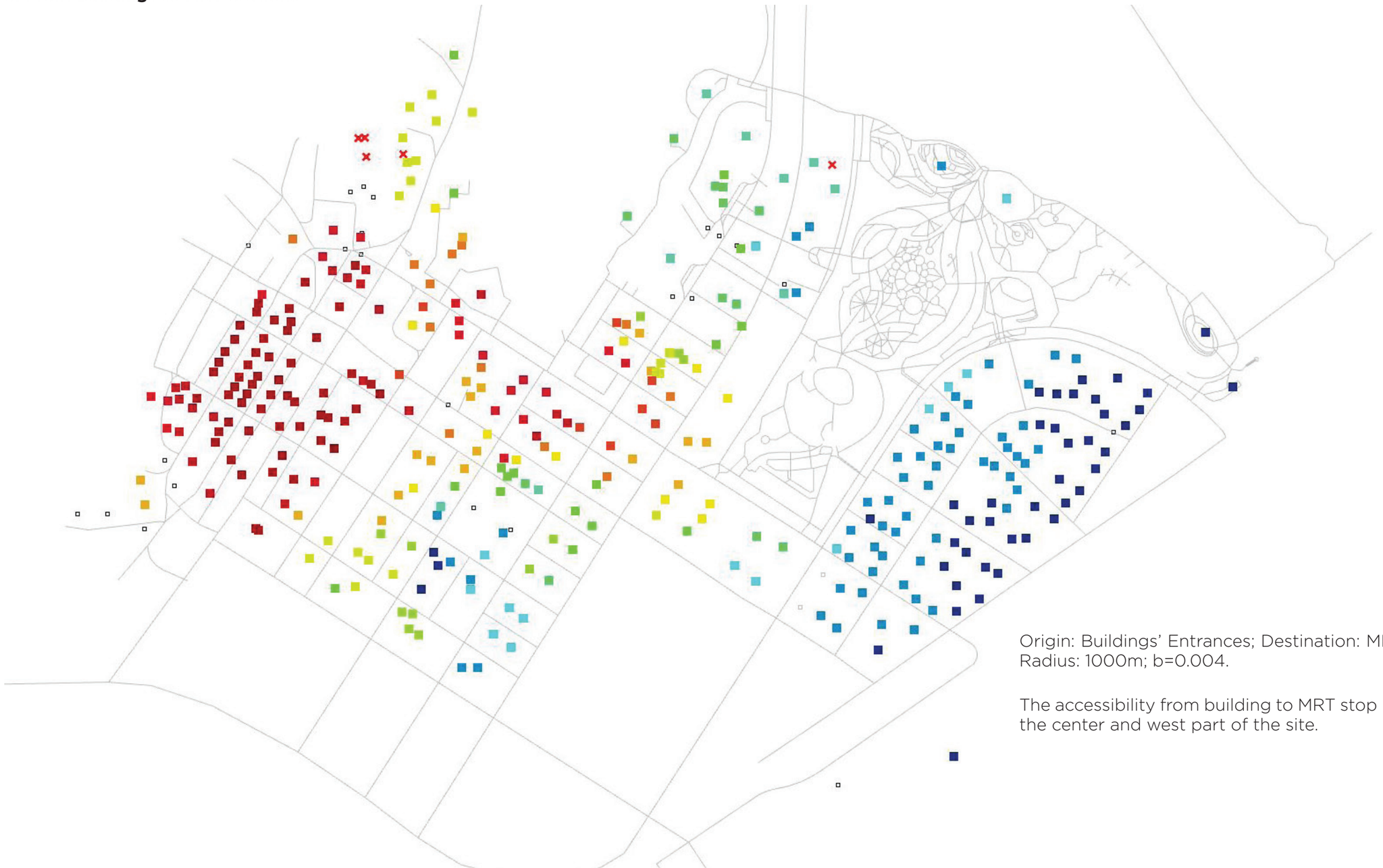
2. From Buildings to Bus Stops (weighted bus lines)



Origin: Buildings' Entrances; Destination: Bus Stops; Radius: 600m; b=0.004; Weigh: No. of bus lines

If the number of bus lines are weighted to the destination, the CBD shows more bus transit options than the unbuilt coast area. Since bus stops in the west have more bus line services.

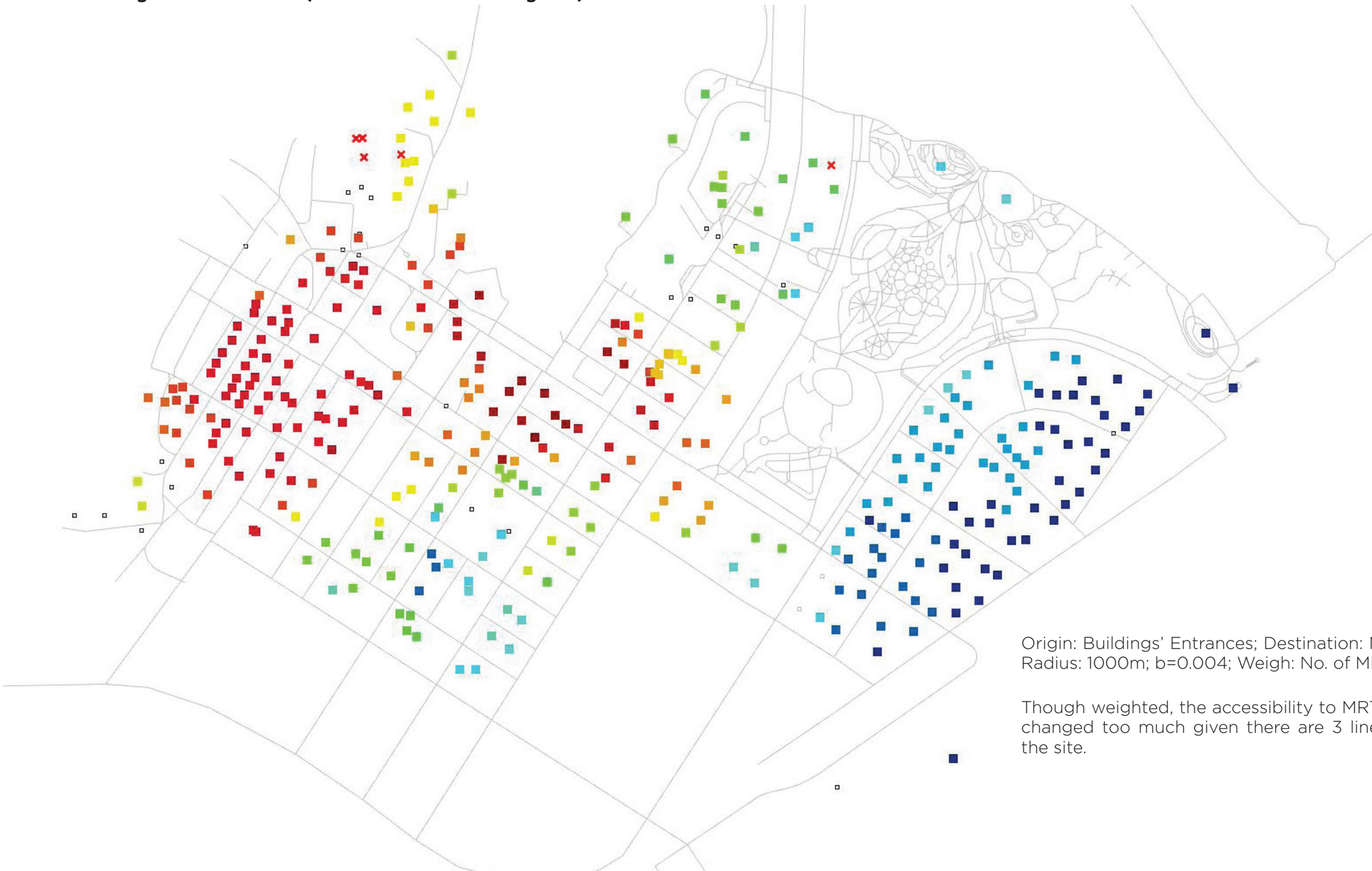
3. From Buildings to MRT Stations



Origin: Buildings' Entrances; Destination: MRT Stops; Radius: 1000m; b=0.004.

The accessibility from building to MRT stop is good in the center and west part of the site.

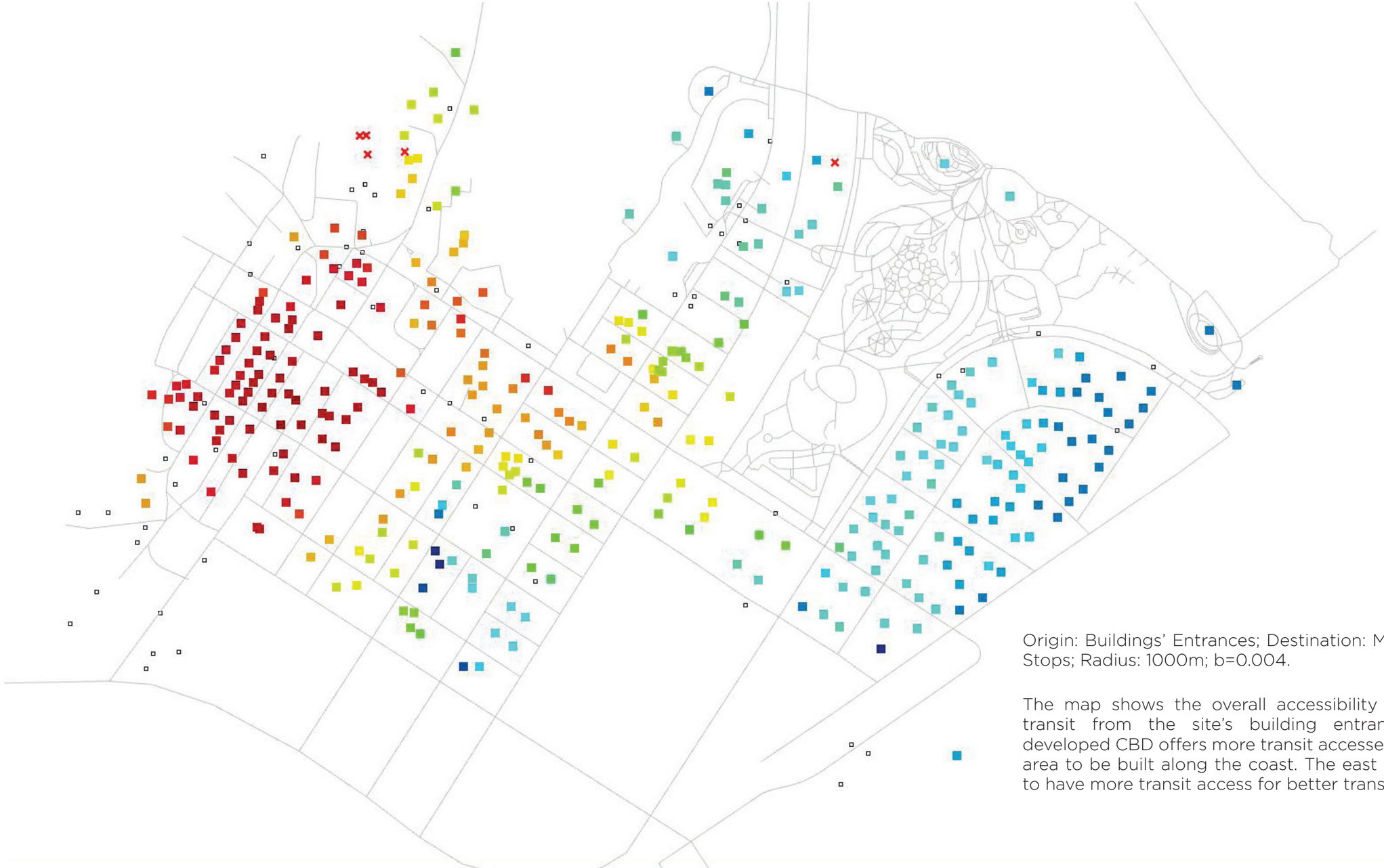
4. From Buildings to MRT Stations (number of MRT lines weighted)



Origin: Buildings' Entrances; Destination: MRT Stops; Radius: 1000m; b=0.004; Weigh: No. of MRT lines

Though weighted, the accessibility to MRT stops not changed too much given there are 3 lines crossing the site.

5. From Buildings to Bus Stops & MRT Stations.



Origin: Buildings' Entrances; Destination: MRT & Bus Stops; Radius: 1000m; b=0.004.

The map shows the overall accessibility to public transit from the site's building entrances. The developed CBD offers more transit accesses than the area to be built along the coast. The east part need to have more transit access for better transit equity.

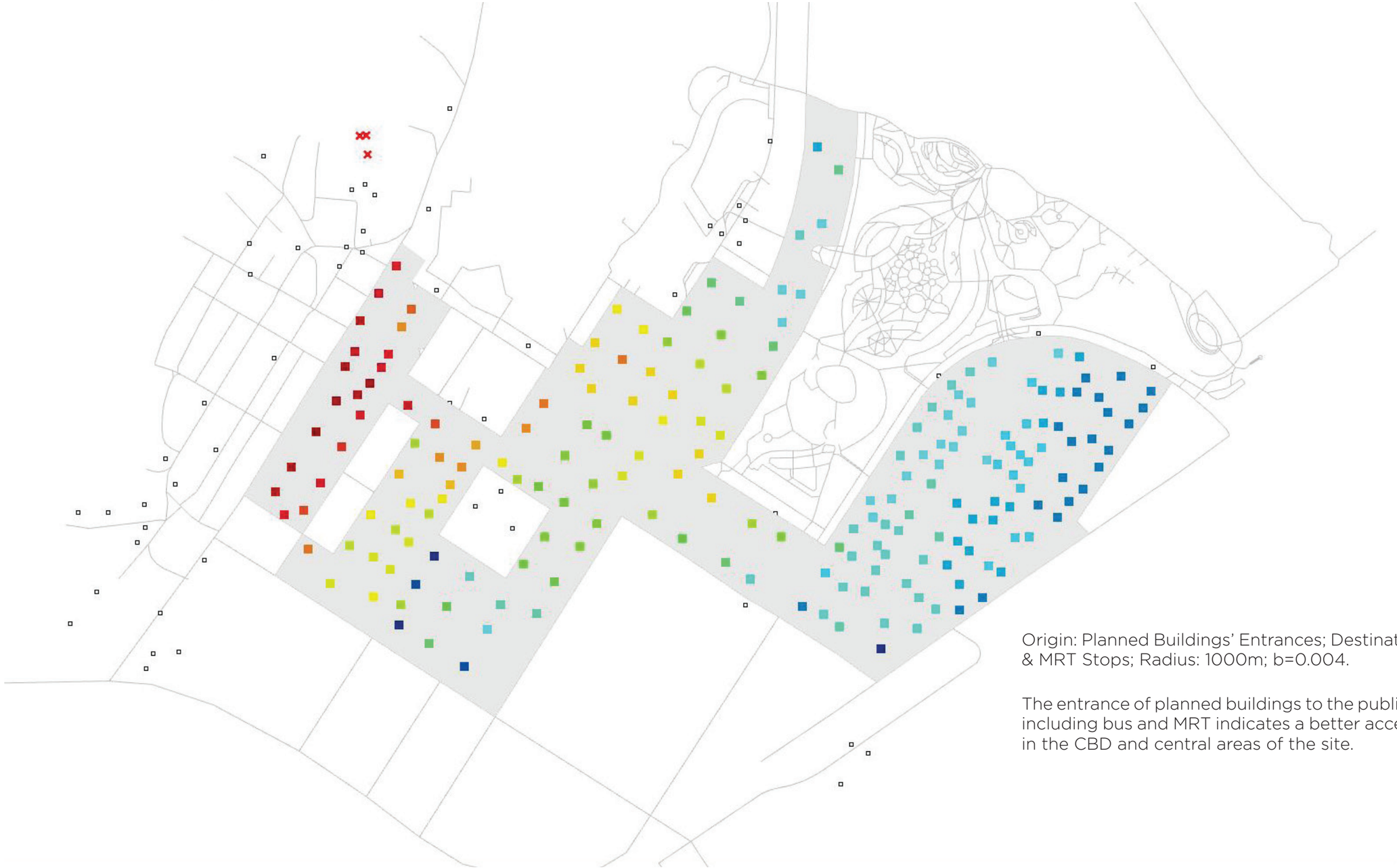
6. From Buildings to Bus Stops & MRT Stations Accessibility Overlaid With Current Activity-generating Plan



Origin: Buildings' Entrances; Destination: MRT & Bus Stops; Radius: 1000m; b=0.004;

The activity generating uses map shows the areas where activity-generating developments are encouraged. The map fits very much with the transit analysis, which means the activity-generating areas have better exposure to the public transit.

7. From Planned Buildings to Bus Stops & MRT Stations.

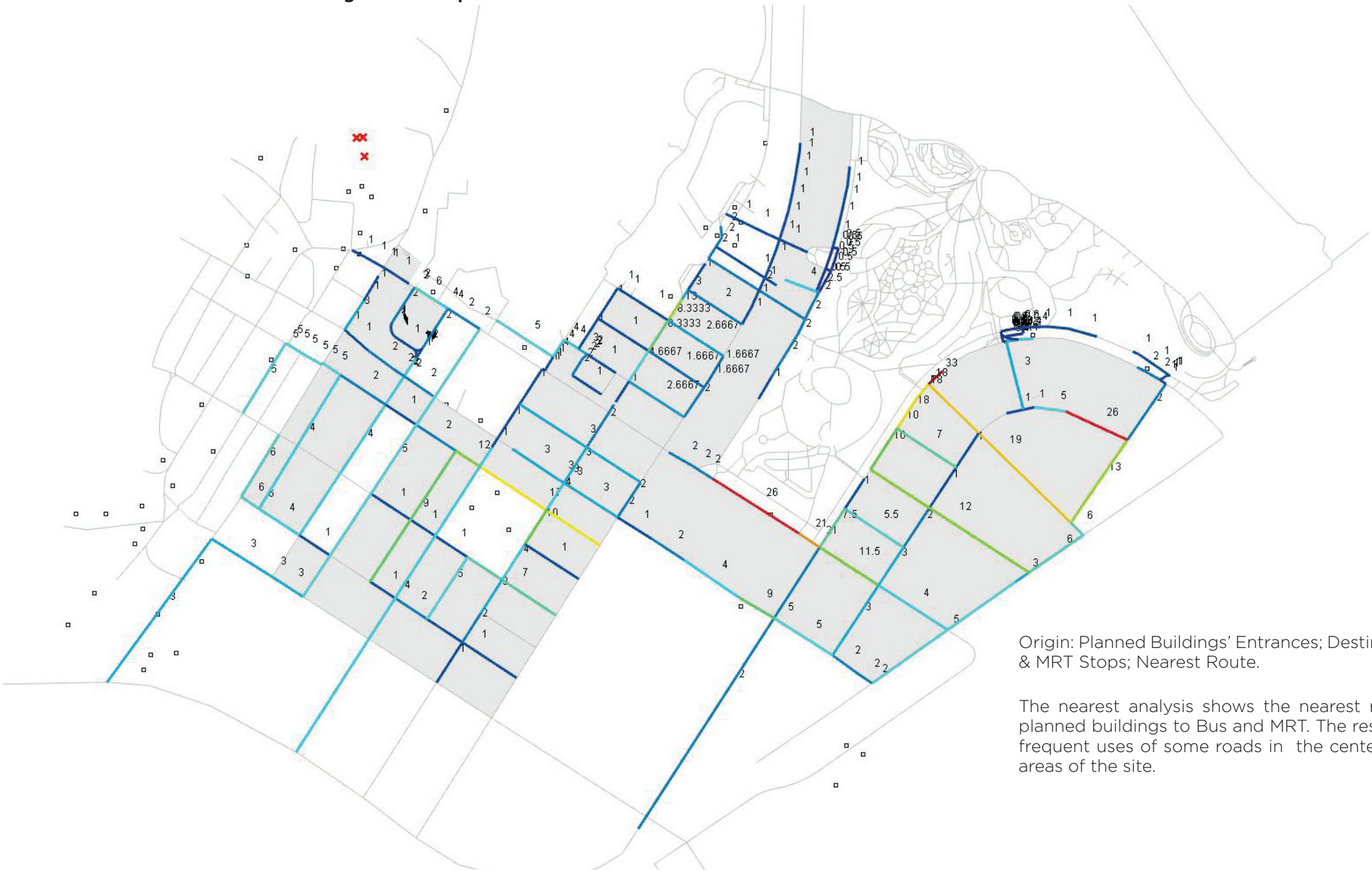


Origin: Planned Buildings' Entrances; Destination: Bus & MRT Stops; Radius: 1000m; b=0.004.

The entrance of planned buildings to the public transit including bus and MRT indicates a better accessibility in the CBD and central areas of the site.

Gravity Analysis

1. Nearest Routes From Planned Buildings to Bus Stops & MRT Stations.



Origin: Planned Buildings' Entrances; Destination: Bus & MRT Stops; Nearest Route.

The nearest analysis shows the nearest route from planned buildings to Bus and MRT. The result reveals frequent uses of some roads in the center and east areas of the site.

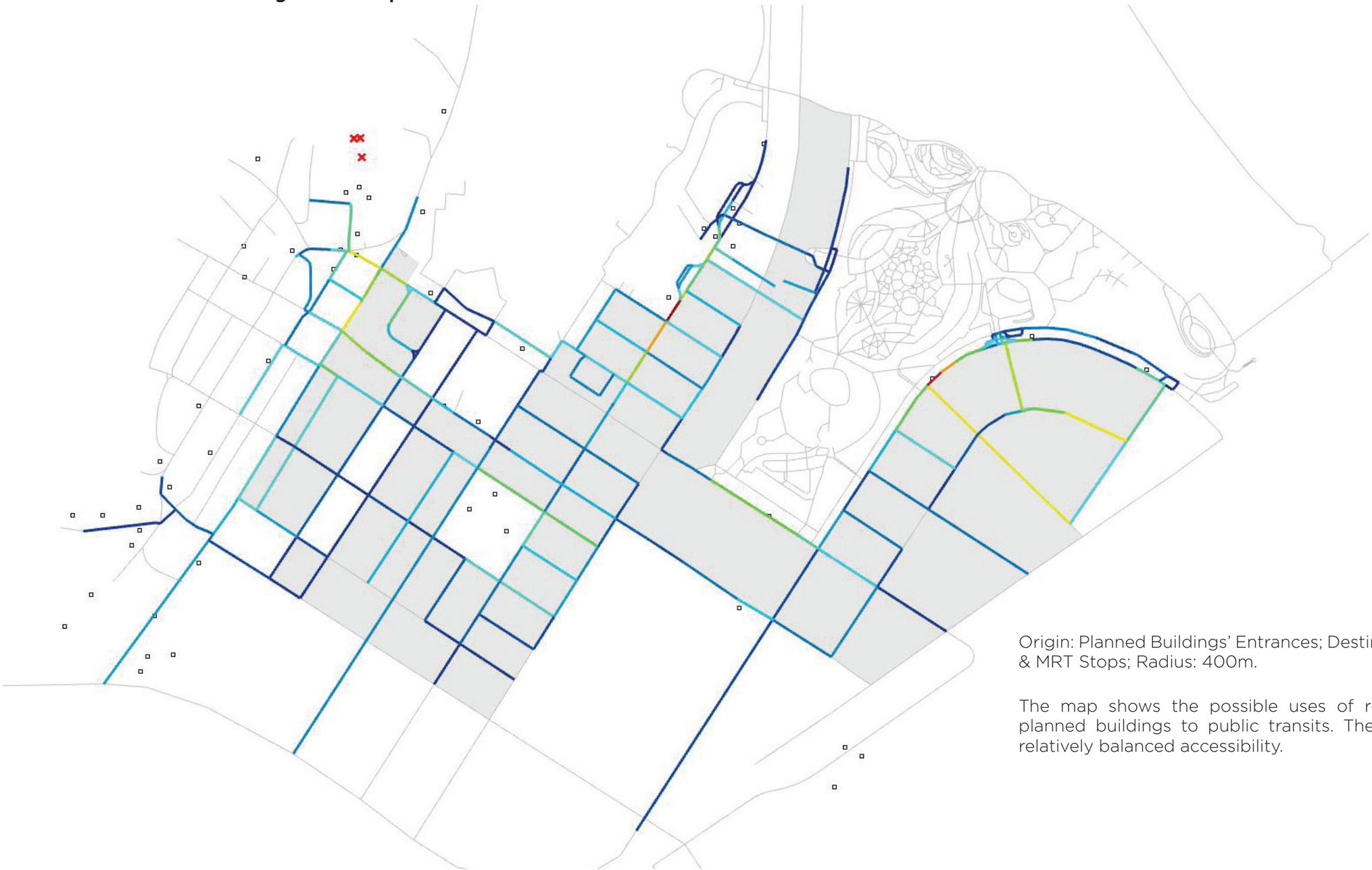
2. Nearest Routes From Planned Buildings to Bus Stops & MRT Stations. (The building entrances are weighted by the population.)



Origin: Planned Buildings' Entrances; Destination: Bus & MRT Stops; Nearest Route. The Entrances are Weighted by the Population.

If the entrances are weighted by the populations, the central area has been used more frequently. Since the FAR permission in the plan is relatively higher than rest of the site.

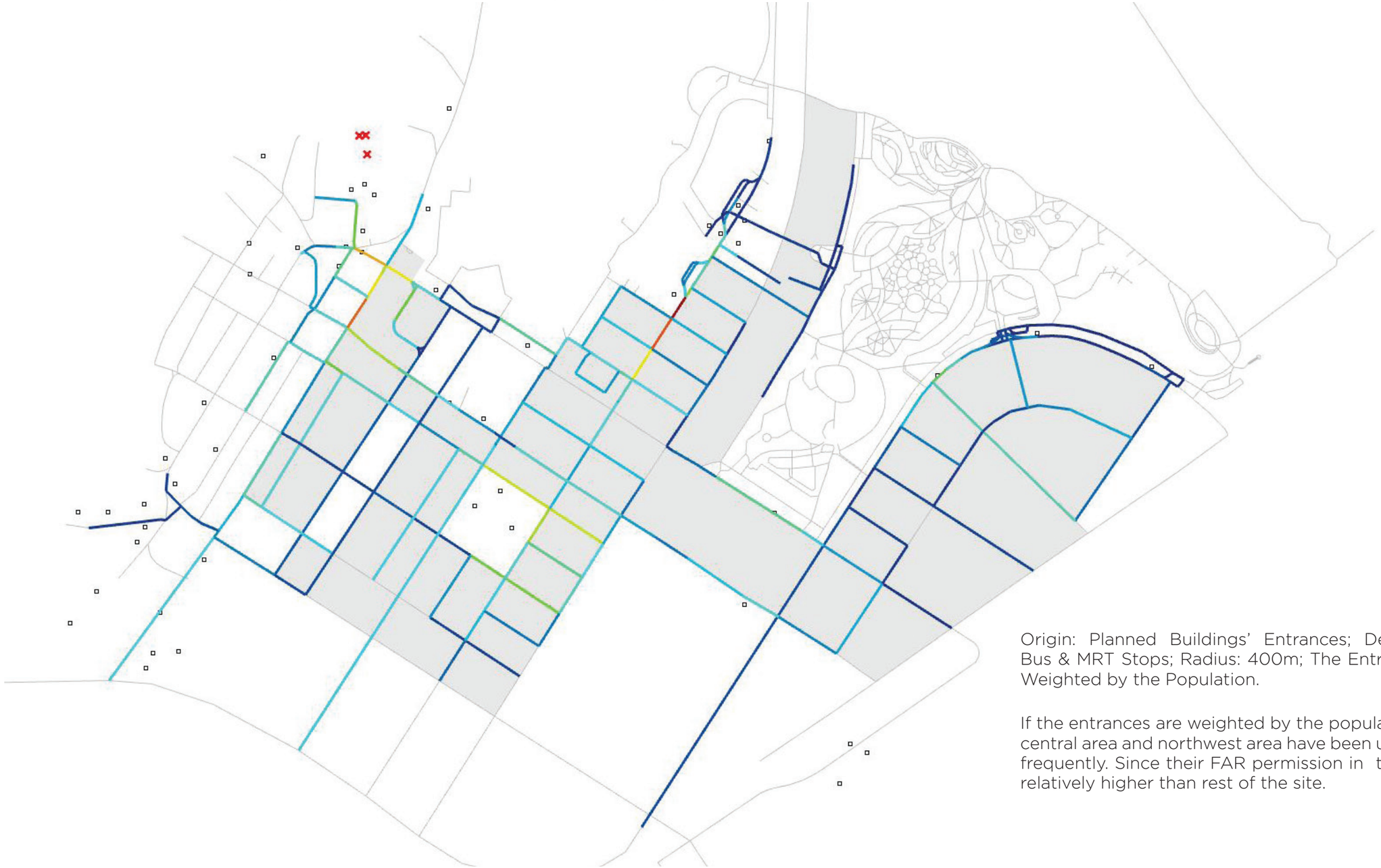
3. Routes From Planned Buildings to Bus Stops & MRT Stations.



Origin: Planned Buildings' Entrances; Destination: Bus & MRT Stops; Radius: 400m.

The map shows the possible uses of roads from planned buildings to public transits. The site have relatively balanced accessibility.

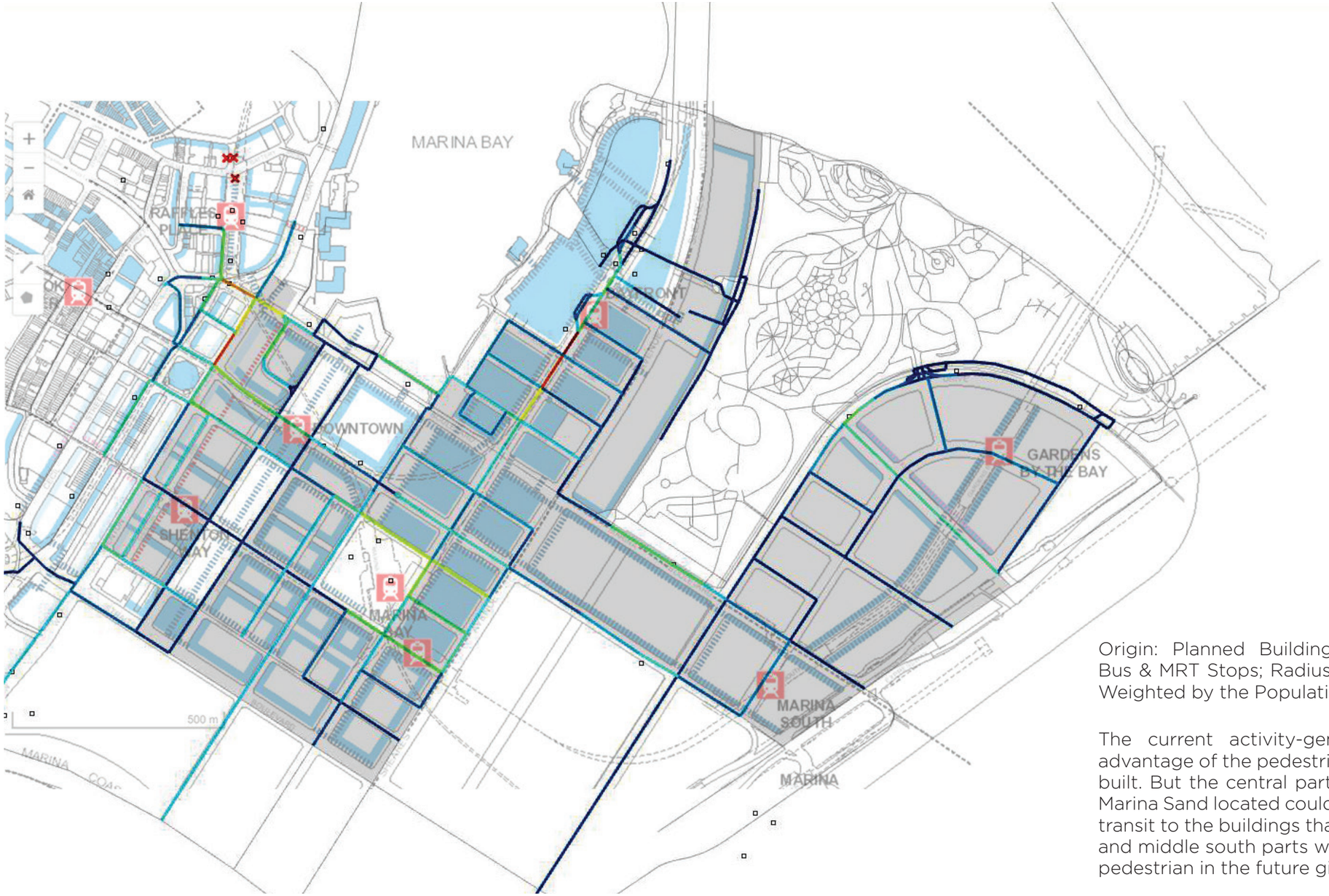
4. Routes From Planned Building to Bus Stops & MRT Stations. (The building entrances are weighted by the population.)



Origin: Planned Buildings' Entrances; Destination: Bus & MRT Stops; Radius: 400m; The Entrances are Weighted by the Population.

If the entrances are weighted by the populations, the central area and northwest area have been used more frequently. Since their FAR permission in the plan is relatively higher than rest of the site.

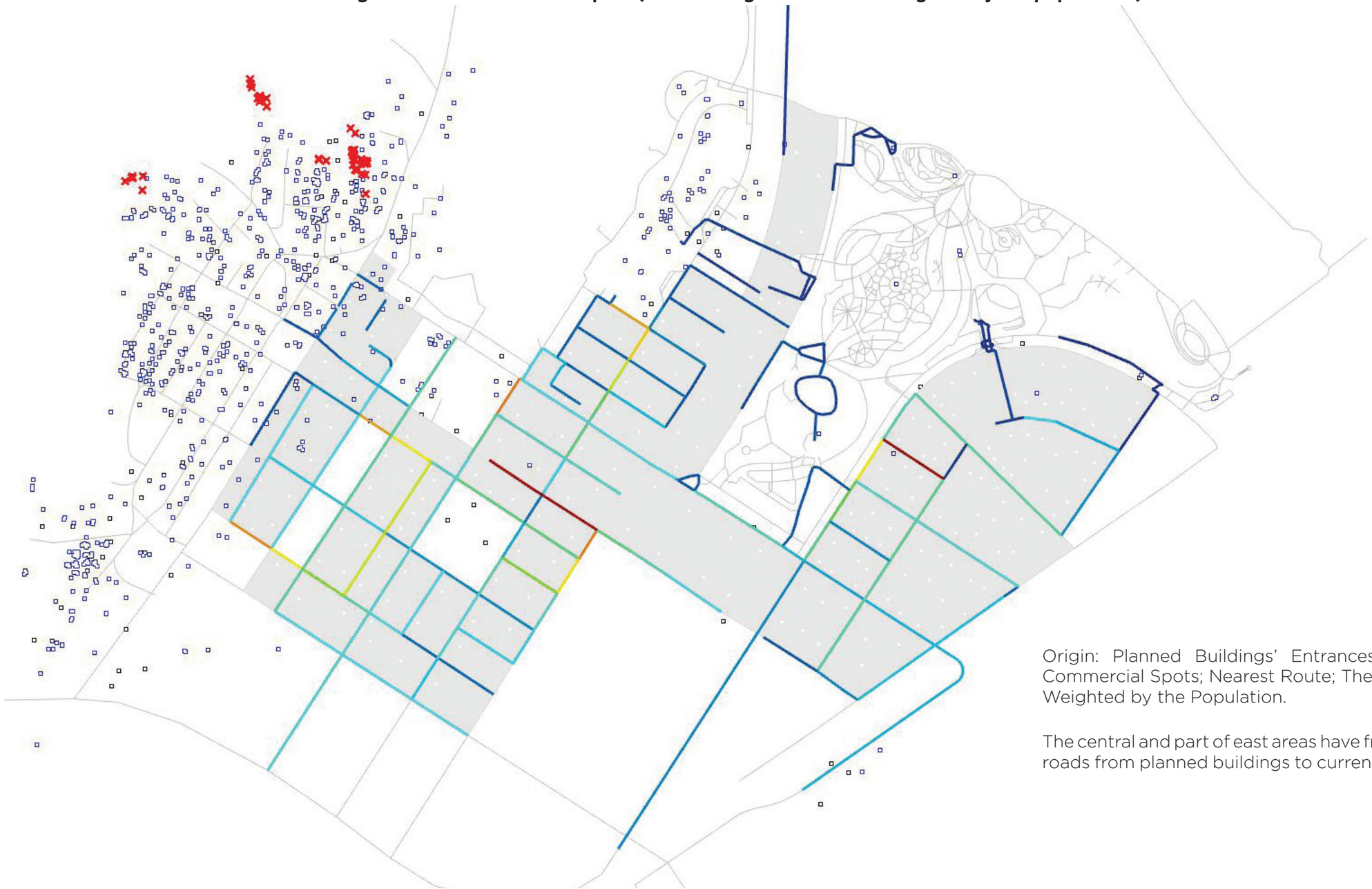
5. Routes From Planned Building to Bus Stops & MRT Stations. (The building entrances are weighted by the population and overlaid with activty-generating plan.)



Origin: Planned Buildings' Entrances; Destination: Bus & MRT Stops; Radius: 400m; The Entrances are Weighted by the Population.

The current activity-generating plan could take advantage of the pedestrian flow after the site is fully built. But the central part and north area where the Marina Sand located could have less people flow from transit to the buildings than the other. The north west and middle south parts will witness higher volume of pedestrian in the future given its higher allowed FAR.

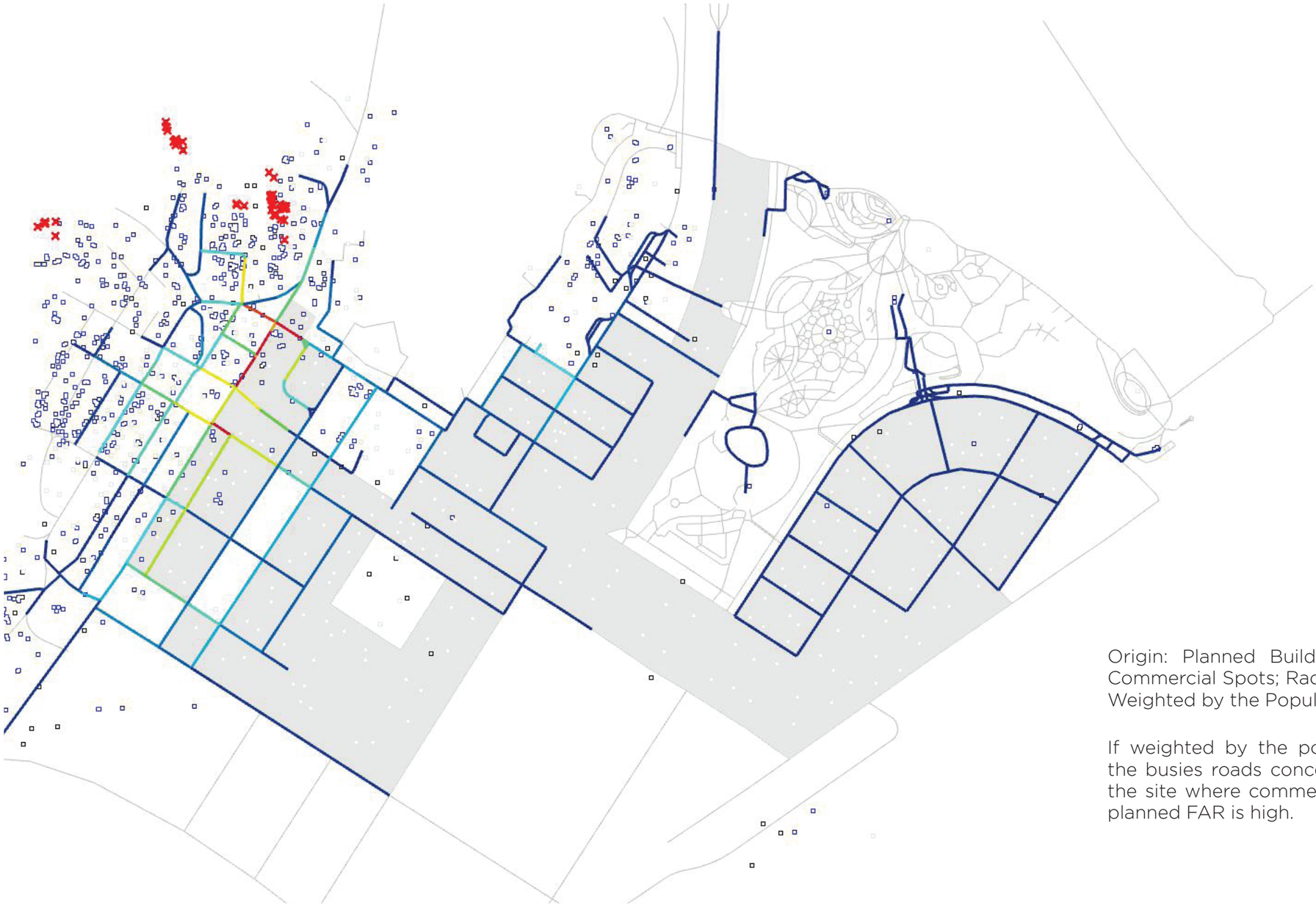
6. Nearest Routes From Planned Building to Current Commercial Spots (The building entrances are weighted by the population.)



Origin: Planned Buildings' Entrances; Destination: Commercial Spots; Nearest Route; The Entrances are Weighted by the Population.

The central and part of east areas have frequently used roads from planned buildings to current commercials.

7. Routes From Planned Building to Commercial Spots (The building entrances are weighted by the population.)



Origin: Planned Buildings' Entrances; Destination: Commercial Spots; Radius: 400m; The Entrances are Weighted by the Population.

If weighted by the population, the analysis shows the busies roads concentrated in the north west of the site where commercials are well developed and planned FAR is high.

8. Routes From Planned Buildings to Current Commercial Spots (The building entrances are weighted by the population and overlaid with activity-generating plan.)



Origin: Planned Buildings' Entrances; Destination: Commercial Spots; Radius: 400m; The Entrances are Weighted by the Population.

The analysis shows pedestrian flow from planned buildings to current commercial spots would be concentrated more in the west developed areas. Current commercial areas could not help very much to generate pedestrian flow for the planned areas.

Lessons Learnt

Marina Bay, Singapore

Pros

- Providing clear guideline through well-organized urban planning documents/drawings by government;
- Easy access the documents via the redevelopment authority's website - very open data to public;
- Activity generate planning is unique urban restriction to vitalize new community;
- Relatively ideal public transportation networks already set up in the city.

Cons

- Too big urban block size; less care about pedestrian environments on the ground;
- A potential issue about social segregation between car users and public transit users;
- Current public spaces (Gardens by the Bay and waterfront) are detached from planned neighbors.

Lessons learnt

Marina Bay, Singapore

1. It is important to provide multiple transit options and equally distribute MRT stations and bus stops in the site. (10 mins walking distance to public transits)
2. According to the weight analysis, numbers of transit lines and location of MRT station highly effect the pedestrian accessibility.
3. Land use, FAR, and road networks impact pedestrian flow.
4. Fully developed CBD area already has better pedestrian accessibility and generates more people flows. Planners consider the advantages for new development area.
5. There is a plan to provide 3D pedestrian network associated with proposed building typologies. -underground, ground, and over ground levels. It could offer diverse accessibilities for the residents.
6. There is sometimes a gap between reality and urban planning: it needs to carefully consider the bottom-up pedestrian perception before it has been built.

The Hand-Shaped Metropolis Copenhagen, Denmark

The government's plan is to develop ground transits. The transit system provides multiple options to connect from rail stations to a car or buses, when people move to central city. It helps to improve convenient inter-city services and constrain automobile accessibility in the center city. Government upgraded the traditional city core by improving the viability and esthetic qualities. This could be a solution when an old historic center needs to be re-developed. The transit oriented development corridor leads to urban growth along the fingers and develops within 1km walking distance. The hand-shaped plan keeps the green open spaces from being encroached as well.

How to Read the Street

There are five key points that have to consider when planners upgrade the street design. First, physical environment conditions such as street dimension, road with, number of lanes, and type of traffic lanes. Second, to provide better life qualities such as more transit options for low income people, safety, vital human behaviors, social interaction, physical activity, and spontaneity. Third, construction cost or budget. Forth, urban density types such as compact city form versus sprawling suburb. Fifth, conversation with community to learn will of neighborhood residents. Additionally, the book introduces a new street design standards for pedestrian environment such as road diet and traffic calming strategy.

References

https://www.ura.gov.sg/uol

https://www.ura.gov.sg/uol/master-plan

https://en.wikipedia.org/wiki/Marina_Bay,_Singapore

https://goo.gl/images/RV0P3b

https://goo.gl/images/YZD41h

https://goo.gl/images/vZ2rYv

https://goo.gl/images/GjVR3V

https://goo.gl/images/oagl9k

https://goo.gl/images/Dy1iic

http://www.gardensbythebay.com.sg/en.html

http://www.singapore-guide.com/attractions/marina-bay.htm

https://timesofmylife.wordpress.com/2011/02/28/marina-bay-in-1800s/



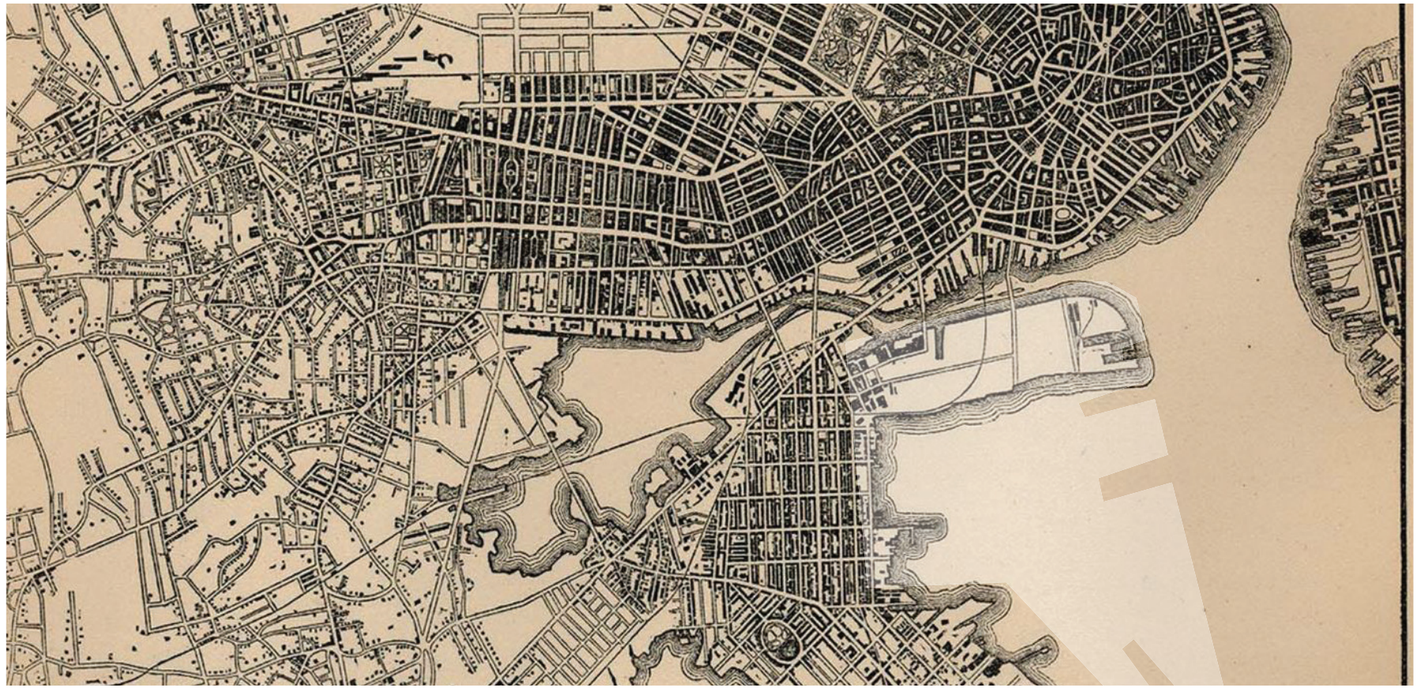
Boston Waterfront District

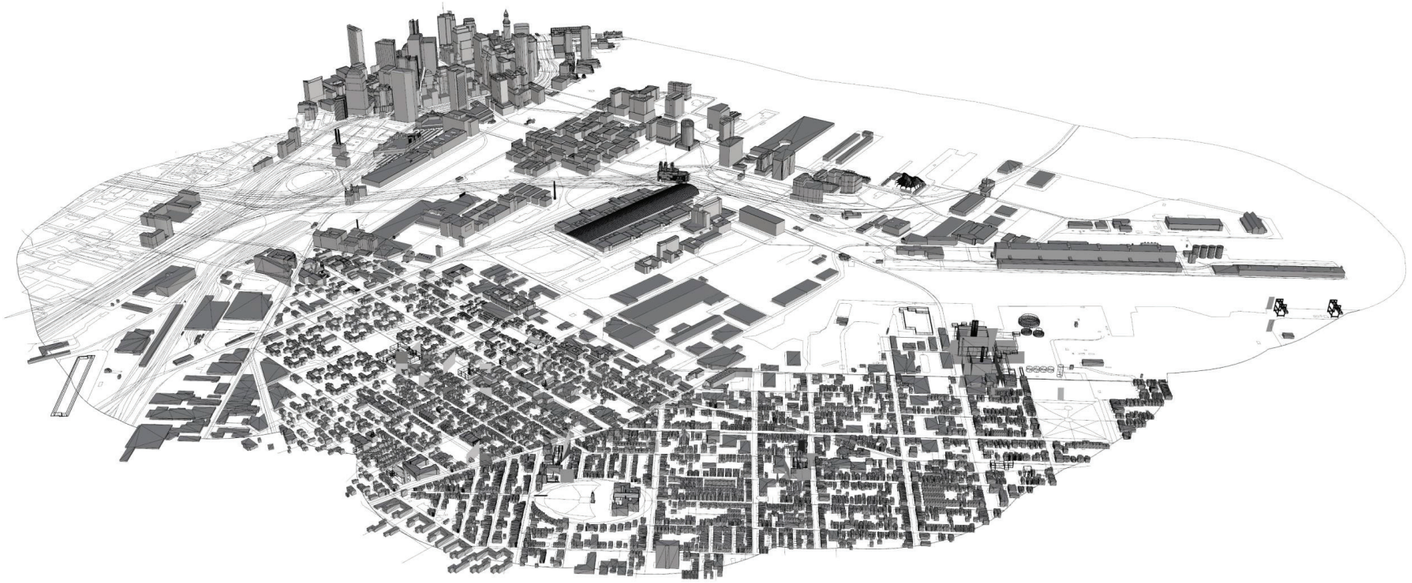
Djuro Bartulica | Ramon Gras Aloma

Introduction

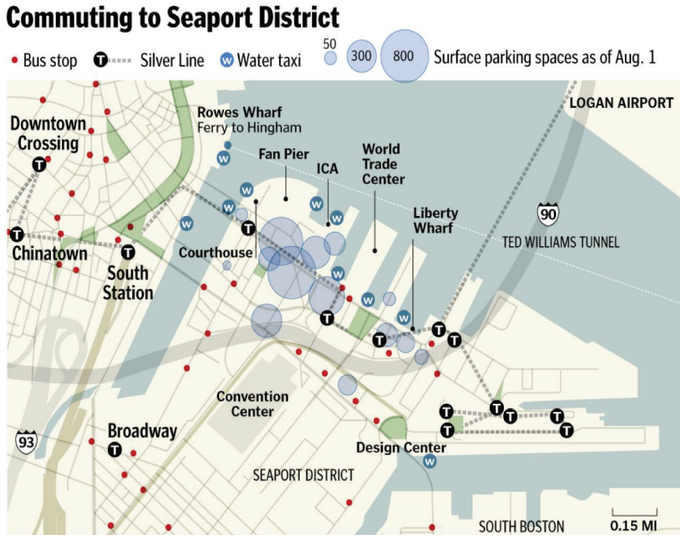
The title ‘Boston Innovation District,’ gained prominence during former Mayor Menino’s redevelopment of Boston’s shipping and docking facilities. It is as good a place to start as any as a description of this project. This title, and others such as Seaport came under scrutiny when local residents of South Boston had claimed ‘more ownership’ over the site area, claiming that it had historically been ’theirs’ more so than downtowns and have vocalized their beliefs that the area should instead be referred to as the ‘South Boston Waterfront.’

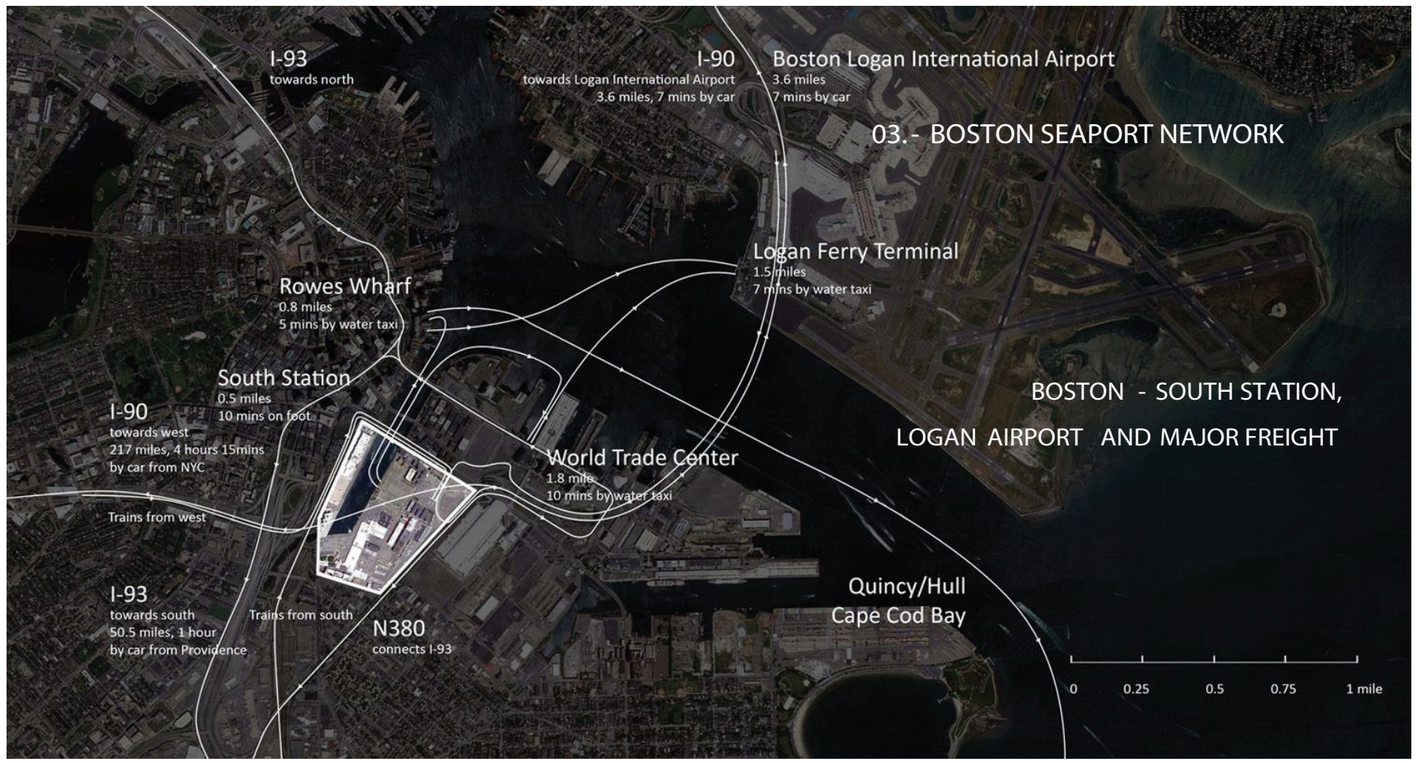
This exchange, though seemingly unimportant or trivial , serves as a useful allegory for an in-depth understanding of the development pressures and challenges associated with this site, including how to leverage market-driven goals with integration within surrounding neighborhoods. For convenience, it will be further referred to as Seaport.











Background

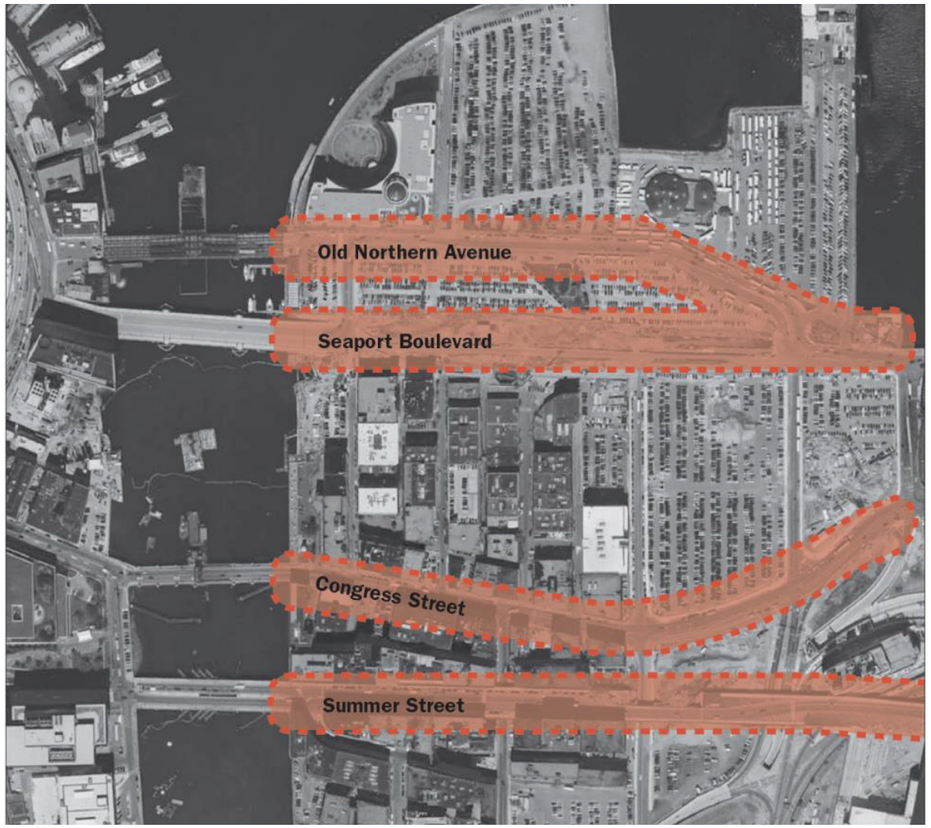
Once a muddy edge to Boston Harbor (up until the 1800s-see figure 1), Seaport has undergone a series of major transformations. The first major transformation occurred when ongoing land reclamation project had finalized the areas shipping and dock canals in the early 20th century and where thriving port operations would continue well into the mid-century. This transformation would face drastic and familiar change in later decades. Earlier, Seaport serviced huge quantities of wool and leather for the local textile industry.

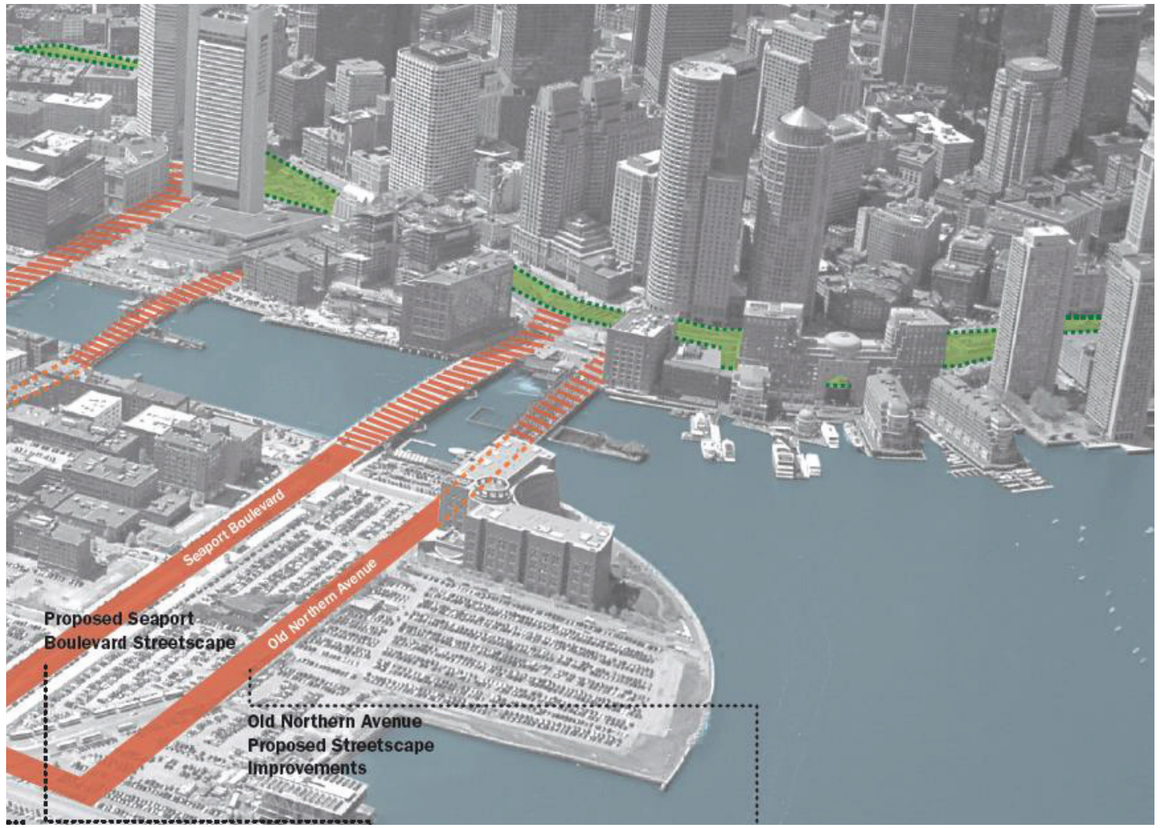
The globalized economic status of the port in the late 1980s and early 1990s reduced the area to a vast array of parking lots, abandoned warehouse uses and open impervious surfaces. The late 2000s had, as in most US cities, spurred an interest in the revitalization of central city industrial space (formerly cargo-based) into places for downtown or 'waterfront' expansion (mainly through highly integrated retail-hotel-entertainment-office (Live-Work) mixed-use developments. The development plan for Seaport is a reflection of such interests. Boston's national prominence as a technology center would also be reflected in the development plan,(figure 2) even to the point of pricing out office tenants to the existing downtown and financial districts.

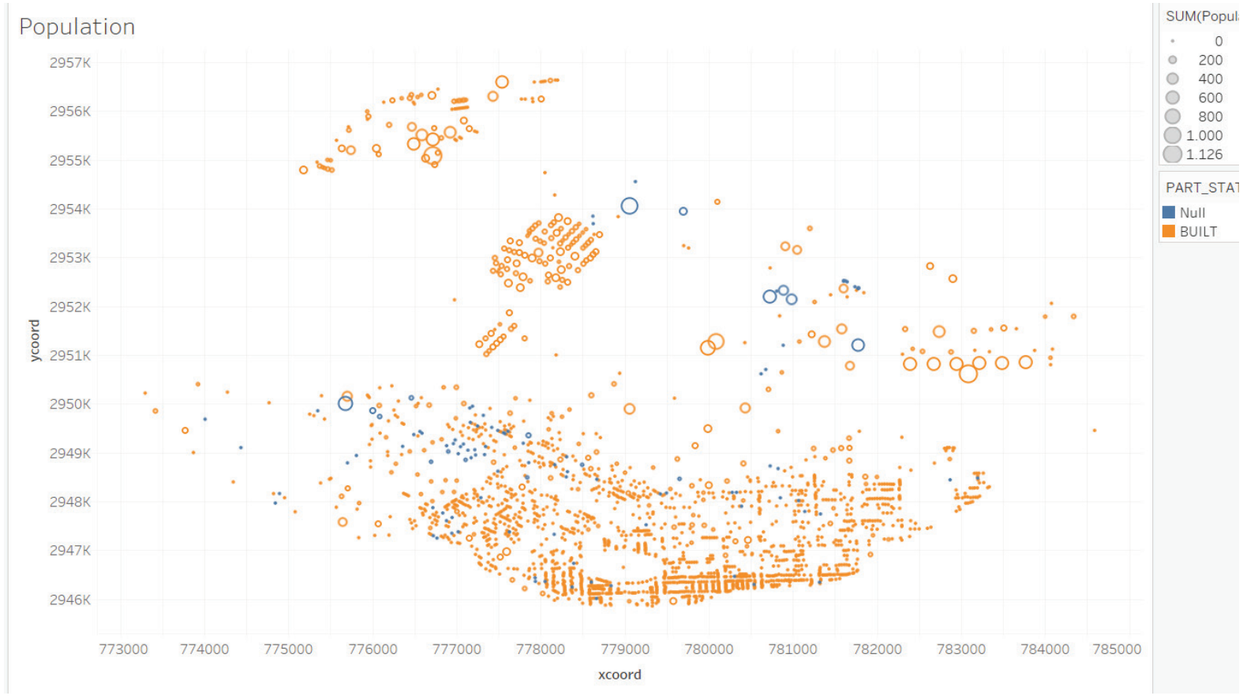
The rate and absorption of this development, it's market potential in the next decade and it's overall integration with surrounding neighborhoods and downtown Boston are all considered in this analysis.

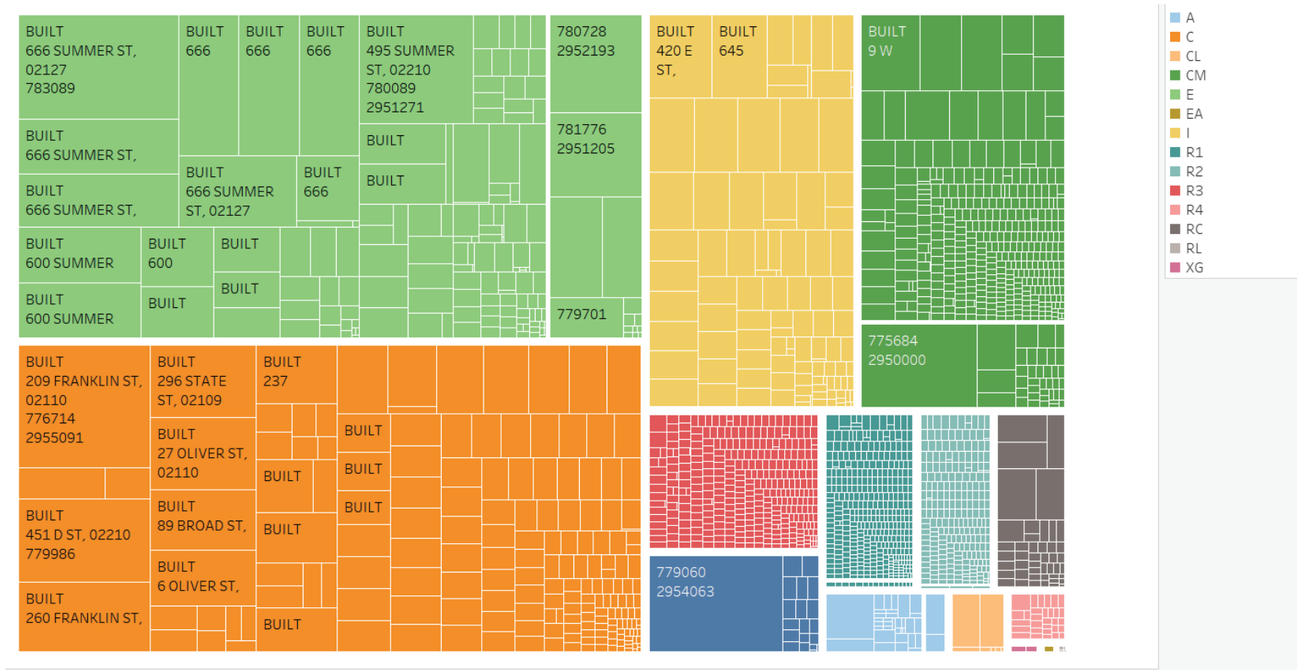
Integration with the cites ‘center of mass’ in the downtown and it’s potential integration with South Boston/Telegraph Hill are considered and analyzed using a hypothetical light rail link connecting South Station and Broadway Ave. (Telegraph/South Boston) populations with the Boston Convention and Exhibition Center. Impacts of this hypothetical rail system are contrasted with planned development yet to be built.

In addition to this analysis, a general study of food resources in conducted with the site area. This analysis compares prevalence, spatiality and density of restaurants and grocery stores within the different areas. This is seen as an increasingly important aspect of planning ‘Live, Work’ developments as well as those that are hoping to sustain ongoing tourist and leisure uses.









Current Network/Planned

The current transit network consists of South Station, the largest train station in the city and a network of MBTA bus lines, including the Silver Line which serves the nearby Logan International Airport via a tunnel running underneath the site. Planned development in the Seaport area would greatly impact traffic capacity on the 4 main gateways to the area from downtown. (figure 3) Instead of proposing that more automobile connections be made, the use of light rail is considered as a means to provide alternative access to the site.

Challenges

The challenges for the Seaport district include major infrastructural barriers and dilapidated port and shipping uses that spans hundreds of the thousands of square feet along the western portion of the study area. These uses will increasingly be redeveloped, but will only proceed along specific axes. Determining which axes is the problem of urban economic development planning of obsolete downtown uses. From the standpoint of accessibility and impact, the Betweenness analysis at the end of this study provides useful insight into which axes show greater prominence.

Other challenges include maintaining the dirigisme of the existing development plan in future years as office uses enter hypersupply stages within the market cycle and condo sales (especially high end) begin to dwindle nationwide.

Analysis:

Our selected analysis begins with (1) the catchment areas of both rail and bus transit in the study area as a starting point for the understanding of serviced and unserviced space on site.

One can observe isolated catchment areas for bus and silverline uses in the Seaport area with much more usage in the South Boston and Telegraph Hill neighborhood.



TRANSIT SERVICE AREA

ORIGIN: POPULATION

DESTINATION: BUS & SILVER LINE

WEIGHTED BY: COUNT

R = 400M, β= 0.002

Similar to the bus uses, rail catchment in Seaport is isolated to a portion of the site that is immediately adjacent to downtown. South Station is the only major rail link currently within the site area.



TRANSIT SERVICE AREA

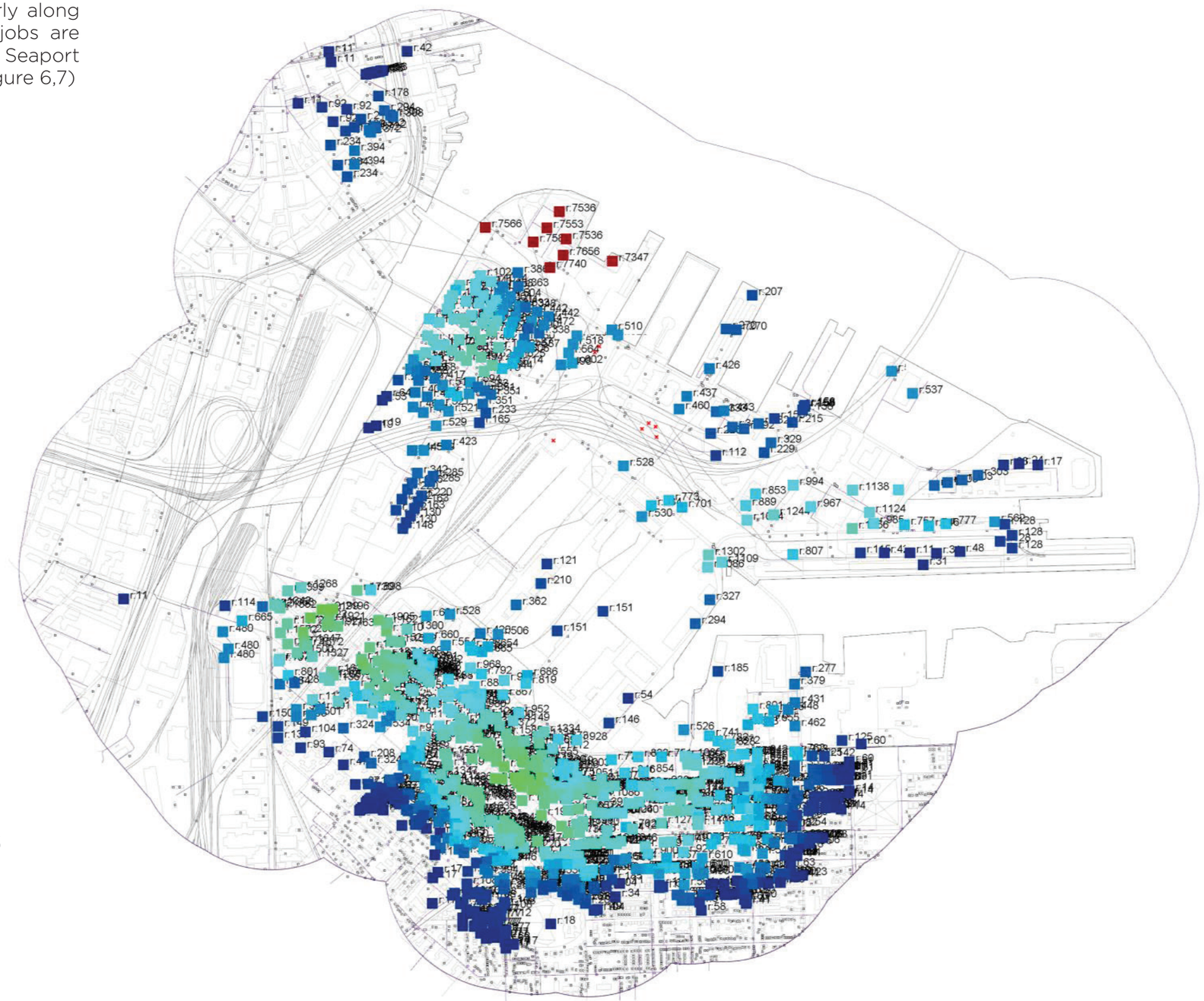
ORIGIN: ALL BUILDINGS

DESTINATION: METRO – SOUTH STATION

WEIGHTED BY: COUNT

R = 1000M, β= 0.002

(2), the job market impact of the site is taken into account and weighted by population in order to show that many small-scale jobs are located within South Boston and Telegraph Hill (particularly along Broadway) but that the vast majority of jobs are located within a much smaller cluster in the Seaport area immediately adjacent to downtown. (figure 6,7)



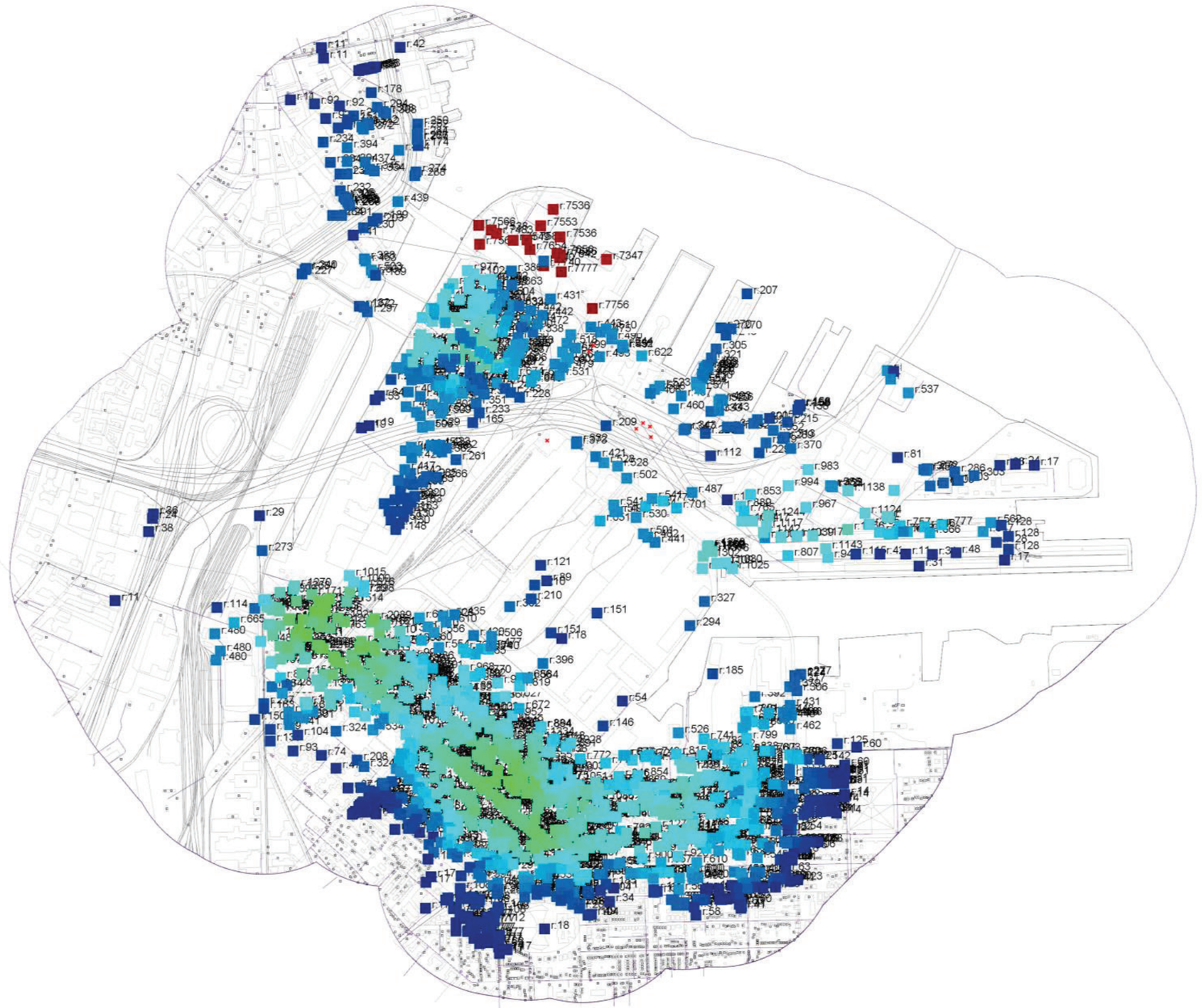
NEW RAIL TRANSIT CENTRALITY

ORIGIN: OLD & NEW POPULATION

DESTINATION: CURRENT BUSINESSES

WEIGHTED BY: JOBS

R = 500M, β= 0.002



NEW RAIL TRANSIT CENTRALITY

ORIGIN: OLD & NEW POPULATION

DESTINATION: OLD & NEW BUSINESSES

WEIGHTED BY: JOBS

R = 500M, β= 0.002

After this, we considered (4) the availability of grocery stores in the area in order to investigate the accessibility of more commmunity-based uses. We find the Seaport area extremely lacking, especially considering that the remaining planned development consists of raising the residential population from ~11,000 to ~30,000 people with no grocery stores on site. (takeaway: A Whole Foods must appear at some point?) (figure 8,9)



CENTRALITY – ACCESS

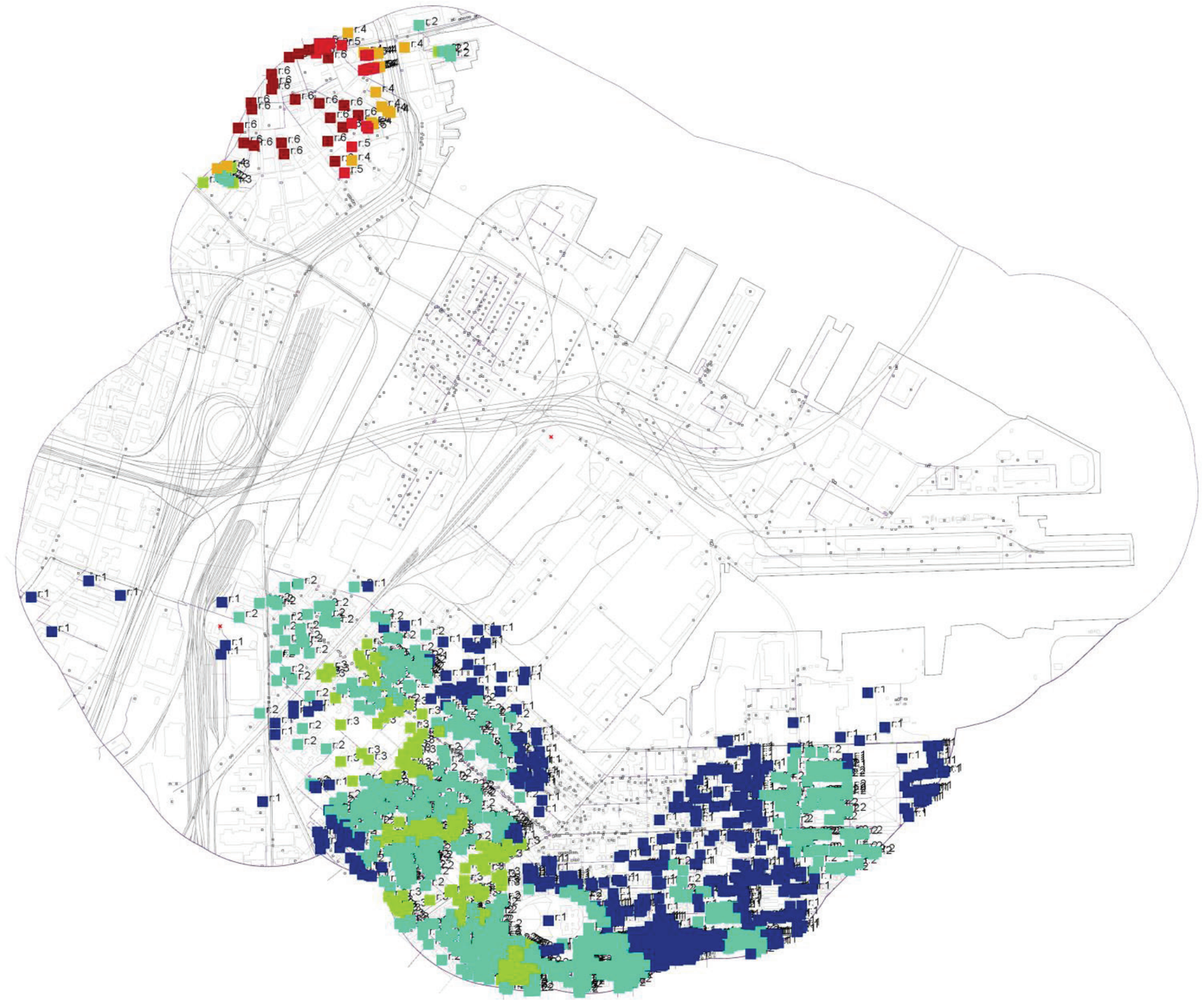
REACH INDEX

ORIGIN: GROCERIES STORES

DESTINATION: POPULATION

WEIGHTED BY: POPULATION

R = 500M, β= 0.002



CENTRALITY

REACH INDEX

ORIGIN: POPULATION

DESTINATION: GROCERIES STORES

WEIGHTED BY: COUNT

R = 500M, β= 0.002

By parsing the existing and planned development potential (office and residential), this next set of analysis (5) considers how both existing and proposed transit will support the area.

What is most important from this study is the relationship between the major axes shown in red. The red axis running E-W in the southern portion of the site is Broadway Ave, a main retail and small-scale commercial center for South Boston and Telegraph Hill. If planned accordingly this area could potentially be connected via the red axis running N-S on the site which eventually terminates on Summer St.

Visualization of these primary axis is crucial for planning the integration of the new are with existing uses.



BETWEENNESS

REACH INDEX

ORIGIN: BUSINESSES

DESTINATION: ALL TRANSIT

WEIGHTED BY: JOBS

DETOUR RATIO: 1.00



Weighted by population, we see a difference in the potential investment axis. From the standpoint of pure adjacency, the corridor shown in red running N-S on Downtown's East Side shows more Betweenness access than Broadway Ave in Telegraph Hill.

Although, nominally, there are more businesses located on Broadway, the populations associated with these businesses are far less.

BETWEENNESS

REACH INDEX

ORIGIN: BUSINESSES

DESTINATION: ALL TRANSIT

WEIGHTED BY: J

DETOUR RATIO: 1.00

And finally, (6) an assessment of transit load and hotel choice is considered alongside a special event simulation of about 60,000 people at the Boston Convention and Exhibition Center. The hotels associated with this study include all new hotels existing in Seaport as well as transportation to South Station where downtown and Back Bay hotels can be reached.

This diagram shows the strain associated with egress of the Special Event. In this model, Summer St. (shown in red) exhibits the highest capacity.



BETWEENNESS – SPECIAL EVENT

ORIGIN: BOSTON EXHIBITION CENTER

DESTINATION: DOWNTOWN BOSTON (SOUTH STATION)

WEIGHTED BY: EVENT ATTENDANCE

DETOUR RATIO: 1.40



This analysis depicts likely traffic densities for non-highway vehicles either travelling to downtown or to Back Bay from the hypothetical Special Event.

[NEXT IMAGE]

And finally we see a simulation of pedestrian traffic to surround ing hotels in the Seaport area.

BETWEENNESS – SPECIAL EVENT

ORIGIN: BOSTON EXHIBITION CENTER

DESTINATION: DOWNTOWN BOSTON (SOUTH STATION) & NEW RAIL LINK STATIONS

WEIGHTED BY: EVENT ATTENDANCE

DETOUR RATIO: 1.40

BETWEENNESS – SPECIAL EVENT

ORIGIN: BOSTON EXHIBITION CENTER

DESTINATION: 5 HOTELS IN SEAPORT

WEIGHTED BY: EVENT ATTENDANCE

DETOUR RATIO: 1.00



Conclusions

The Betweenness analysis and the increased transit service areas, while indicating Seaports growth to the southwest, also indicate a potential development axis in connection with the existing small-scale community retail corridor located in South Boston/ Telegraph Hill (Broadway Ave). From the standpoint of community integration, the betweenness analysis contributes to the idea that development could foster unique and beneficial relationships to the entire area if planned accordingly. Further, if such development took place along these axes (noted in red when weighted by Jobs) the area left blank by port operations would not remain such a major impediment, and could be better sustained a back-of-house use for the city. We do not feel that the potential of this development would encompass this entire site.

As far as existing accessibility it is little surprise that the southern gateways take most of the transit impact overall. (Congress and Summer Sts.) The vehicular and pedestrian impact will continue unless new stations are placed (most likely at the southeastern end of the site).

Overall the Seaport development fuses with downtown uses relatively well, but cannot sustain it's own growth (with it's natural market direction moving to the southeast) without testing heavily its own program. Development of a light rail system and with the existing South Boston neighborhood could add resilience to this circumstance in time, but are not immediate recommendations. Overall livability onsite remains at a mid-way urban and mid-way office park scale. Walkability and public space at this scale is strained by block size and programmatic atrophy at the ground floor as one moves into the site. Small scale landscape masterplanning as well as more compact retail uses can aid with this condition but are generally more likely to pay higher rents and are therefore more difficult to attach to longterm leases.

Lessons Learnt

Pros:

- Location near downtown as well as the airport made value capture easy to achieve and will improve chances for subsequent investment .
- Location also took advantage of underutilized infrastructure.
- Major open spaces provided means to develop large-scale uses while retaining good accessibility to downtown fabrics.

Cons:

- Integration with neighboring uses was largely ignored.
- Attempts to solve major infrastructure barriers existing in the urban fabric were not attempted.
- Waterfront recreation, community uses, and regional uses of the waterfront were ignored (apart from ICA)

Lessons

(1) - Case study

The Seaport district and the Tallinn Redevelopment Area that we have discussed in class share many similarities. The first similarity is directly associated with large infrastructural barriers and constraints that are prevalent on both sites. These barriers have, over time, reinforced the behaviors of the multiple user groups— dividing them from each other and disassociated the space between them as potentially useful. This is perhaps the most difficult aspect of planning new developments that attempt to attach 'new front doors' to existing urban fabrics.

(2) - Case study

The problem of integration within the surrounding communities follows from this point and is a major factor affecting the direction, phasing and program of the development. This problem is best defined by the question: for whom is this site to be developed? In the case of Boston the new development meant 'new people', and caused some real anxieties with in situ populations. What does this question mean for Tallinn? The 'new' in most European cases is shorthand for the young, these people tend to buy stuff, but other cultural aspects of the waterfront also exist which allows for the Seaport district to have retained some culture at least in the form of theme restaurants.

(3) - Case study

In all waterfront redevelopment projects the aspect of value capture is likely the most popular one to maintain, but this means completely different things for each site. In the case of Tallinn the current waterfront prevents the entire central city from accessing the downtown, whereas in Seaport the area exists as ancillary downtown extension.

(4) - Jeff Speck

Overall livability onsite remains at a mid-way urban and mid-way office park scale. Walkability and public space at this scale is strained by block size and programmatic atrophy at the ground floor as one moves into the site. Small scale landscape masterplanning as well as more compact retail uses can aid with this condition but are generally more likely to pay higher rents and are therefore more difficult to attach to longterm leases. Social engagement with the waterfront will be an essential feature of the Tallinn development, failure to address the human scale will prove to be disastrous to the success of the site by residents of the city.

(5,6) - Jeff Speck

Above all aspects discussed in the Speck reading two remain most important for the situation in Tallinn. They are the aspects of induced demand and local density/neighborhood structure. Induced demand as a lesson that Tallinn seems to have endured with the rise of automobile use in the area. Automobile use in Boston remains pervasive, but alternative transit modes in both cases could prove more beneficial than increasing existing transit supply. This happens not only by the alternative method and its ability to leaven capacity, but also as Speck suggests in his discussion of Dallas, by interjecting itself into the everyday self-reinforcing behavior prevalent in society. "Walking 500m, let alone taking a bus, to the grocery store is considered Communism in Dallas." - R. Peiser (2016). People will try new things before switching to systems they do not currently use.

(7) - Robert Cervero

The Seaport district and Tallinn district are fortunate in having regional design organizations for their respective urban areas. Such organizations are essentially for 'forecasting and tailoring transit needs.'

(8) - Robert Cervero

Viable historic centers (very relevant in Tallinn's case, given its precious historic quarter) that are well integrated within the city are critical to consolidate the aura and spirit of the city and provide historical continuity to the community, reinforcing the sense of belonging and community despite major transformation.

(9) - Case study

Tallinn's size makes it easier to develop than significantly larger metropolitan areas, where footprint dispersion & diseconomies of scale affect their implementation for the worse. Like Seaport, the Tallinn area had relatively low amount of land-owning stakeholders. This is quite beneficial from a transactions costs/ Coasian analysis of the development, but many many stakeholders exists in urban areas, whether they are major landowners or not.

(10) - Robert Cervero

“Public transit is inherently a public sector enterprise”

(11) - Jeff Speck

There are multiple types of walks that one can experience in the city. Speck outlines an approach through the titles of his sub-chapters. These titles are a useful summary of his ideas. They read as follows:

(1) Put Cars in Their Places

(2) Mix the uses

(3) Get the Parking Right

(4) Let Transit Work

(5) Protect the Pedestrians

(6) Welcome Bikes

(7) Shape spaces (places)

(8) Plant Trees

(9) Make Friendly and Unique Faces

(10) Pick (Hedge) Your Winners

All of these parameters with which we undertake planning can and ought to be thought of as a singular effort— that it is possible that each parameter can be attached end to end in the pursuit of a larger goal of transformation and that the existing ignorance of their interdependence or interconnectedness is a major factor in the failure of existing systems.

Vancouver Harbor

Cesar Castro | Yonghui Chen

Downtown Vancouver aerial (Credit: Tourism Vancouver/ Albert Normandin)

Vancouver Harbour Case Study

History

The city of Vancouver is situated in British Columbia, the westernmost province of Canada. Though visited by famous explorers and traders throughout its early history, the city did not come into full existence until gold drove people to the area during the 1850s. Aided by the arrival of the Canadian Pacific Railway, the settlement quickly grew in the late 19th century to become an incorporated city in 1886. Along with the railroad, logging, a natural harbor, and exports supported the growth of the city well into the 20th century.

After WWII, exports from Vancouver, particularly to China and other Asian nations, continued to drive the growth of the region. The city was placed in the international spotlight during Expo 86, an international event focused on transportation innovations held in 1986. It was this particularly event that also sparked a number of planning-related innovations in the city, including the inauguration of its metropolitan railway system SkyTrain and the approval of viewing corridor guidelines, which came to define the aesthetics of urban planning for the region.

Population

According to UN and local census figures, as of 2015, the City of Vancouver had over 603,000 residents, while the Greater Vancouver area had a population of over 2.4 million. During the last few decades the area has experienced noticeable growth. For example, between 2006 and 2011 the metro region of Vancouver experienced an almost 10% increase in its population. Much of this growth has been fueled by international and national immigration to the city with over 40% of Vancouver's current residents having an Asian background.

In terms of age, the city and metropolitan region is relatively young, with 71.2% of the population between 15 and 64, compared to the national average of 68 percent. Meanwhile, the median age for Vancouver is around 40 years-old.

From a family perspective, 56.5% of Vancouver residents were married, while the remaining 43.5% were single. Of those married families, over 46% had children. Lastly, single-parent families make up about 10% of the population of the area.

Housing Type

From a family perspective, 56.5% of Vancouver residents were married, while the remaining 43.5% were single. Of those married families, over 46% had children. Lastly, single-parent families make up about 10% of the population of the area.

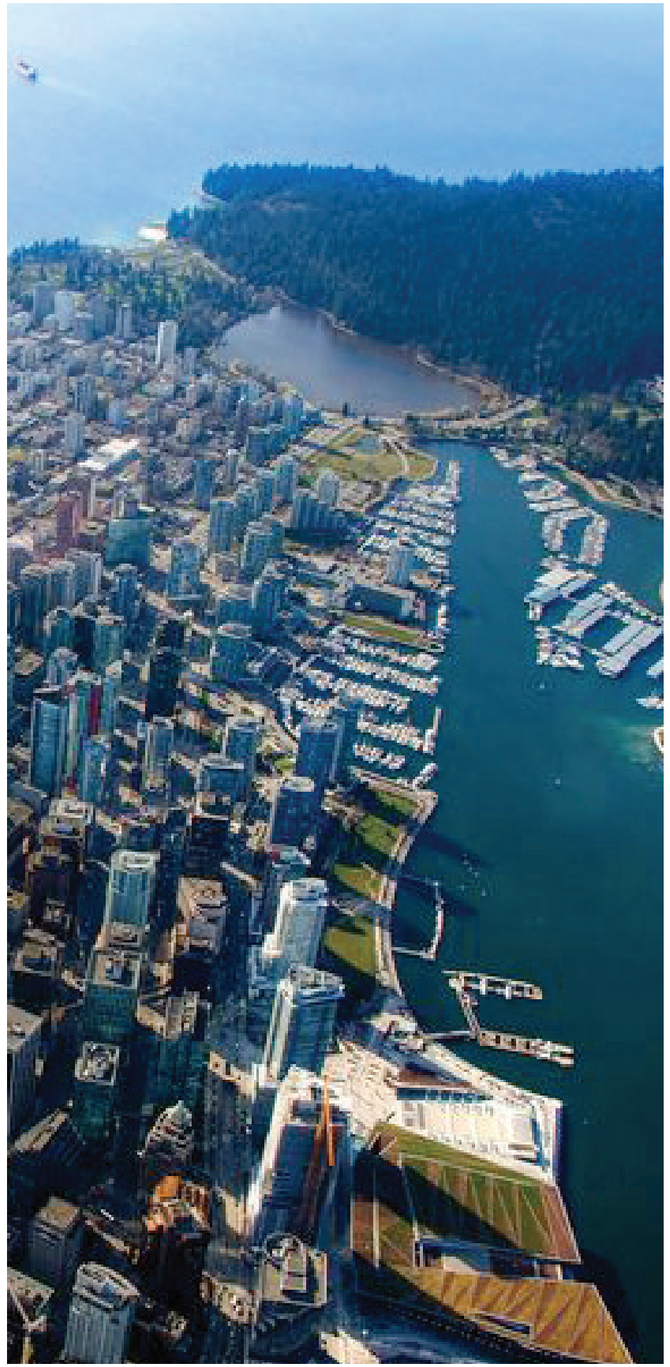
Local Economy

While Vancouver's economy continues to be driven by international trade, other industries have spurred economic growth in the city. Sectors such as film, finance, tourism, and technology have also helped the city become a regional and national employment hub. Moreover, local universities such as the University of British Columbia and Simon Fraser University continue to attract talent and help create new sources of employment for the region.

Transit

Since the 1980s, the city has enjoyed a robust rapid transit network via its SkyTrain lines. Moreover, its bus system provides express and local services to the city center and its peripheries. Furthermore, a regional railroad network connects the city to the rest of the western region of Canada. All facets of transportation are handled in the region by TransLink, which is also responsible for maintaining roads and ferries.

In the last few years, the city has also been toying with the idea of creating a downtown streetcar system using old and new streetcar technology. Moreover, according to city data, despite population growth in



A Bursting City. Photo by ecstaticist on Flickr

the last 15 years, vehicles entering the city have been reduced by 5 percent. Meanwhile, vehicles entering the downtown area have been reduced by 20% during the same time period.

From a mode sharing perspective, over 40% of all trips in the city were made via a bike, walking, or transit. The city plans to raise those ratios to 66% through the implementation of new infrastructure by 2040.

Regional Planning and Vancourism

Since the 1950s, growth in the area has been closely monitored and planned by a strong regional planning committee. The Greater Vancouver Regional District has the power to coordinate regional services and urban planning on behalf of the 23 municipalities in the area. It is through this coordination and other regional planning efforts that the planning phenomenon now known as Vancourism was able to be created and to flourish.

At its core, Vancourism is characterized by mixed-use, high density development in the city core. Other elements, such as the reliance on mass transit, walkable streets, strong urban design principles, and environmentally-friendly sustainable growth have also become hallmarks of this particular brand of city planning. It is via this particular type of planning that the city has won several international awards and has been regarded as one of the most livable cities in North America and across the globe.

Coal Harbour and Waterfront Development

During the 1990s, the city's success in redeveloping the West End neighborhood at the edge of Downtown provided the right impetus to also develop the city's former shipyard and railroad hub in Coal Harbour. The project provided continuity to the skyline of downtown's financial district with a new set of upscale housing towers and activated ground-level commercial uses. Moreover, the new neighborhood's proximity to Stanley Park provided not only an amenity for potential new residents, but also closed the gap between the famous urban park and downtown. From the inception of the area's plan, the city's vision was an area of mixed-used high-density development that maintained public access to the waterfront. Overall, the site added 2,200 housing units to the downtown district with an average net FAR of 3.75.

Development

The site was developed jointly by Marathon Realty, which was the real estate arm of Canadian Pacific Railroad, and Sun Hung Kai Properties, a Hong Kong-based firm eager to invest in the North American market. By 1996, Marathon was sold to Oxford Properties Group, a Toronto-based firm which had also been recently acquired by a Hong Kong based conglomerate. Thus, the story and success of the site also rest with the overall stability of the developers from a financial and political perspective. Moreover, the role of foreign investment in the real estate development of the area, which in itself was an innovation at the time, should not be overlooked, particularly as we assess the long-term success of the project.

Urban Design

Much of the success of the 20 hectare area can be attributed to the detailed urban design principles established and enforced in the city's plan. For example, the plan and zoning for the area dictates that:

"The site's northerly aspect with respect to sun orientation and shadowing impacts from development to the south should be considered; and the site's major northerly mountain and water view opportunities should be respected and exploited."

Moreover, other elements, such as parking, street layouts, ground-level uses, and pedestrian movement are all critically integrated in the development of each parcel and the area as a whole, thus giving it the cohesive and livable character the area still enjoys to this day.

Such emphasis on urban design was not unique to



Coal Harbour. simoneanne.com

the site. Since the 1970s the city and the region have proactively guided the growth and form of urban development in the area.

Mobility

In addition to the design principles established in the area's plan, mobility was also a high priority. Movement via pedestrian walkways, bicycle lanes, and transit were all highlighted and implemented in the development of the area. The construction of a bike lane along the coastline, pedestrian-friendly sidewalks along the main residential corridor, and a new bus line on W. Georgia Street helped connect the area to the Commercial Business District.

Despite these forward-thinking mobility accommodations, some challenges still remain. Based on our analysis, the distance to the nearest SkyTrain and rapid transit station remains highly inaccessible to many parts of the neighborhood. Lateral access to the nearby West End neighborhood and commercial district also remain a high hurdle.

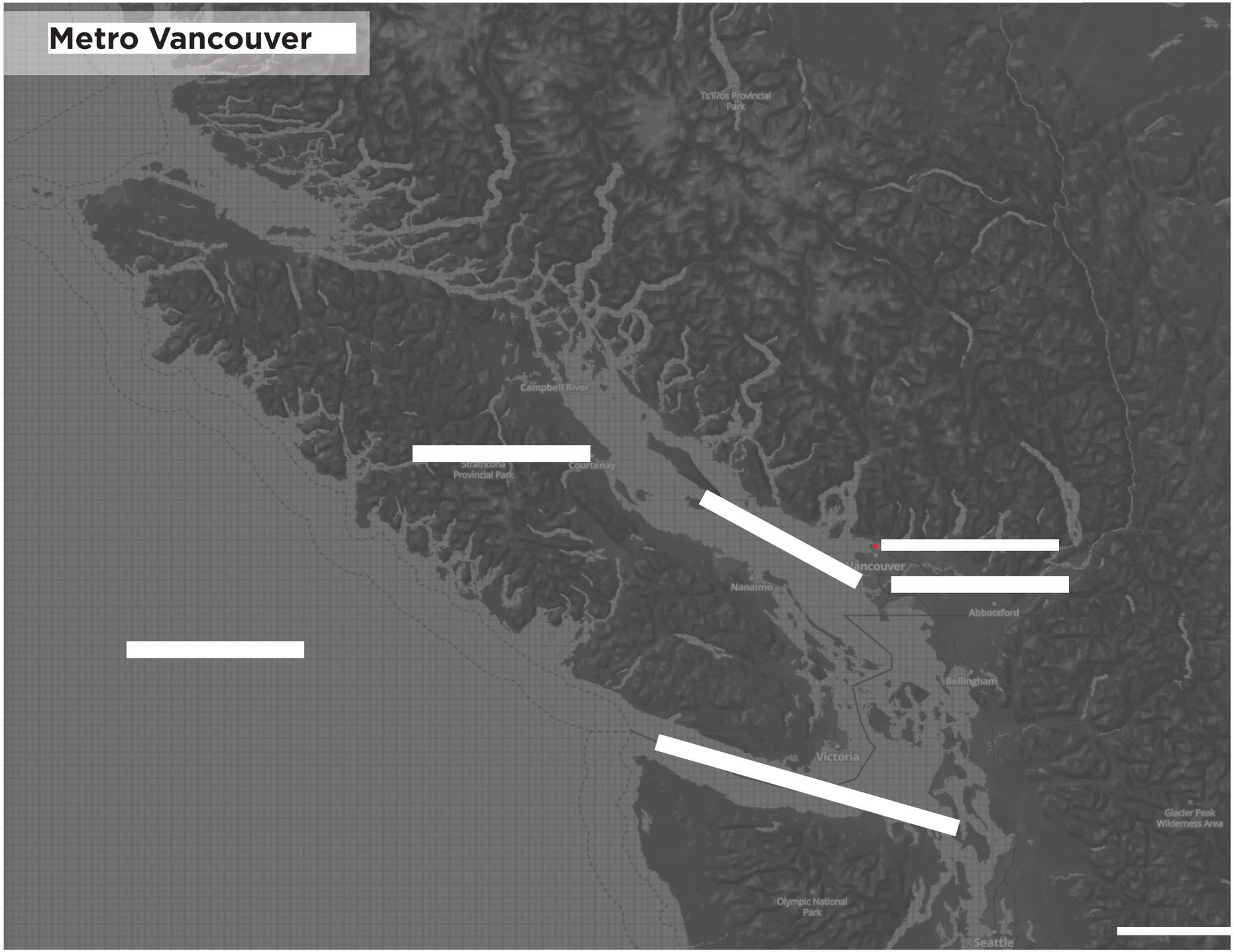
Lessons Learned

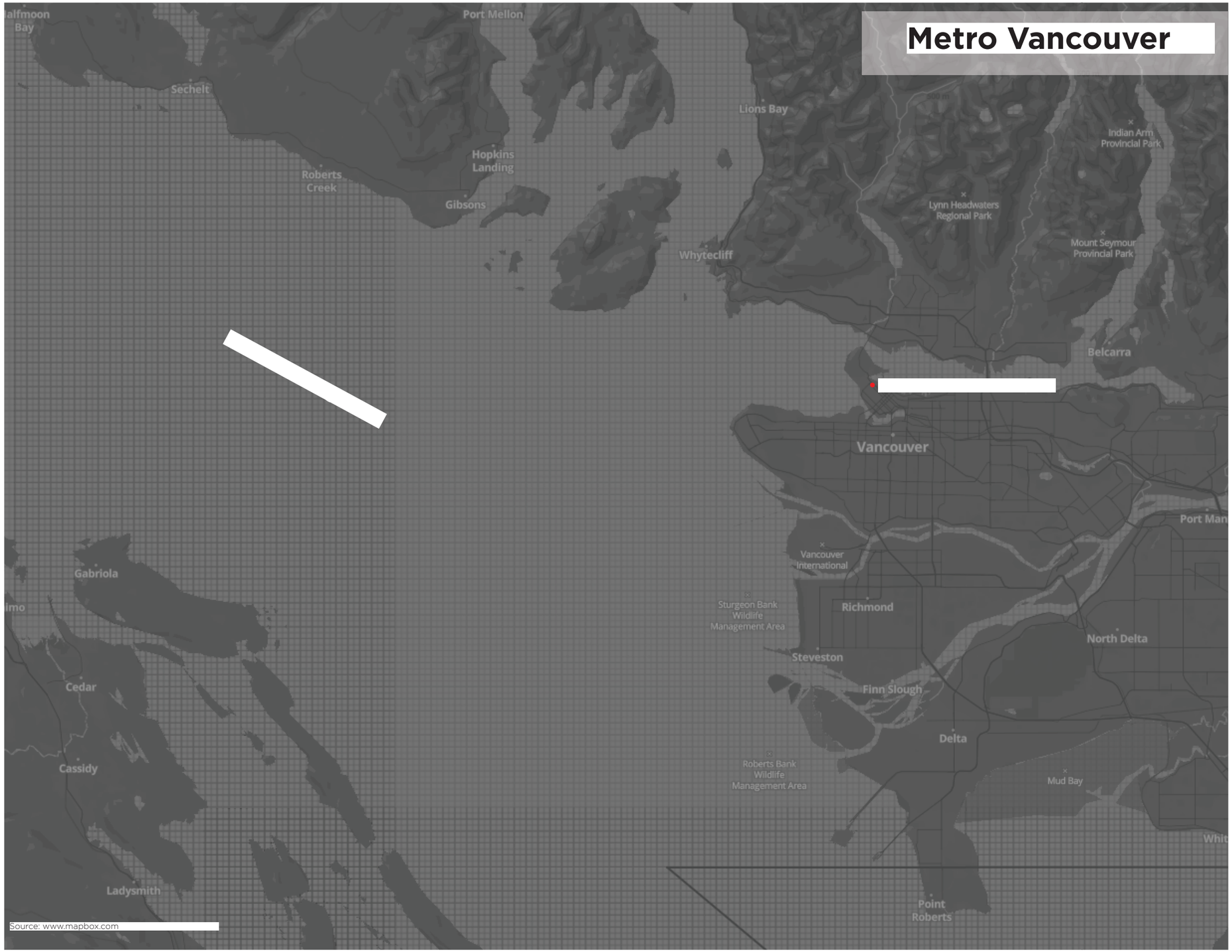
Based on the history of Vancouver, the success of Coal Harbour, and our analysis we can draw a few lessons for this case:

- A strong regional agency ensures multi-modal connectivity and a healthy transit system
- A history of adhering and enforcing particular urban design principles ensures a successful project
- Stable public-private relationship ensures the continuity of a project
- The addition of community anchors, such as a park or community center, in the new development allows the new development to become part of the spatial fabric of the area
- Attention to detail matters, particularly as each parcel is developed
- It is possible to create sustainable, human-centric developments with high density
- Issues related to social equity and inclusion should be considered and reexamined after each phase of the project



Coal Harbor Viewed from Downtown CBD. From rmmla.wsu.edu


Metro Vancouver
Ts'il?os Provincial Park
Campbell River
Strathcona Provincial Park
Courtenay
Vancouver
Nanaimo
Abbotsford
Bellingham
Victoria
Glacier Peak Wilderness Area
Olympic National Park
Seattle


Metro Vancouver
Port Mellon
Sechelt
Lions Bay
Hopkins Landing
Roberts Creek
Gibsons
Whytecliff
Indian Arm Provincial Park
Lynn Headwaters Regional Park
Mount Seymour Provincial Park
Belcarra
Vancouver
Vancouver International
Sturgeon Bank Wildlife Management Area
Richmond
North Delta
Steveston
Finn Slough
Delta
Roberts Bank Wildlife Management Area
Mud Bay
Point Roberts
Gabriola
Cedar
Cassidy
Ladysmith
Source: www.mapbox.com



Vancouver Harbor Boundary

Source: Google Earth

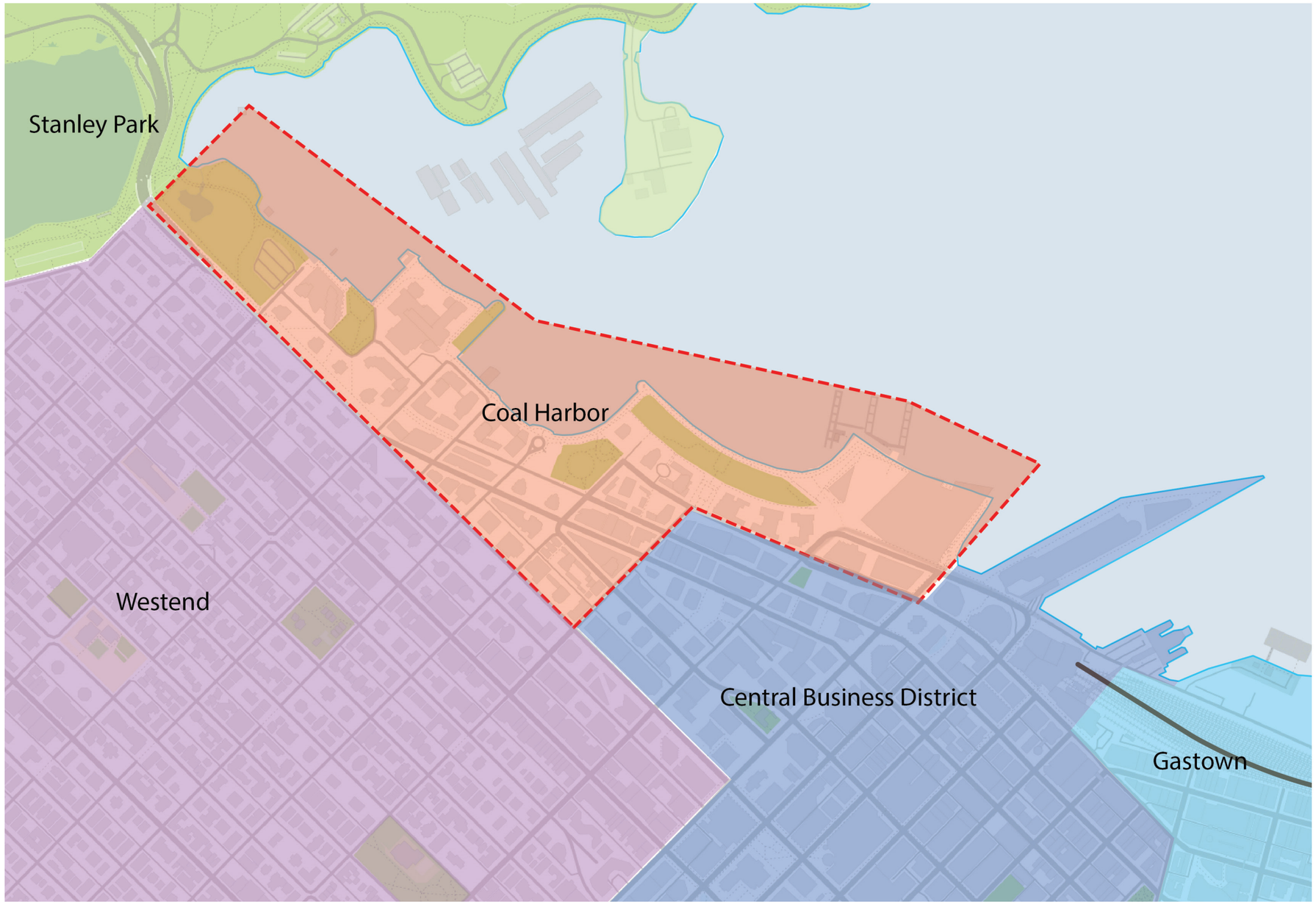


Vancouver Harbor Boundary
Source: Google Earth

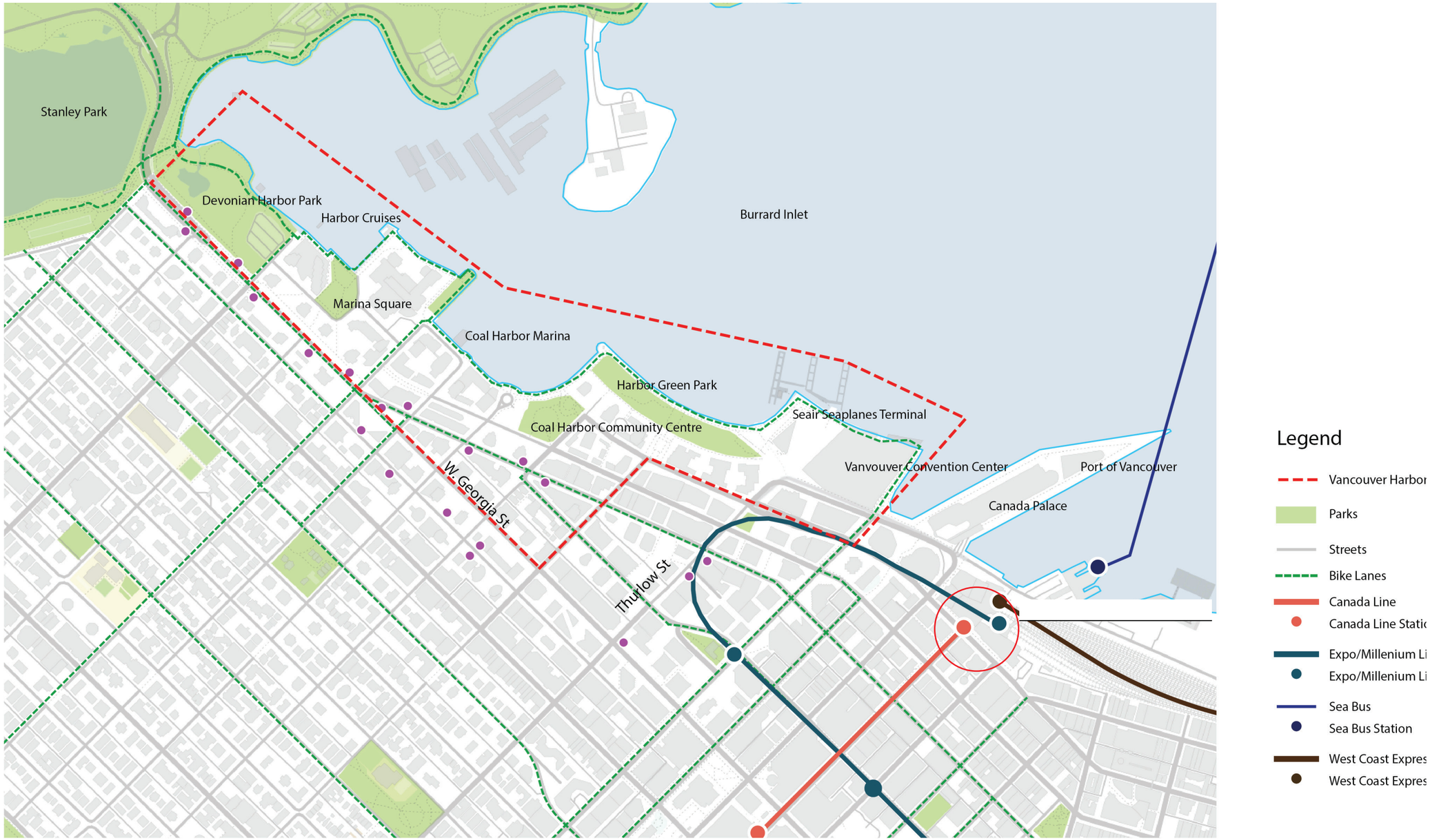


Source: Googlemap

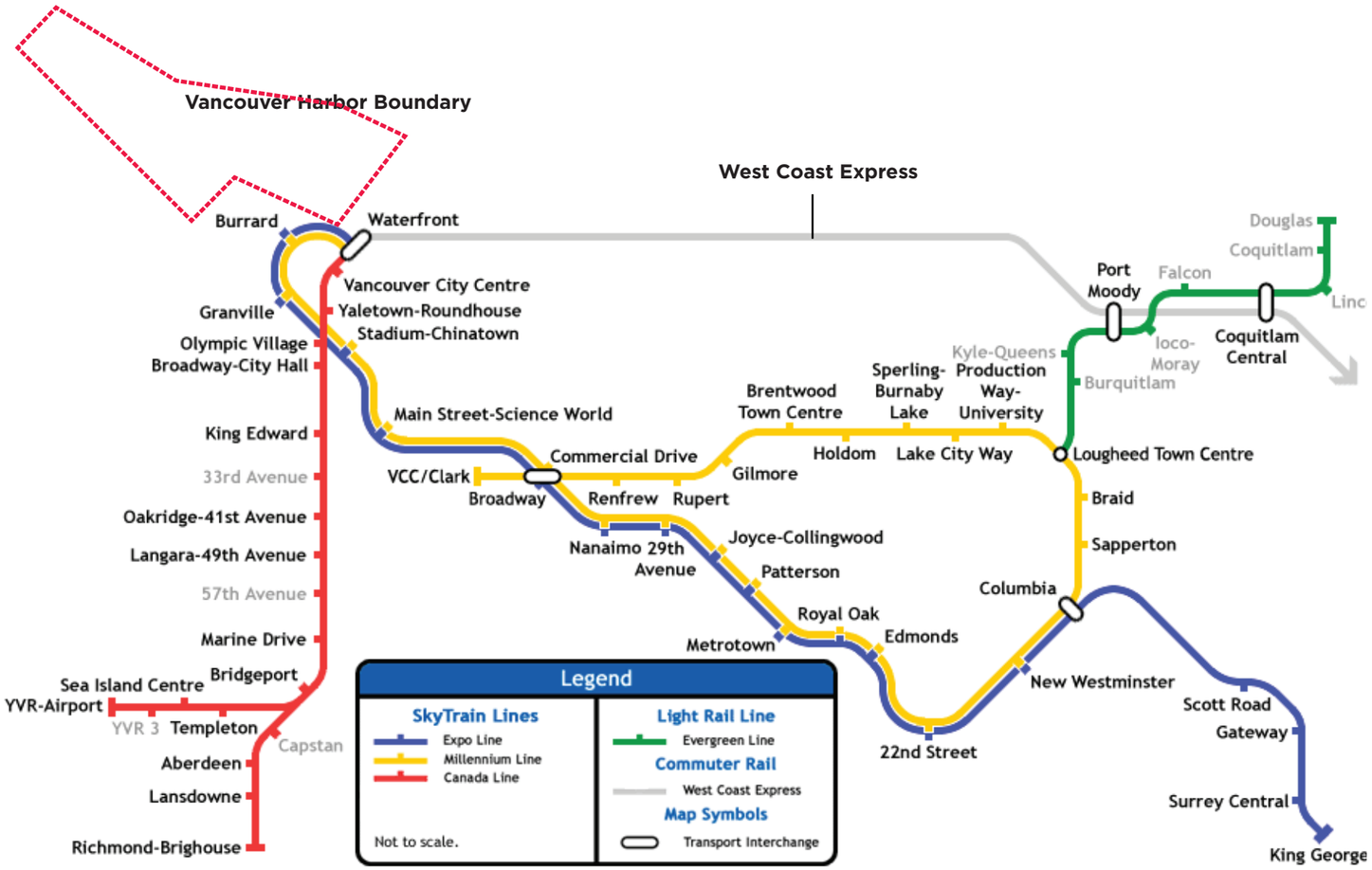
Character Area



Transportation Layout



Transit



Vancouver Transit Map
Source: http://www.vancouver.hm/skytrain.php

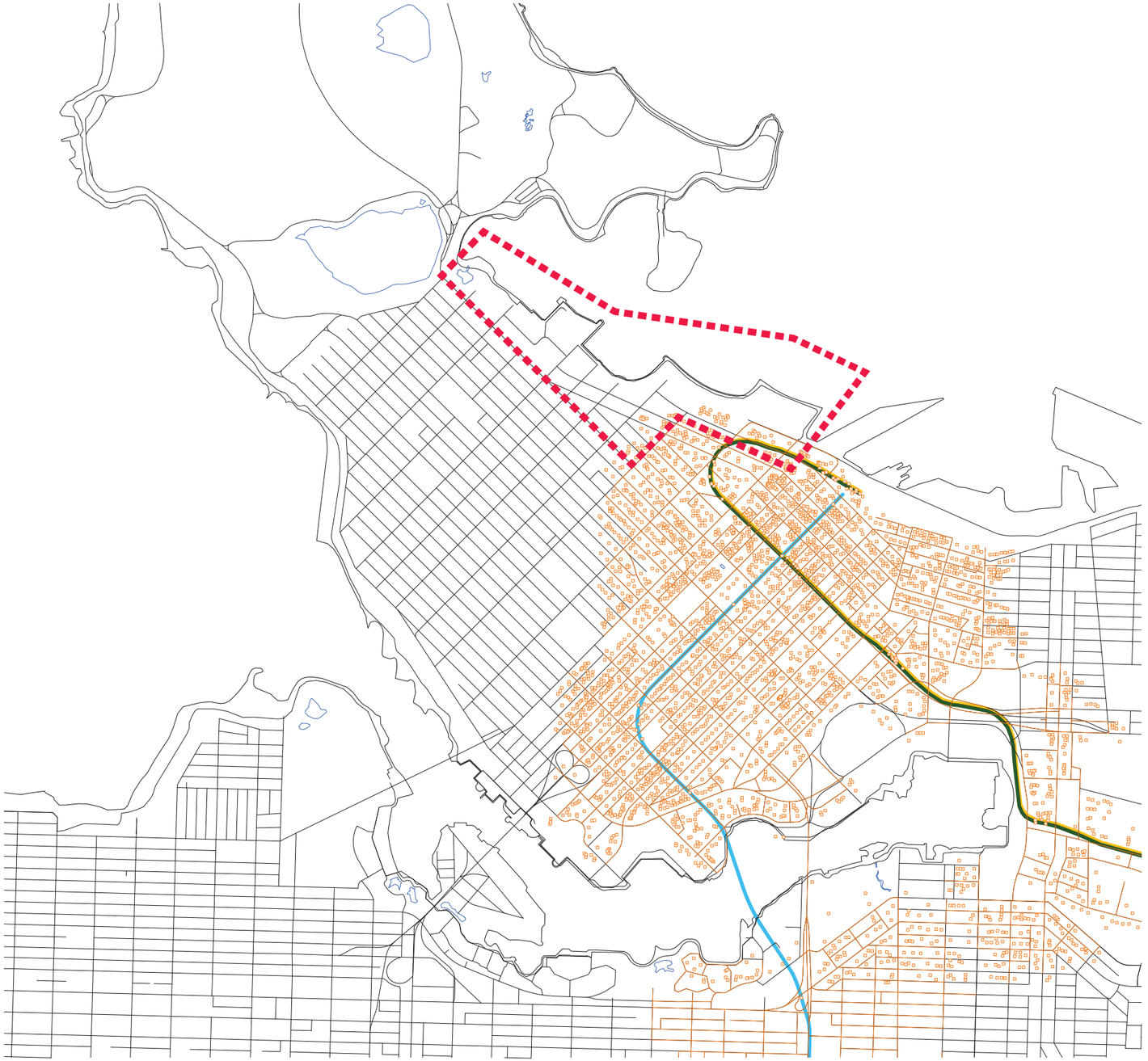


Vancouver Skytrain: powered by clean hydroelectricity
Source: http://www.serveyourworld.com/the-greenest-forms-of-public-transportation-in-the-world/



Burrard Station Along Waterfront-bound SkyTrain Vancouver
Source: by Andy Tucker. https://www.flickr.com/photos/mspdude/6618142211

Transit



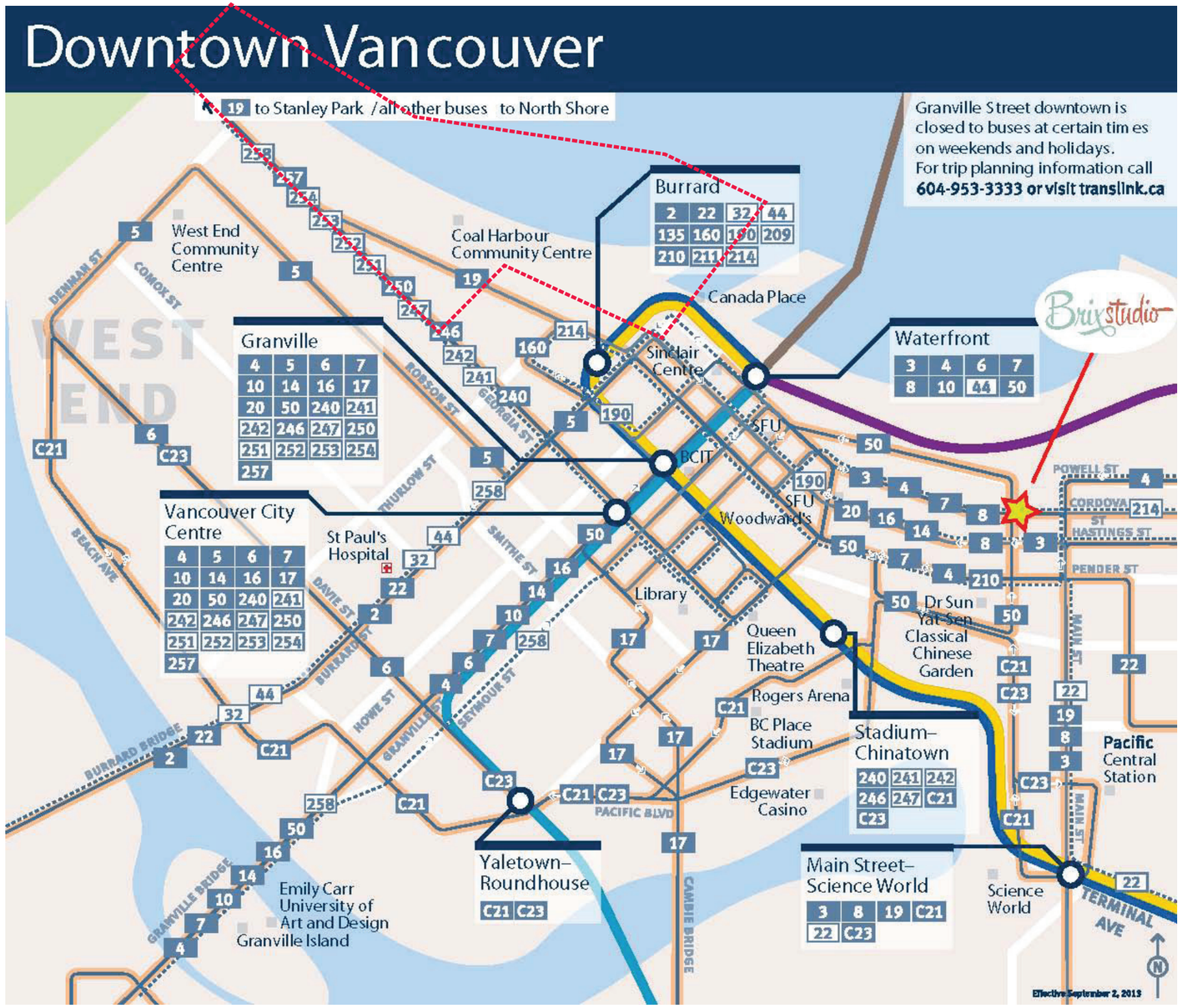
Service Areas Analysis

Transit Stations to Buildings

Gravity, R=800M, Beta=0.002

Vancouver Harbor Boundary

Bus



Vancouver Downtown Bus Map
Source: https://transportactionbc.wordpress.com/category/announcement/

Vancouver Harbor Boundary



Vancouver Bus Operated by Translink Company
Source: http://globalnews.ca/news/2043351/young-woman-experiences-van-couver-bus-fare-nightmare/

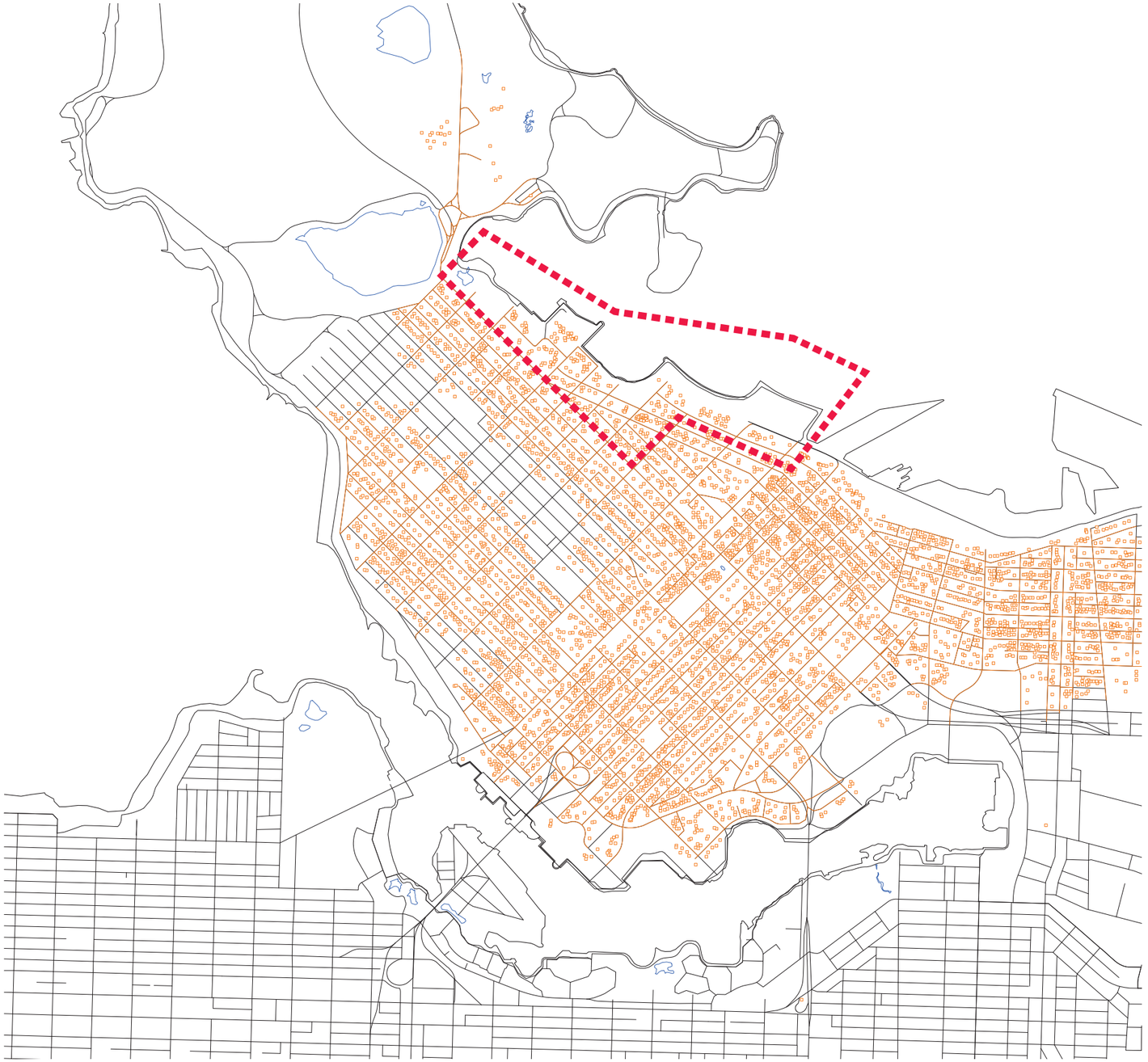


Vancouver Bus
Source: http://i1os.com/ju6AFwLMHjs.video



Vancouver Sea Bus
http://www.vancitybuzz.com/2015/05/free-transit-today-metro-vancouver-due-skytrain-shutdown/

Bus



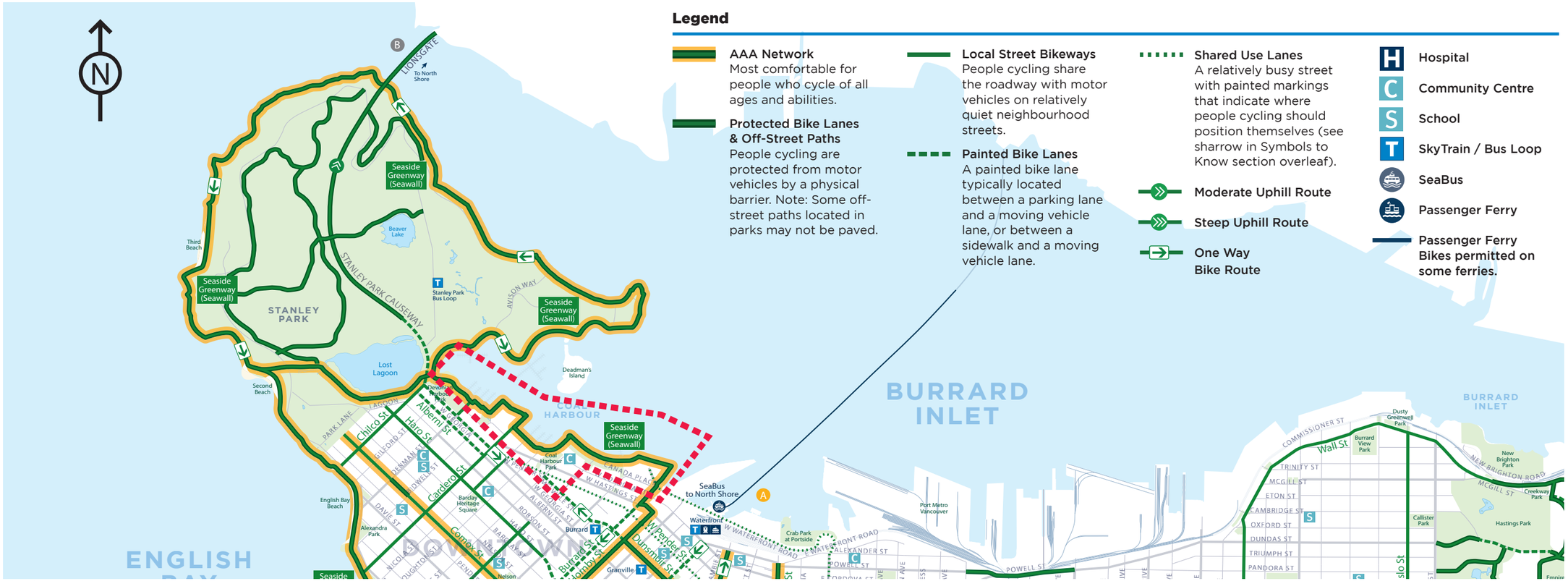
Service Areas Analysis

Bus Stops to Buildings

Gravity, R=400M, Beta=0.002

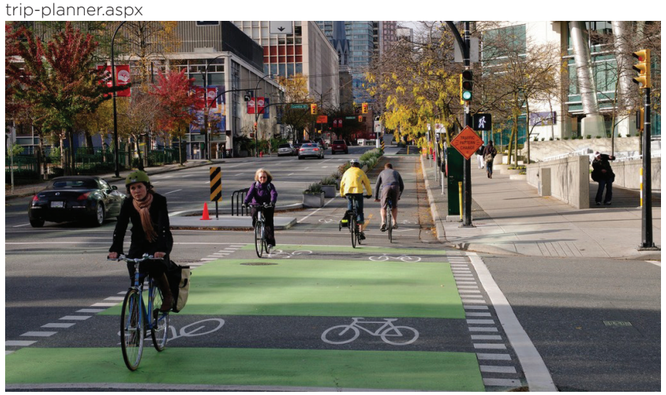
Vancouver Harbor Boundary

Bicycle



Cycling in Vancouver

Source: http://vancouver.ca/streets-transportation/cycling-routes-maps-and-trip-planner.aspx



Vancouver Bike Lanes

Source: http://www.news1130.com/2015/05/27/downtown-vancouver-businesses-attitudes-towards-bike-lanes-have-changed-in-the-last-five-years/



Vancouver Bike Sharing

Source: http://www.vancouversun.com/Bike+share+program+expected+rolling+Vancouver+within+months/8689114/story.html

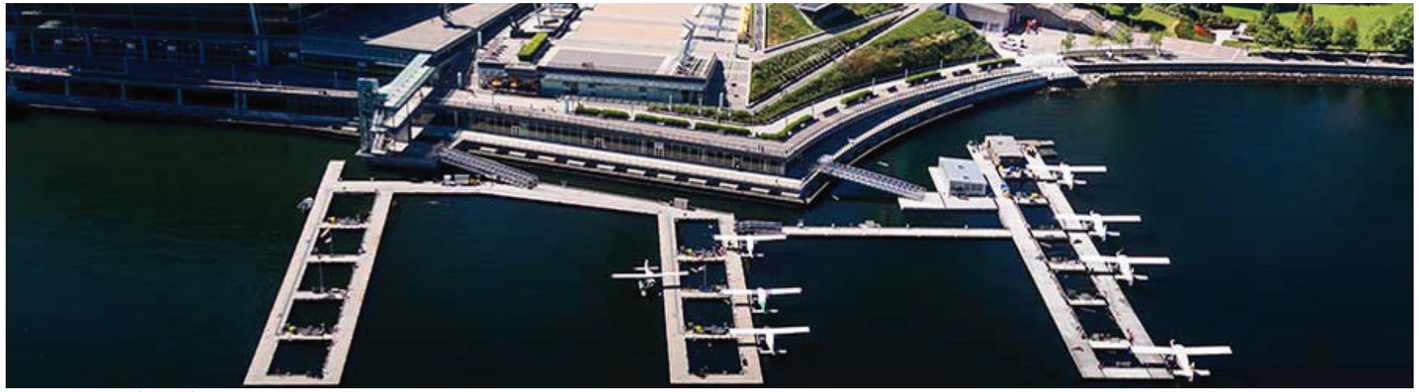


Vancouver Bike Lane on riverfront Greenway

Source: http://www.hellobc.com/vancouver/things-to-do/outdoor-activities/biking.aspx

Floatplanes





Vancouver Floatplanes
http://www.seaflex.net/case/vancouver-seaplane-terminal/



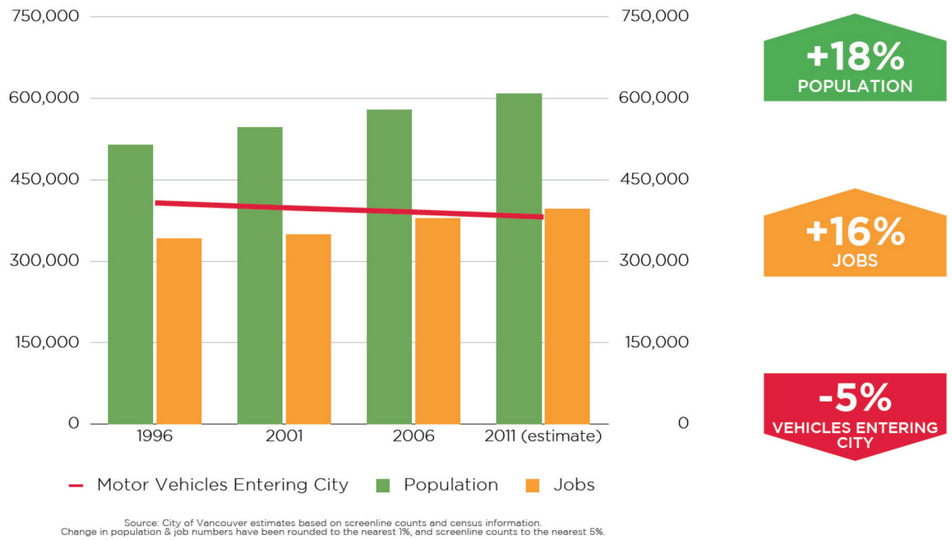
Vancouver Floatplanes
http://travelwithbender.com/travel-blog/western-canada/how-to-get-to-victoria-from-vancouver-seaplane-vs-ferry

This floatplane departing from in front of the iconic Vancouver Convention Center in downtown Vancouver Coal Harbour, provides Vancouver panorama experience tour over the city and Stanley Park.

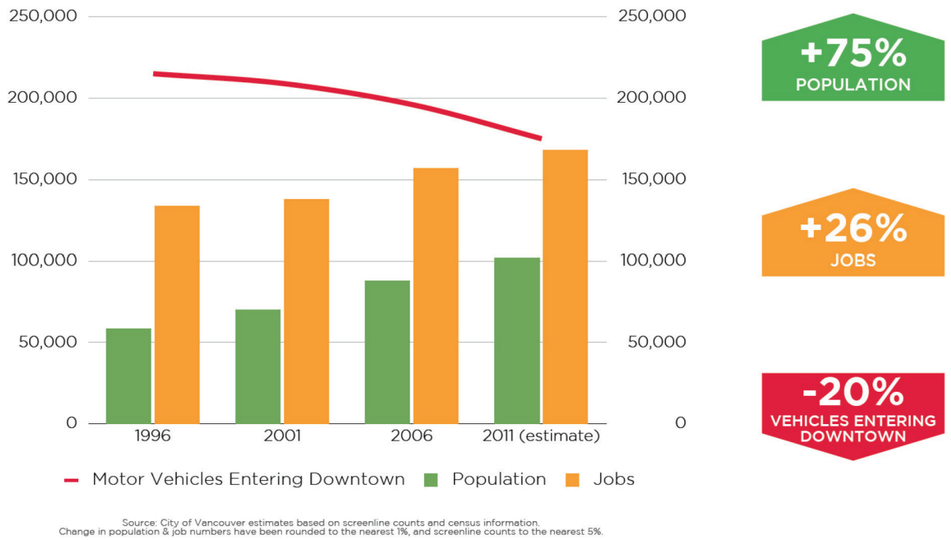


Vancouver Floatplanes
Source: www.harbourair.com

Achievement and Prospect



Source: City of Vancouver estimates based on screenline counts and census information.
Change in population & job numbers have been rounded to the nearest 1%, and screenline counts to the nearest 5%.



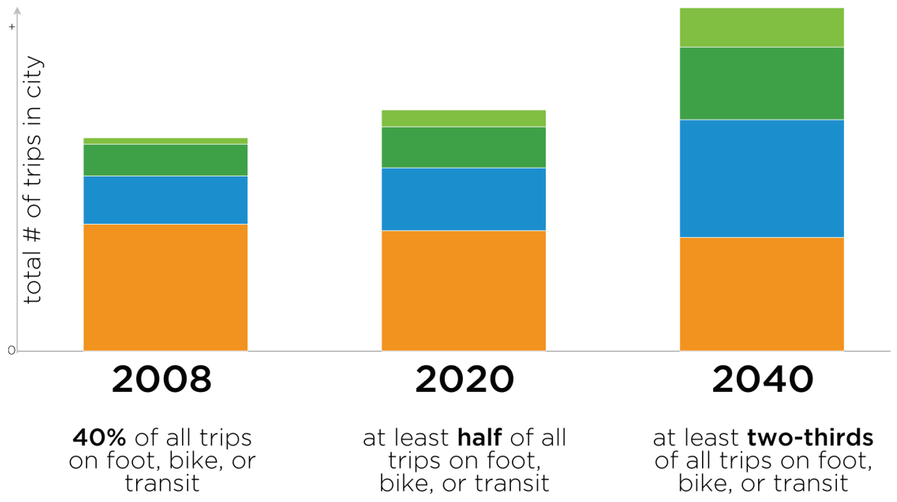
Source: City of Vancouver estimates based on screenline counts and census information.
Change in population & job numbers have been rounded to the nearest 1%, and screenline counts to the nearest 5%.

Source: Transportation 2040 Plan. http://vancouver.ca/streets-transportation/transportation-2040.aspx

Since the 1980s, the city has enjoyed a robust rapid transit network via its SkyTrain lines. Moreover, its bus system provides express and local services to the city center and its peripheries. Furthermore, a regional railroad network connects the city to the rest of the western region of Canada. All facets of transportation are handled in the region by TransLink, which is also responsible for maintaining roads and ferries.

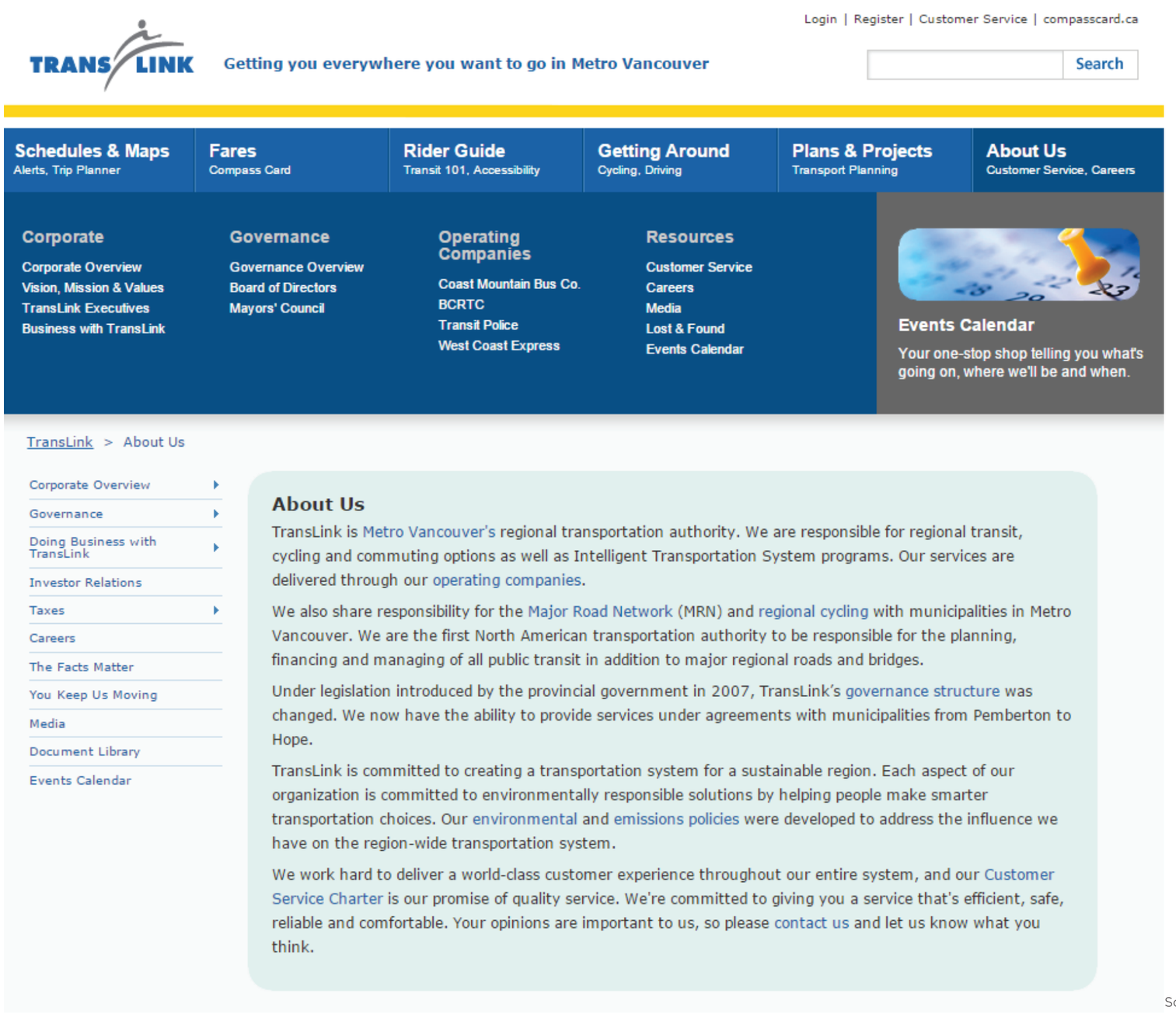
In the last few years, the city has also been toying with the idea of creating a downtown streetcar system using old and new streetcar technology. Moreover, according to city data, despite population growth in the last 15 years, vehicles entering the city have been reduced by 5 percent. Meanwhile, vehicles entering the downtown area have been reduced by 20% during the same time period.

From a mode sharing perspective, over 40% of all trips in the city were made via a bike, walking, or transit. The city plans to raise those ratios to 66% through the implementation of new infrastructure by 2040.



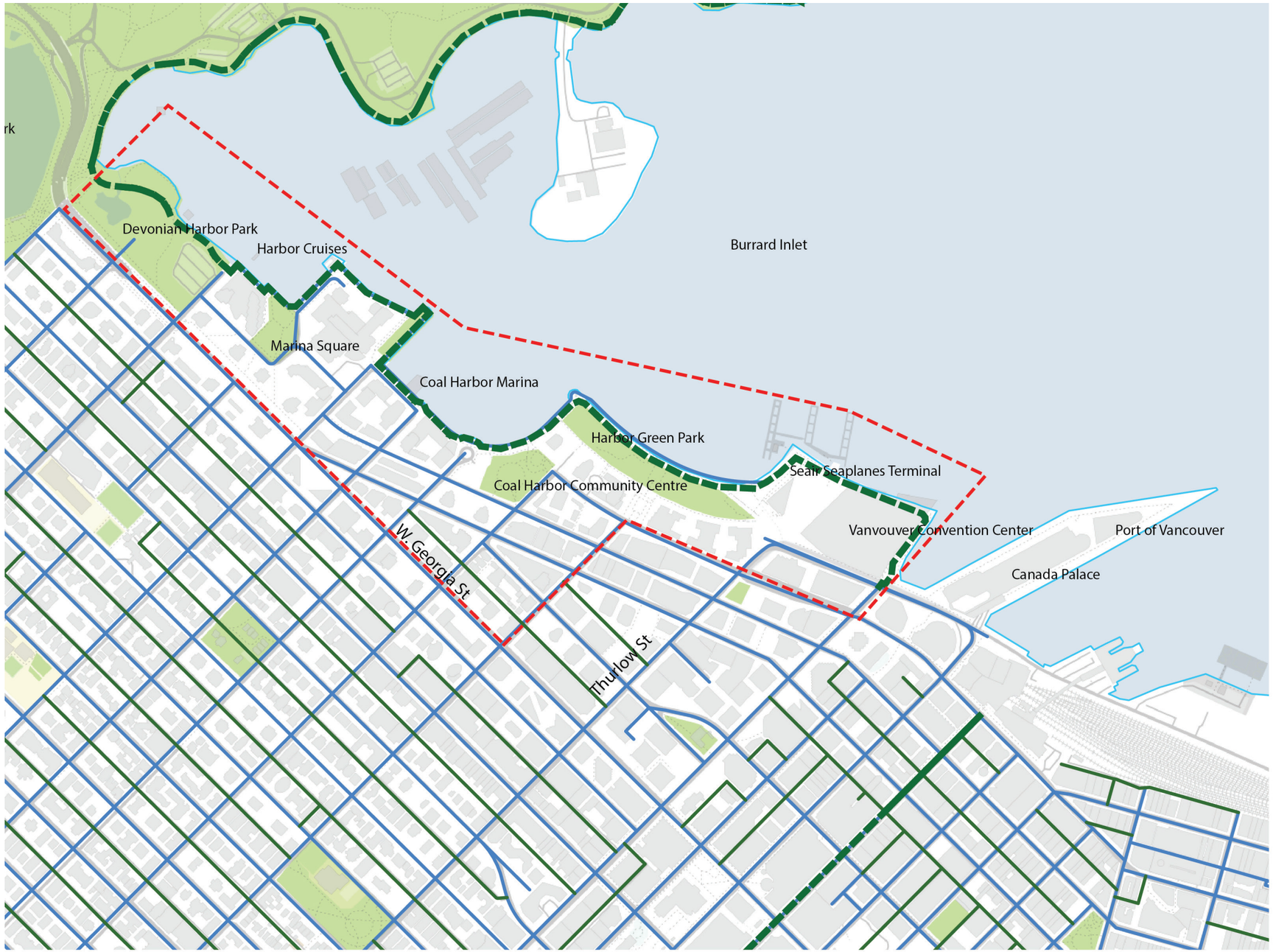
Source: Transportation 2040 Plan. http://vancouver.ca/streets-transportation/transportation-2040.aspx

A strong regional agency ensures multi-modal connectivity and a healthy transit system.



Source: www.Translink.ca

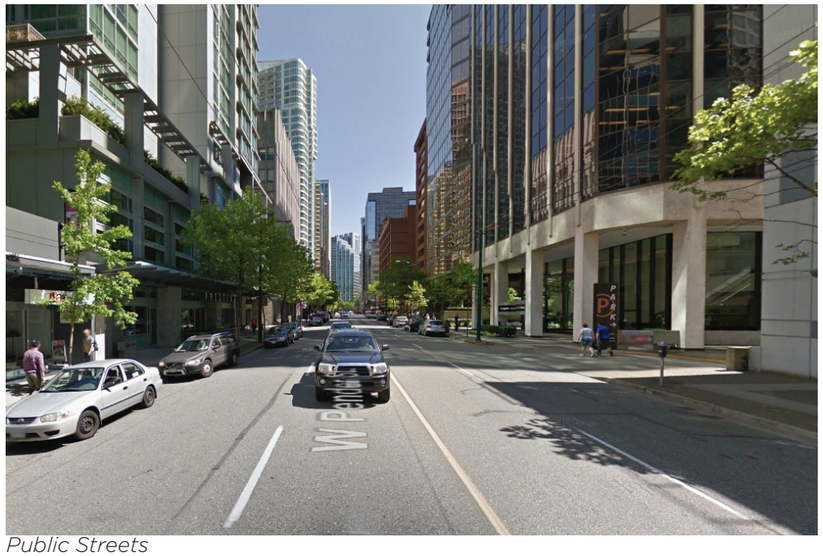
Road Profiles



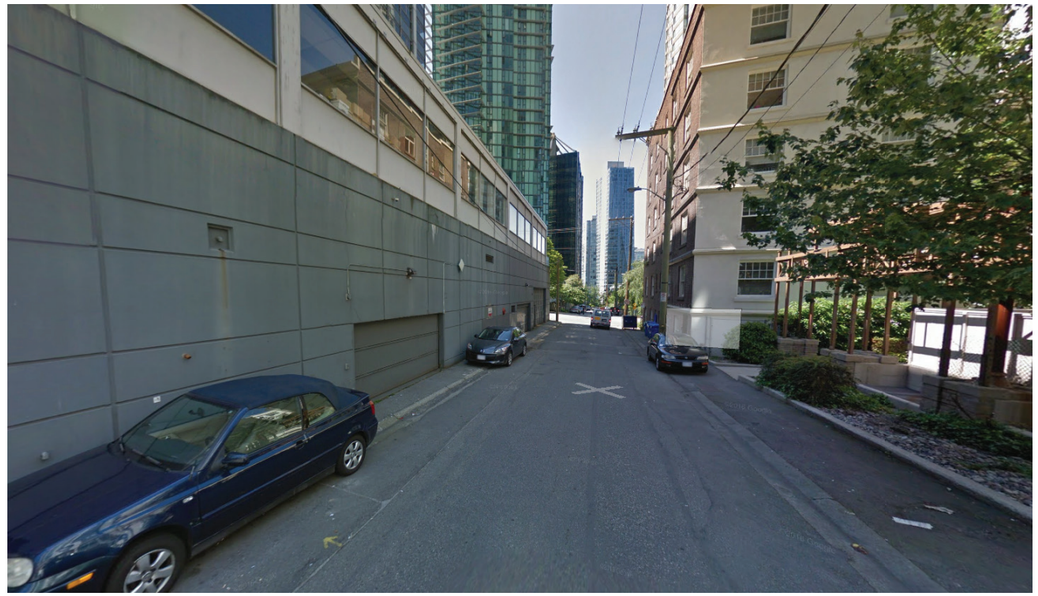
Road Profiles



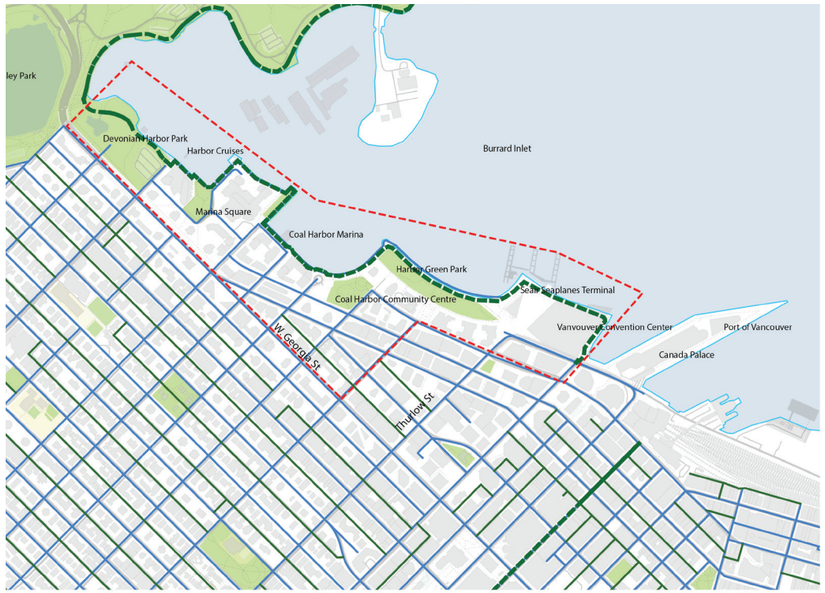
Greenways
Source: Googlemap



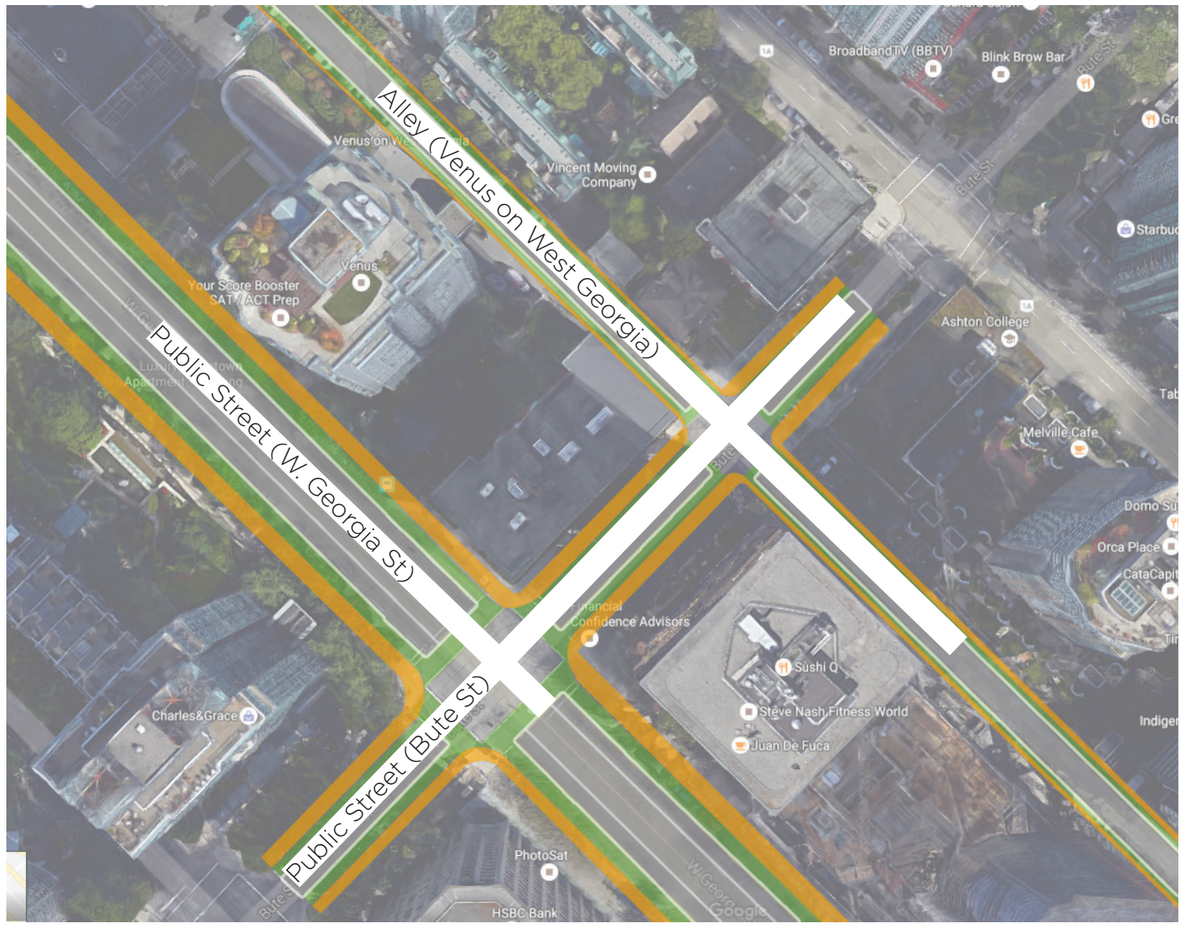
Public Streets
Source: Googlemap

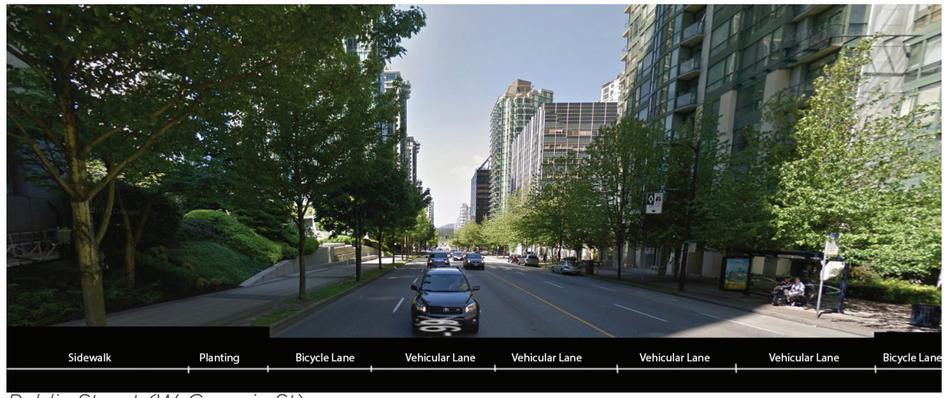


Alleyways
Source: Googlemap



Road Profiles





Public Street (W. Georgia St).
Source: Googlemap

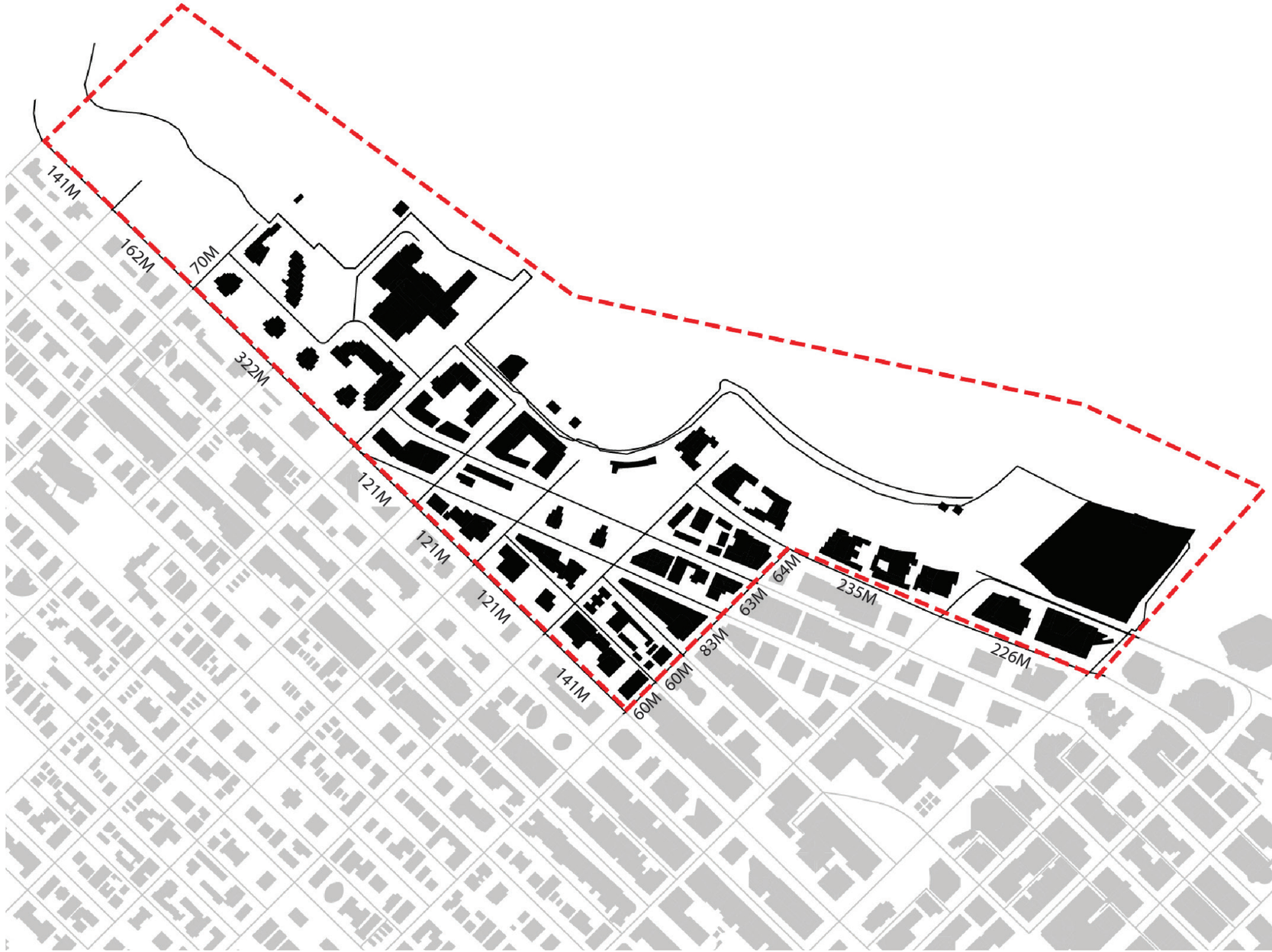


Alley (Venus on West Georgia).
Source: Googlemap

Legend

- Sidewalk
- Bicycle Lanes
- Vehicle Lanes

Blocks


141M
162M
70M
322M
121M
121M
121M
141M
60M
60M
83M
63M
64M
235M
226M




Axis Hair Salon
RBC Royal Bank
IBI Group
Chichi Nails
Melville St
Coal Harbour Liquor Store
UPS Access Point
Luxury Residence on Georgia
Vancouver Extended Stay
W Georgia St
HSBC Bank


Pinnacle Hotel Harbourfront
Vancouver Marriott Pinnacle Downtown
Portal Park

View Corridors



1



2



3

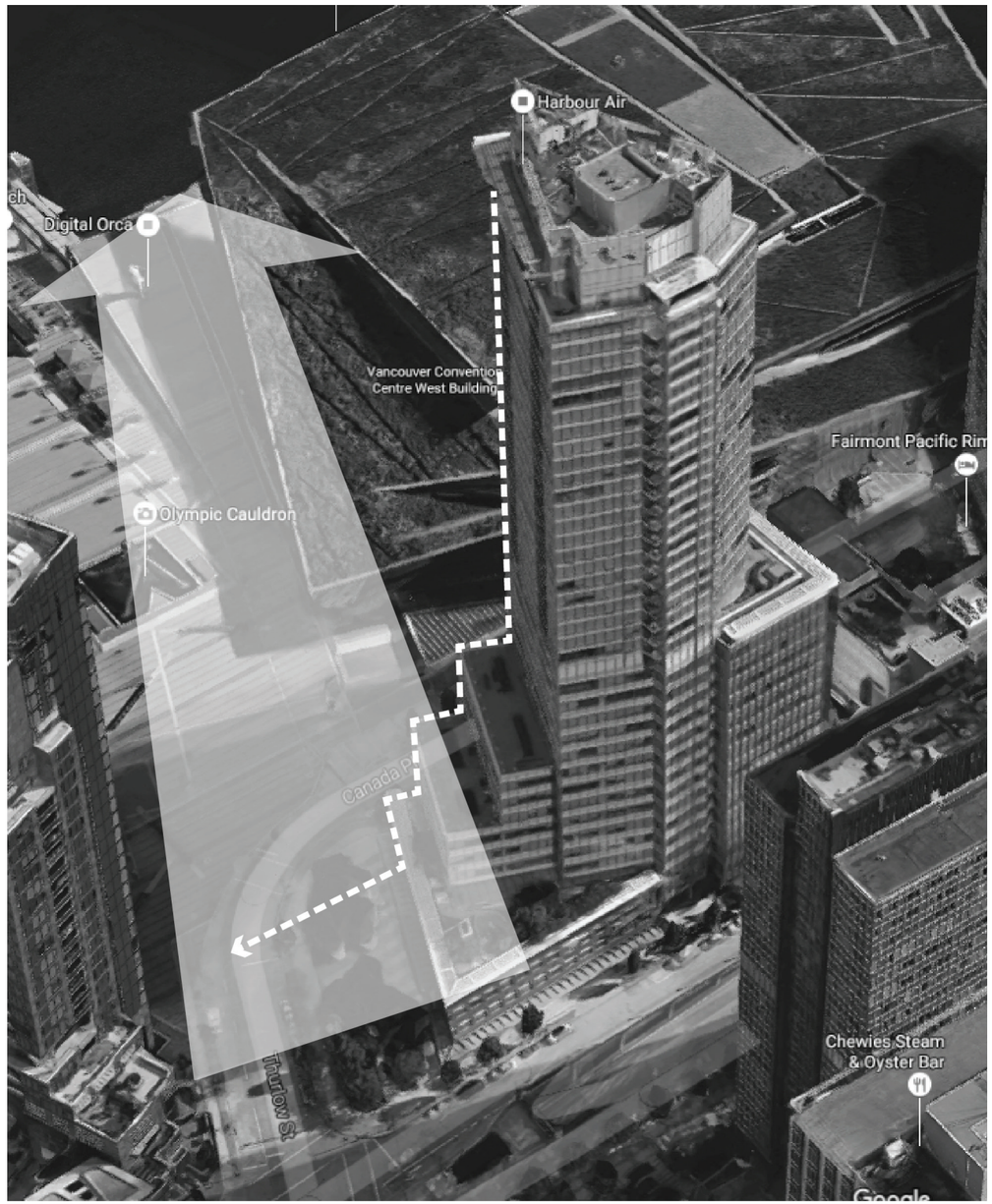


Source: Googlemap

The plan and zoning for the area dictates that:

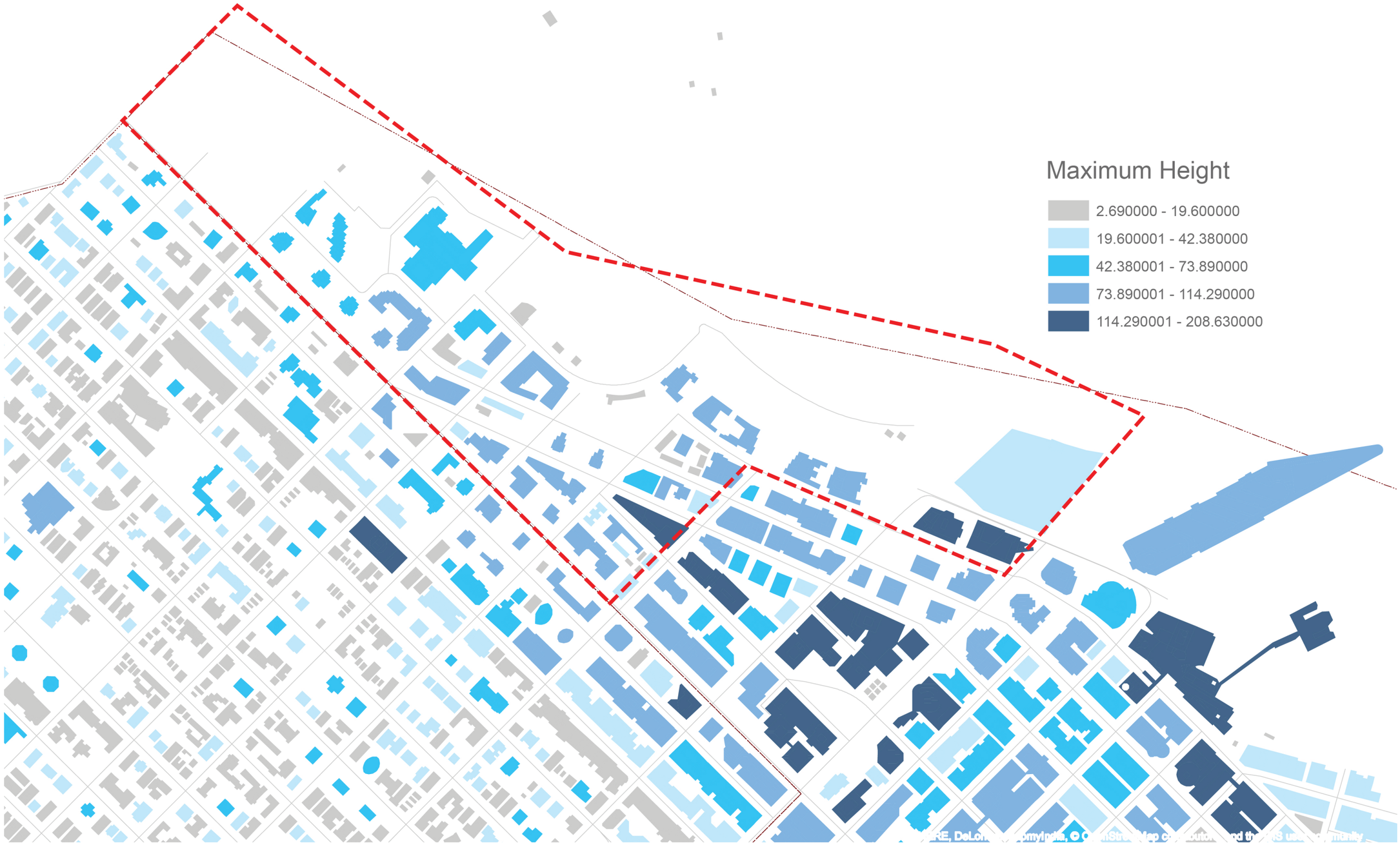
"The site's northerly aspect with respect to sun orientation and shadowing impacts from development to the south should be considered; and the site's major northerly mountain and water view opportunities should be respected and exploited."

View Corridors





Maximum Height

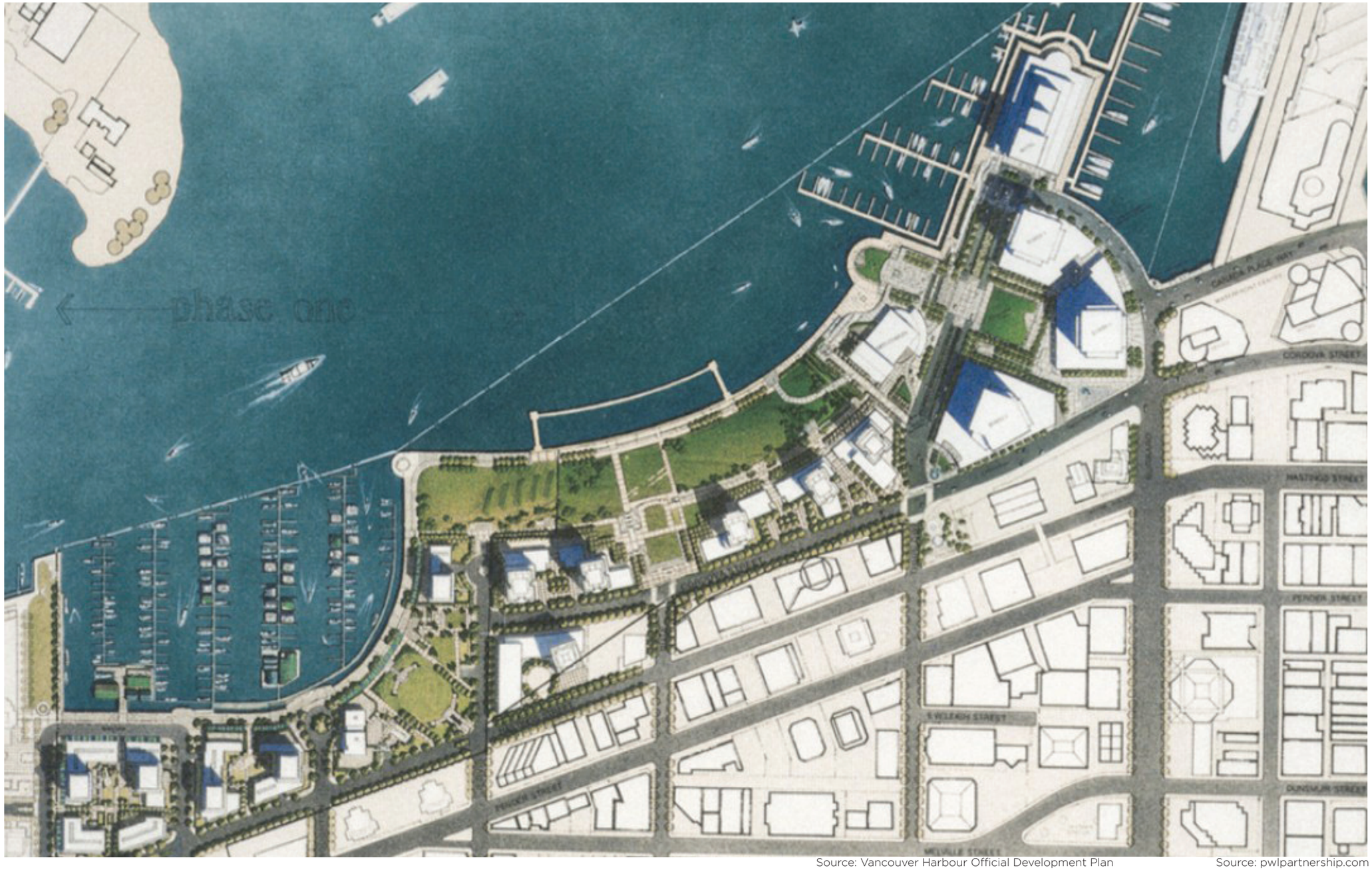


Skyline


Downtown CBD
Canada Place
Harbour Green Park
Vancouver Harbour
The Stanley Park

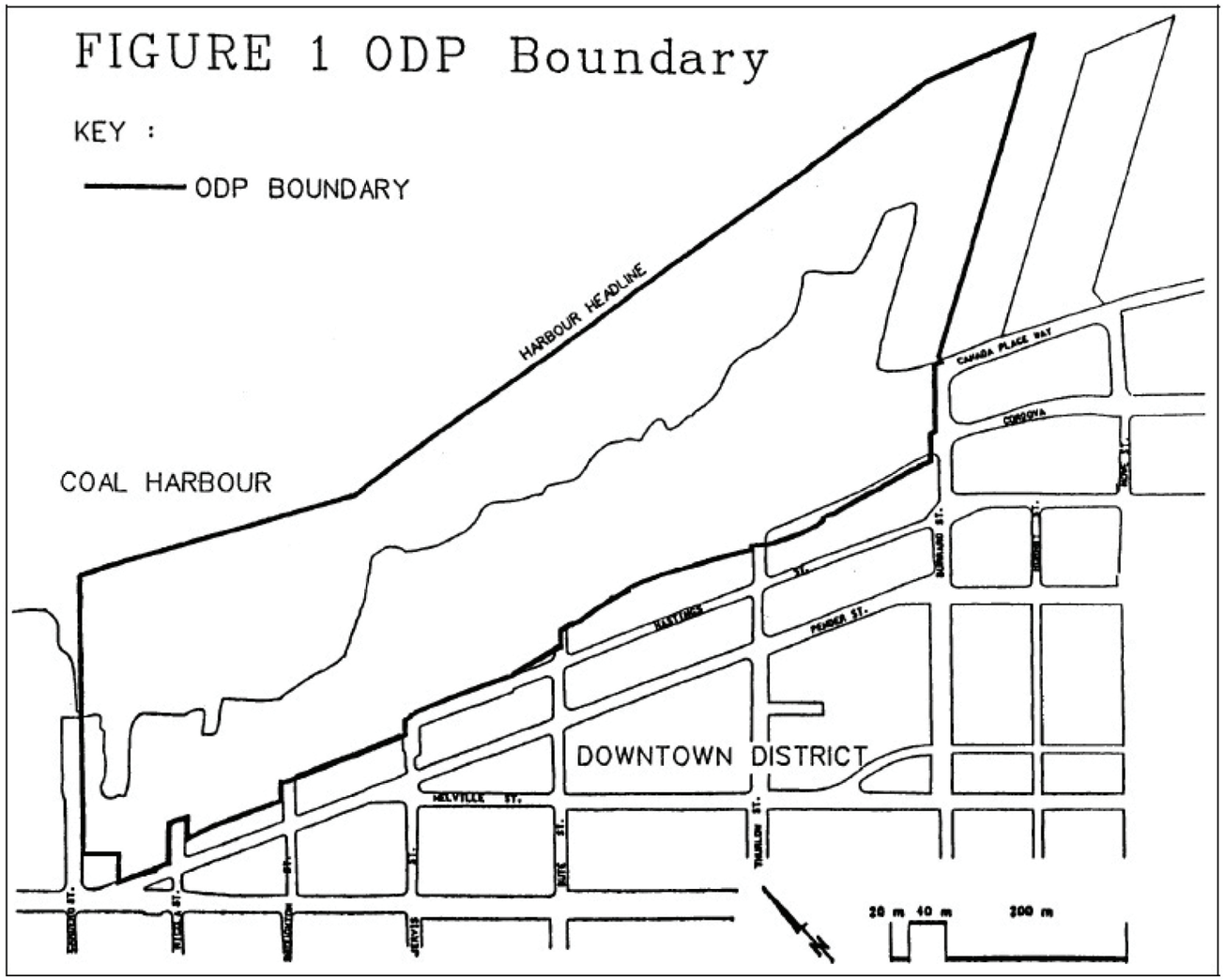
Recent Plan on Vancouver Harbor

Coal Harbor Official Development Plan (Adopted by By-law No. 6754 November 6, 1990)



Source: Vancouver Harbour Official Development Plan

Source: pwlpartnership.com



Source: Vancouver Harbour Official Development Plan



1935: Above Lost Lagoon looking over the Coal Harbour
Source: http://www.vancitybuzz.com/2015/11/vintage-vancouver-skyline-photos-1919-2015/

"The intent of this ODP is to provide a framework for the creation of a mixed-use neighborhood which focuses on residential and public waterfront access opportunities. It is intended that the buildings, open spaces, circulation patterns, and land uses be designed and planned to complement and take advantage of the setting on the water with a northern aspect, the adjacency to downtown, and the close proximity to Stanley Park. It is further intended that Coal Harbour be well integrated with the rest of the city."

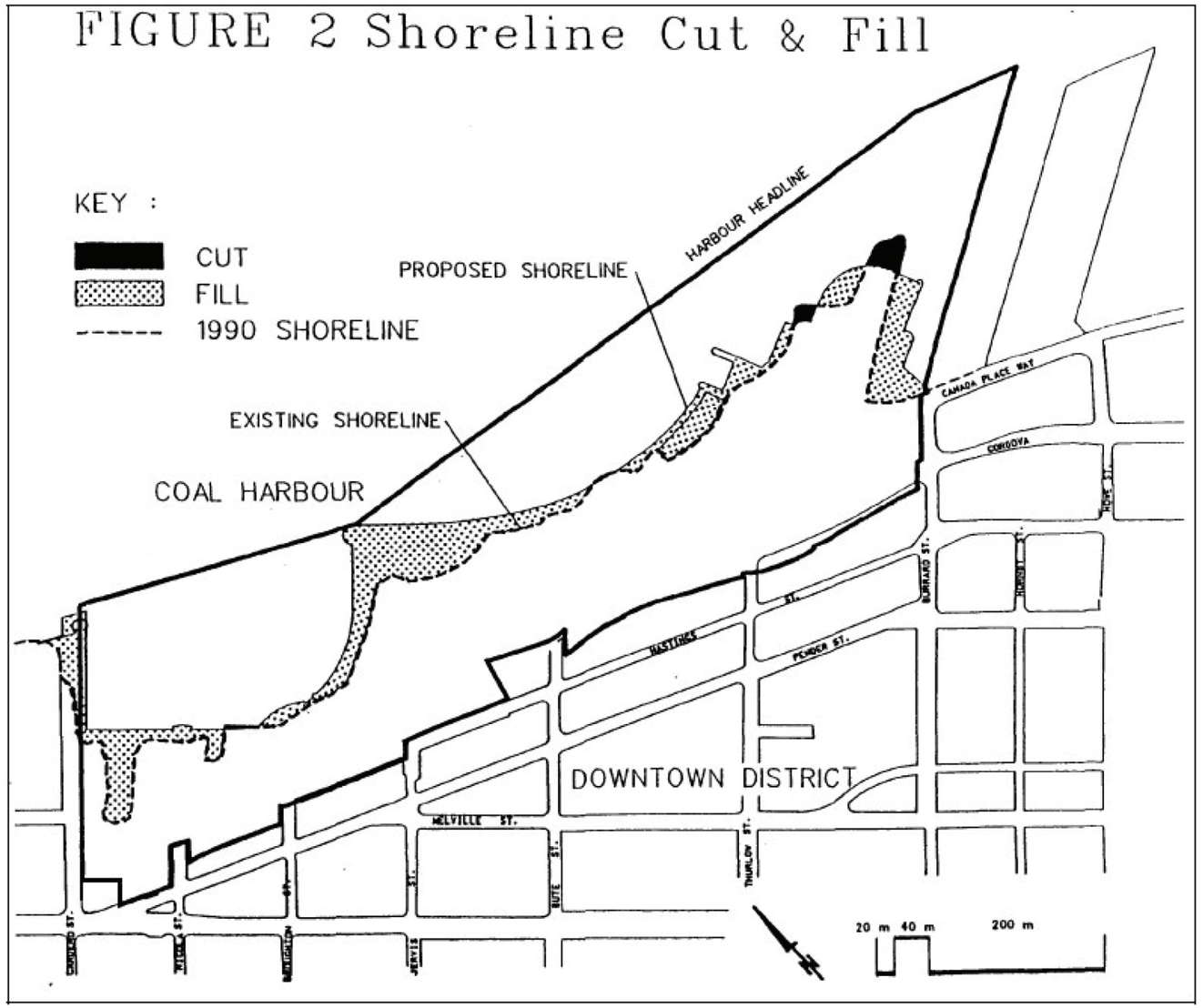
--Excerpt from Coal Harbor Official Development Plan



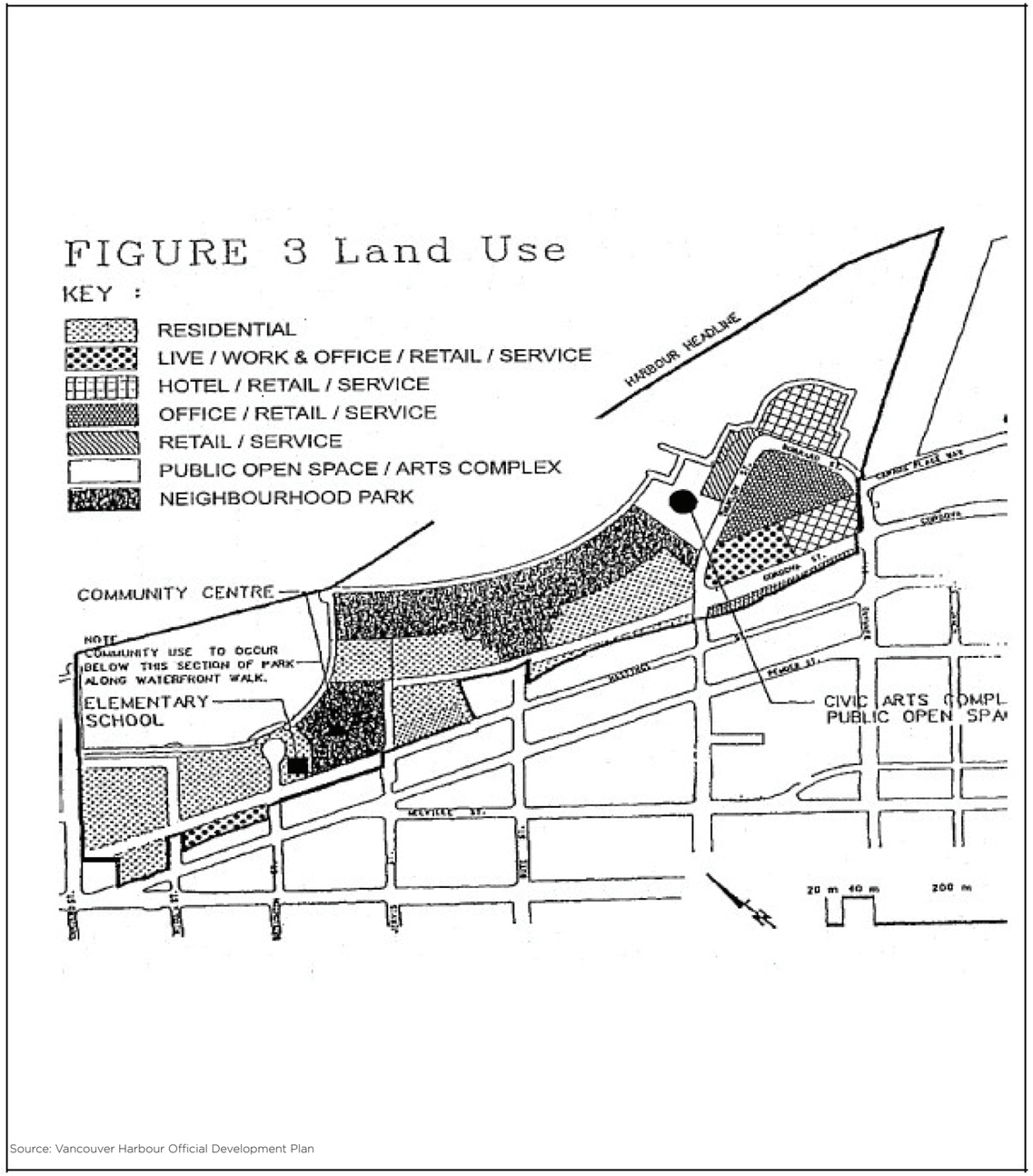
Vancouver Harbor in 1930
Source: https://www.pinterest.com/pin/510525307732474529/



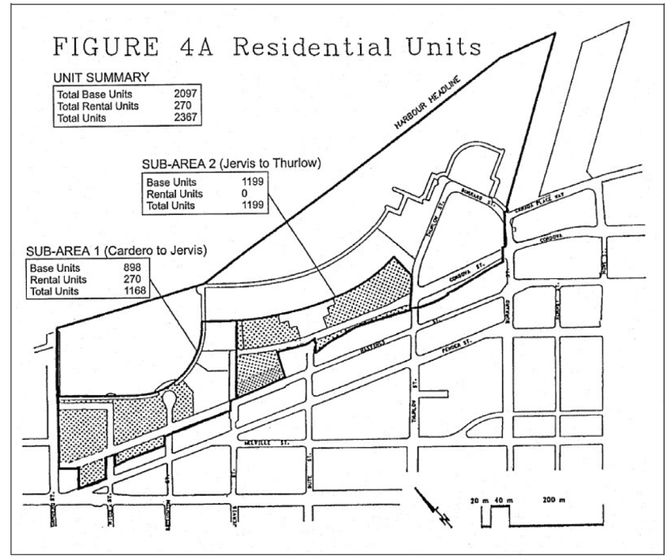
Vancouver Harbor in 2000
Source: Googlemap



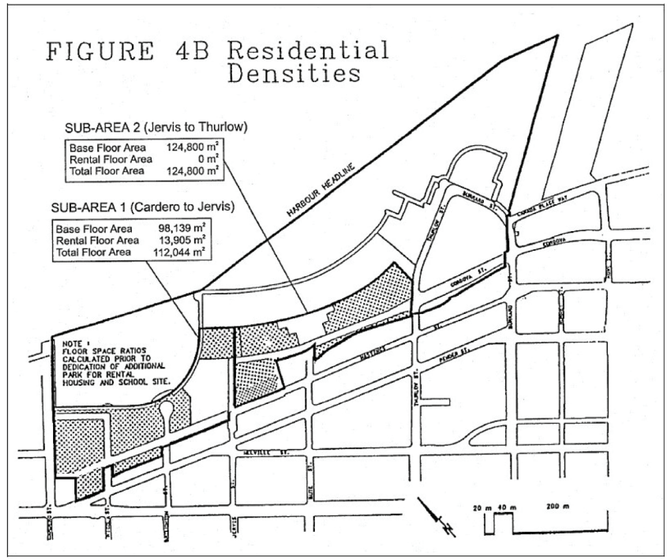
Source: Vancouver Harbour Official Development Plan



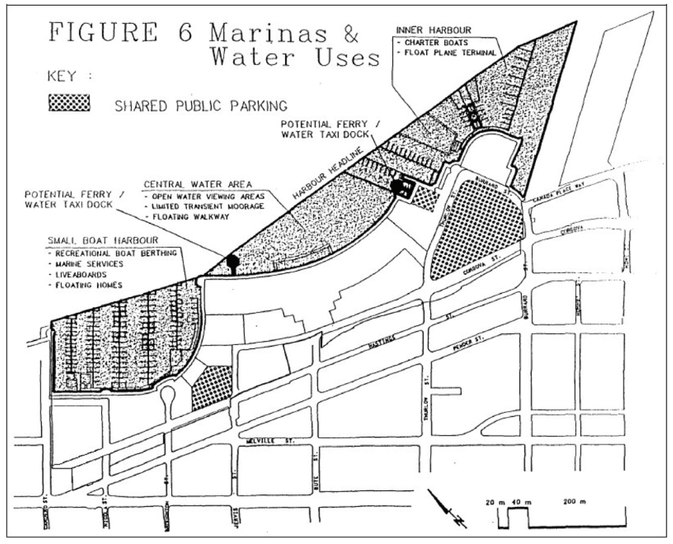
Source: Vancouver Harbour Official Development Plan



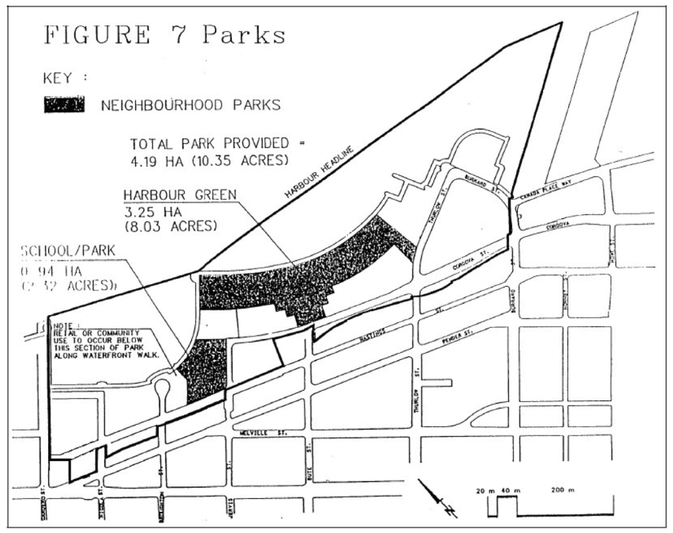
Source: Vancouver Harbour Official Development Plan



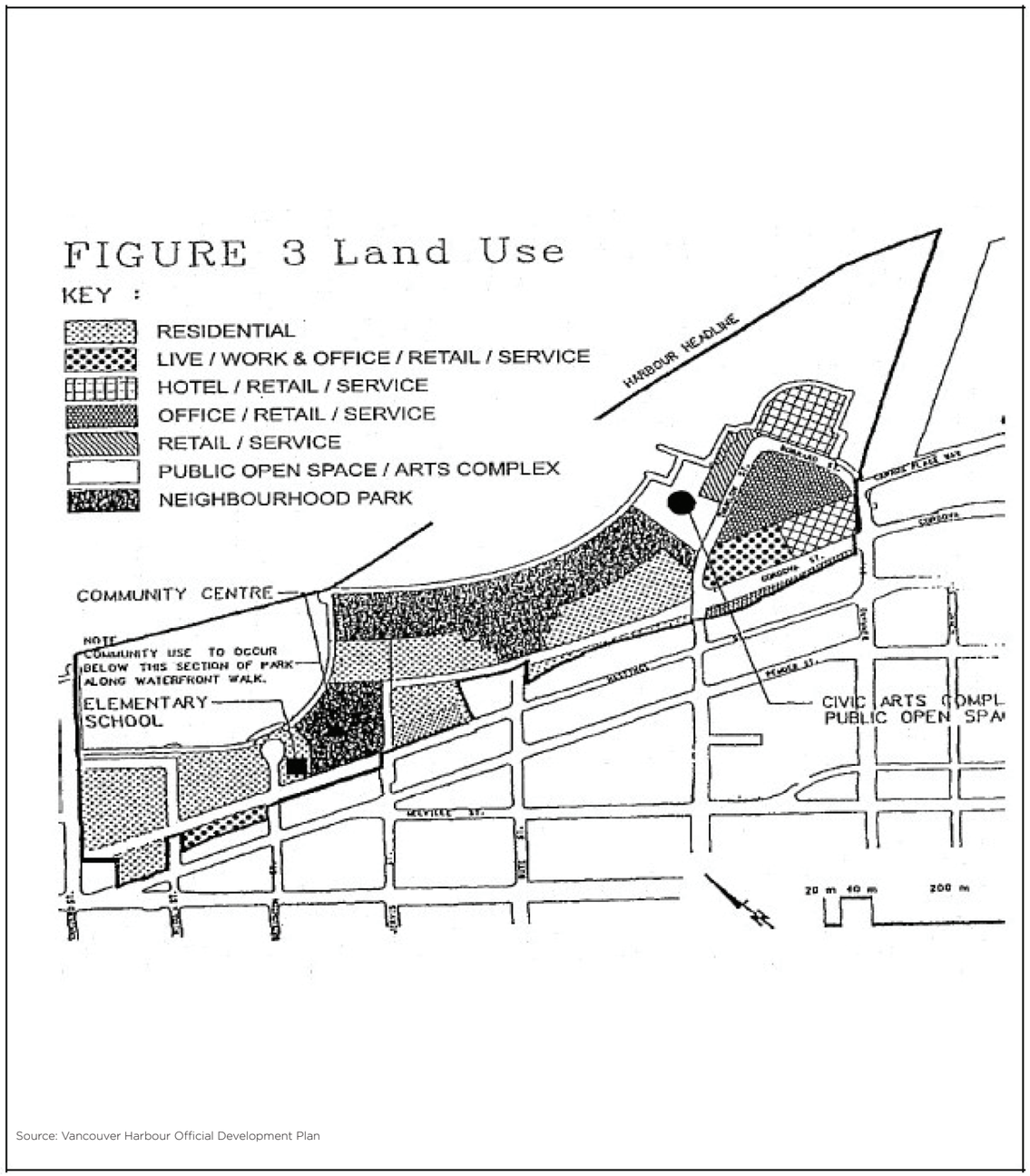
Source: Vancouver Harbour Official Development Plan



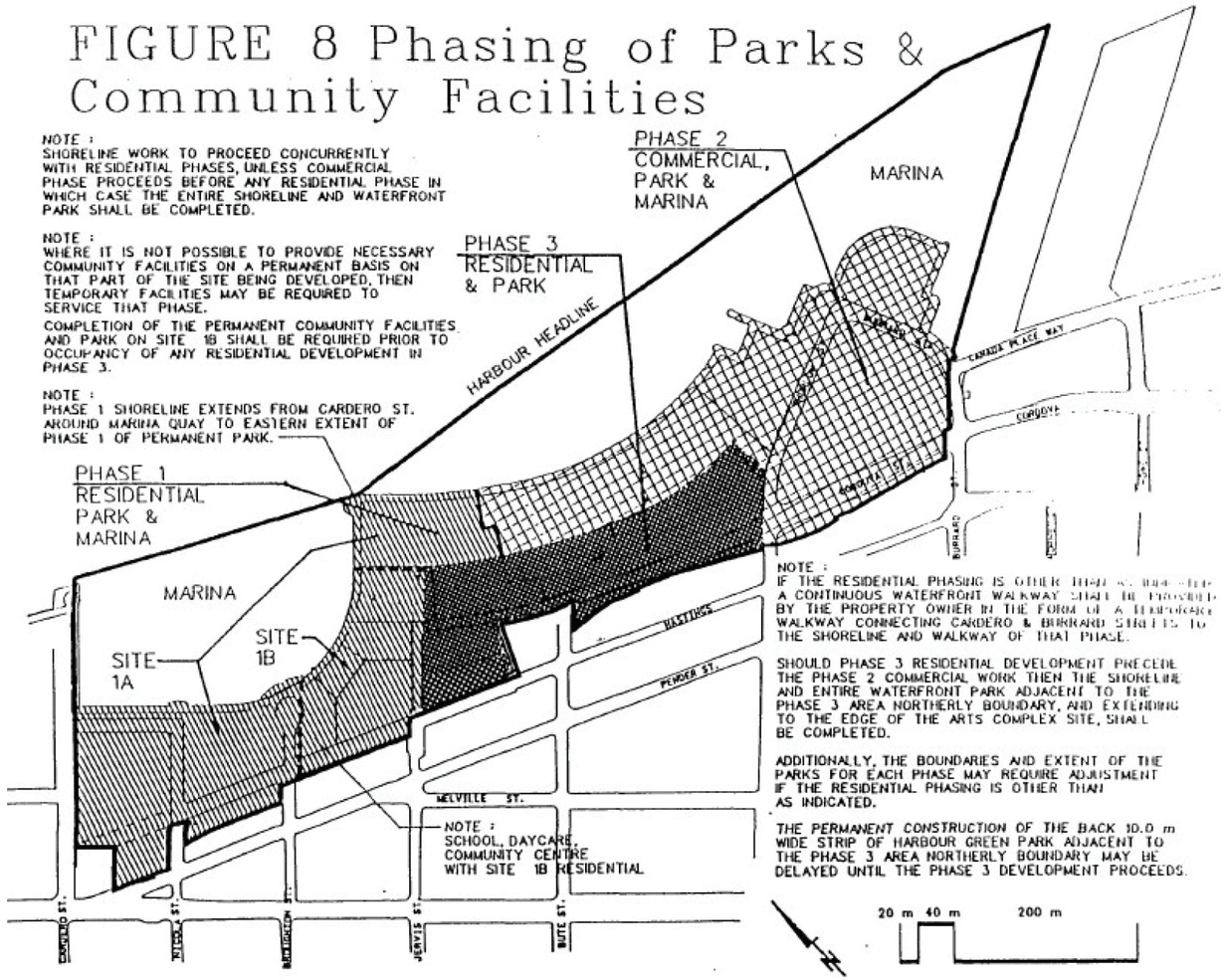
Source: Vancouver Harbour Official Development Plan



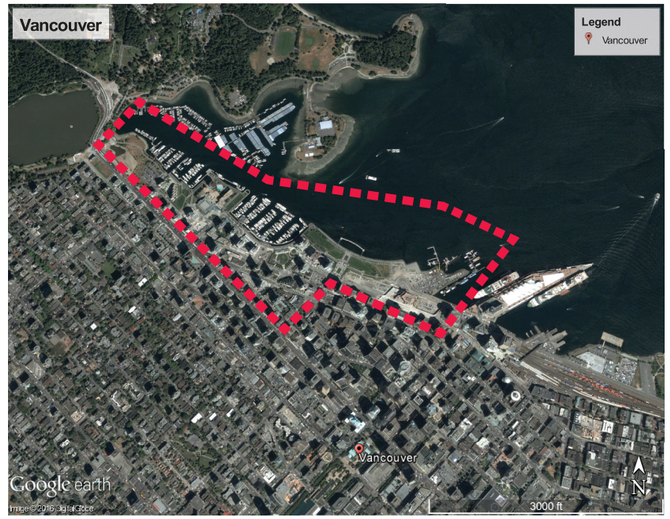
Source: Vancouver Harbour Official Development Plan



Source: Vancouver Harbour Official Development Plan

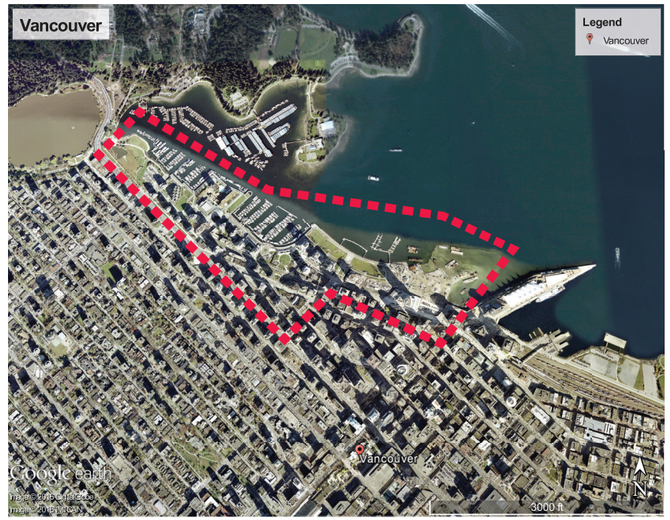


Source: Vancouver Harbour Official Development Plan



Vancouver Harbor in 2003

Source: Googlemap



Vancouver Harbor in 2005

Source: Googlemap

Existing Landuse



Evolution

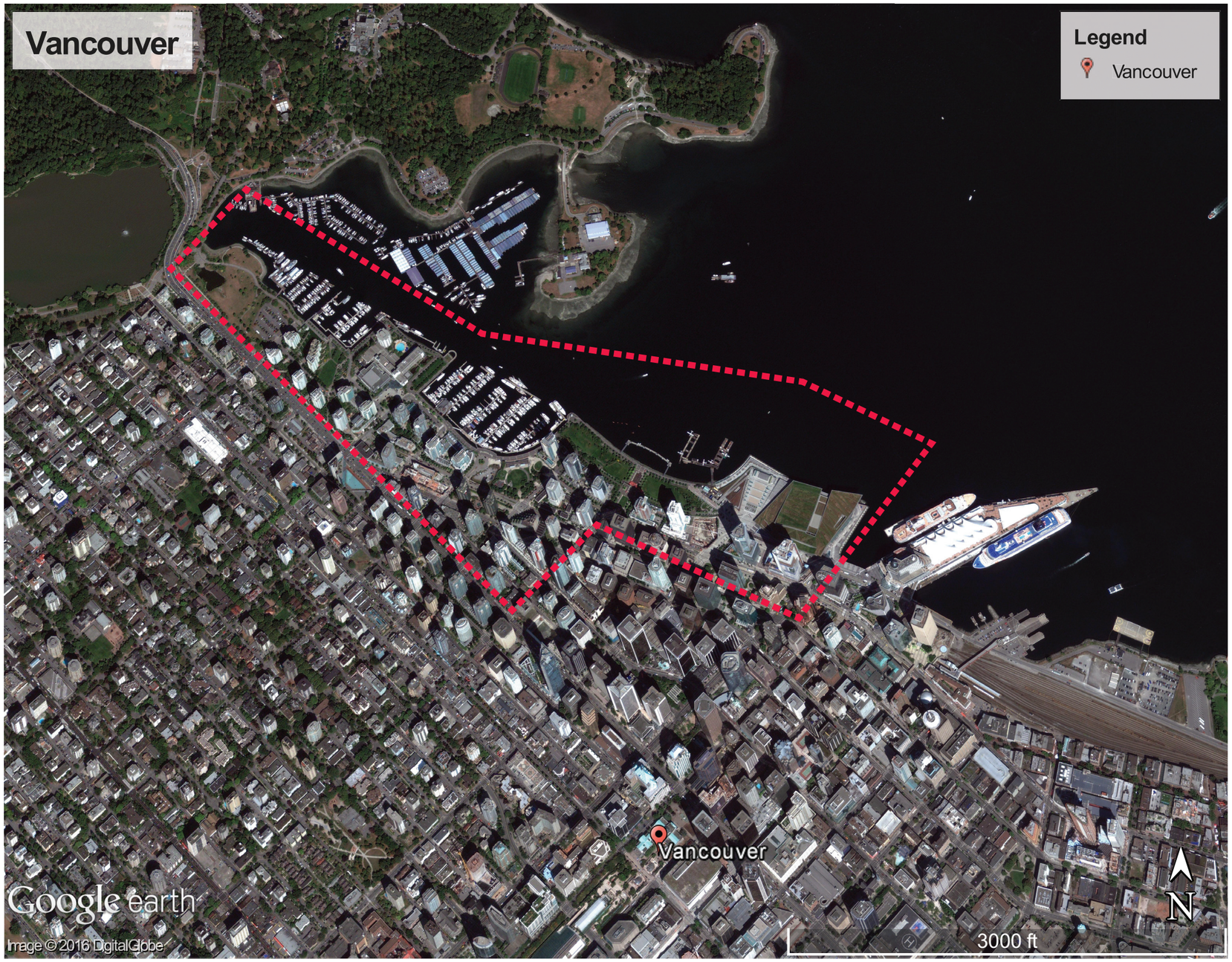
2008



Source: Googlemap

Evolution

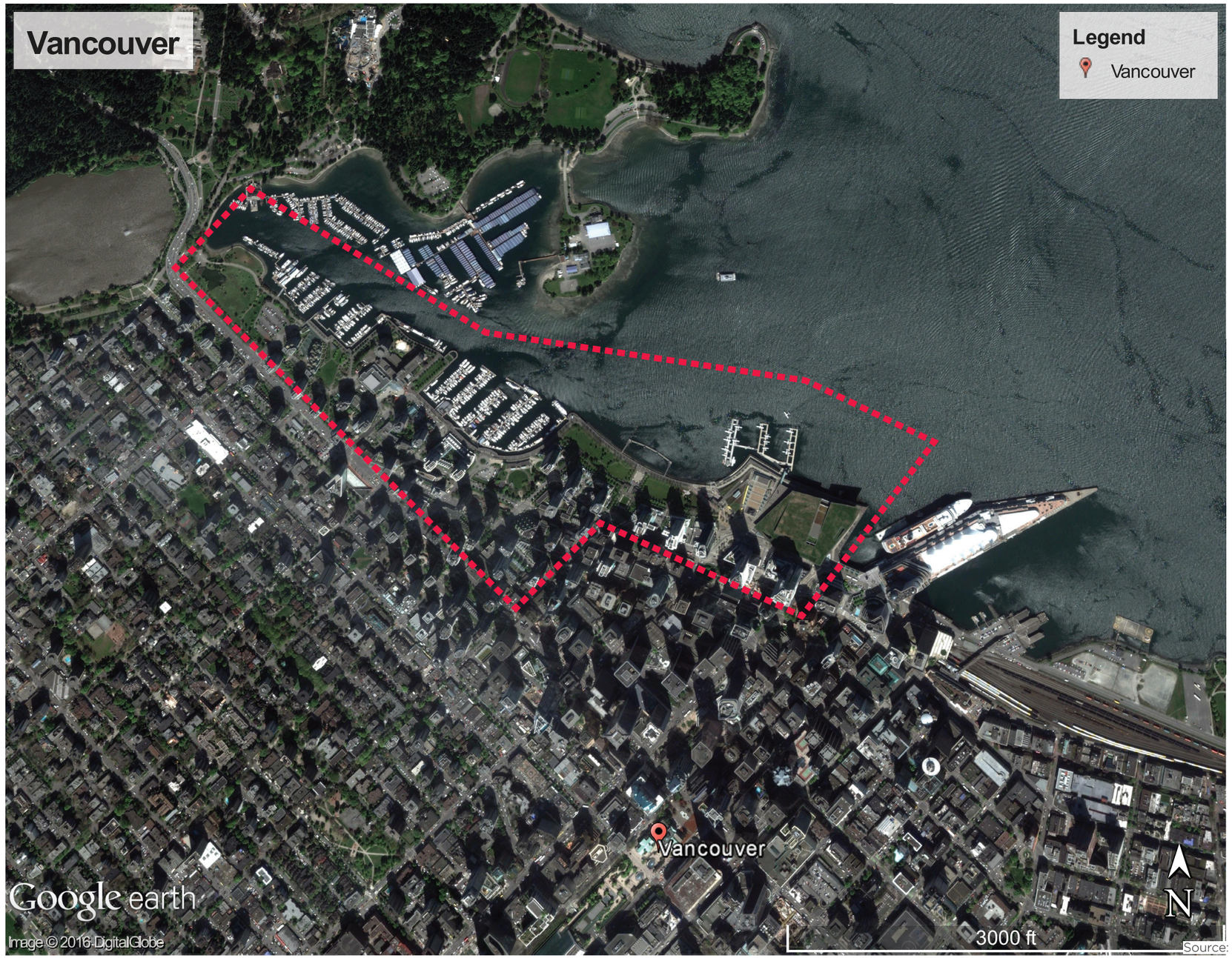
2009



Source: Googlemap

Evolution

2013



Source: Googlemap

Evolution

2014



Source: Googlemap

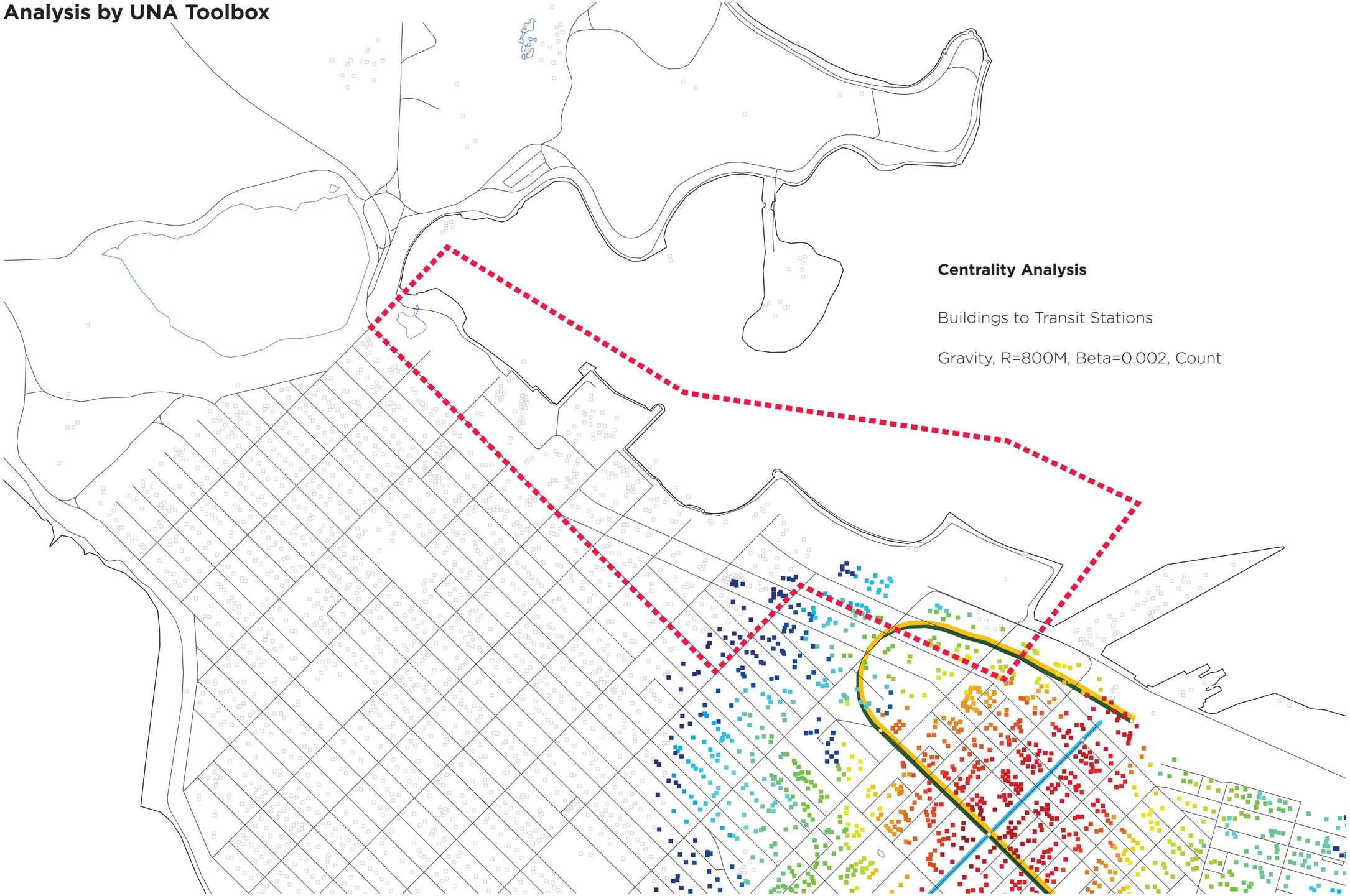
Evolution

2016



Source: Googlemap

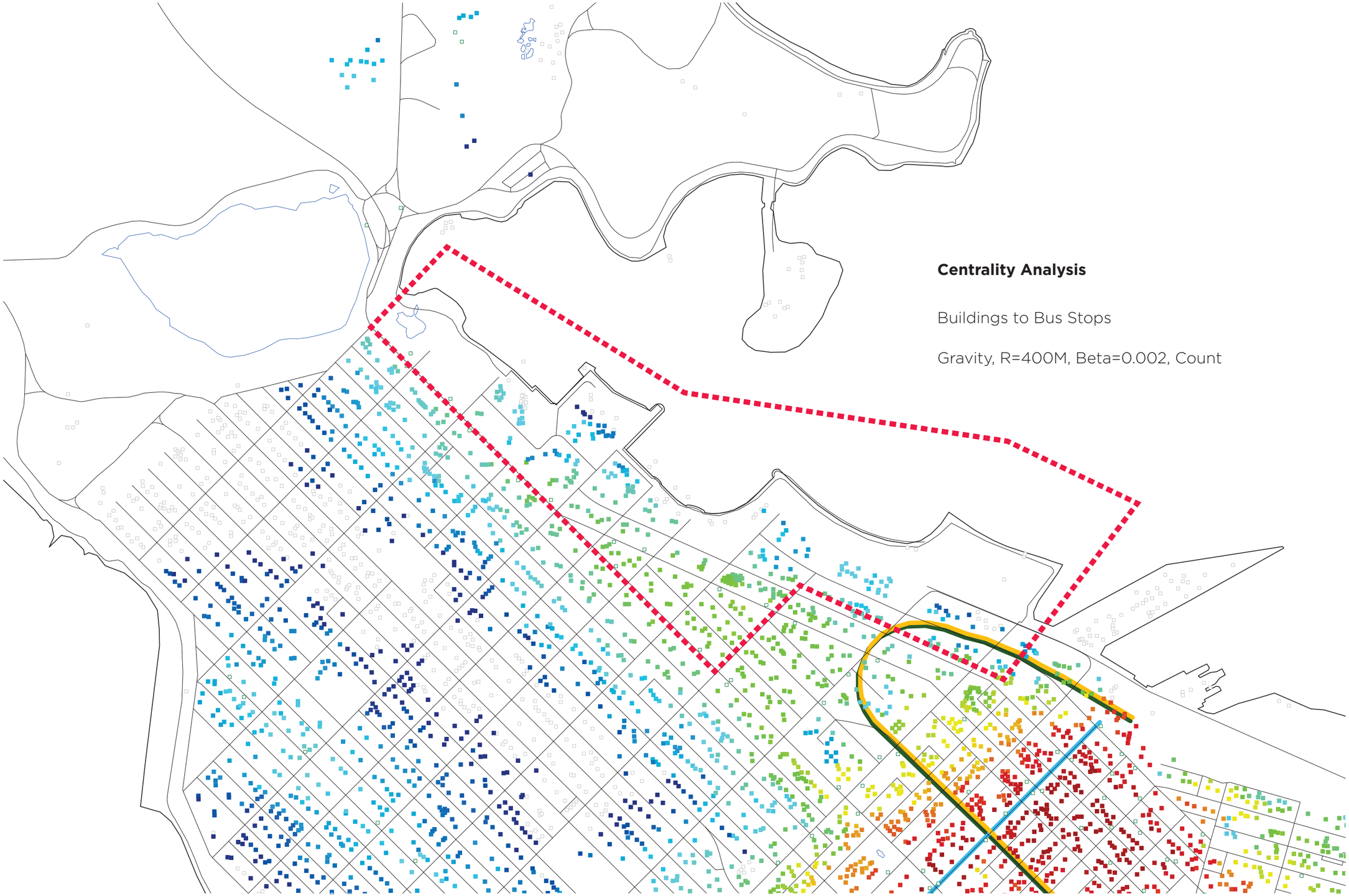
Analysis by UNA Toolbox



Centrality Analysis

Buildings to Transit Stations

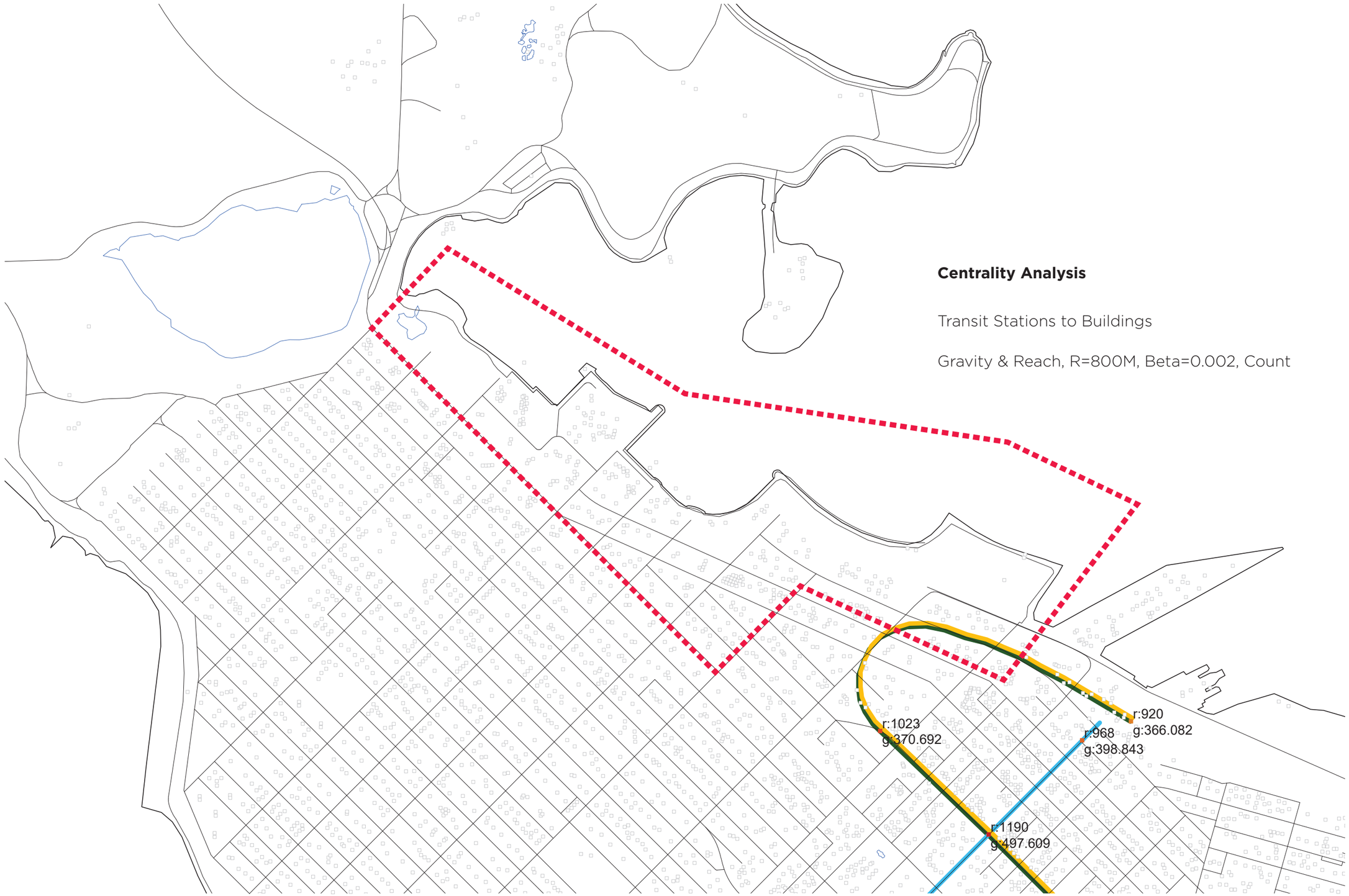
Gravity, R=800M, Beta=0.002, Count



Centrality Analysis

Buildings to Bus Stops

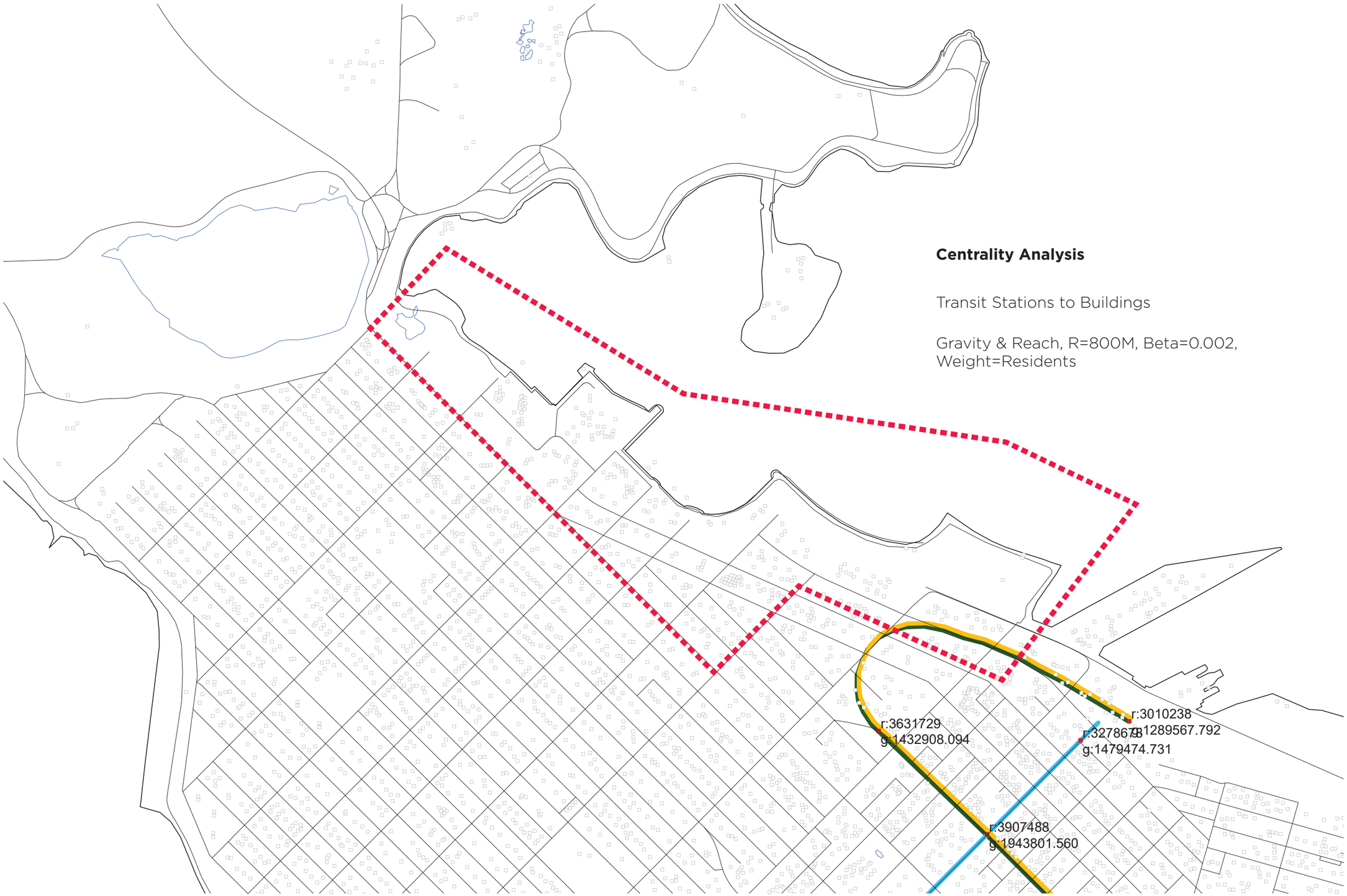
Gravity, R=400M, Beta=0.002, Count



Centrality Analysis

Transit Stations to Buildings

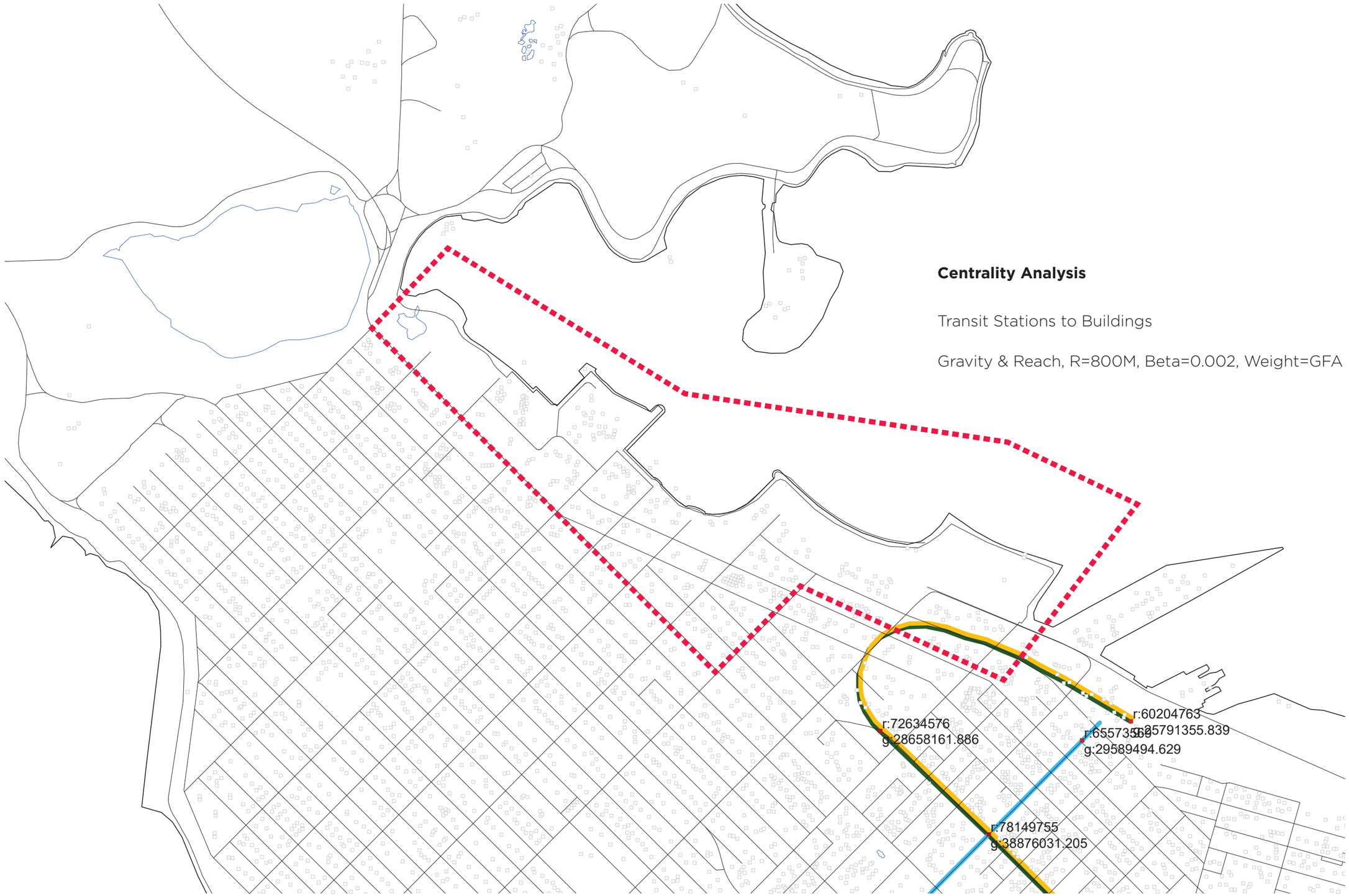
Gravity & Reach, R=800M, Beta=0.002, Count



Centrality Analysis

Transit Stations to Buildings

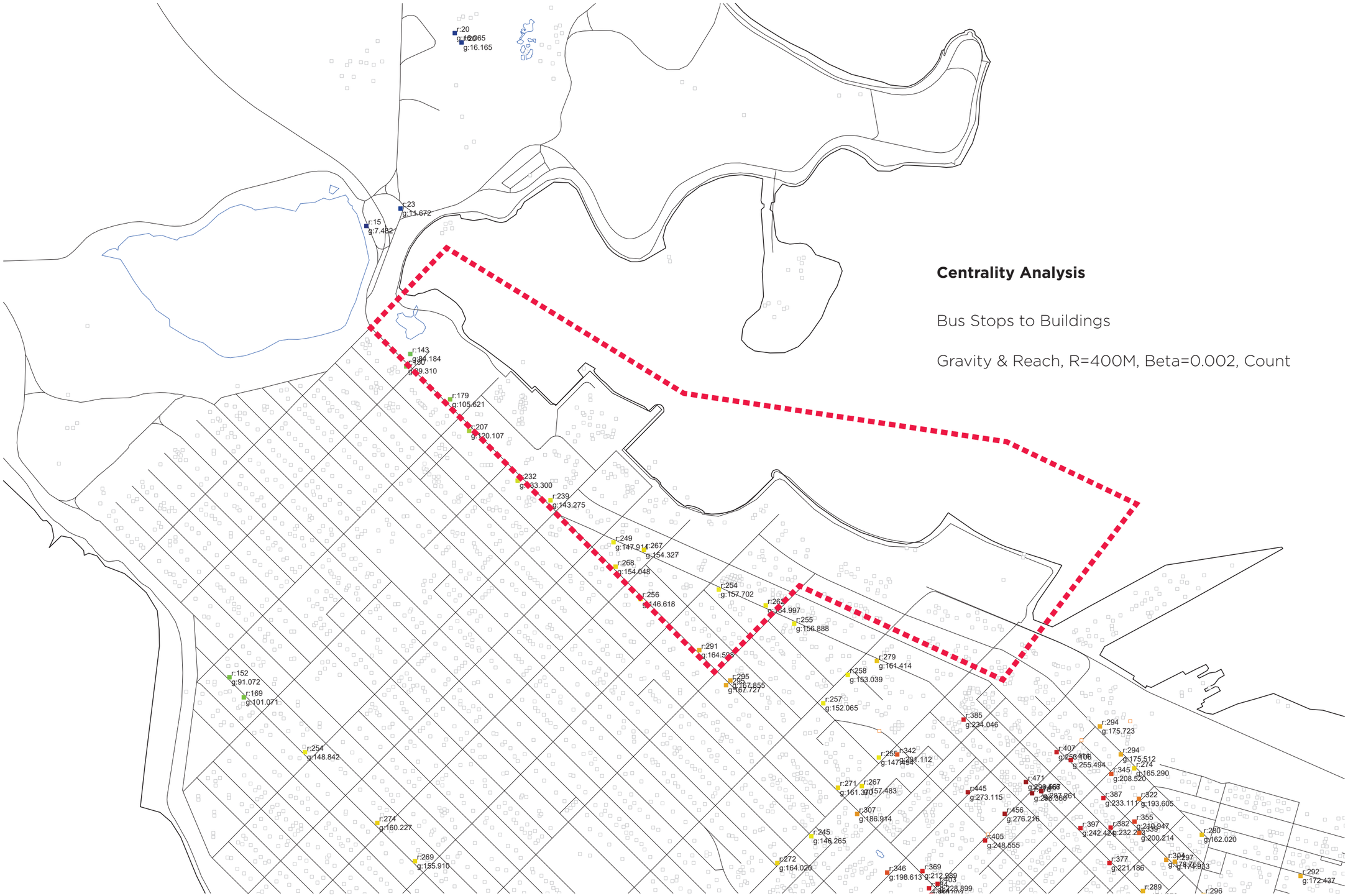
Gravity & Reach, R=800M, Beta=0.002,
Weight=Residents



Centrality Analysis

Transit Stations to Buildings

Gravity & Reach, R=800M, Beta=0.002, Weight=GFA



Centrality Analysis

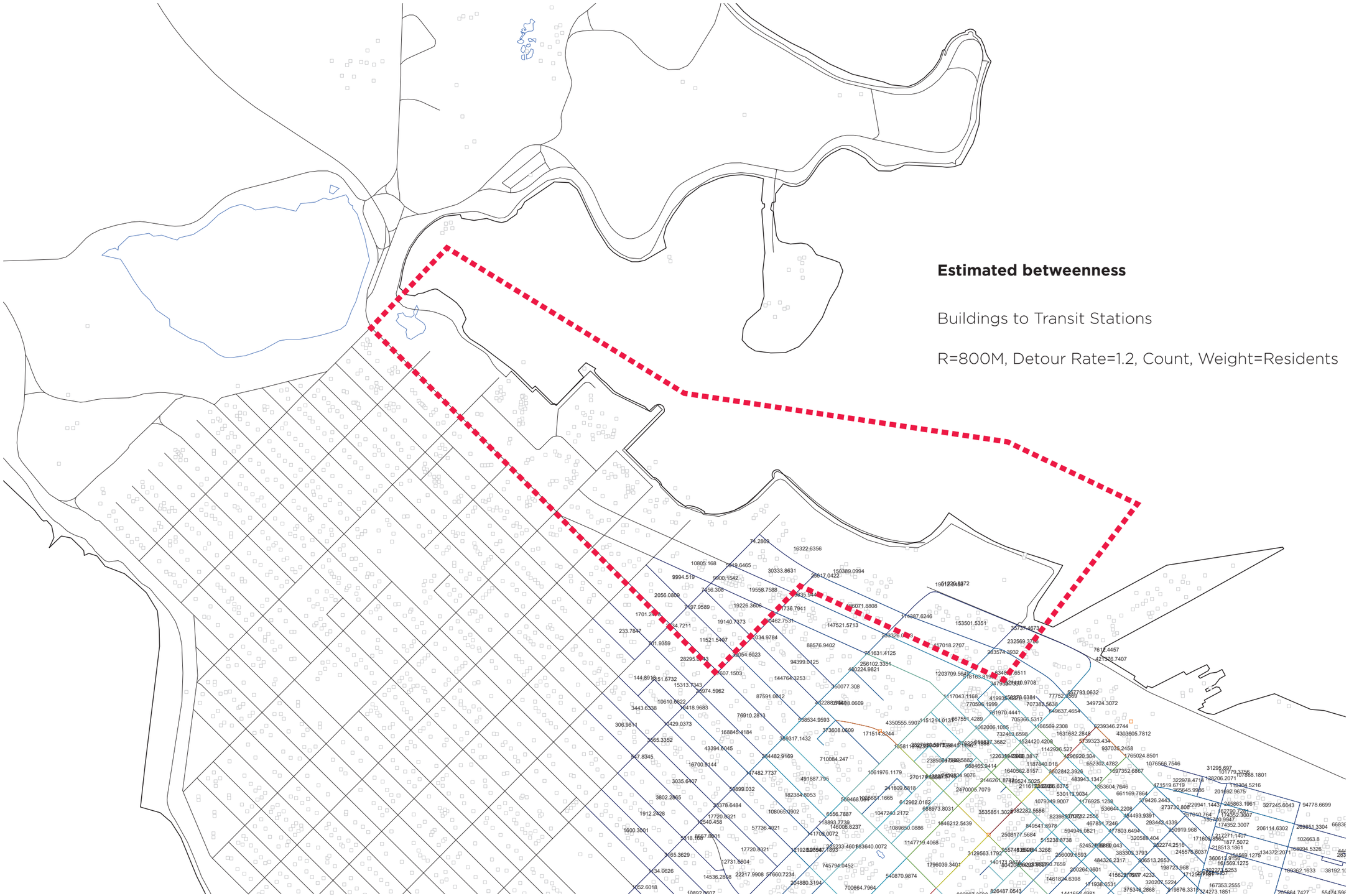
Bus Stops to Buildings

Gravity & Reach, R=400M, Beta=0.002, Count

Centrality Analysis

Buildings to commercial services

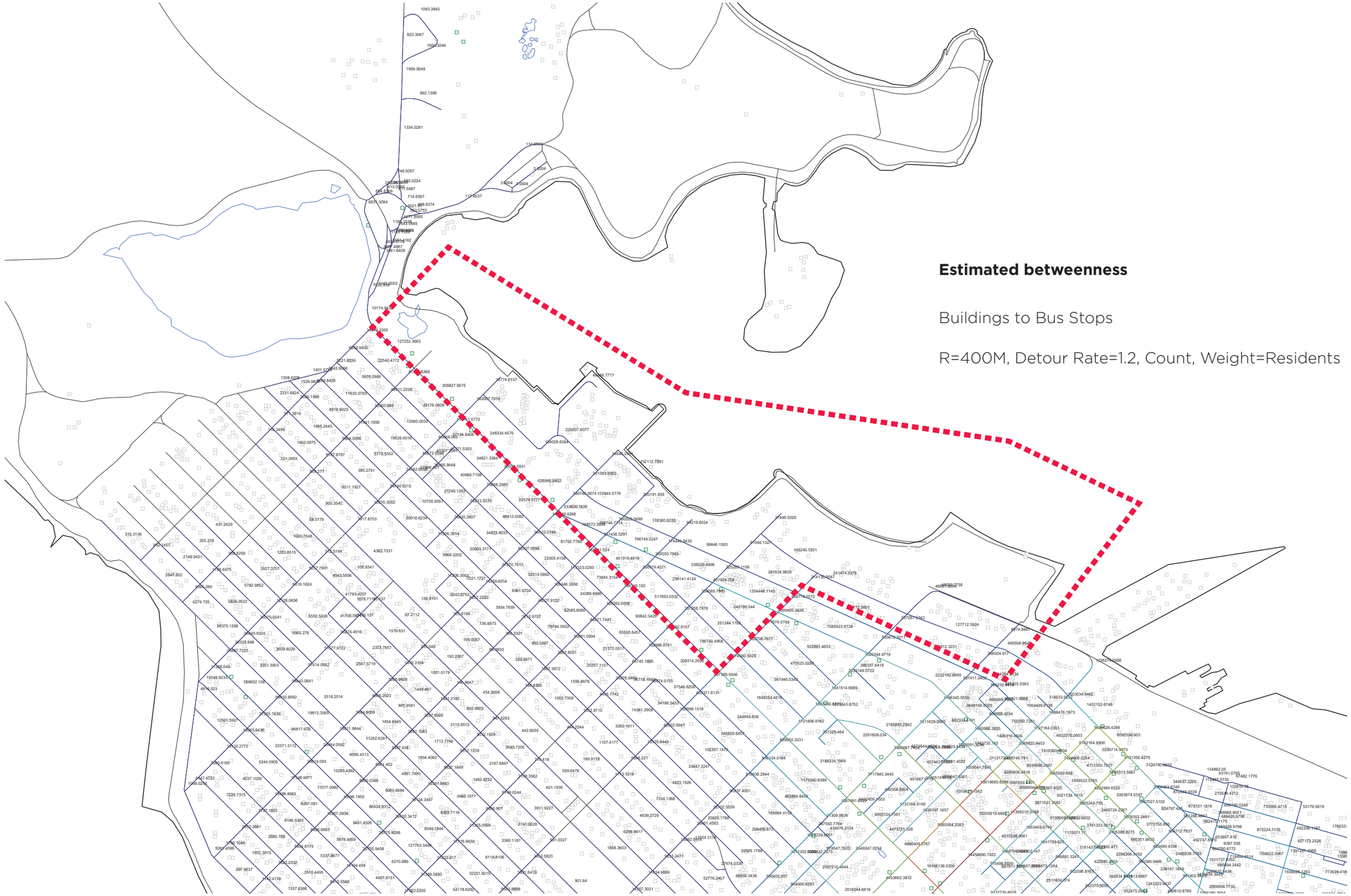
Gravity & Reach, R=400M, Beta=0.002, Weight=GFA



Estimated betweenness

Buildings to Transit Stations

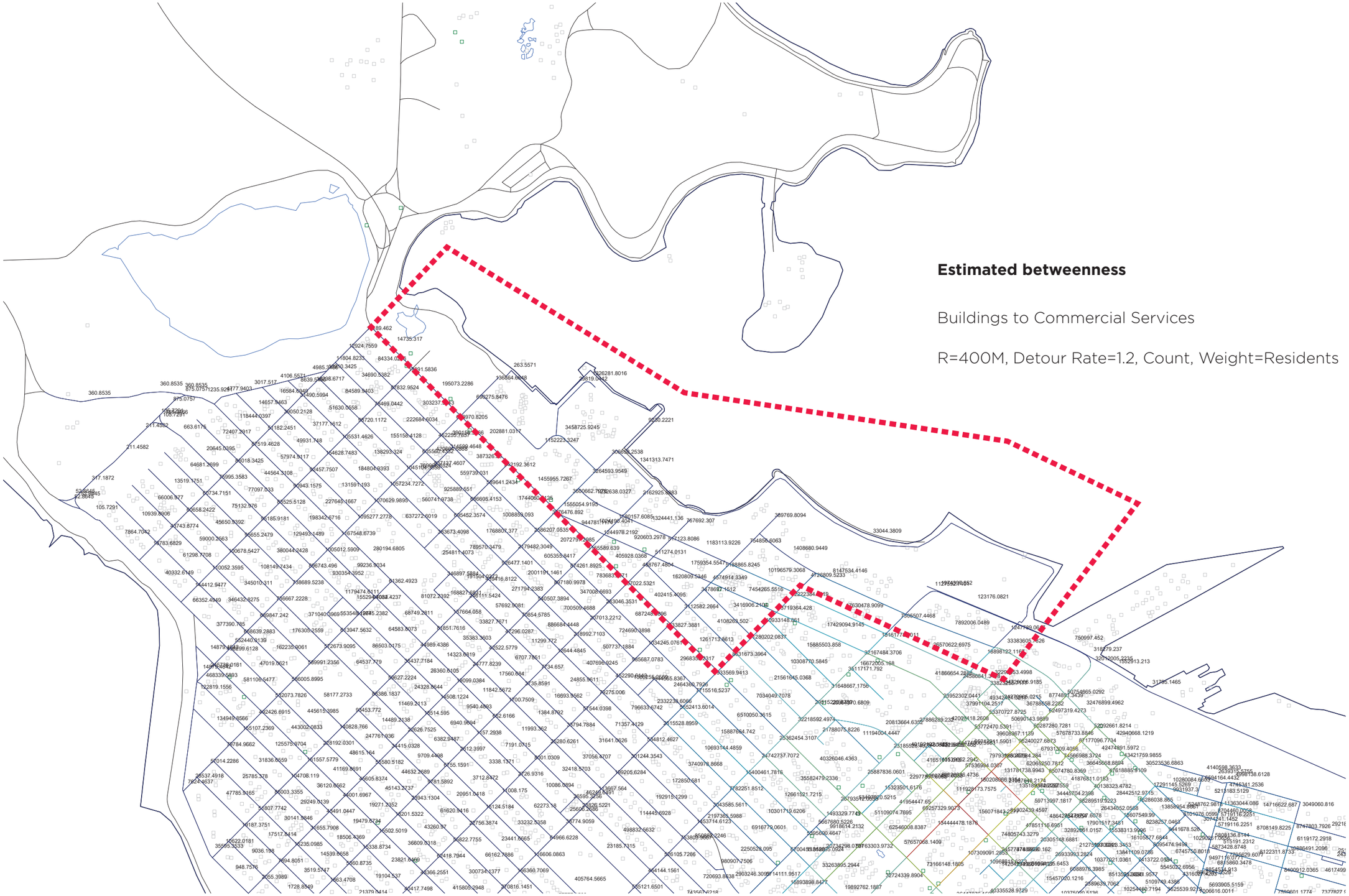
R=800M, Detour Rate=1.2, Count, Weight=Residents



Estimated betweenness

Buildings to Bus Stops

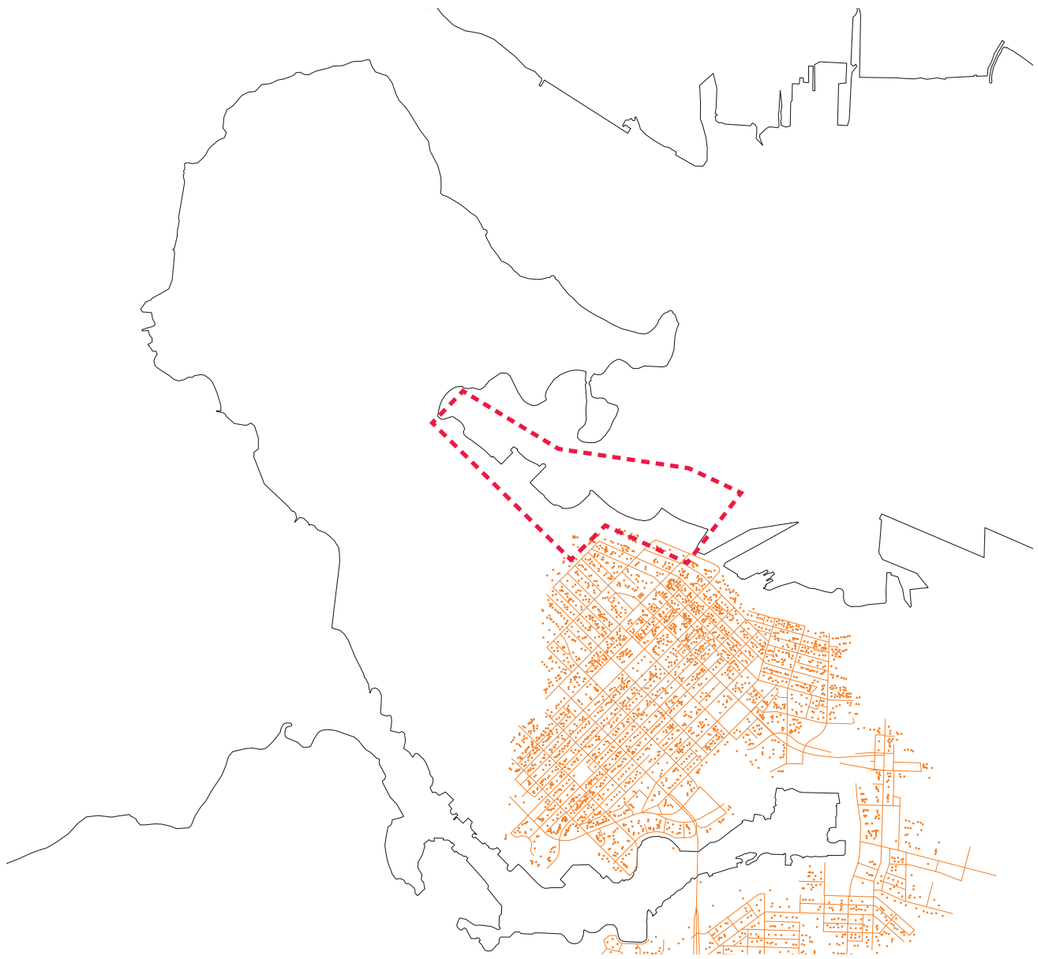
R=400M, Detour Rate=1.2, Count, Weight=Residents



Estimated betweenness

Buildings to Commercial Services

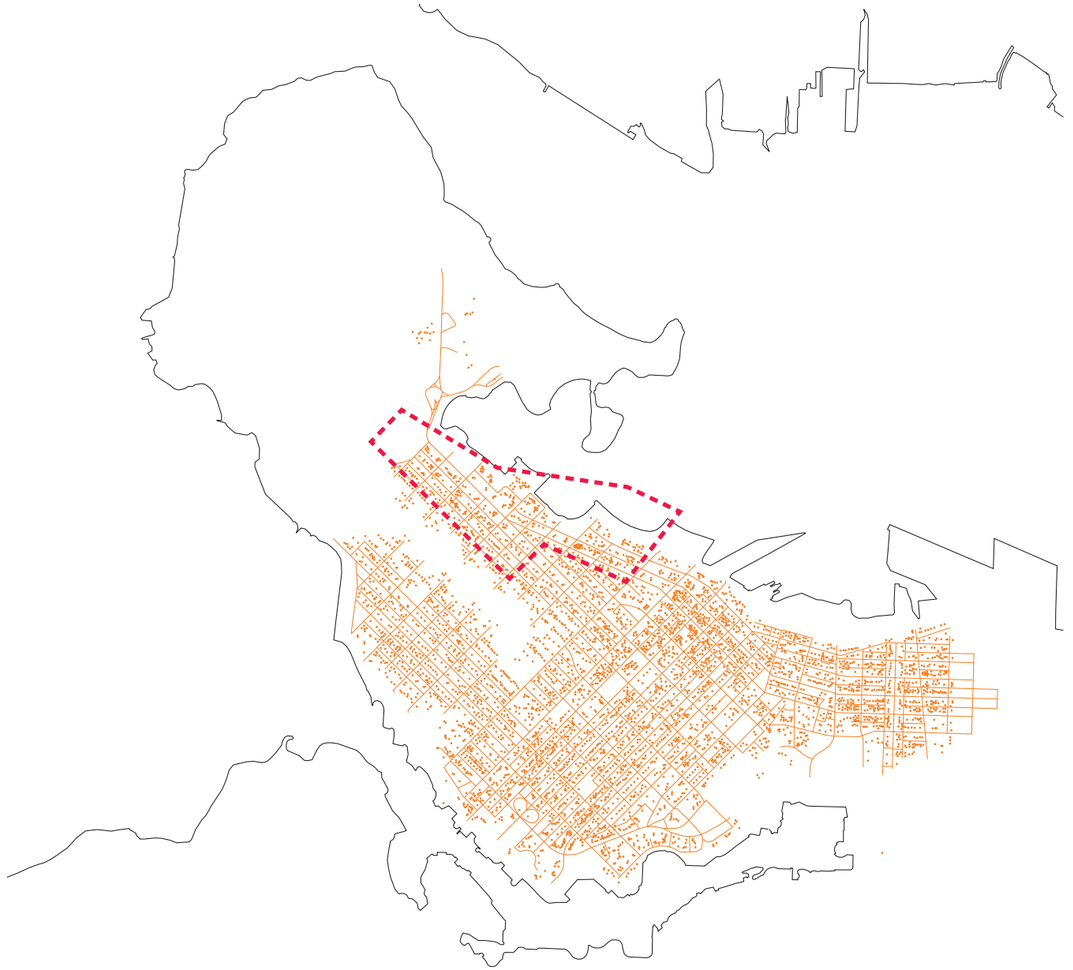
R=400M, Detour Rate=1.2, Count, Weight=Residents



Service Areas Analysis

Transit Stations to Buildings

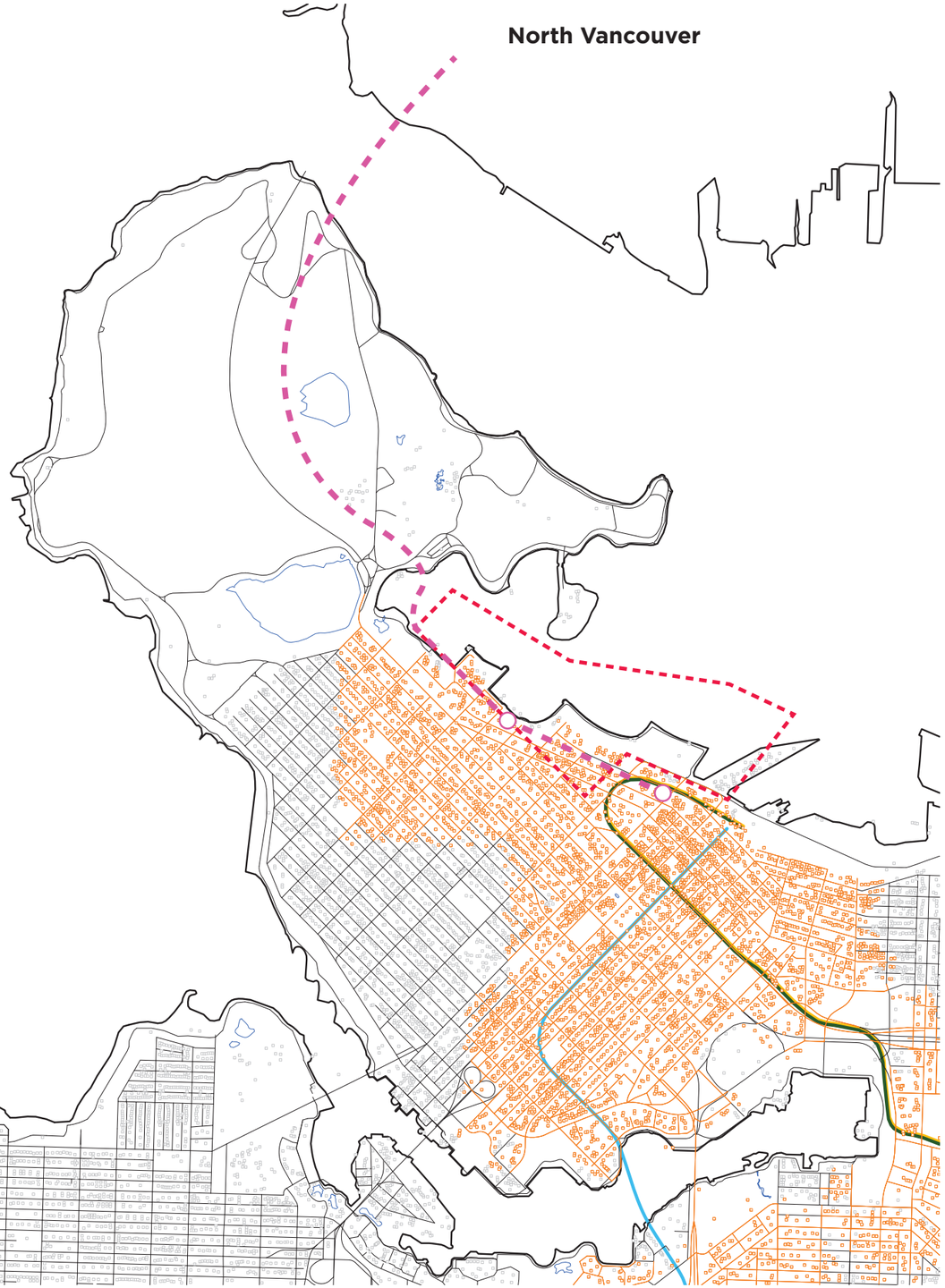
Gravity & Reach, R=800M, Beta=0.002

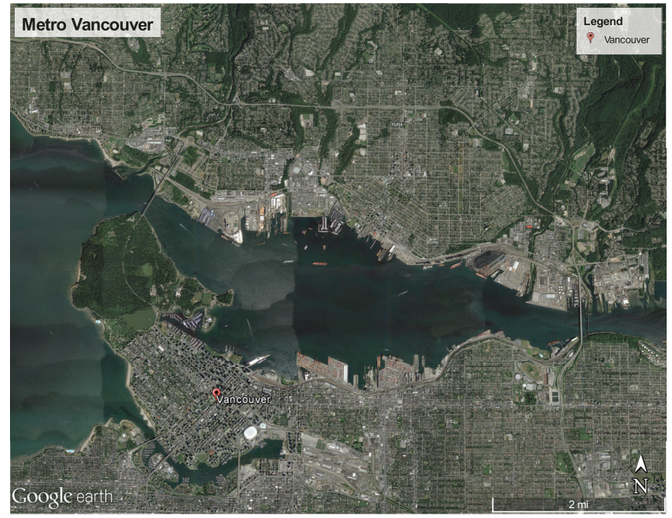


Service Areas Analysis

Bus Stops to Buildings

Gravity & Reach, R=400M, Beta=0.002





Source: Googlemap

Service Areas Analysis

Transit Stations to Buildings

Gravity & Reach, R=800M, Beta=0.002

Proposed Extension Line

Proposed Transit Station

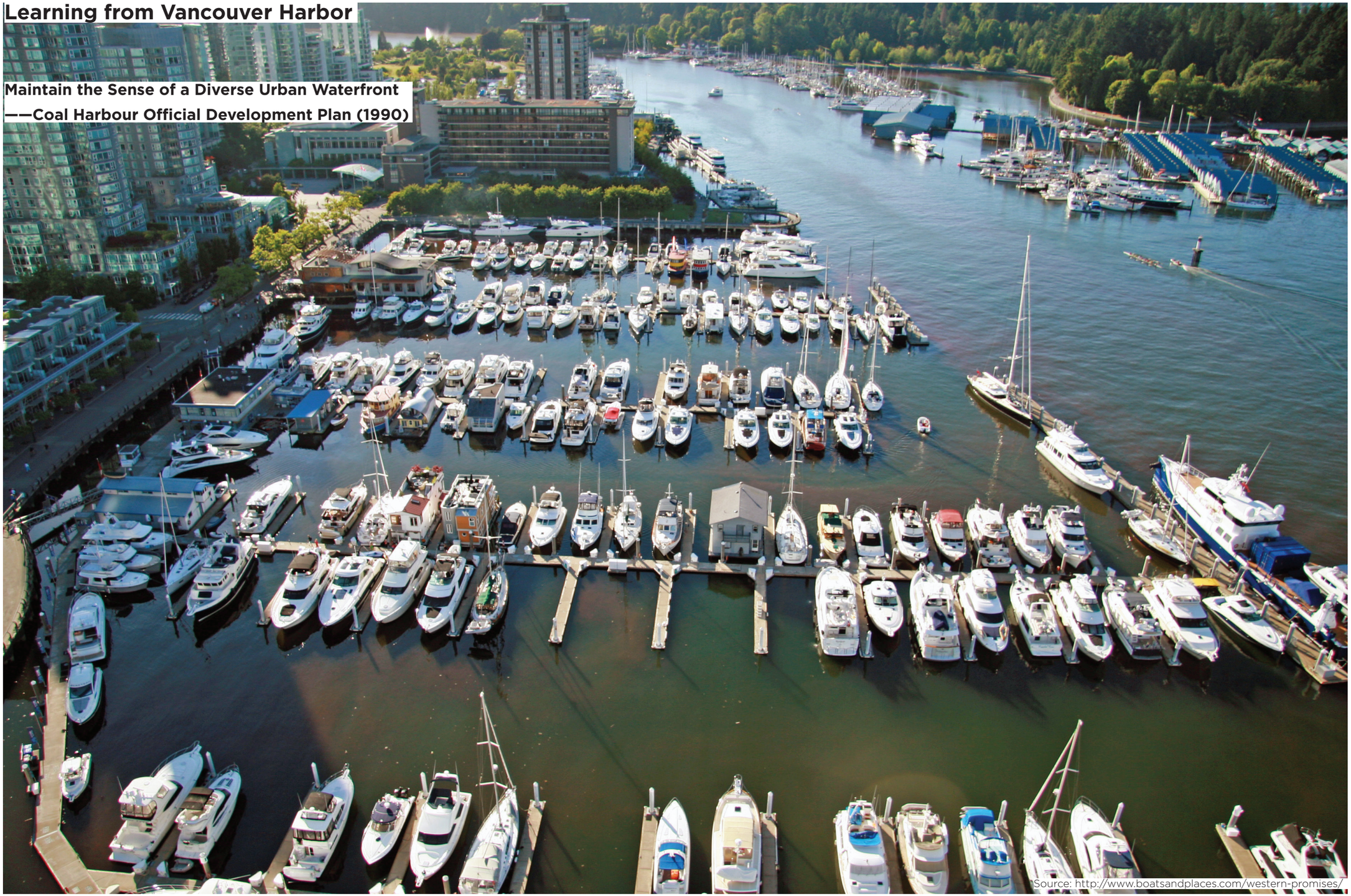
3D Models





Learning from Vancouver Harbor

Maintain the Sense of a Diverse Urban Waterfront
——Coal Harbour Official Development Plan (1990)



Source: http://www.boatsandplaces.com/western-promises/

Build on the Setting——Coal Harbour Official Development Plan (1990)



Source: http://www.boatsandplaces.com/western-promises/

Integrate with the City——Coal Harbour Official Development Plan (1990)



Source: www.faithwilsonggroup.com

Create Distinctive and Lively Public Space ——Coal Harbour Official Development Plan (1990)



Source: www.vancouverconventioncentre.com

Use Streets as an Organizing Device ——Coal Harbour Official Development Plan (1990)



Source: mbcbay.com



- A strong regional agency ensures multi-modal connectivity and a healthy transit system
- A history of adhering and enforcing particular urban design principles ensures a successful project
- Stable public-private relationship ensures the continuity of a project
- The addition of community anchors, such as a park or community center, in the new development allows the new development to become part of the spatial fabric of the area
- Attention to detail matters, particularly as each parcel is developed
- It is possible to create sustainable, human-centric developments with high density
- Issues related to social equity and inclusion should be considered and reexamined after each phase of the project

Source: www.dianliwenmi.com



NORDHAVNEN, COPENHAGEN

YUJUN YIN | MARIA GLORIA ROBALINO

NORDHAVNEN DEVELOPMENT

2009 -

PROPOSALS SUBMITTED BY

-COBE

-SLETH

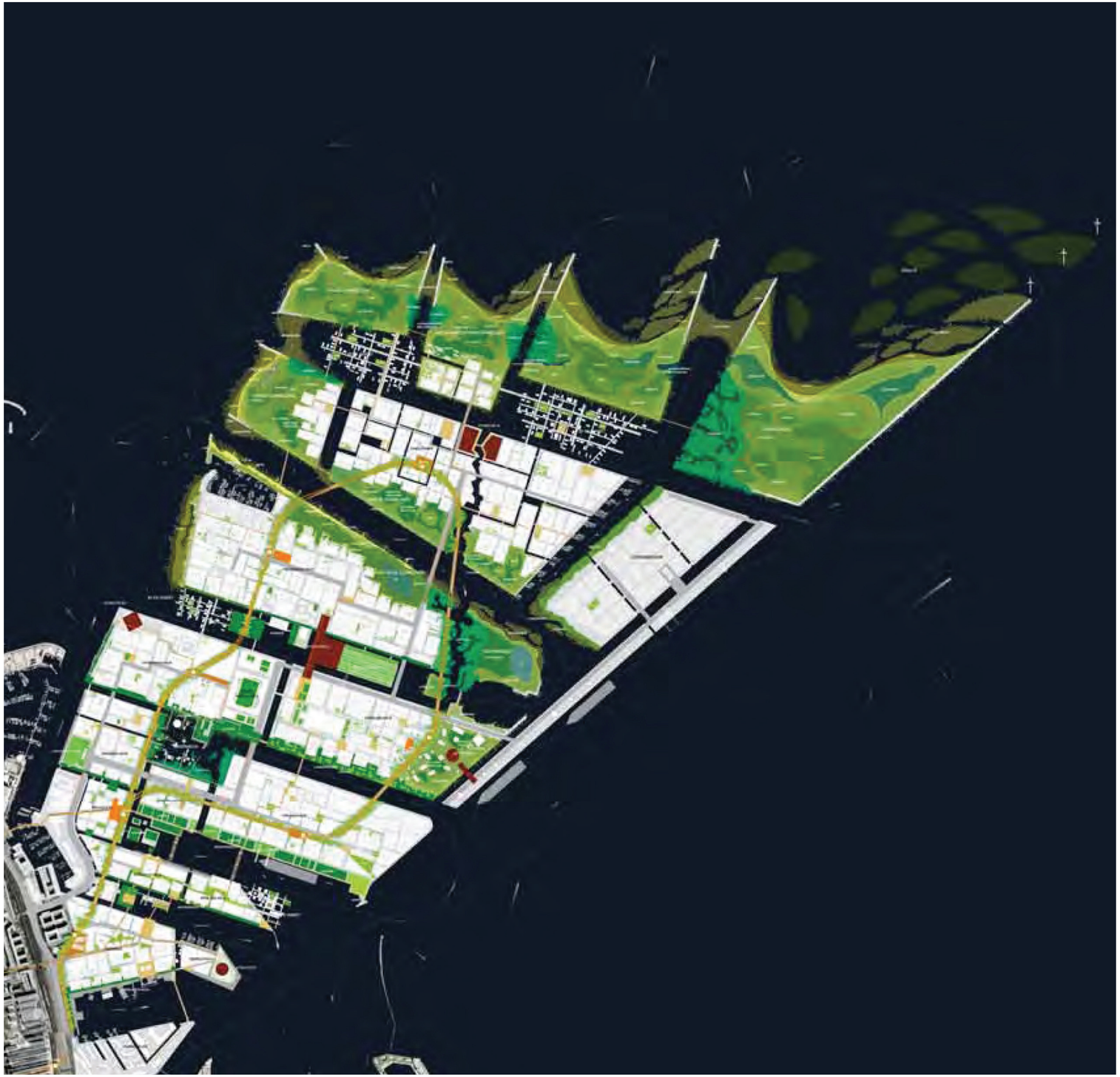
-POLYFORM

-RAMBOL



NORDHAVNEN DEVELOPMENT

SITE PLAN



NORDHAVNEN DEVELOPMENT

General Overview

The Nordhavnen Port Development Project started in 2012, and will continue to grow in planned stages. In the first stage 400,000 squared meters of new floorspace were developed and existing buildings of a cumulated total of 70,000 squared meters of floor area were preserved. The second stage will begin in 2018, when 200,000 squared meters of new floorspace is developed. More stages of development will follow that will be scheduled once the performance and impact of the first two are gaged. Overall, the cumulative area of Nordhavnen to be developed amounts to four million squared meters.

The Ministry of Transport of Denmark owns 45% of the development, and the City of Copenhagen owns 55% of it. The consultants involved in the project are COBE, SLETH, Polyform and Ramball, which were selected after the city opened an international competion calling for proposals for the site. The city chose all of these consultants for their different strengths instead of just one, thus putting together a stronger overall scheme. The district aims to be compact, sustainable, diverse and active in its design. Nordhaven is the first harbor district that will be developed, and based on its performance, the neighboring districts of Nordbassin, Kronlobsbassin and Kronlob will follow.



Historical Context

The development project aims to engage its water front with different kinds of activities, stitch a dense and mixed-use urban fabric together, establish mixed-income residential buildings within it, and encourage the use of sustainable forms of transportation such as biking, walking, and using public transportation. Nordhavnen will be developed on reclaimed land, most of which has been extended over the last 150 years using rubble and other material left from previous construction and excavation projects in Copenhagen. Therefore, the development will literally sit on top of much of the historical development of Copenhagen.

The plot ratio of the development is 1:8, similar to other dense areas in Copenhagen, and its use distribution is broken evenly between Commercial (40%) and Residential (40%) types. The leftover 20% of the development remains flexible. The architecture of the development aims to remain consistent with the principles that inform its urban design. Therefore, they are meant to have engaging facades and silos. Yet, they must also be sensitive to the remaining historical buildings on the site, sometimes having prescribed colors for their facades. Similarly, they are meant to be enhanced with green infrastructure such as green facades and gardens in order to retain more stormwater and ensure clean air for the district. A reserved portion of the buildings will be set afloat in the water, offering an interesting habitation typology in the area.


FRIHAVNSTERRAINET 1928



NORDHAVNEN 1948
NORDHAVNEN 1948

MASTERPLAN
BEBYGGELSESPLAN



Average Plot Size





ISLETS AND CANALS
HOLME OG KANALER



CO2 FRIENDLY CITY
CO2 VENLIG BY



FIVE-MINUTE CITY
FEM-MINUTTERS BY

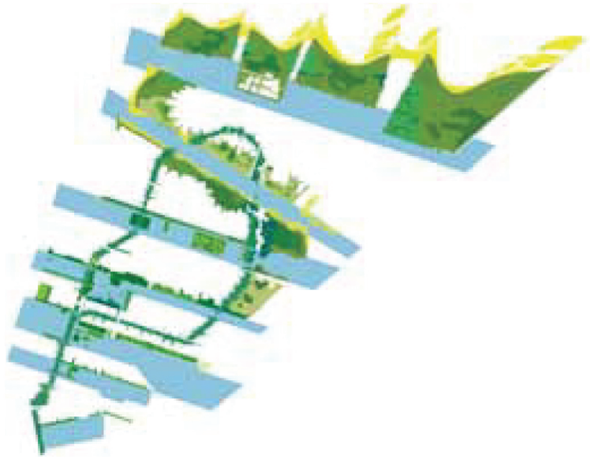
6 THEMES
6 TEMAER



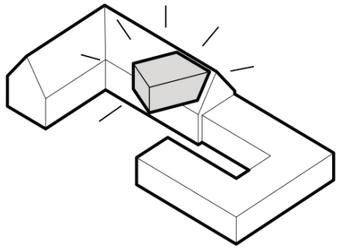
IDENTITY AND HISTORY
IDENTITET OG KULTURSPOR



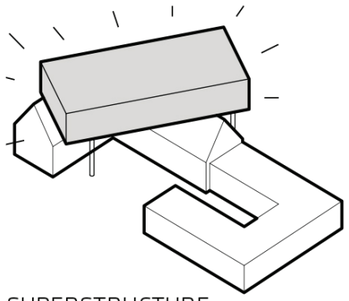
INTELLIGENT GRID
INTELLIGENT GRID



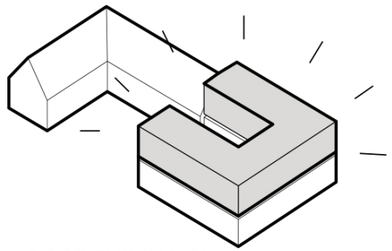
BLUE AND GREEN CITY
BLÅ OG GRØN BY



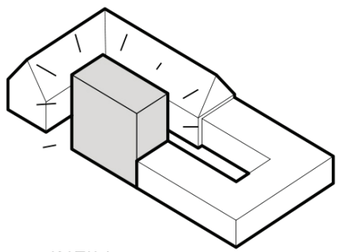
BUILDING EXTENSION
PÅBYGNING



SUPERSTRUCTURE
OVERBYGNING



ROOF EXTENSION
TAGUDVIDELSE



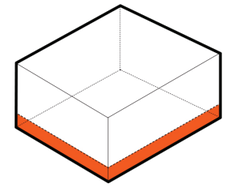
INFILL
INFILL

Building Typologies

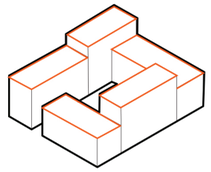
Most of the buildings will be low-rise except for four, which can reach up to 16 floors and will remain gray. These will hold some of the bigger retail spaces of the district and be located close to metro stations for easy access. In all cases, the buildings have to follow the outline of the plot, but will be rather small, following the 1:8 plot ratio present in some of the most dense areas of Copenhagen.

The rest of the buildings will have a maximum height of 6 floors, and will be required to change their height at least three times in order to ensure variation of the urban envelope. The relatively low heights of most of these buildings will help prevent the presence of strong winds on the streets that would make the district less walkable and bikeable. The buildings also invite “add-ons” which are structures that can be added to the existing buildings but do not have to completely subscribe to their exisiting architecture, thus resulting in interesting new typologies that make the experience of walking through the city an interesting one.

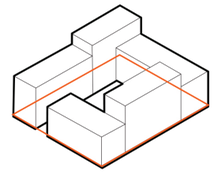
Finally some of the buildings will be placed in the water, allowing for the literal inhabitation of the waterfront and a direct engagement with this element. Some of the histoic port buildings will be preserved given that they provide a sense of site’s history and add on to the diversity of the urban experience of the district. The preservation of these buildings was the result of a careful selection, since not all could be preserved.



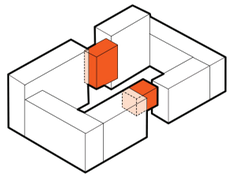
HIGH GROUND FLOOR LEVELS WITH A WEALTH OF DETAILS
HØJE STUEETAGER MED STOR DETALJERIGDOM



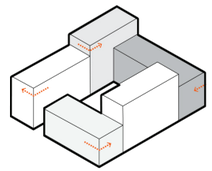
DIVERSITY THROUGH DIFFERENT BUILDING HEIGHTS
DIVERSITET GENNEM SPRING I BYGNINGSHØJDER



UNINTERRUPTED BUILDINGS
WITH GATE OPENINGS ALONG EDGES
SLUTTET RANDBEBYGGELSE MED PORTÅBNINGER



CONNECTIONS ABOVE TERRAIN CREATE PASSAGES
SAMMENBYGNING I HØJDEN GIVER PASSAGER



VARIATION BY MEANS OF DIFFERENT FACADE DESIGNS
VARIATION GENNEM SKIFT I FACADEUDTRYK

CURRENT SKYLINE



NORDHAVNEN'S CURRENT SKYLINE: LOW-RISE STRUCTURES AND LARGE VOLUMES
NORDHAVNENS BYPROFIL I DAG – LAVE STRUKTURER OG STORE VOLUMENER

COPENHAGEN SKYLINE: HIGH-DENSITY AND SLIM TOWERS
KØBENHAVNS BYPROFIL – TÆT BY OG SLANKE TÅRNE



PROPOSED SKYLINE



NORDHAVNEN'S FUTURE SKYLINE: HIGH-DENSITY WITH VARIATION AND LARGE VOLUMES
NORDHAVNENS FREMTIDIGE BYPROFIL – TÆT VARIERET BY OG STORE VOLUMENER



Water Pocket Space



Redmole Canal



Public Space Typologies

One of the main pillars for the development of Nordhavnen was its commitment to provide a varied set of public spaces. In addition to typologies such as urban squares and pocket parks, the district offers innovative public spaces that engage directly with the waterfront. The overall distribution of these public spaces was carefully planned in order to provide all of the district areas with a similar access opportunity to public spaces. This is particularly important in the case of Nordhavned, given that the urban fabric itself is planned to be a mixed-use one.

The district aims to engage the waterfront as much as possible, which is why quays and promenades will provide access to the water through stairs and ramps. Along the water edge activities such as resting, harbor bathing, winter bathing and water sports will be available. In addition, canals and bridges will be used to further enhance the use and presence of the water's edge and its islet structure, while allowing for boats and other modes of water transportation to pass through them.

Some of the new water specific typologies that will be implemented in this project include new islands and water pocket spaces. The new islands wil help connect this district to another one, and create a series of intimate canals and basins. The islands will be accessible through a houseboat marina. Water pocket spaces will be surrounded by quays and protected from the wind to allow for a comfortable experience of the water line.

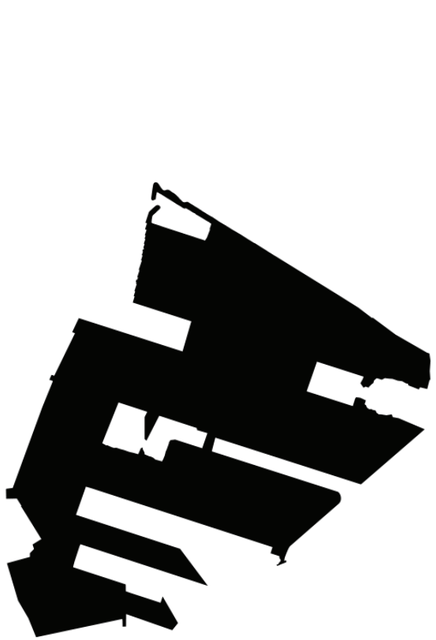
New Islands



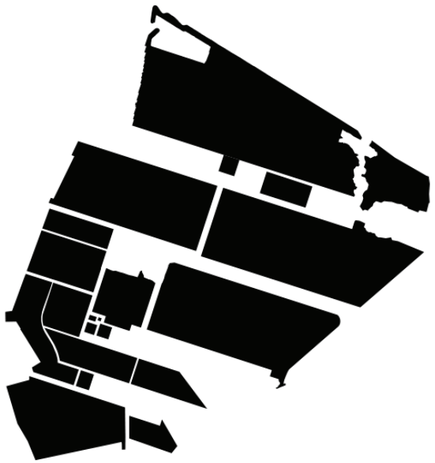
Quays & Promenades



ISLETS AND CANALS
HOLME OG KANALER



NORDHAVNEN
NORDHAVNEN



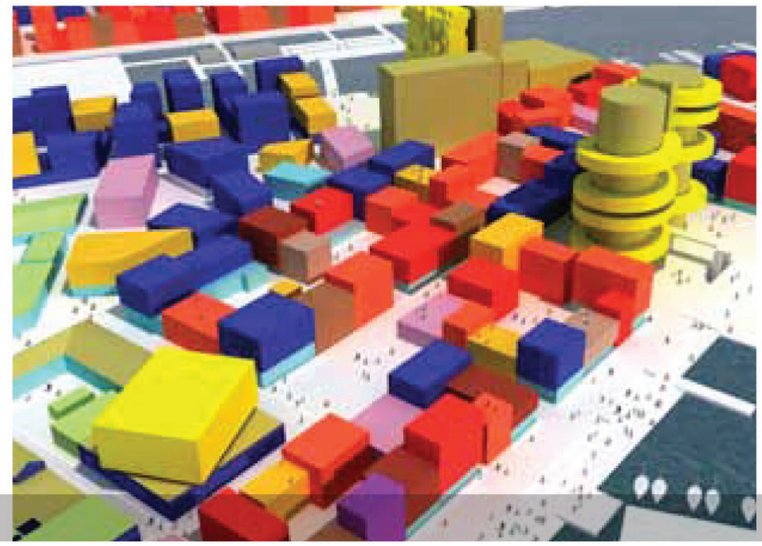
CANALS
KANALER



ISLETS
HOLME



DYNAMIC URBAN DEVELOPMENT
PHYSICAL, FUNCTIONAL, SOCIAL
DYNAMISK BYUDVIKLING
FYSISK, FUNKTIONELT, SOCIALT

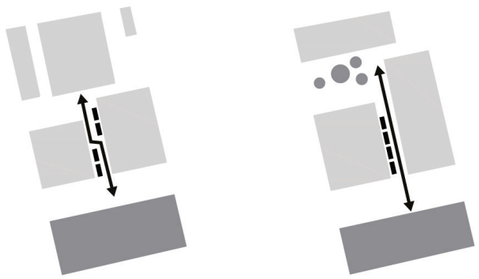


Street Typologies

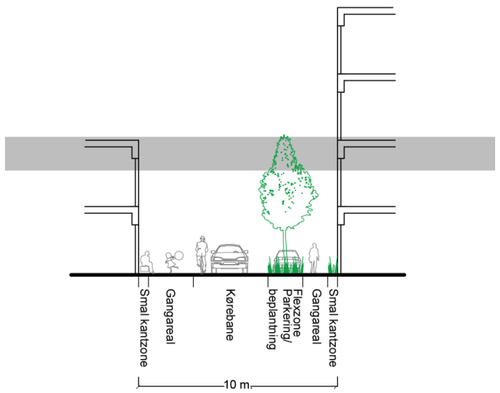
The network typologies present in the development are similarly varied. These include alleys, islet streets, canals, bridges, a high street, and quays. The ways in which these come together open the possibility for different public spaces, such as small pocket parks, designed islands, open squares, promenades, water pocket spaces. The district will have three major traffic arteries: Sundkrogsgade, Arhusgade, and Ludersvej. Arhusgade Street is the main street of the district and will be lined with trees and stand as the district's largest boulevard. The other two will have more variation in their structure to allow for different urban experiences. The buildings at main street will hold high-end shops at their floor level, but will remain residential on their upper floors, thus achieving a mixed land use.

Many different techniques to reduce speed will be implemented, such as chokers and multi-use street parameters. In addition, the district is laid out in such a way as to emphasize transversing connections, which is a technique that helps further reduce traffic. In streets that clearly demarcate a difference for bike, car, and pedestrian use, the district will prioritize making the walking portion of the street as legible and comfortable as possible, through smooth, non-slip and clearly legible paving. The sidewalks are separated by running areas called "Fixture Zones" which are 2.1 meters wide and are delineated by planting, parking, and street furniture. A distance of 0.6 m separates the sidewalks from the building facades.

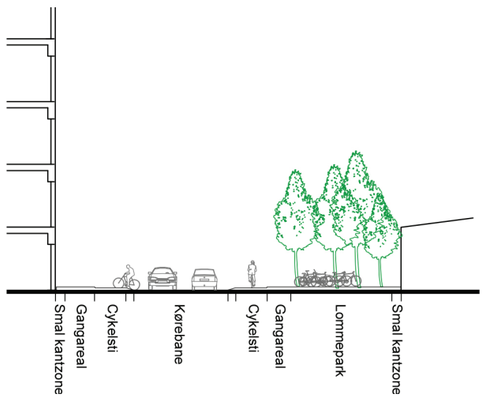
Flexible Zones



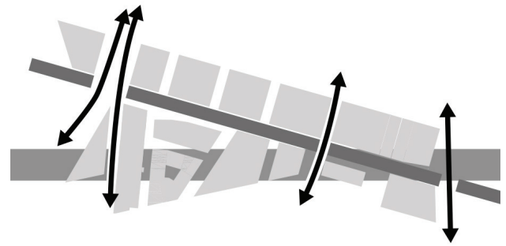
Alleys



Main Streets



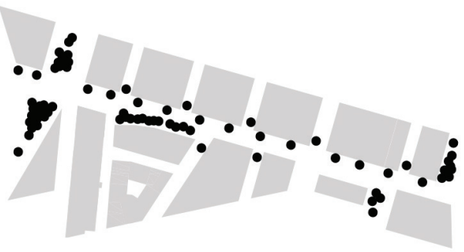
Transversing Connections



Pavement for Sun Exposure



Scattered Street Planting



Border Zones

The streets themselves are designed in a way that aims to enhance their walkability and encourage their use as social spaces. Innovative fringe elements such as designed “Border Zones” which are private spaces on the side of the house that faces the street, have a certain public character (benches, planting, pots) that invite residents to stay and engage with their neighbors on the street. Similarly, alleys allow for traffic to flow through but provide a sense of intimacy and slowness in the district that increases its sense of walkability.

Closed House Fronts



Engaged Border Zones



Multi-Story Parking



Underground Parking

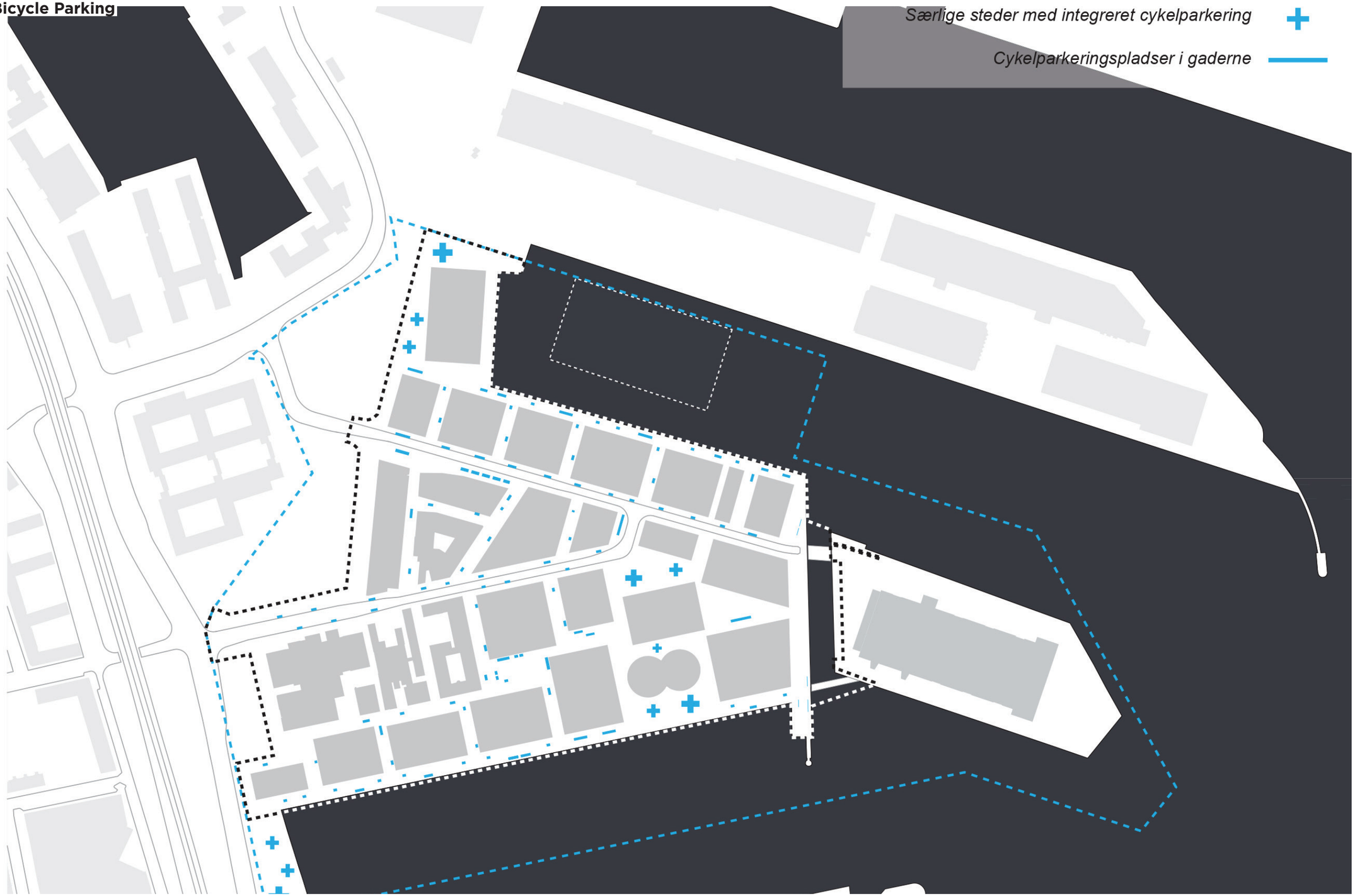


Parking

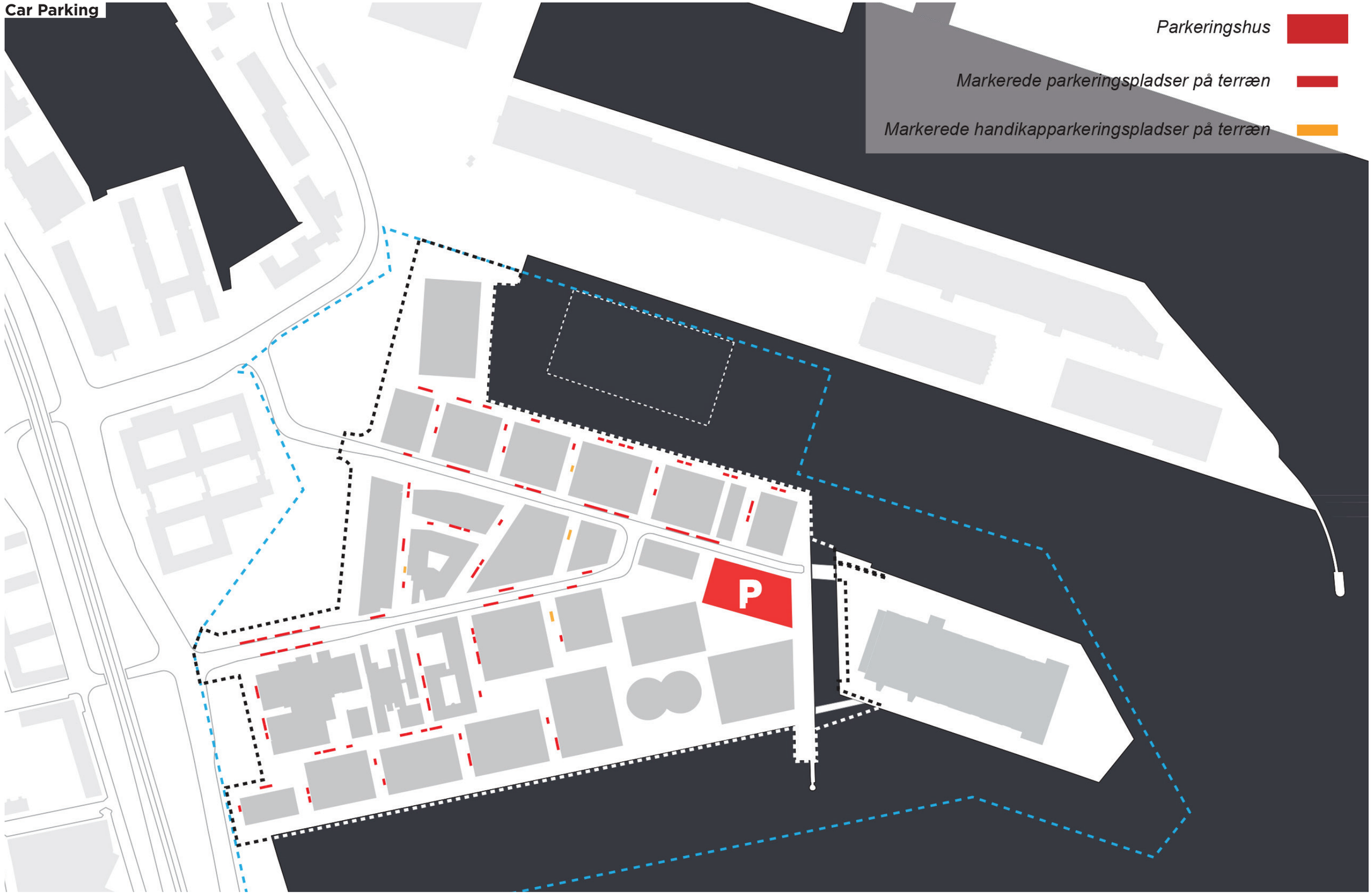
Overall, 90% of the parking predicted for the district must be accomodated within the three building facilities reserved for parking. Two of these facilities will sit on top of the ground, while one of them will be buried underground. The remaining 10% will be distributed on the streets. In terms of bicycle parking, stations for this purpose will be distributed evenly over the district, except for large public squares that have additional stations for bicycle parking.

The lack of parking aims to discourage the use of cars, and through an induced demand effect, the use of public transportation and bicycles is expected to gain popularity in the district. Copenhagen itself is already one of the most bikable cities in Europe.

Bicycle Parking



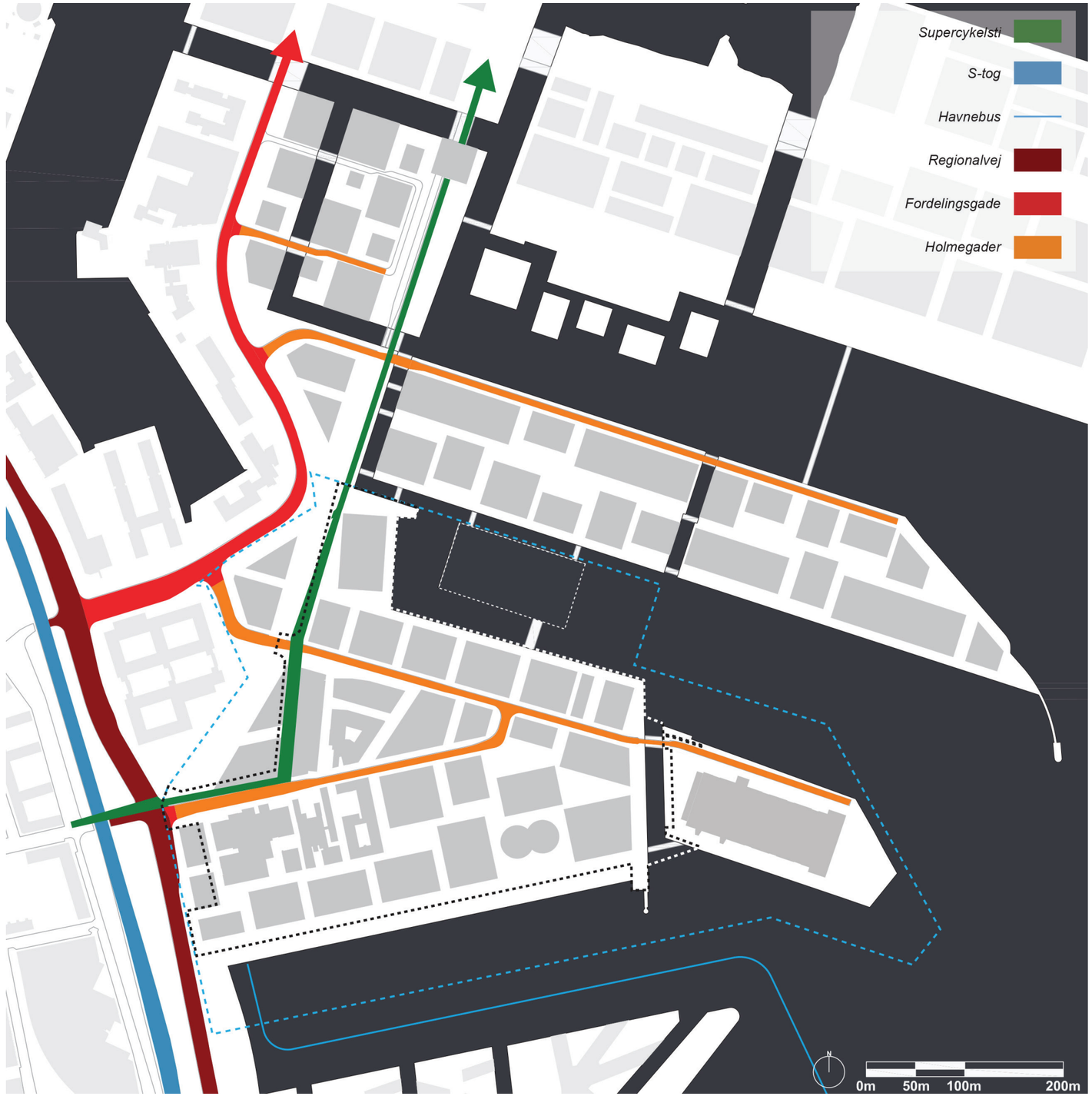
Car Parking


Parkeringshus
Markerede parkeringspladser på terræn
Markerede handikapparkeringspladser på terræn
P

Traffic Structure

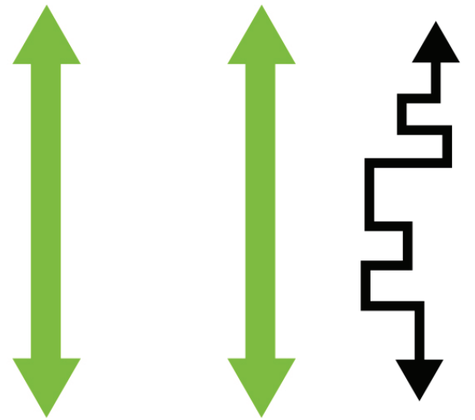
In terms of its traffic structure, Nordhavnen aims to offer as many alternatives to car use as possible and to prioritize the needs of the most vulnerable road users. Most of the district will be within a radius of 600 m from the district's Metro station, which makes it easy to access the rest of Copenhagen or Denmark. In addition, a bus line will be available, and so will a cycle superhighway that travels in a green loop. Given that most of Conpenhagen is highly bikeable, allowing this district to continue with this initiative creates a seamless connection to the rest of the city.

Nordhaven will have an elevated Metro line laid out as a loop with seven stations. These stations will dictate the development of new districts, which must be within a radius of 600 m to at least one of them. The first stage of the metro will open in 2019 and will comprise 2 stations. These two stations will offer the alternative to connect to other trains or buses, thus integrating other systems of public transportation within the same station. The Nordhavnen Metro Station will be located close to large mixed use buildings. In case residents need to use a car occasionally. Stations for electric car share will be available, which recharge and thus result in less pollution.



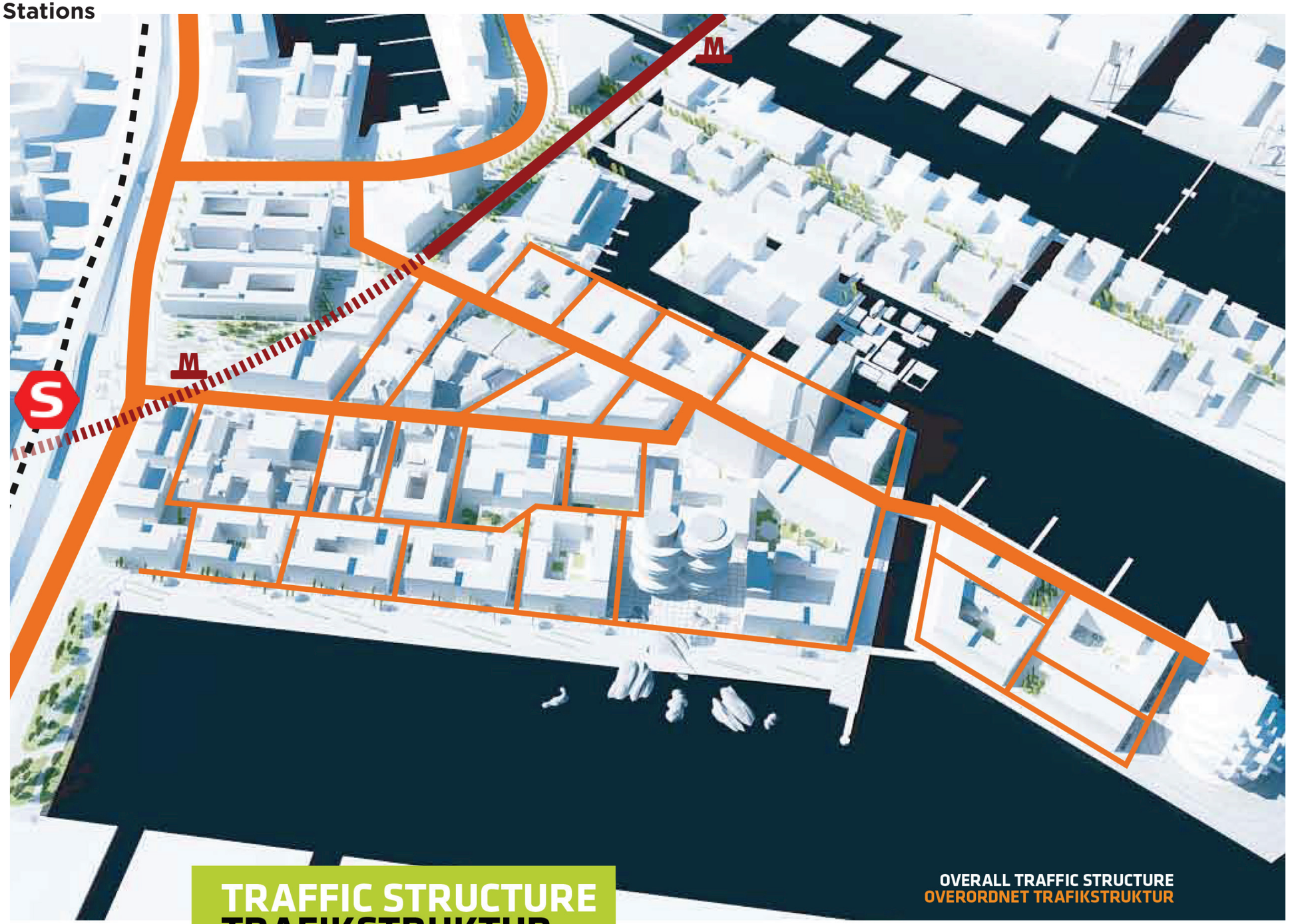
FIVE-MINUTE CITY
FEM-MINUTTERS BY





FIVE-MINUTE CITY
PUBLIC TRANSPORT WITHIN FIVE MINUTES WALKING DISTANCE
FEM-MINUTTERS BY
KOLLEKTIV TRAFIK INDENFOR FEM MINUTTERS GANGAFSTAND

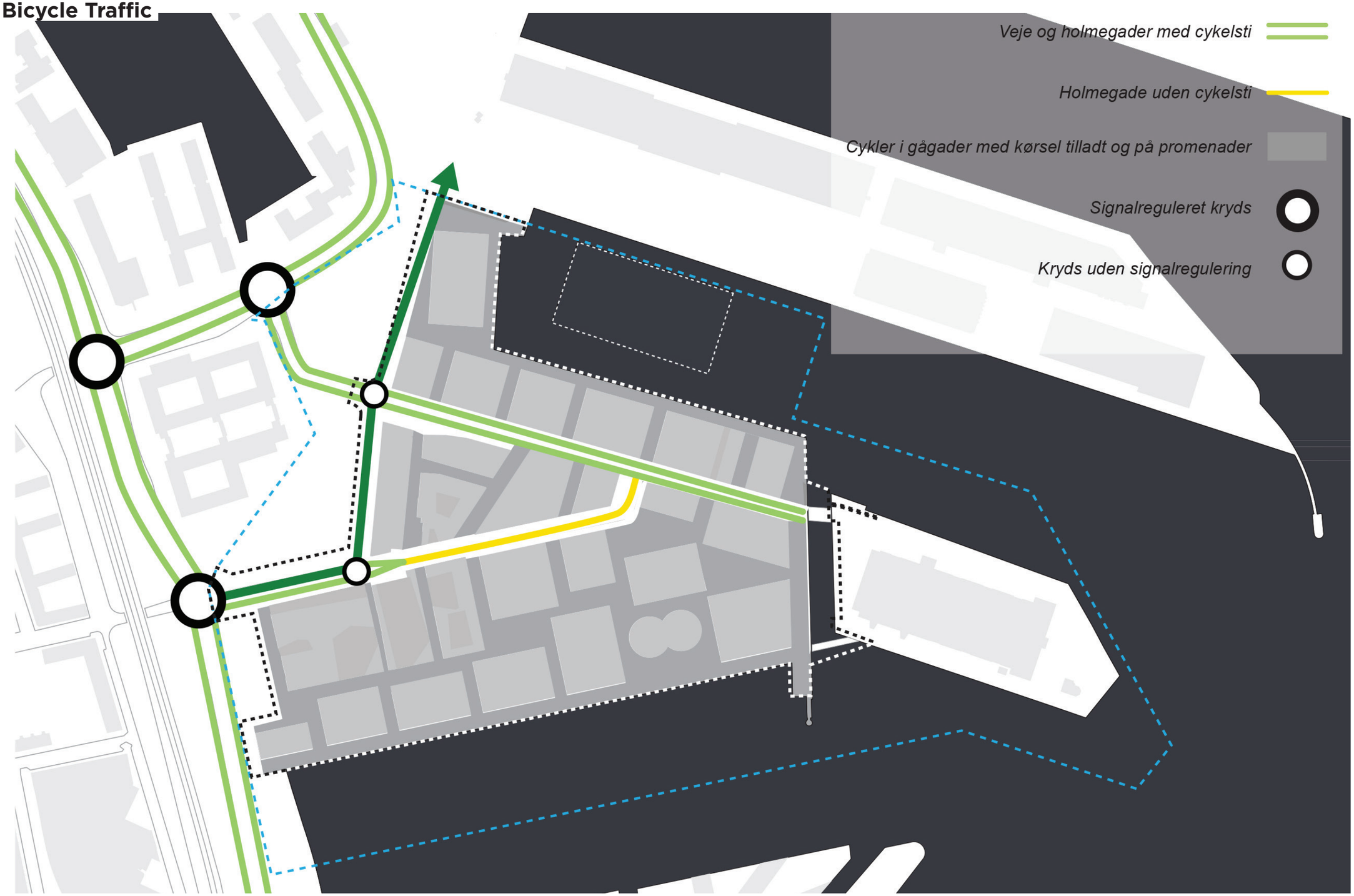
Metro Stations



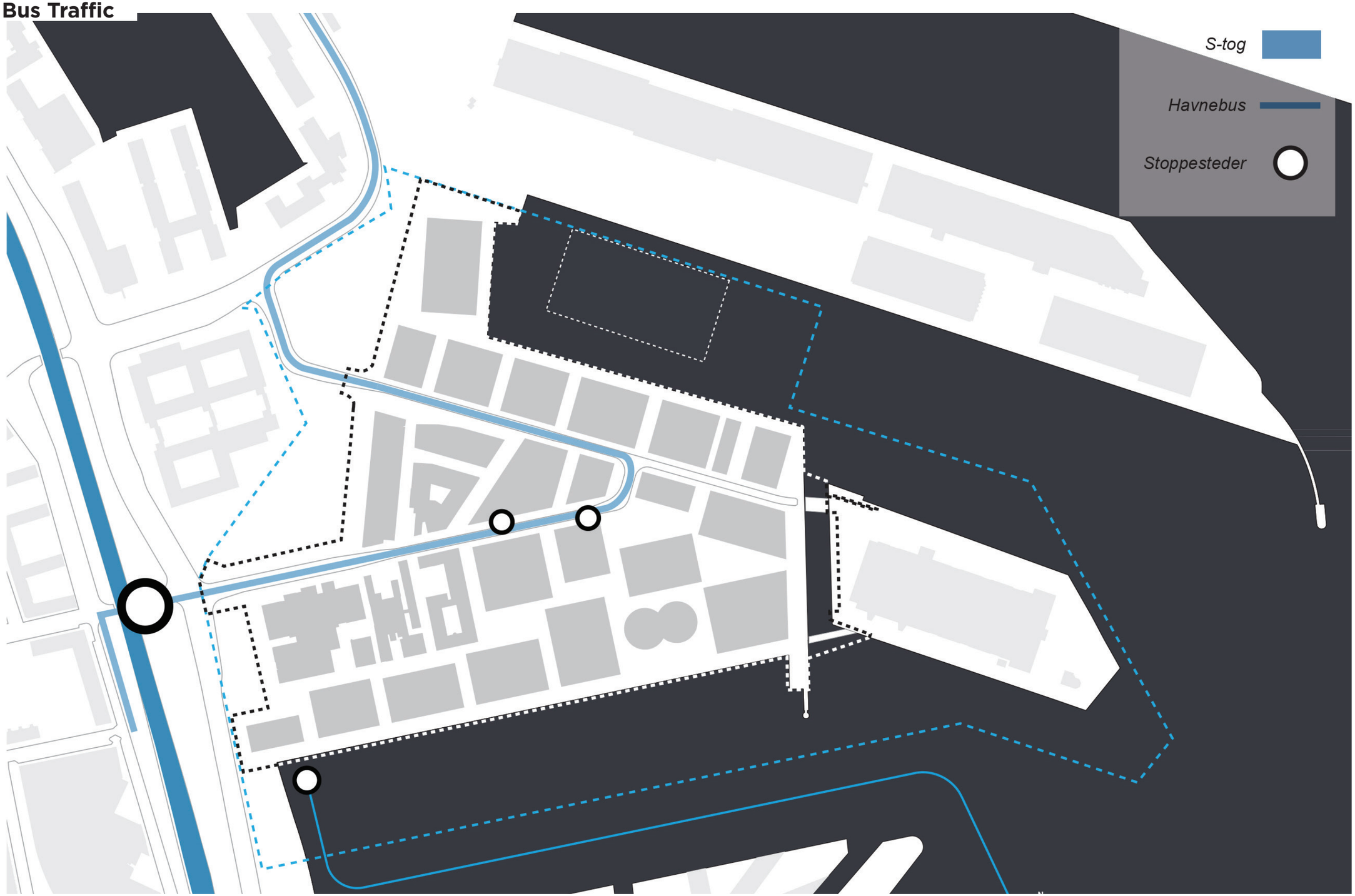
OVERALL TRAFFIC STRUCTURE
OVERORDNET TRAFIKSTRUKTUR

TRAFFIC STRUCTURE
TRAFIKSTRUKTUR

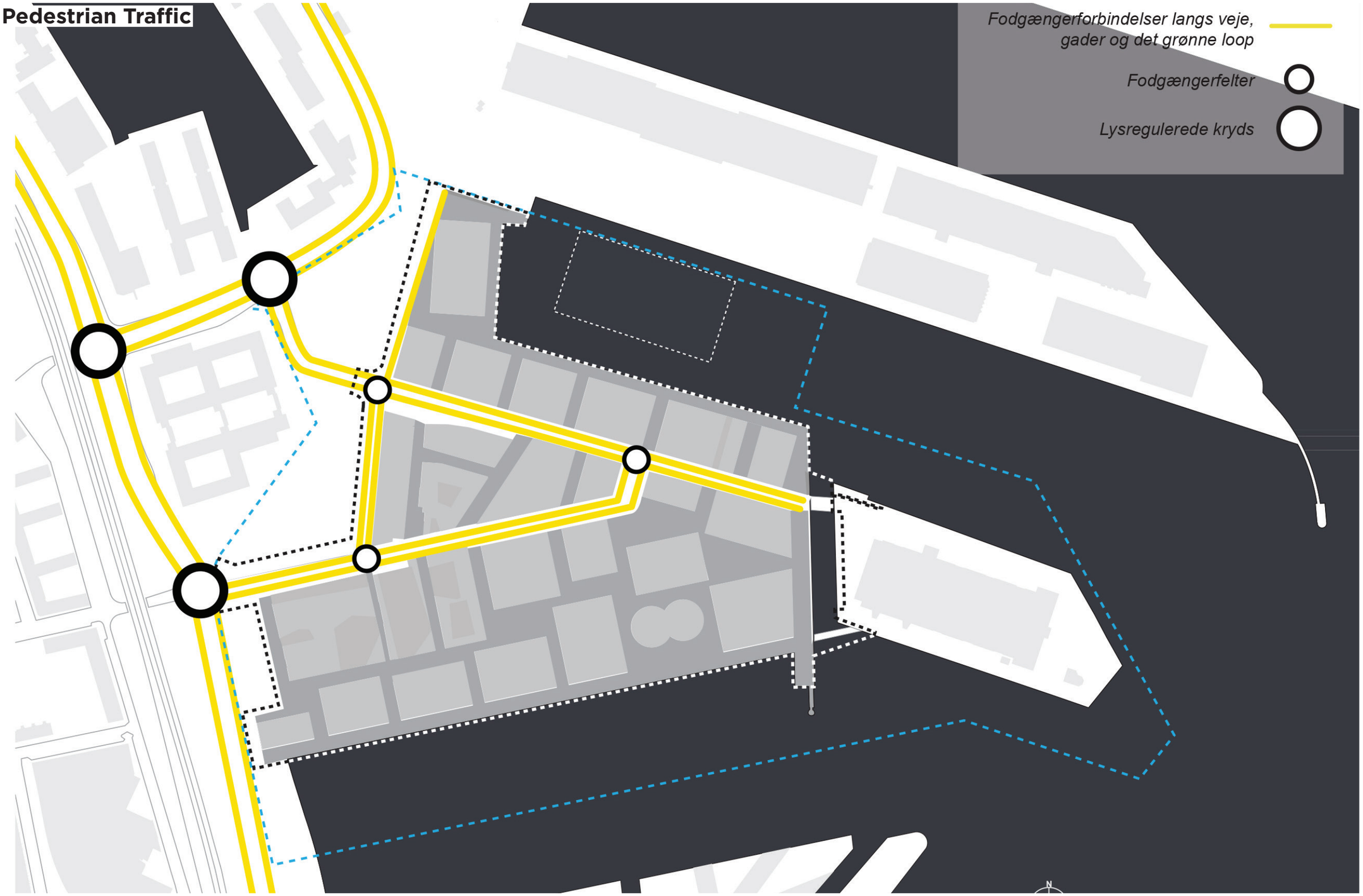
Bicycle Traffic



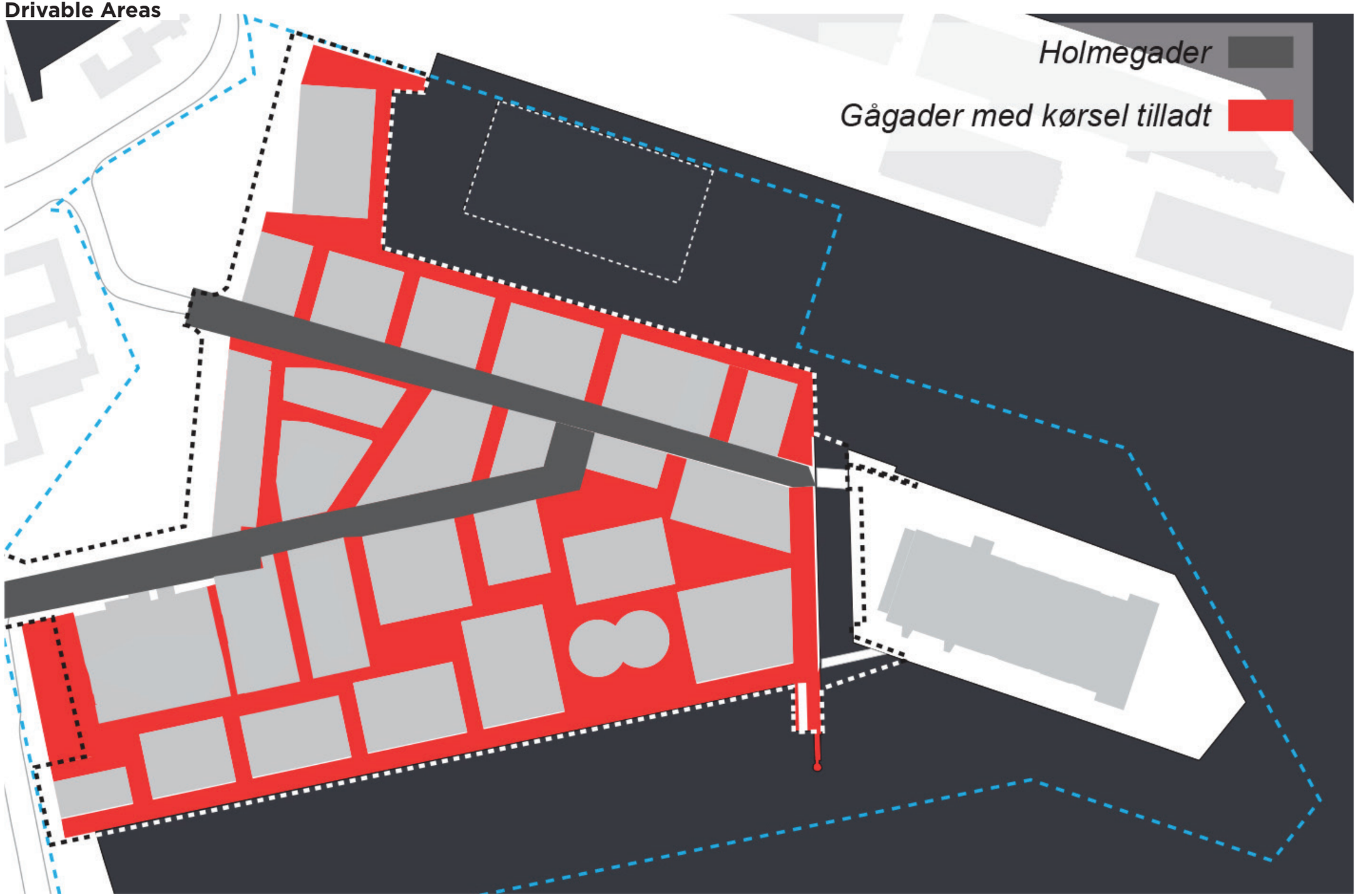
Bus Traffic



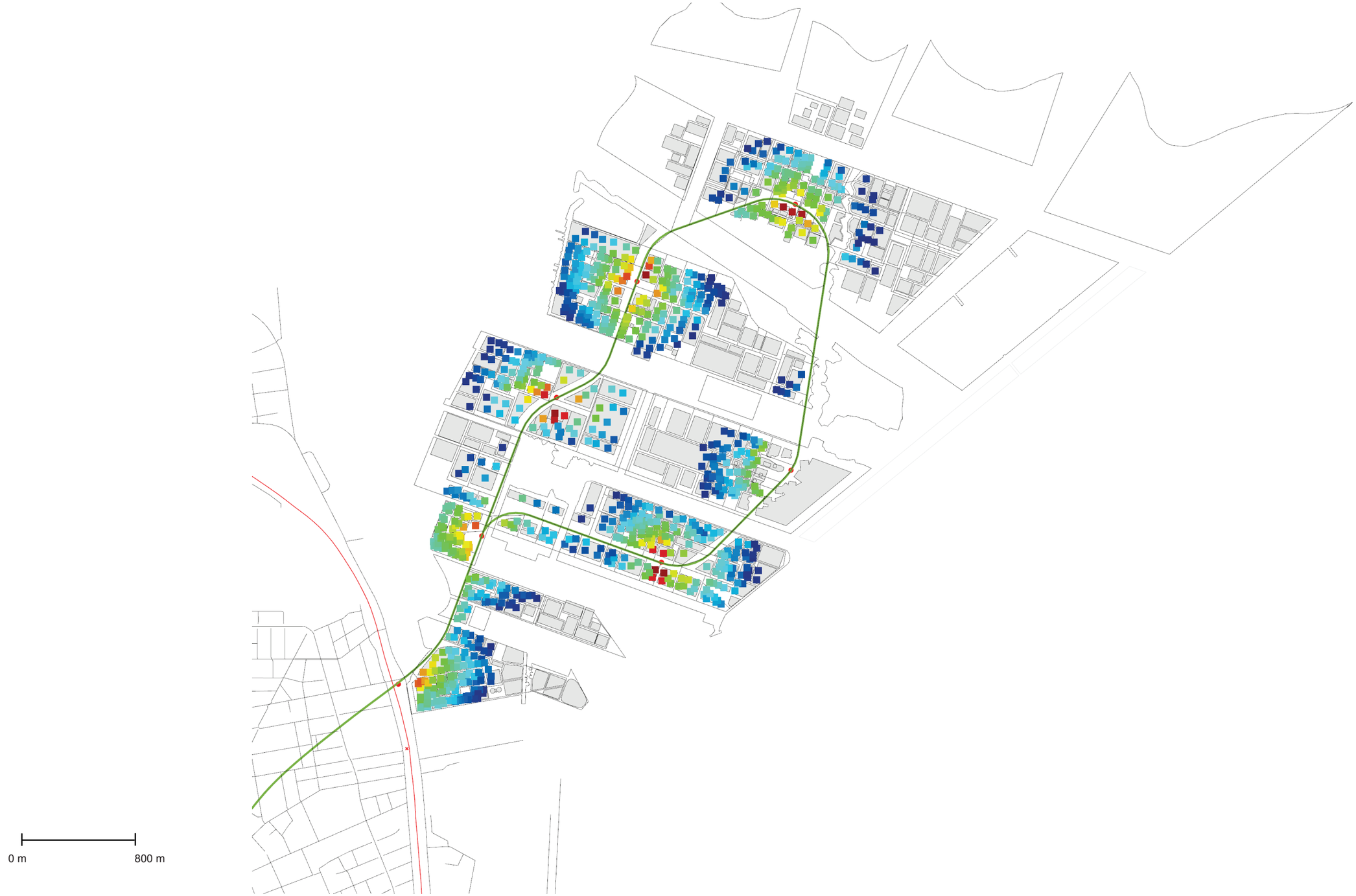
Pedestrian Traffic



Drivable Areas



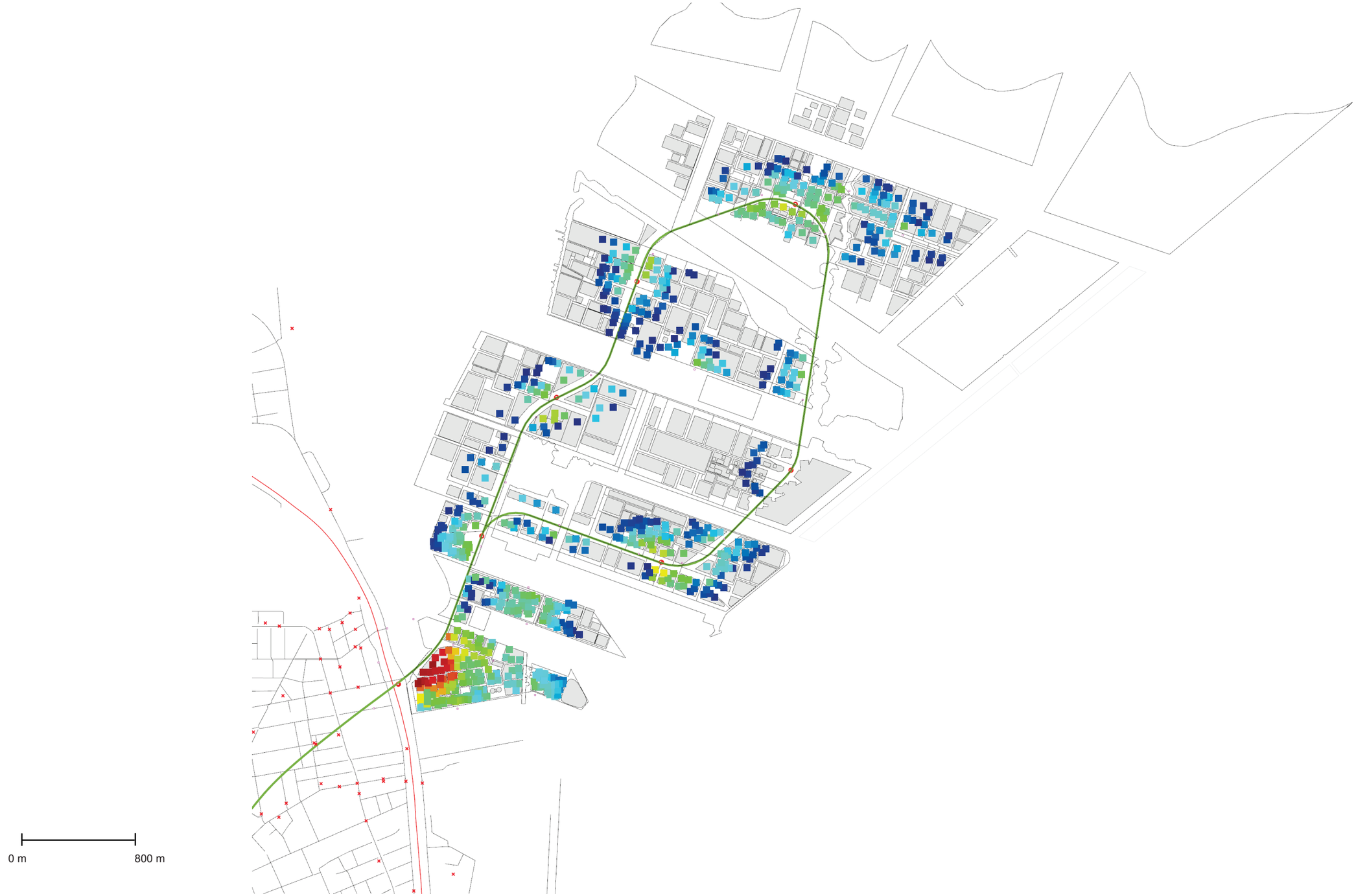
Gravity 800 m MRT Analysis



Reach 800 m MRT Analysis



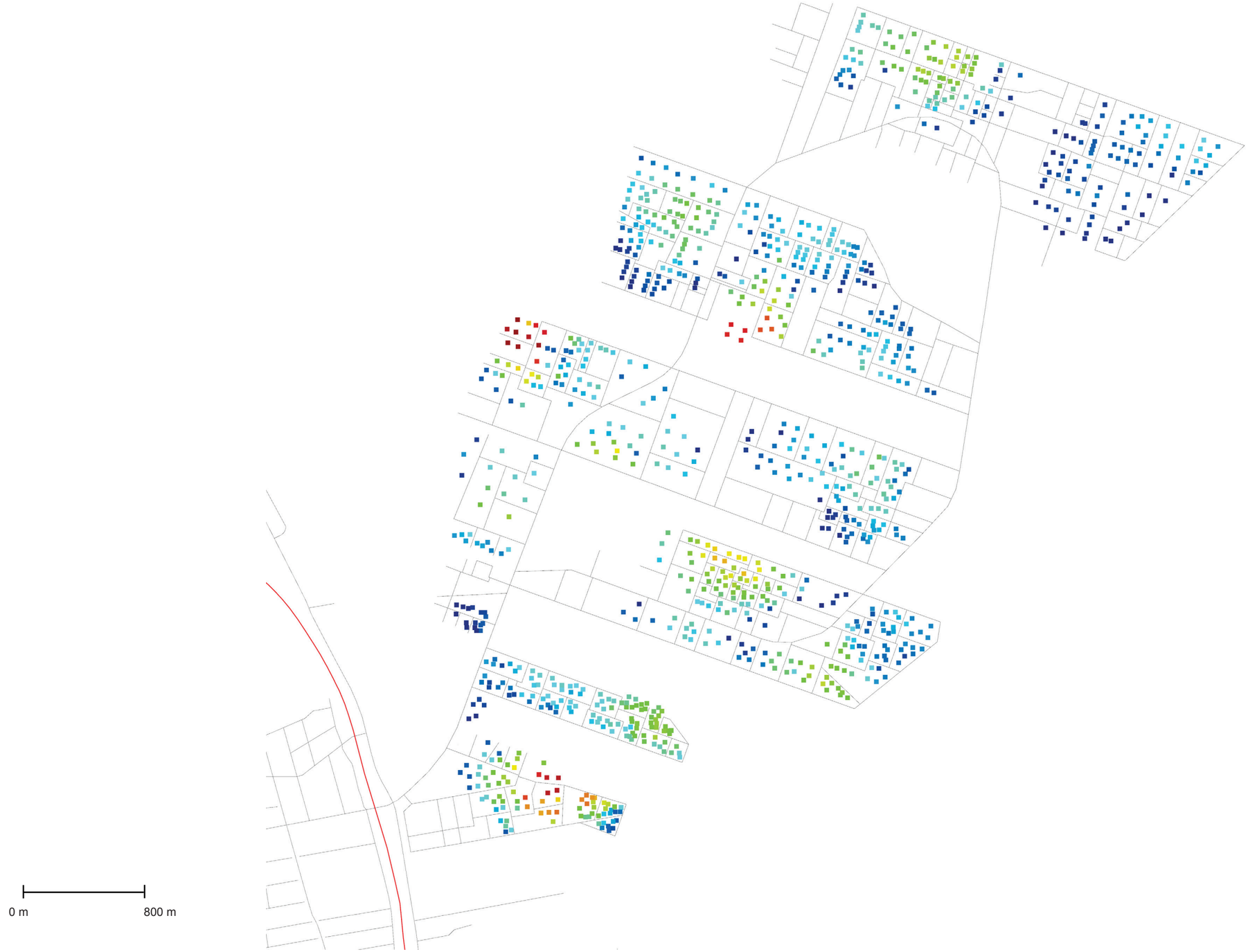
Gravity 400 m Bus Analysis



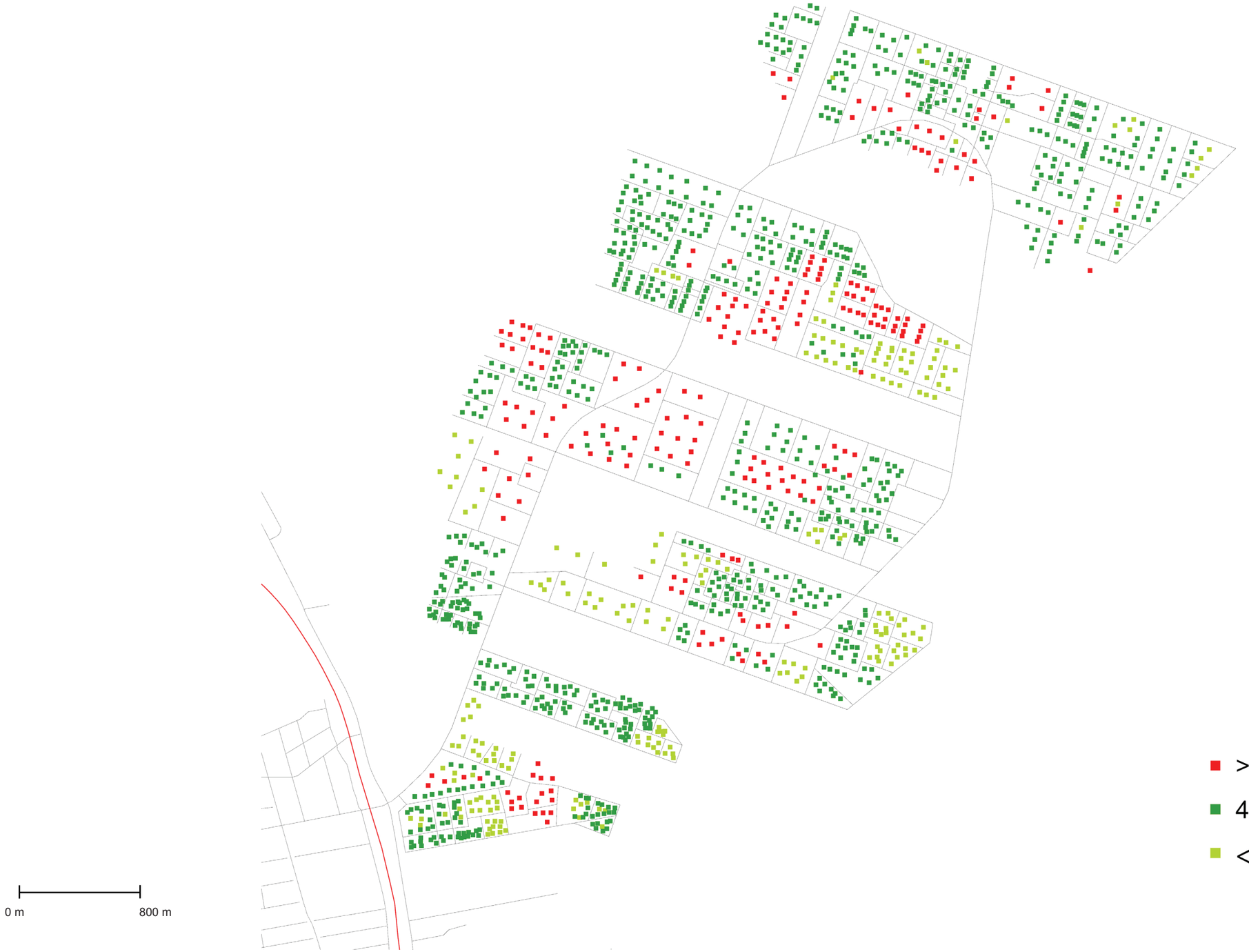
Reach 400 m Bus Analysis



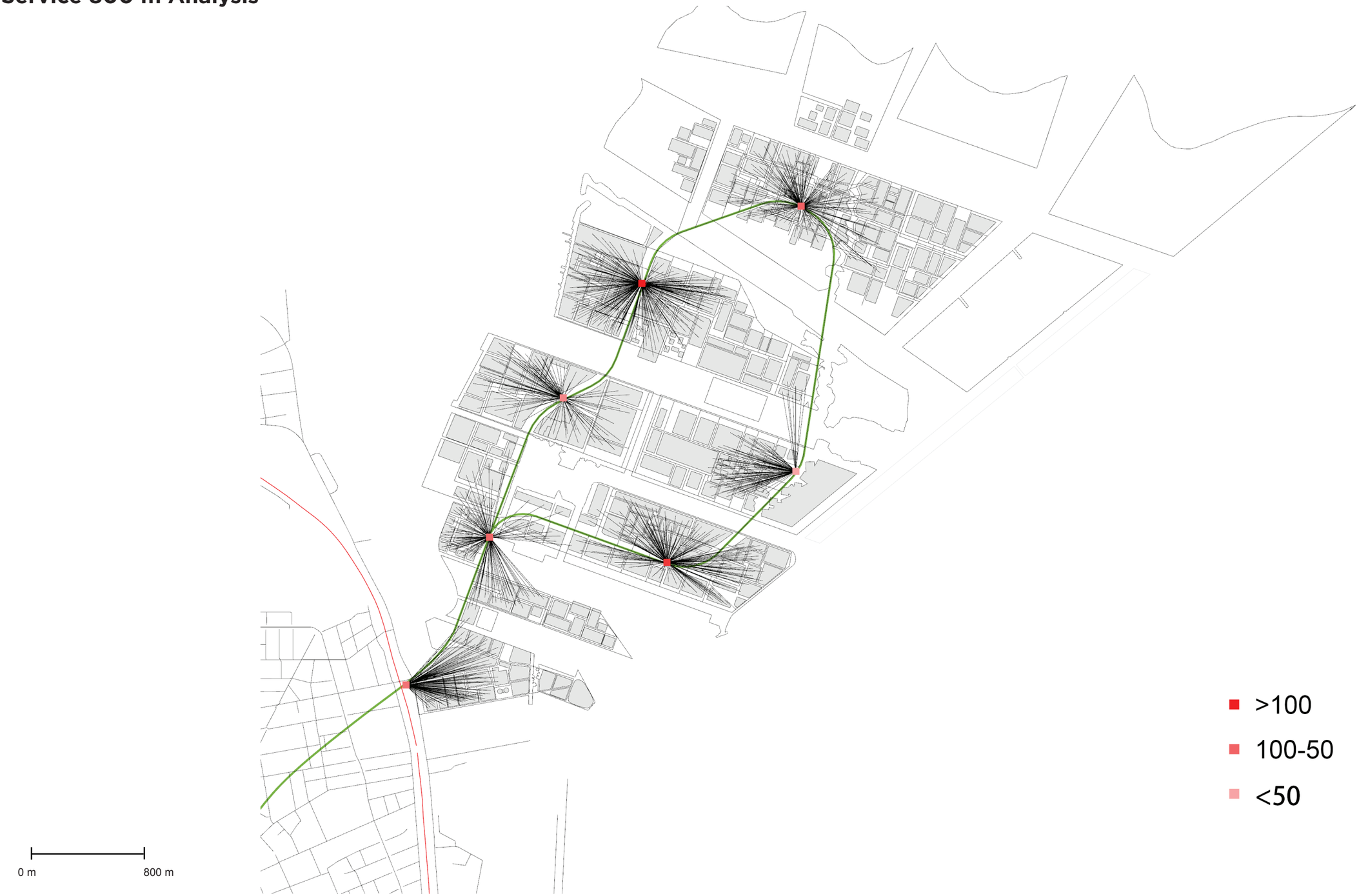
Gravity 400 m Retail Analysis



Reach 400 m Retail Analysis



Service 800 m Analysis



Service 400 m Analysis



Betweenness 800 m MTR Analysis



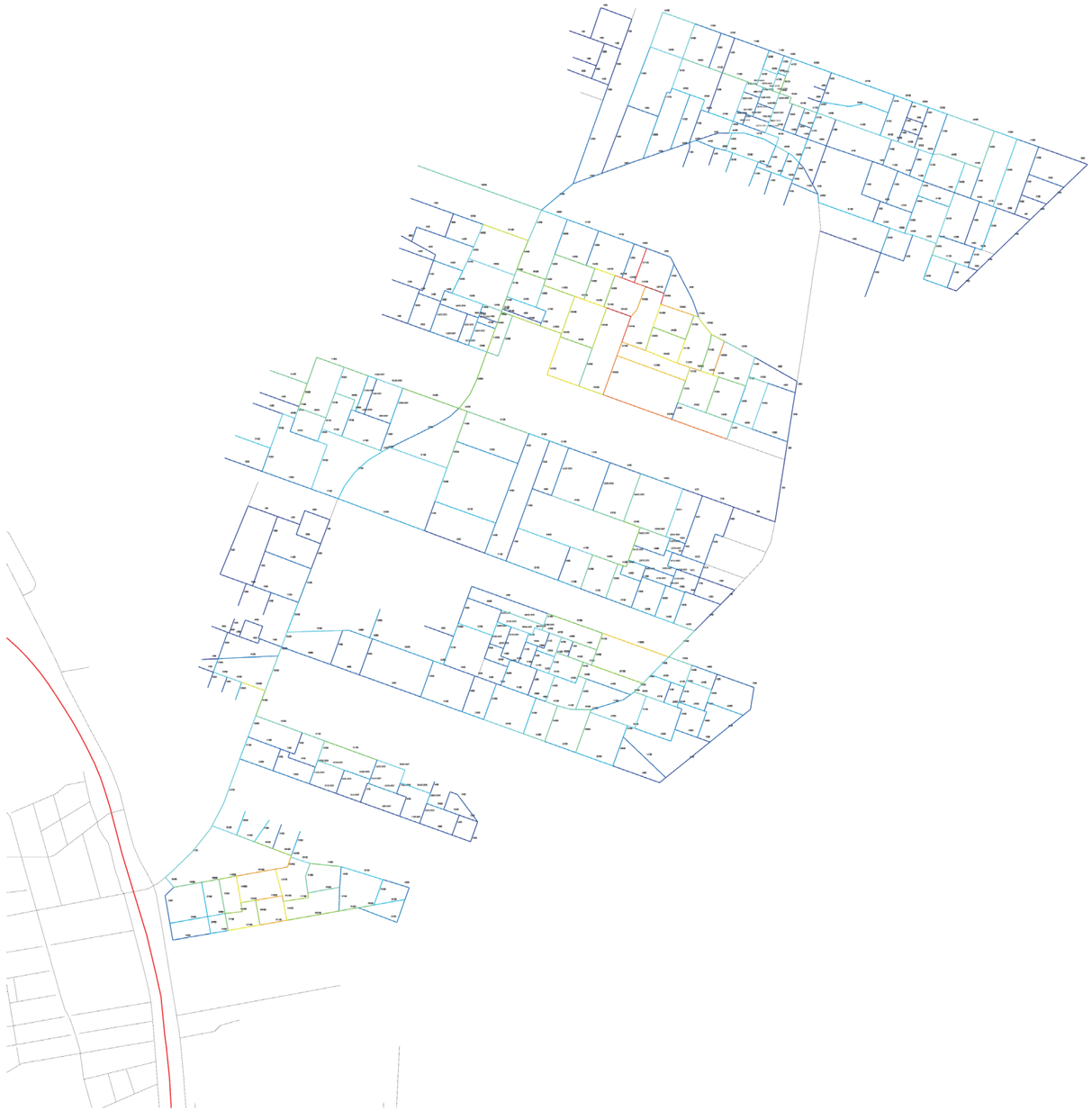
Betweenness 400 m Bus Analysis



Betweenness 800 m MTR+ 400 m Bus Added Weight Analysis



Betweenness 1000 m Bicycle Residence to Work or Retail Analysis



0 m 800 m

Lessons Learnt

1. Climate-Sensitive Design

Through attention to climatic factors such as wind, temperature, water exposure, and sunlight, Nordhavnen stands out as a precedent that designs with nature. The landscape of the region is taken into account in most of the design decisions related to its streets and public spaces, making the district an enjoyable one to walk in, and making its public spaces popular and well-adjusted to the programmatic as well as bodily needs of its residents. Design measures such as increasing the width of the sidewalk where most sunlight falls, keeping the height of the buildings capped to six floors to avoid wind vents on the streets, and sheltering water pocket spaces from the wind in order to provide a more intimate and pleasant experience with the water are some of the tangible examples of the attention to the weather invested in this design.

2. Mixed-Use Program

The design of most of Nordhavnen incorporates mixed-use buildings and blocks. This allows for an even flow of traffic throughout the district as well as a relatively similar level of activity. In addition, this facilitates the process of distributing metro stations, bus stations, and bicycle parking evenly throughout the district.

3. Parking Reduction

About 90% of Nordhavnen's parking space is allocated to three large parking garages. Only 10% of cars are allowed to be parked on the streets, and most of the street parking is reserved for users with special needs. Less parking space helps reduce the popularity and use of cars, and makes more room for other uses and programs on the streets. Borrowing this model from Nordhavnen could prove beneficial for Tallin, given it would open up new possibilities for street configurations that are currently stunted by parking requirements.

4. Street Multi-Modal Mobility

Most of the streets in Nordhavnen are rather narrow, but have enough space for fire or delivery trucks. Nevertheless, their narrowness, and the fact that sidewalks and streets are rarely differentiated by a grade change allows for a more equal sharing opportunity of the street space as a whole between cars, pedestrians, and bicycles. This diminishes the average car speed and allows for streets to be read not only as lines to pass by, but as places to stay in. Borrowing elements of this street typology for Tallin would make the experience of walking on the port streets a more pleasant one, and would establish a greater commonality between the port area and the nearby historic center of the city.

Redevelopment Strategies

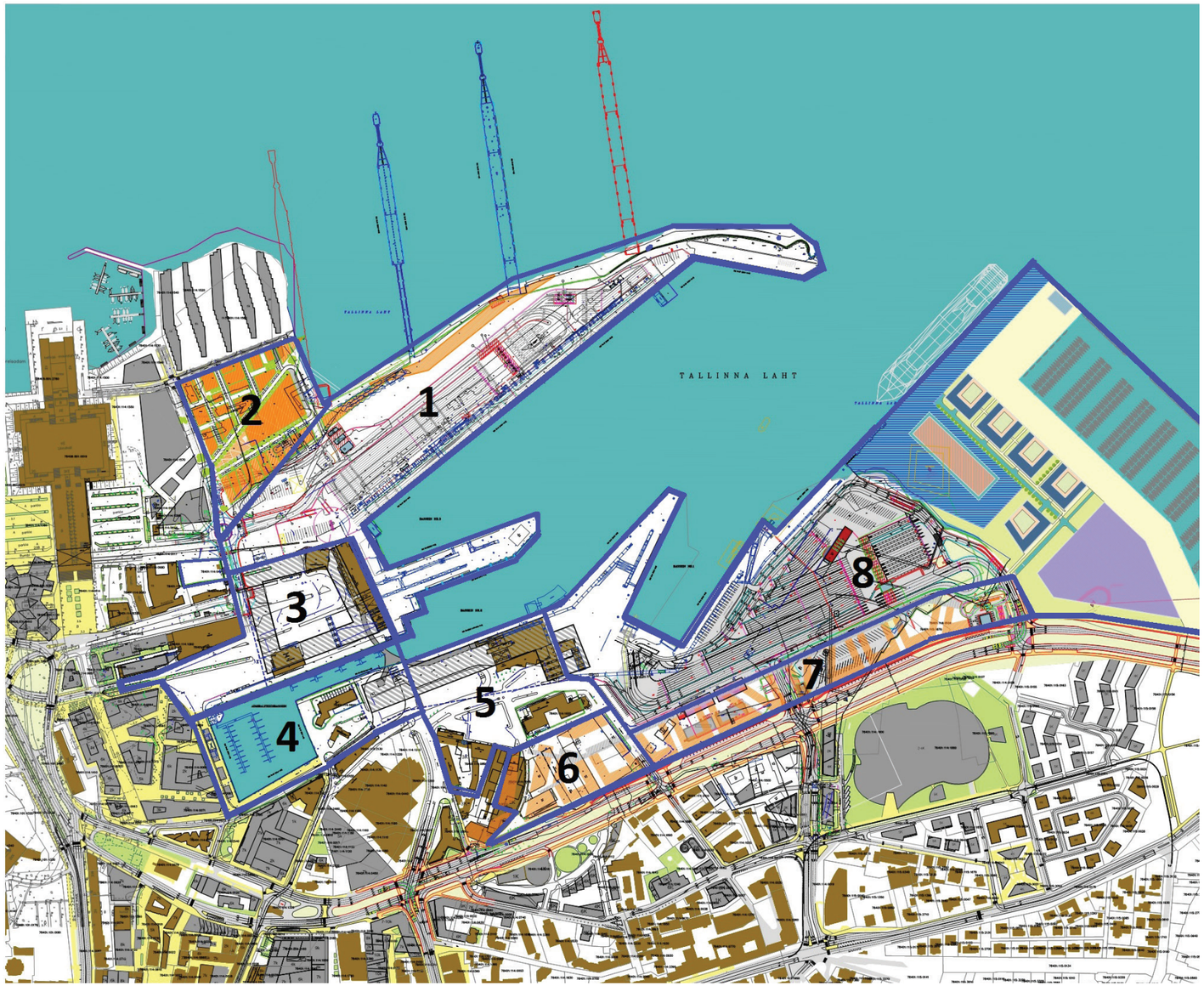
Built Form & Land Uses

Antara Tandon | Yonghui Chen

Land Use and Built Form

For the redevelopment of the port in Tallinn, we try to emulate the urban grain as seen in the Old Town while allowing land use and a built form conducive to modern buildings.

The plan incorporates the development proposal for the City Hall by BIG architects and re-development of Porto Franco that is already under construction. Porto Franco is envisioned as a commercial development with retail along a pedestrian street. The building facade in appearance resembles discontinuous and smaller buildings however the building footprint is much larger allowing a floor plate for larger retail stores to set up shop.



Proposed Developments

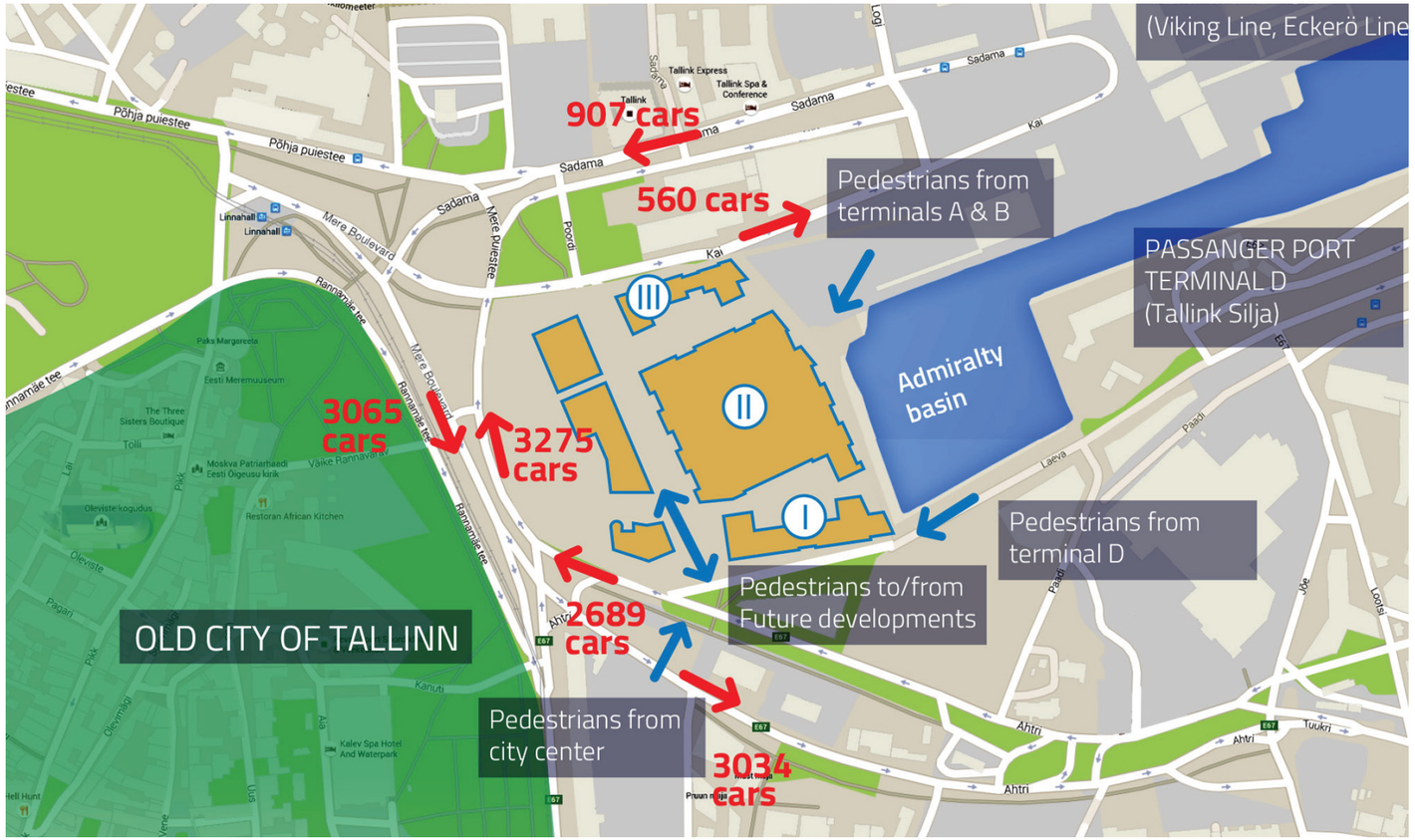
Tallinn City Hall







Porto Franco





Block Size

Tallinn Old Town

BLOCK SIZE 100 m to 150 m long X 75 m deep

STREET WIDTHS 9 m to 20 m

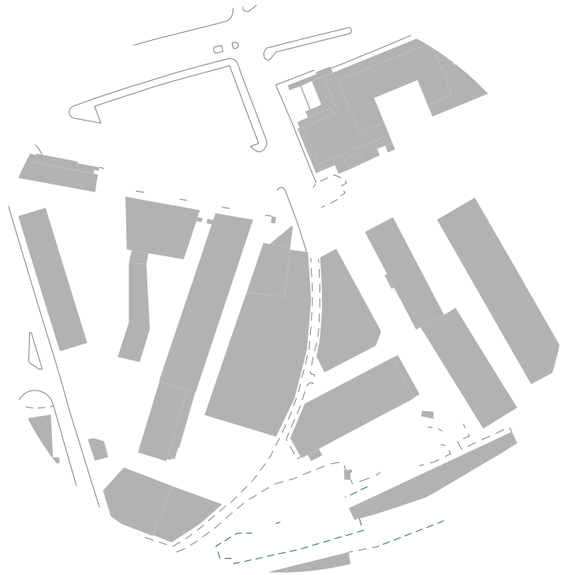




Tallinn CBD

BLOCK SIZE 200 m long X 150 m deep

STREET WIDTHS 30 m to 40 m





Tallinn Proposed Port Development

BLOCK SIZE 85 m long X 100 m deep

STREET WIDTHS 20 m to 30 m





Phase 1

We try to continue this pedestrian and commercial corridor leading to the port allowing the passengers who alight at the ferry terminal to traverse through the city on foot to reach the historic old town. The corridor also continues eastwards with cultural kilometer diverging at the plaza in front of City Hall and Linnahall.



Phase 1

Pedestrian Access

The pedestrian corridor would have tram access with no vehicles encouraging public transit and walkable streetscapes.

It connects the harborfront to the cultural kilometer and the eastern part of Tallinn.



Phase 1

Vehicular Access

The streets emanate from major intersections and draw the city towards the waterfront. Each building parcel is ensured street access while keeping road connection minimum.

The vehicles from the port have access routes into the old town or into the CDB for efficient traffic management.



Phase 1

View Corridor



Phase 2

For Phase II, we wish to move the port onto one side of the harbor to free up the other side for recreational or cultural activities. We now connect the entire development through a commercial or transit loop and allow vehicular routes into the old town or the CBD

The entire harborfront is envisioned as a public open space with landscaped promenades and outdoor activities. The water's edge is a continuous walk that connects the eastern and the western part of the shoreline in Tallinn



Phase 2

Figure Ground



Phase 2

Pedestrian Access



Phase 2

Vehicular Access



Phase 2

View Corridor



Phase 2

Land Use



Public/ Cultural
Commercial
Greens/ Pedestrian Corridor
Street
Tram 1
Tram 2

This plan highlights the commercial loop created in the port redevelopment that is pedestrian with tram access in some parts.

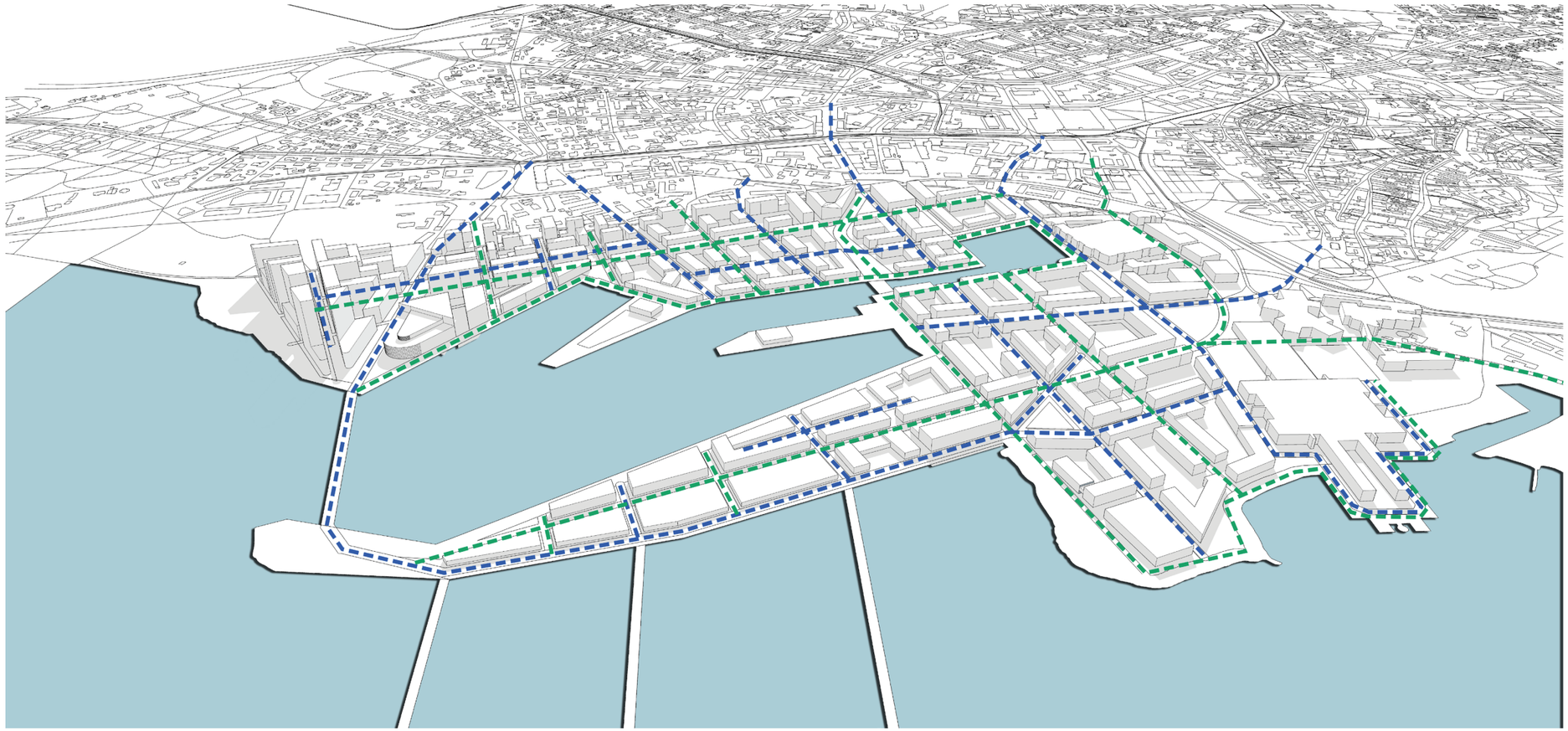
The loop connects the port to the old town and the new commercial/ office development

Phase 2

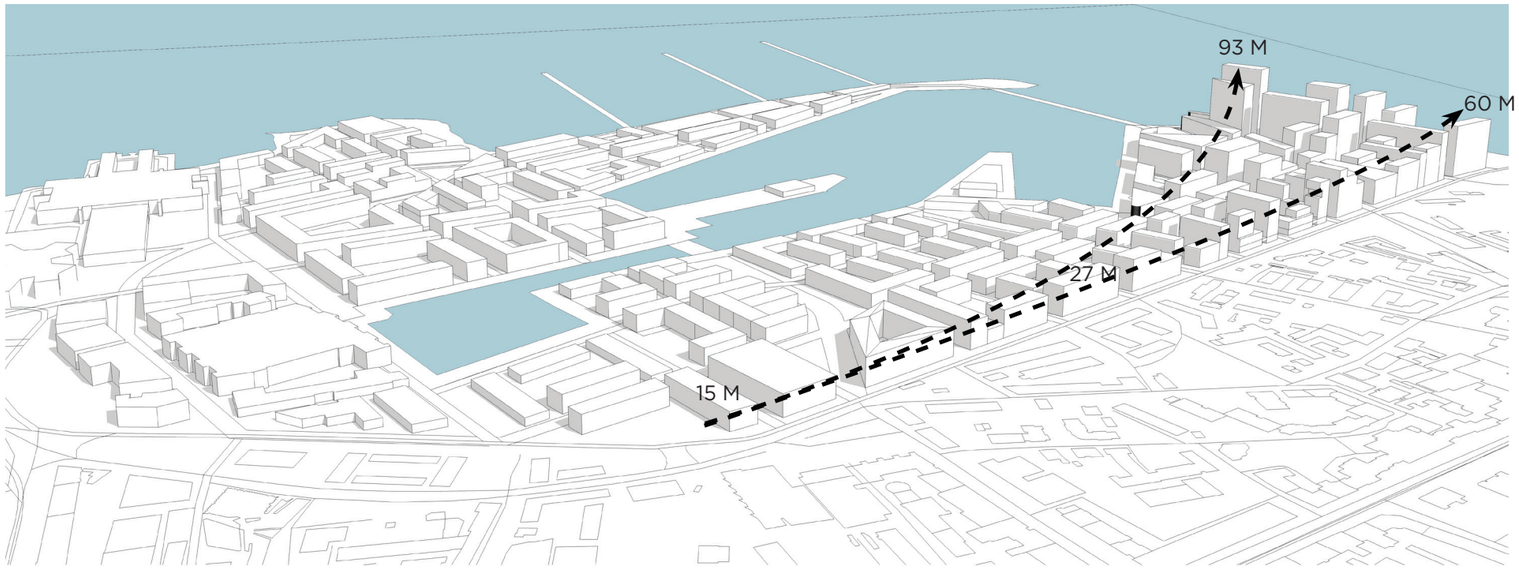
Land Use

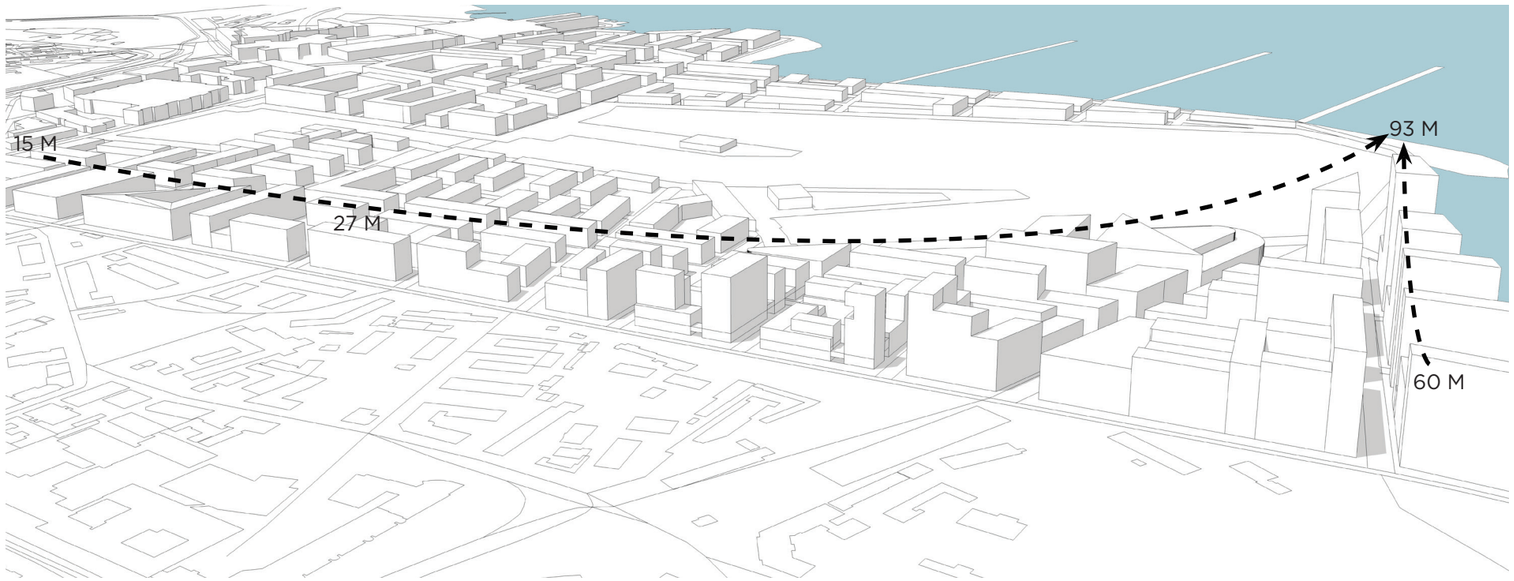


Built Form



Built Form

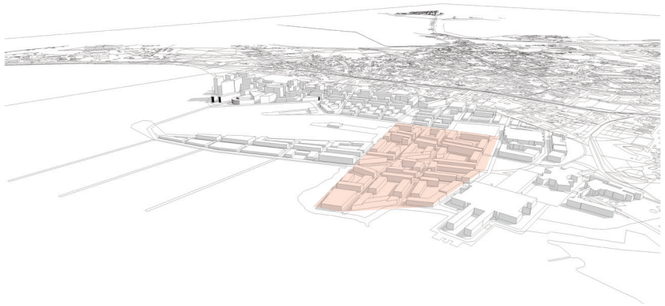


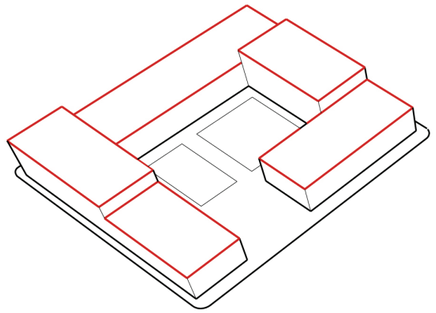


Built Form

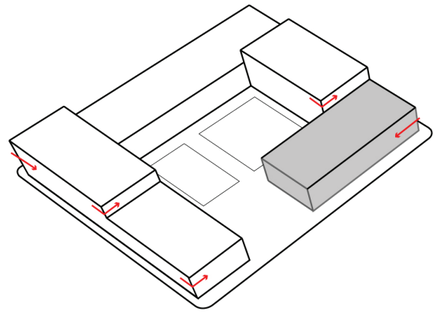
The built form here consists to discontinuous blocks that allow variety in form, development and greater pedestrian connections. The heights of the blocks vary slightly to break the monotony.

The blocks are similar to the ones seen in Copenhagen case study.

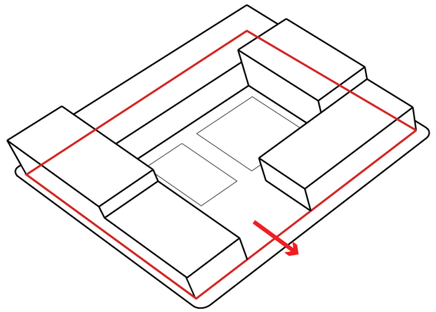




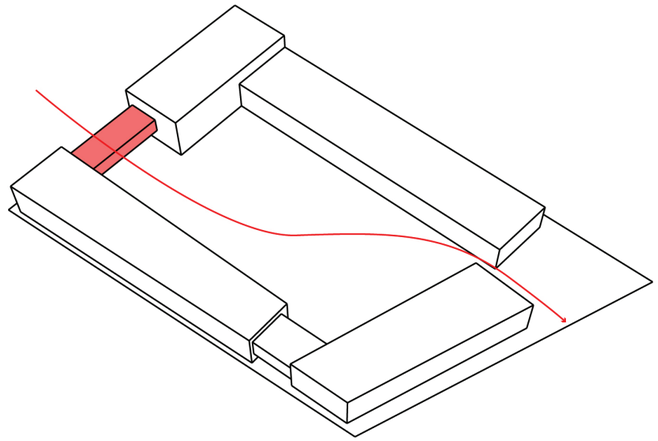
Different Building Heights



Variation By Diversified Facade Design



Continuous Boundary with Gate Opening Along Edges



Connections Above Create Passages

Built Form

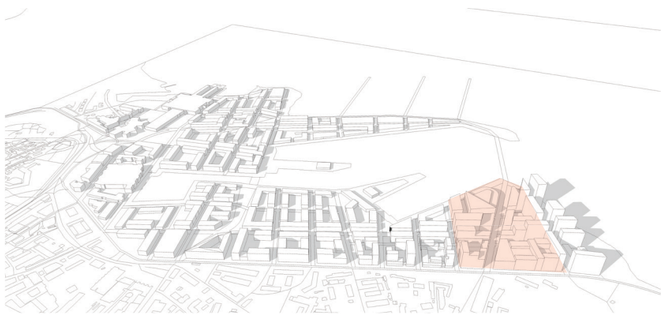
In terms of the built form, we have tried to keep the buildings within the allowable height limit of 35m except in the Eastern part. We have tried to create a higher density commercial/ office development that has transit as well as street access.

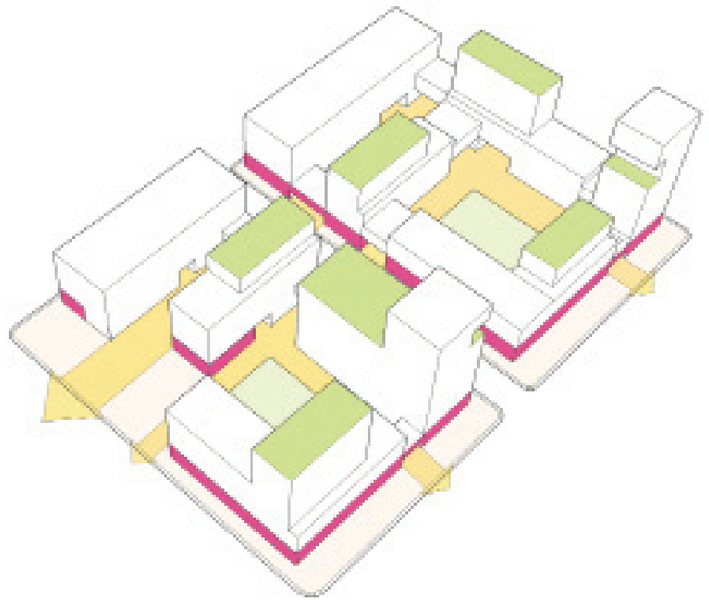
The blocks are similar to the ones seen in Singapore and Vancouver case studies.

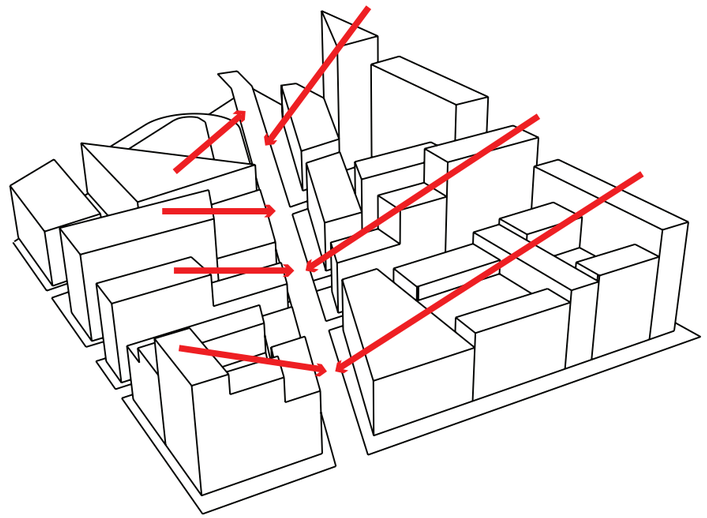


This site is strategically located to allow taller buildings without hindering the view of the old town or the harbor. It also lies close to the CBD and on the same line connecting the new development near the airport.

The building typology in this part of the development is different. It is mostly podiums with taller buildings setback from the street.







Kultuuri KM

Plats

Kultuuri KM

Public Transit Networks

JungHyun Woo | Longfeng Wu

Contents

Public Transit Networks and Capacity

1. Tallinn Today

Introduction
1. Tram
2. Bus
3. Trolleybus
4. Commuter Train
5. Ferry
6. Taxi
7. Tickets

2. Tram and Street Design Studies

1. Tram Stop Designs
2. Tram Station Configurations
3. Typical Surface Alignment Options
4. Tram-running Configurations and Street Dimension
5. Common Fare Collection Methods
6. Typical Tram Car Assumptions
7. Tram Vehicle and Platform Profile
8. Tram Railway Construction Costs
9. Storage and Maintenance Facility
10. Estimating Tram Fleet Size

3. Tallinn Tram Network Proposal

Original Tram Lines
Propsoed Tram Lines (Adjusted)
Proposed Tram Lines (added)
Tallinn's Tram Network Plan and Map

4. Tram Network Development Phases

Phase 1.

Phase 2.

Phase 3.

Phase 4.

5. Network Analysis (Before and After)

Reach Analysis (before)

Reach Analysis (after)

Gravity Analysis (before)

Gravity Analysis (after)

6. Street Sections and Design Ideas

1. 15M Road

2. 20M Road

3. 30M Road + Public Plaza + 20M Road

7. Cost Estimation

1. Needs of A Number of Tramcars by 2030

2. Construction Cost for 20km new tracks

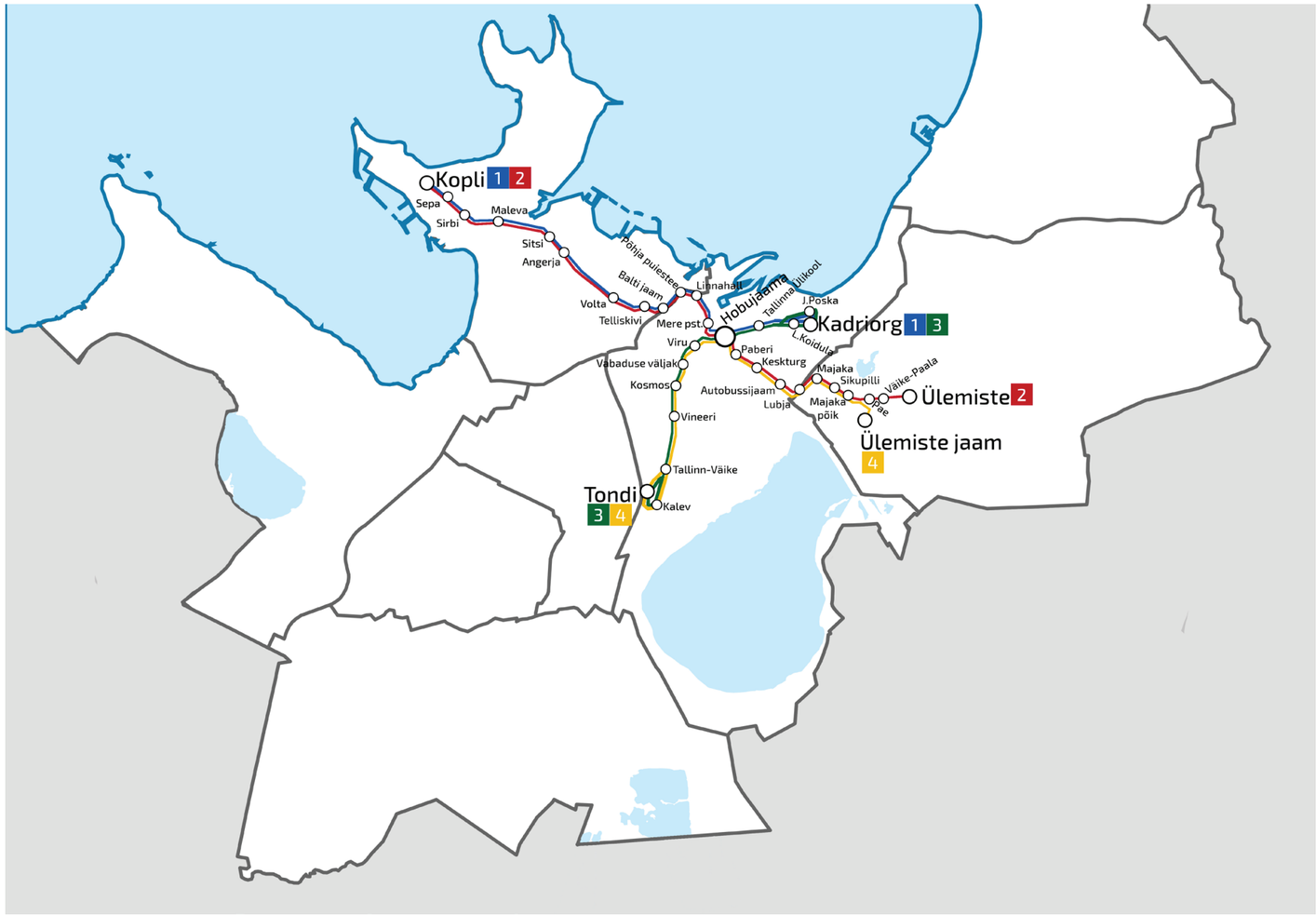
1. Tallinn Today

Introduction

Central Tallinn is compact and easy to get around, however, reaching farther out destinations is less accessible now and needs more integrated city's network of trams, buses, and trolleys. Particularly the tram networks is cross-shaped and radial network system now so that an additional loop line, a city circle line, will be significantly improved the city network and provide convenient systems. Also, revival of the existing train track along the historic canal will extend the function of line number two.

The public transport network operates from 6:00 to 23:00 (some lines until 24:00). The ticket system works on a random-inspection basis. You must, however, have a validated ticket or you risk a €40 fine. Some riders are entitled to use the system for free: children under school age (under 7), an adult travelling with a child under 3 years of age, registered Tallinn residents (using a personalised Smartcard and carrying ID).[1] Since 1 January 2013 all public transport has been free of charge for people registered as living in Tallinn.

1. Tram



Map of the Tallinn Tram network

1 https://www.visittallinn.ee/eng/visitor/plan/getting-around/public-transport

Light rail transit (LRT) systems (“full-size” and “streetcar”) continue to generate interest in cities across North America.

The Tallinn tram network (Trammiliiklus Tallinnas) is the only tram network in Estonia. Together with the nine-route trolleybus network, the four tram lines (currently allocated into five routes), with a total length of 39 km (24 miles) arranged in a roughly cross-shaped layout, provide a backbone for the public transport network in the Estonian capital. All the routes meet up at Hobujaama in the city centre.[1]

Number of lines: 4 (arranged in 5 routes)

Number of stations: 33

Annual ridership: 25.2 million (2009)

Operator(s): Tallinna Linnatranspordi AS

Number of vehicles: 85 (2009)

System length: 39 km (24 mi) (2009)

Currently, the tram network is fairly short and serves the city centre with its surrounding areas. There are 4 tram lines and two types of trams—Tatra KT4 and KTNF6, which basically is a KT4 with a lowered middle-section. In 2015–16 new CAF Urbos AXL trams are expected to enter service on the lines 3 and 4. First new tram went into service on 31 March 2015.[2]

1 https://en.wikipedia.org/wiki/Trams_in_Tallinn
2 https://en.wikipedia.org/wiki/Public_transport_in_Tallinn



Tatra KT4D-type tram



Tatra KTNF6-type tram



Urbos AXL-type tram (Urbos)

Urbos is a complete low floor tram, making boarding and alighting all the more easier as it is at the exact same height as the platform. The tram can become a characteristic feature, an essential part of a city’s identity, which features a modern, futuristic interior and exterior design, whilst ensuring a high standard of passenger comfort. The Urbos design is focussed on passenger comfort and safety. Urbos is fitted with interior indicators to keep passengers informed of the route and other details such as arrival times, next stops, connections. Each access platform has an indicator, which coincides with the location of a vertical handhold. [3]

3 http://www.cafusa.com/en/productos-servicios/familia/urbos/index.php

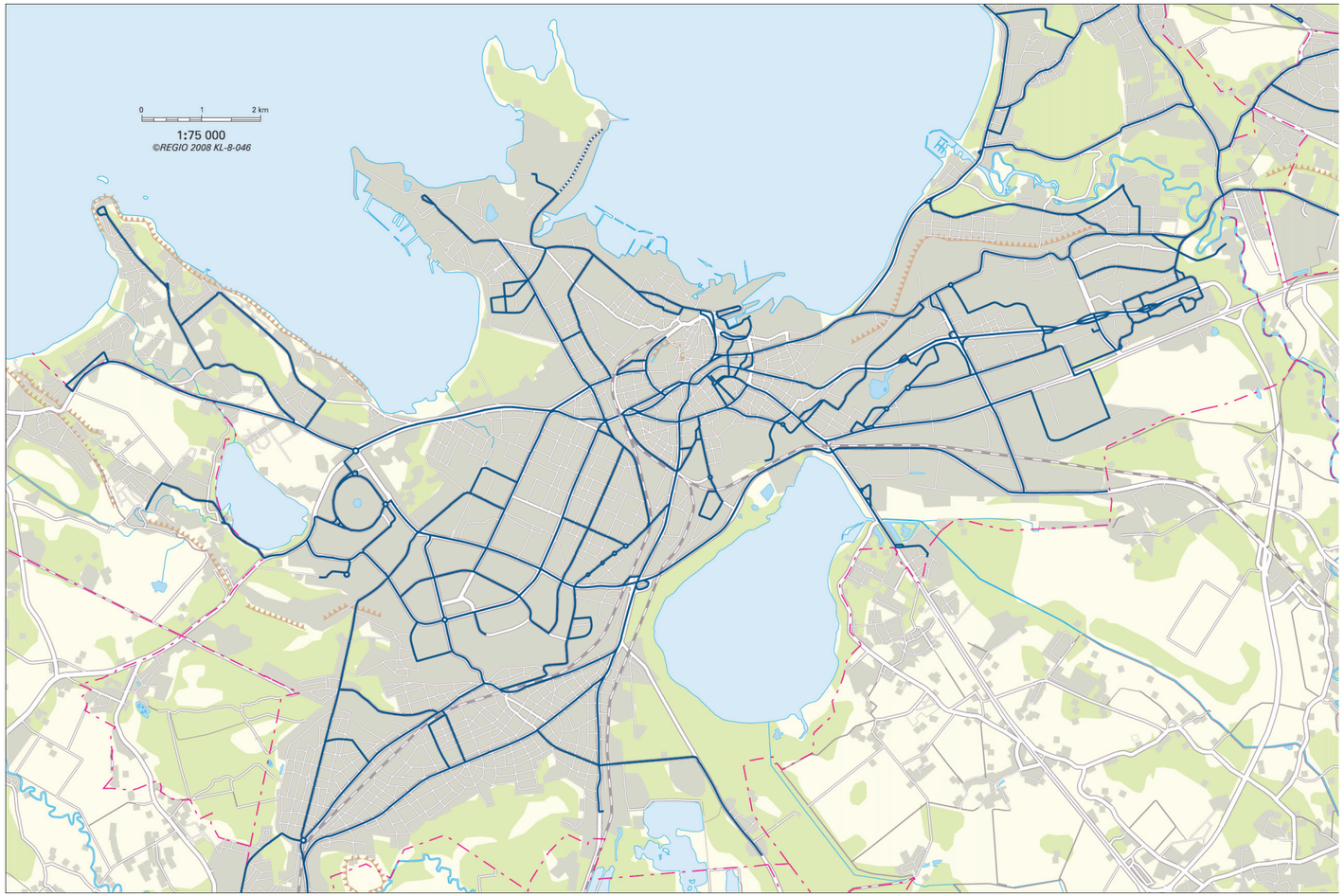
Image Source. https://en.wikipedia.org/wiki/Trams_in_Tallinn#/media/File:Tallinn-tram-map.png
https://en.wikipedia.org/wiki/Tatra_KT4#/media/File:Tatra_KT4D_tram_in_Tallinn,_2006.jpg
https://en.wikipedia.org/wiki/Public_transport_in_Tallinn#/media/File:Low-middle_tram_in_Tallinn.JPG
https://en.wikipedia.org/wiki/Trams_in_Tallinn#/media/File:CAF_trams_in_Majaka.JPG

2. Bus

Internal bus routes can be found almost everywhere in Tallinn. Nearly everywhere, especially in Pirita, Lasnamäe and Nõmme they provide the backbone of the public transportation system, as these districts don't have trams or trolleybuses. Nearly all routes have two terminus stops, one of which serves to drivers also as a resting stop.

Regional bus routes are managed by the Harjumaa Ühistranspordikeskus (HÜTK) (Harju County Public Transportation Center). The zones are determined by the distance from Tallinn. Travel cost was determined by the distance driven.[1]

Currently there are 62 city bus routes in Tallinn, of which: 16 operate only on workdays; 9 are expressroutes; 6 operate on Saturdays, but not on Sundays; thirty-five routes are served by low-floor buses; 55 are operated by Tallinna Autobussikoondis, 7 by MRP Linna Liinid; the earliest departure is on route 35 from Seli at 5 am; the latest departure is on route 5 from Metsakooli at 12:14 am; longest route is 13 (Väike-Õismäe - Seli), 13,55 mi; shortest route is 29A (Seli - Iru - Kärmu), 3,85 mi. [2]



Map of the Tallinn Bus network

1 https://en.wikipedia.org/wiki/Public_transport_in_Tallinn
2 http://engold.yhistransport.eu/liinivork.php

Image Source. http://engold.yhistransport.eu/liinivork.php



244TAK Internal Bus



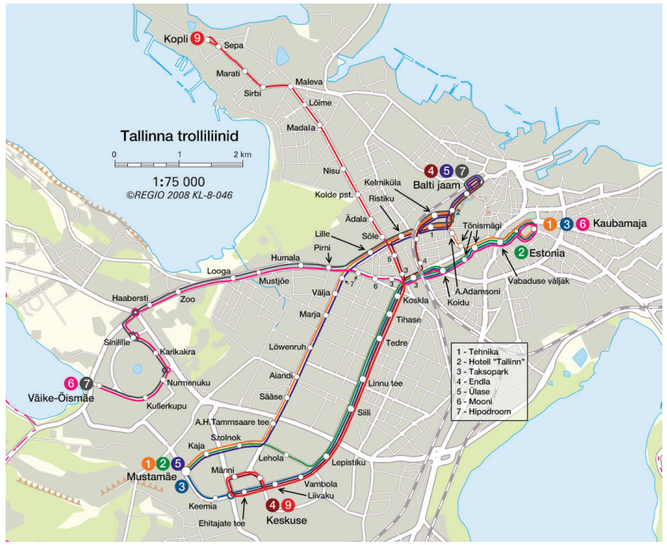
MRP linna liinid's Internal Bus



Regional Bus

3. Trolleybus

Trolleybuses serve the western part of Tallinn, Mustamäe and Haabersti districts especially. Trolleybus service began in 1965 with a route from the Estonian National Opera "Estonia" to Hipodroom (Hippodrome). Currently there are 5 routes: 1, 3, 4 and 5 from city center to Mustamäe, and 9 from Mustamäe to Kopli. On 1 December 2012 trolleybus line nr 2 was replaced by diesel buses.[1]



Trolleybus routes Map



Trolleybus 9

Image Source. https://en.wikipedia.org/wiki/Public_transport_in_Tallinn
http://engold.yhistransport.eu/image/trolliliinid.png
https://en.wikipedia.org/wiki/Public_transport_in_Tallinn#/media/File:%C5%A0kodaTr14inTallinn.jpg

1 https://en.wikipedia.org/wiki/Public_transport_in_Tallinn

4. Commuter Train

The Elron commuter trains are maily used by the Harju County residents for a connection to Tallinn. Routes are also used by city residents, especially of Nõmme district. Railway transport is free for registered city residents inside the city borders (1st zone). Estonia recently renewed its passenger trains completely, all service are now operated by brand new Swiss built EMU and DMU. [1]



Elron Train

1 https://en.wikipedia.org/wiki/Public_transport_in_Tallinn

Image Source. https://blog.rail.cc/baltics-train-bus-ferry/

5. Ferry

Tallinn has a ferry connection to Aegna island, operated by OÜ Kihnu Veteed. Since Aegna doesn't have many residents, the ferry is mostly for tourists and is operated only summertime. City residents can use the ferry for free. [1]



Superstar Ferry to Aegna island

1 https://en.wikipedia.org/wiki/Public_transport_in_Tallinn

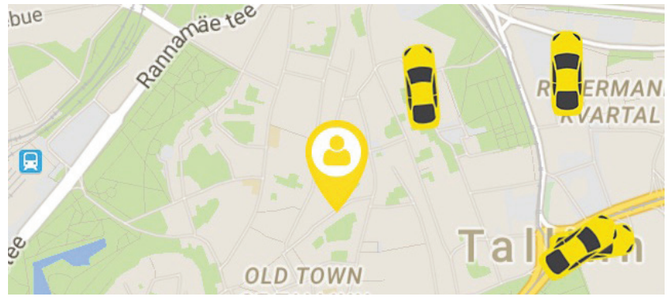
Image Source. http://www.ts.ee/kujundus/soidugraafik/img_superstar.jpg

6. Taxi

Taxis are reserved by the phone and via various mobile apps. The TAXIFY is a mobile app that helps you find and order a legally-registered taxi near your location. They can also be found queuing up at taxi stands in front of larger hotels and some major intersections. Rates are not uniform – they are set by the taxi companies or operators, and vary widely. The cost usually consists of a base fare (starting fare) plus a per-kilometre fare. [1]



Tallinn Taxi



TAXIFY mobile app

1 https://www.visittallinn.ee/eng/visitor/plan/getting-around/taxi

Image Source. http://2.bp.blogspot.com/-J23XOzMo0Lw/T1ZWXBNZ-LI/AAAAAAAAC4w/GvzH-WE-4xA/s1600/62%2Btaxi%2Btallinn.jpg
https://www.visittallinn.ee/static/files/084/taxify.jpg

7. Tickets

Three types of tickets are used on Tallinn's public transport network:

A Tallinn Card acts as a ticket and the holders are unlimited free public transport uses while the period the card is active. It also gives you free admission to museums and signts, a free sightseeing tour of your choice and other discounts. Each time you board a vehicle, you must validate the ride with your Tallinn Card.

A single-ride paper ticket can be bought from the driver for cash – exact change only – when you first board. The ticket costs €2 and is valid only for that ride in that vehicle.

The green, plastic Smartcard (Ühiskaart) is a farecard, using the electronic ticket system. Buy it at any R-Kiosk, post office or the Tallinn City Government customer service desk for a €2 deposit and then load it with enough credit. The €2 Smartcard deposit can be reclaimed within 6 months of the first time the card was validated.

Smartcard fares: 1-hour ticket - €1.10 For this type, one Smartcard can be used for a group of up to six riders. 1-day ticket (24h) for €3; 3-day ticket (72h) for €5; 5-day ticket (120h) for €6; 30-day ticket for €23. The system tracks your use and automatically charges your Smartcard according to the cheapest ticket cost. [1]



Plastic Smartcard (Ühiskaart)

1 https://www.visittallinn.ee/eng/visitor/plan/getting-around/public-transport

Image Source. http://www.tallinn.ee/gal_pildid/54171.png
http://www.eltis.org/sites/eltis/files/styles/adaptive/public/casestudies/picture1_0.png?itok=6zKI-kPj

2. Tram and Street Design Studies

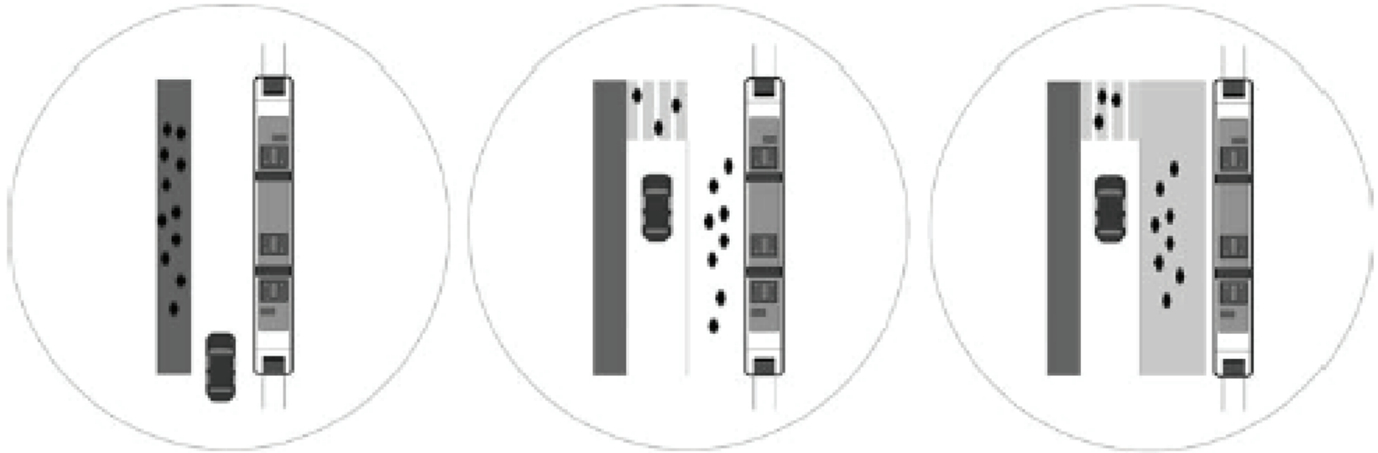
1. Tram Stop Designs

Most kerbside stops are on lower order roads. Trams do not always stop at these locations since stopping is on demand. Tram drivers tend to let cars behind the tram get past the tram before stopping since traffic volumes are not high. It has the highest rate of risks and the most unsafe. Using level access to low floor trams but with this type of stop, cars also share the road space. Cars and cyclists must stop when a tram enters the stop, but passengers should wait clear of the roadway until the tram has stopped and opened its doors.

Most cases platform stops have replaced safety zones rather than kerbside stops. Barriers have mainly been suggested as a means of improved safety at safety zone stops. The provision of barriers and increasing the width of safety zones at stops is recommended as is narrowing roads to reduce driver speeds which are part of general traffic restriction measures and the use of warning signs on trams.

Platform stops, the most safe of the stop options. A platform stops create greater separation of passengers at stops and the use of formal pedestrian.[1] A Platform Stop provides level access to low floor trams. Passengers should stand behind the yellow line until the tram has arrived at the stop and opened its doors. Cars and cyclists are not permitted to follow the tram tracks at Platform Stops. For pedestrians - crossing between the two platforms is prohibited other than at the designated crossings provided.[2]

Three tram stop designs



Kerb-side Stops | Safety Zones | Platform Stops







1 Safety at Kerbside Tram Stops, Call for papers: no. 11-1640 Light Rail Transit Research, November 08, 2010

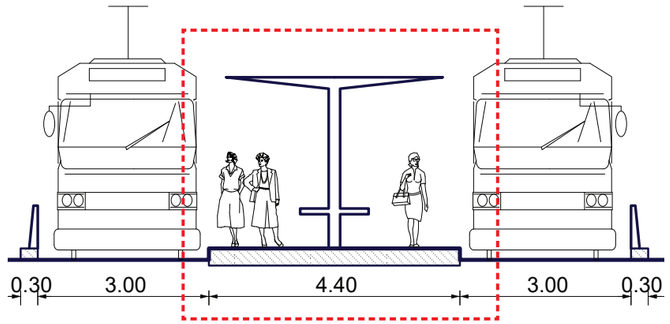
2 http://yarratrams.com.au/using-trams/accessible-journeys/using-accessible-stops/

Image Source. http://www.udf.org.au/udf-quarterly/speeding-up-the-trams/
http://cdn.newsapi.com.au/image/v1/954ca53f81cbdbdc15da9a7f149e9902?width=1024
https://railgallery.wongm.com/albums/melbourne-tram-stops/E120_6342.jpg
http://yarratrams.com.au/media/64120/1-platform-stop.jpg

2. Tram Station Configurations

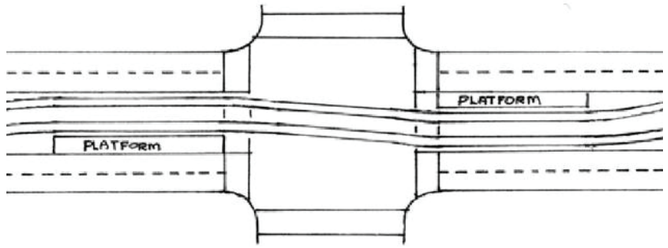
Central island platform: width 15-20ft. (4.5-6.0 m)

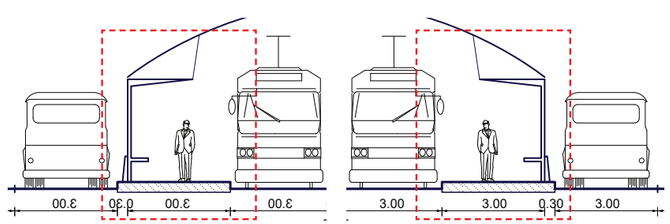




A Central Island Platform stop is located in the centre of the road. Trams approach the stop on the left side of the platform and passengers get off and on from the right hand side of the tram. As the doors open on the opposite side to a 'normal' stop it is important for passengers not to stand in the off-side stepwell of a tram when entering these stops as it can interfere with the operation of the doors. Some centre island stops are limited to trams only, while some also allow road traffic to pass through when trams are not using it. Both motorists and cyclists must stop at the rear of the tram when it stops at the platform.[1]

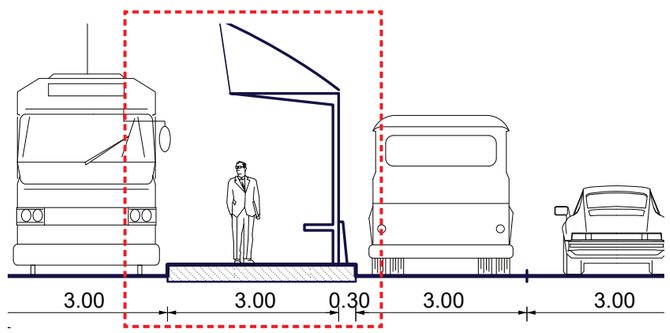
Side platform: width 10-16ft. (3.0-5.0 m) and often staggered across intersections





Curbside platform: often includes 8-10ft. (2.4-3.0-m) "bulgeout" of sidewalk





1 http://yarratrams.com.au/using-trams/accessible-journeys/using-accessible-stops/

Image Source. http://yarratrams.com.au/media/64150/2-centre-island-platform-s.jpg
http://www.lightrailnow.org/images/por-lrt-stc-stn-shows-bulb-out-2003_d-clarke.jpg

3. Typical Surface Alignment Options

Curvature's standard minimum curve radius is 82 ft.(25m), sharper turning capability possible because tight curves limit train speed. Recommended curve radii range is from 100 ft (30m) and streets are to 300 ft. (91 m) or more exclusive alignments.

Gradients allows 6% gradient is a desired maximum slop, but grades of 9% and greater are possible.[1]

1 13th National Light Rail & Streetcar Conference



Curvature-track



Double-track



Interlaced (gauntlet) -track



Gradients-track

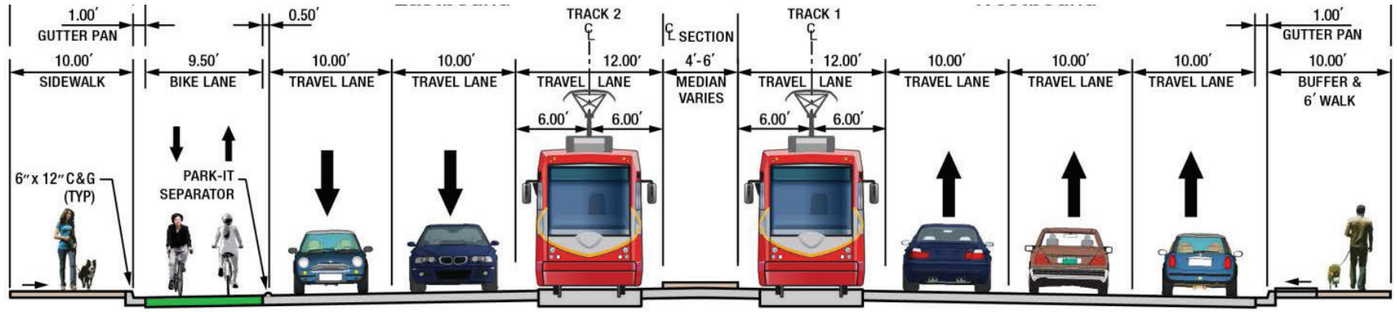


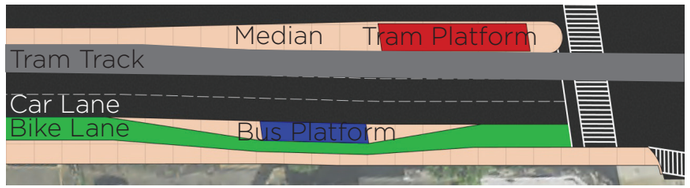
Bi-directional Single-track

Image Source. Salaam Allah/NYCSubway.org
Peter Ehrlich/NYCSubway.org
http://static.progressivemediagroup.com/uploads/imagelibrary/nri/railway/Projects/Lund%20tramway/lund-tram.jpg
Eric Haas/NYCSubway.org
Stefan Baguette
Flickr

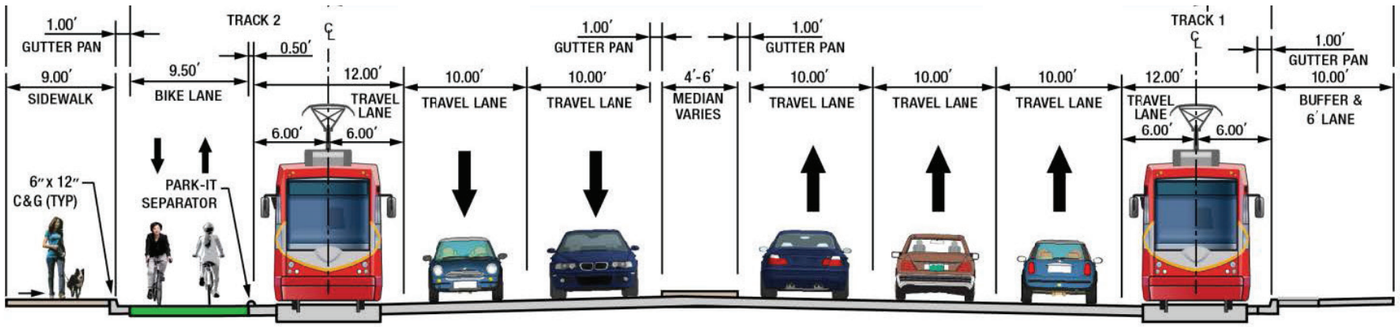
4. Tram-running Configurations and Street Dimension

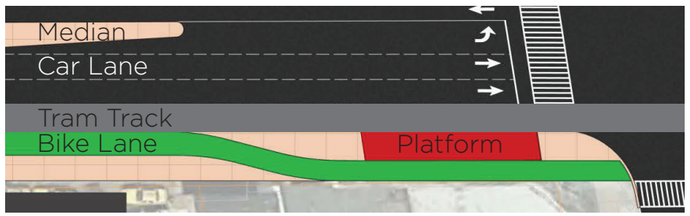
Center Running Type





Side Running Type



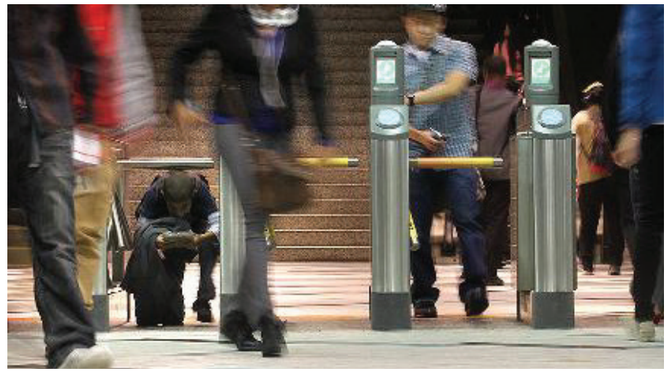


5. Common Fare Collection Methods

Operator collects fares



Turnstiles



Passenger self-service



6. Typical Tram Car Assumptions[1]



Full-performance LRT car
:90 - 100 ft. (27.3-30.3 m) 150 passengers
15 mph(24 km/h)



Full-performance LRT car
:75-85 ft. (22.7-25.8 m) 125 passengers
15 mph(24 km/h)

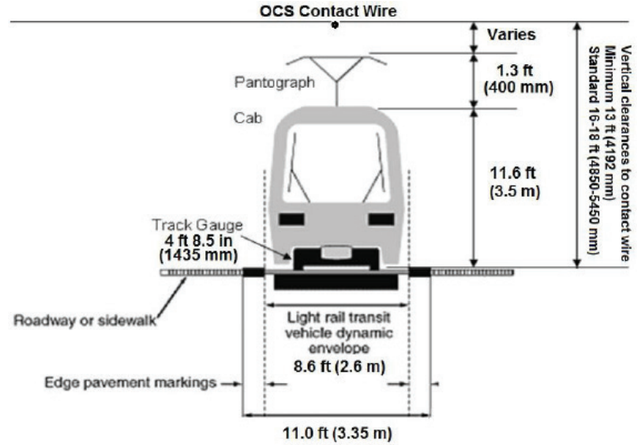


Streetcar
:65-70 ft. (19.7-21.2 m) 110 passengers
12 mph (19 km/h)

1 13th National Light Rail & Streetcar Conference

7. Tram Vehicle and Platform Profile

Tram Vehicle Clearances Profile



Tram Platform Profile

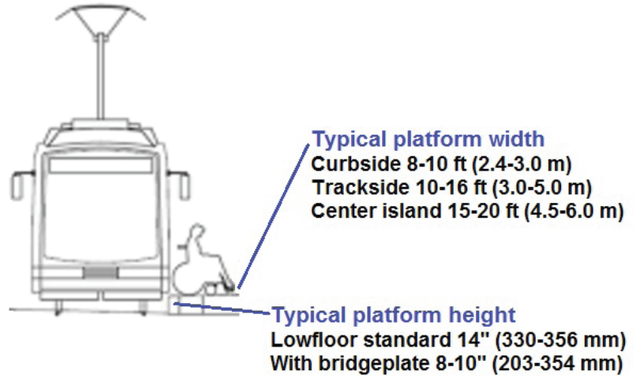


Image Source. PhiladelphiaPlaneto.com
Los Angeles Times
Portland Tribune
GoMetroRail.org, Siemens, OldTrails.com, 13th National Light Rail & Streetcar Conference (Adapted by LH from Hamilton Public Works)
https://lightrailnow.files.wordpress.com/2015/11/0_lrn_lrt-station-platform-profile.jpg (LRT design guidelines. Graphic: L.)

8. Tram Railway Construction Costs

Street/arterial lane: $63 million/mile
($39 million/km)

Roadway median: $32 million/mile
($20 million/km)

Shared use of active railway line: $35 million/mile
($22 million/km)[1]

9. Storage and Maintenance Facility

Space per railcar: 770- 2760 SF (71-253 m^2)

Cost per carspace: $416,000- 1,546,000



1 13th National Light Rail & Streetcar Conference

10. Estimating Tram Fleet Size [1]

Assume: 8-mile (12.8 km) route in urban arterial

Projected ridership: 25,000

Peak-hour/Peak-direction ridership = 10% of 25,000

Average speed: 15 mph = >30 min end-to-end

Conclusion is 23 railcars needed: 20 (short railcars, 125-pax) + 3 (15% spares of fleet size)

1 13th National Light Rail & Streetcar Conference

3. Tallinn Tram Network Proposal

Using the Urban Network Analysis(UNA) toolbox for Rhino 3D, we analyzed current tram network accessibility of Tallinn, based on which we proposed a new public transit system. We also conducted a post-design analysis on the new transit system.

According to the analysis, we conclude that current tram network only connects well the old town and its periphery areas. Areas to be developed such as the Tallinn Port, Highspeed Train Station, are less served. Though the airport is currently connected by the tram system, the actual airport station is more than five hundreds meters from the entrance of the terminal. Passengers have to walk a long distance or transform to another transit system such as bus to get to the airport.

The development of Tallinn Port is critical for the city to attract city residents and travellers arriving at the port. However, in order to promote the accessibility of the people, a new tram system should connect the fully developed districts, tramsportation infrastrctures, and the areas to be developed.

The proposed tram system at the city level better serves and connects city's sub-districts as well as gateways such as train stations, airport, port area and the future highspeed train station. At the site level, we could see the tram system evenly covers the blocks to be developed in the future and the old buildings remained. However, the buslines we proposed at the site has less effect on the accessibility. It serves mainly as a complimentary part of the public transit system and is easily to be adjusted.

Original Tram Lines



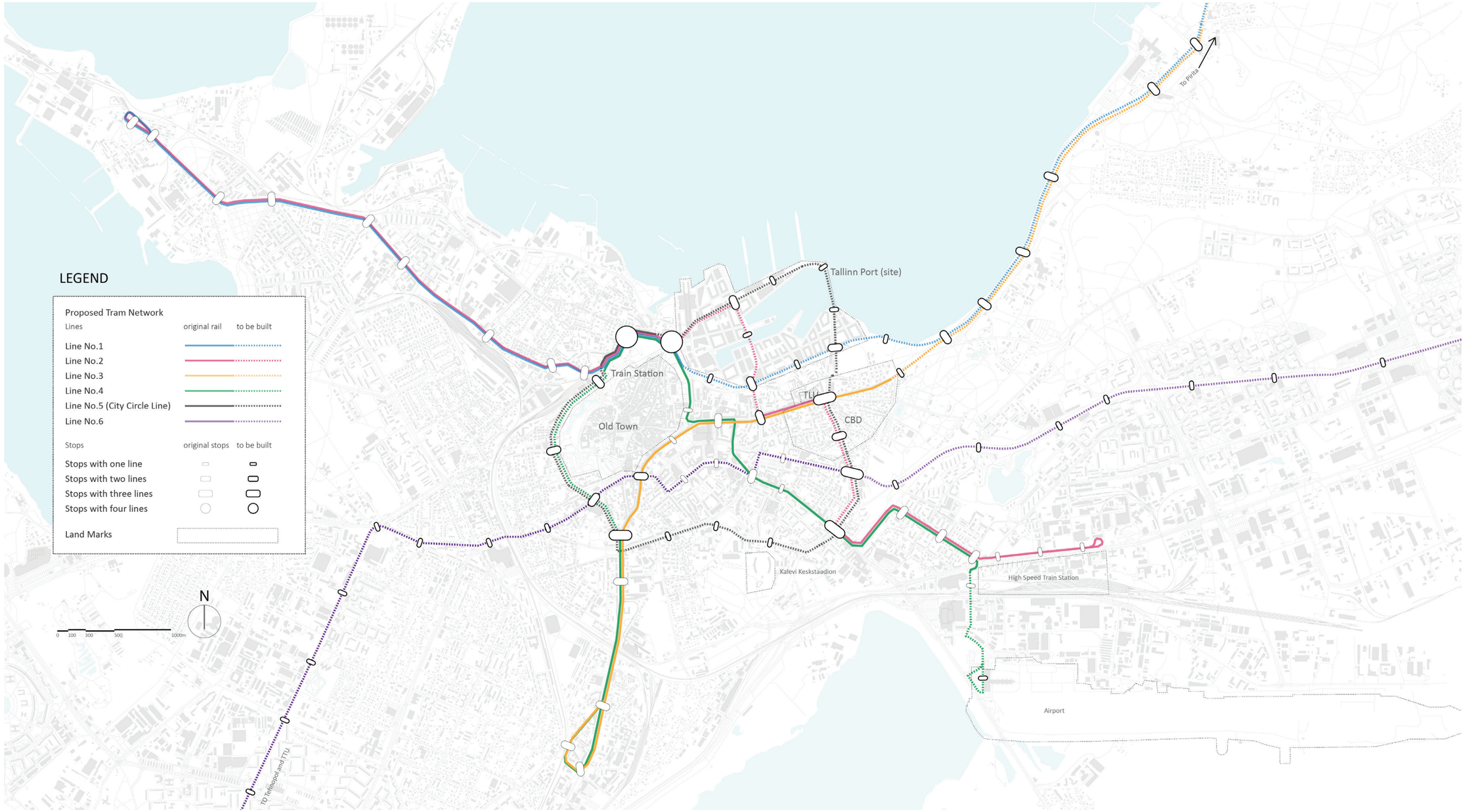
Propsoed Tram Lines (Adjusted)



Proposed Tram Lines (added)



Tallinn's Tram Network Map



4. Tallinn Tram Network Plan Development Phases

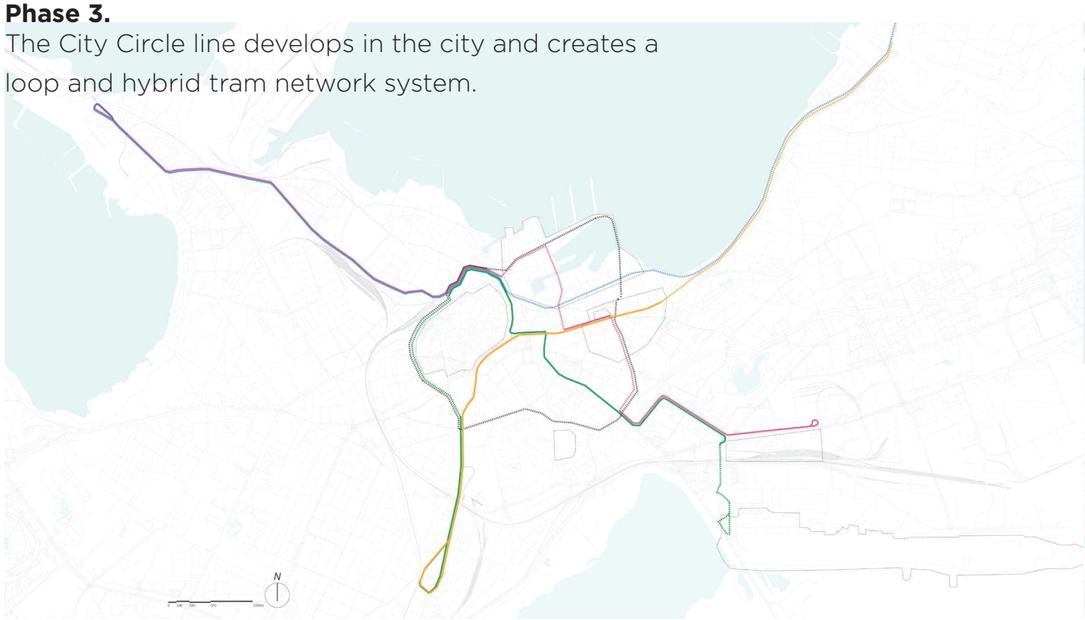
Phase 1.
Tram lines detour around the port and the new CBD area with an extension to Northwest area.



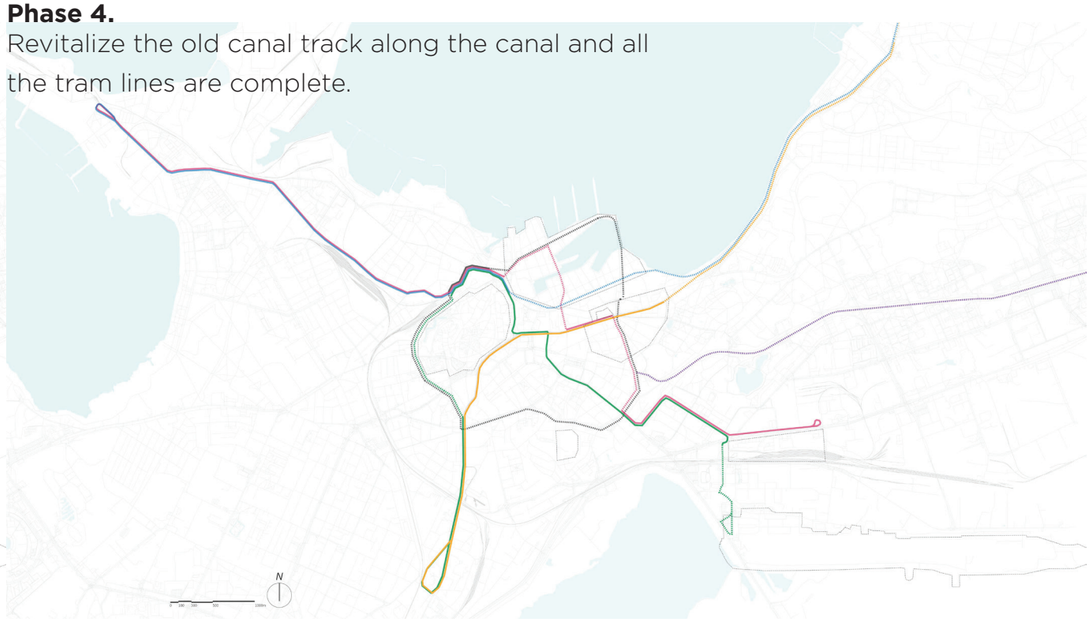
Phase 2.
Tram lines extend to Northeast areas and connect to the Airport terminal and detours around the historic town.



Phase 3.
The City Circle line develops in the city and creates a loop and hybrid tram network system.



Phase 4.
Revitalize the old canal track along the canal and all the tram lines are complete.



5. Network Analysis (Before and After)

At the city scale, a reach analysis unfolds how many lines a building can reach within 600m. The outcome shows current network connects well the old town and its periphery areas that had been developed. Most accessible spots are located at the east of the Old Town. (Some but not many of the buildings could get to the maximum number of line 14). Areas to be developed like Tallinn Port and highspeed train station are less served. Though the airport can be reached by tram, passengers need to walk more than half mile or transfer to another means to get to the entrance of the terminal which is inconvenient.

The proposed network increased more than 1500 buildings that can reach one or more tram lines within 600m radius. The proportion of buildings that could reach more than 6 lines for instance is increased, even though the maximum number of lines a building can get to is decreased from 14 to 12. The change of spatial pattern of tram network on the map, unlike the current distribution of tram stops and lines, creates multiple spots that have higher accessibility most of which are close to critical areas of the city such as CBD, port and old town, also the transportation hubs including future highspeed rail station.

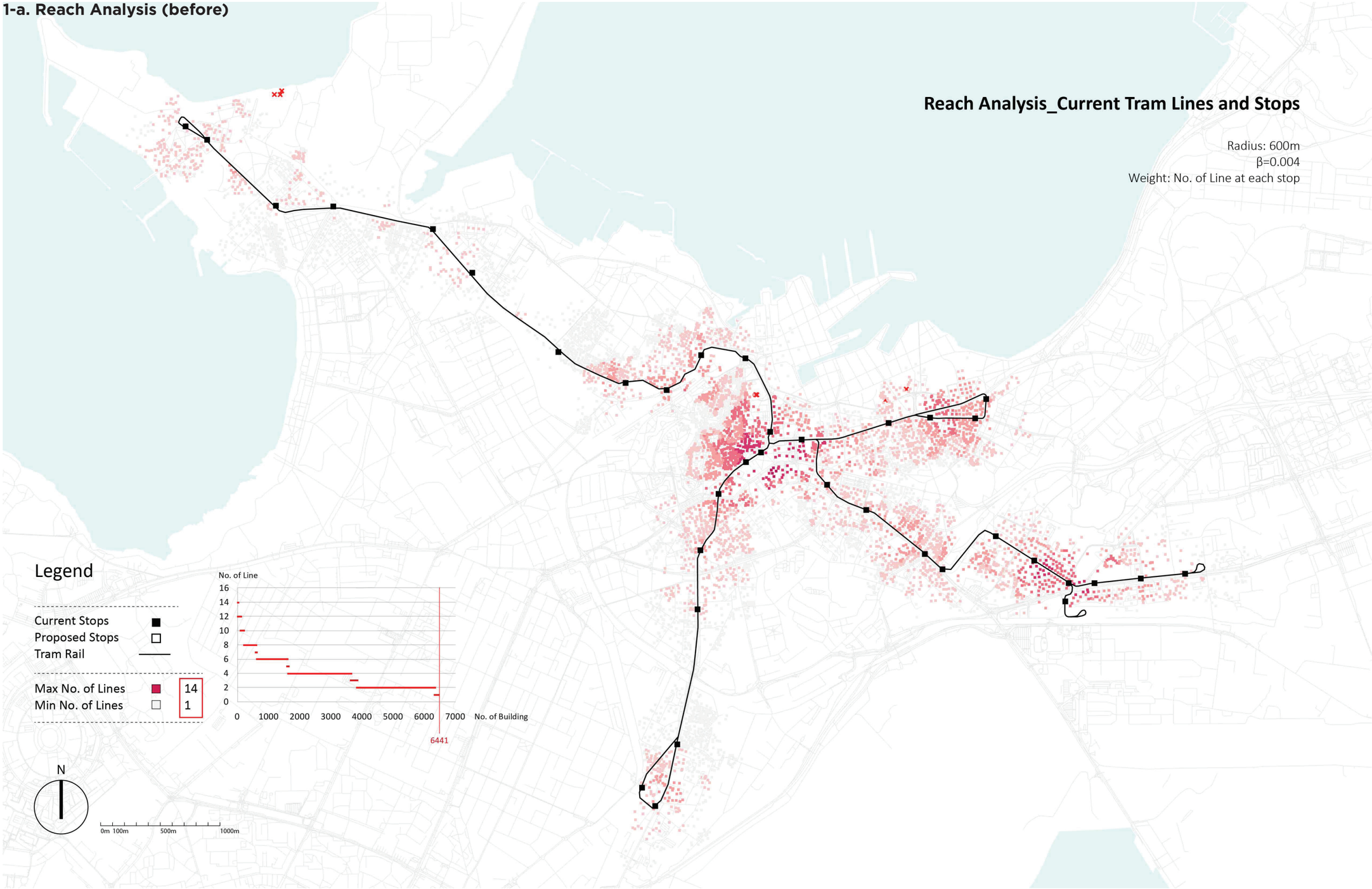
A gravity analysis unpacks the relative attractiveness of buildings to get to tram lines regarding the travel cost. More buildings have better accessibility in our proposal, especially those with attractiveness rate between 1.5 to 3. Spatial pattern of accessibility to the tram is follows the outcome in reach analysis.

At the site level, the proposed tram improves accessibility even more. If we add new tram stops on our proposed port build form. The total number of building that could reach one or more lines increased from 2085 to 2232. The maximum number of lines a building can get to remains. The proportion of buildings can reach more than 6 lines is nearly doubled. Spatially, the new tram system covers every corner of the site by acceptable distance from the stations and buildings proposed.

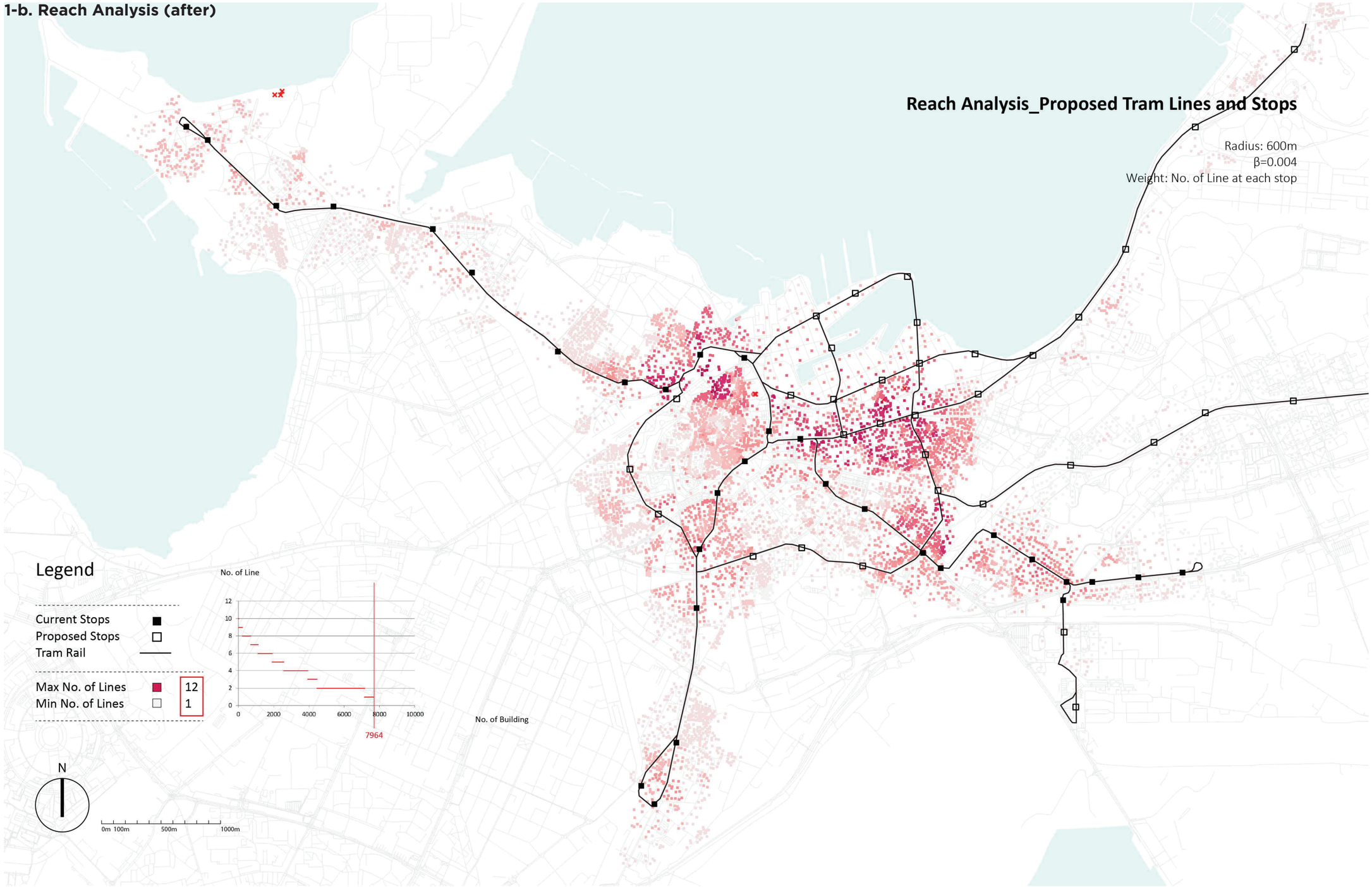
The gravity analysis proves more equal accessibility of tram stops. Although the maximum rate of attractiveness is decreased in the proposal, proportion of building with attractiveness between 0.5 and 3 increased.

In general, the accessibility will increase at critical areas at both city and site scales. The proposal could connect better the developed or to be developed areas and offer convenient access at different sub-areas.

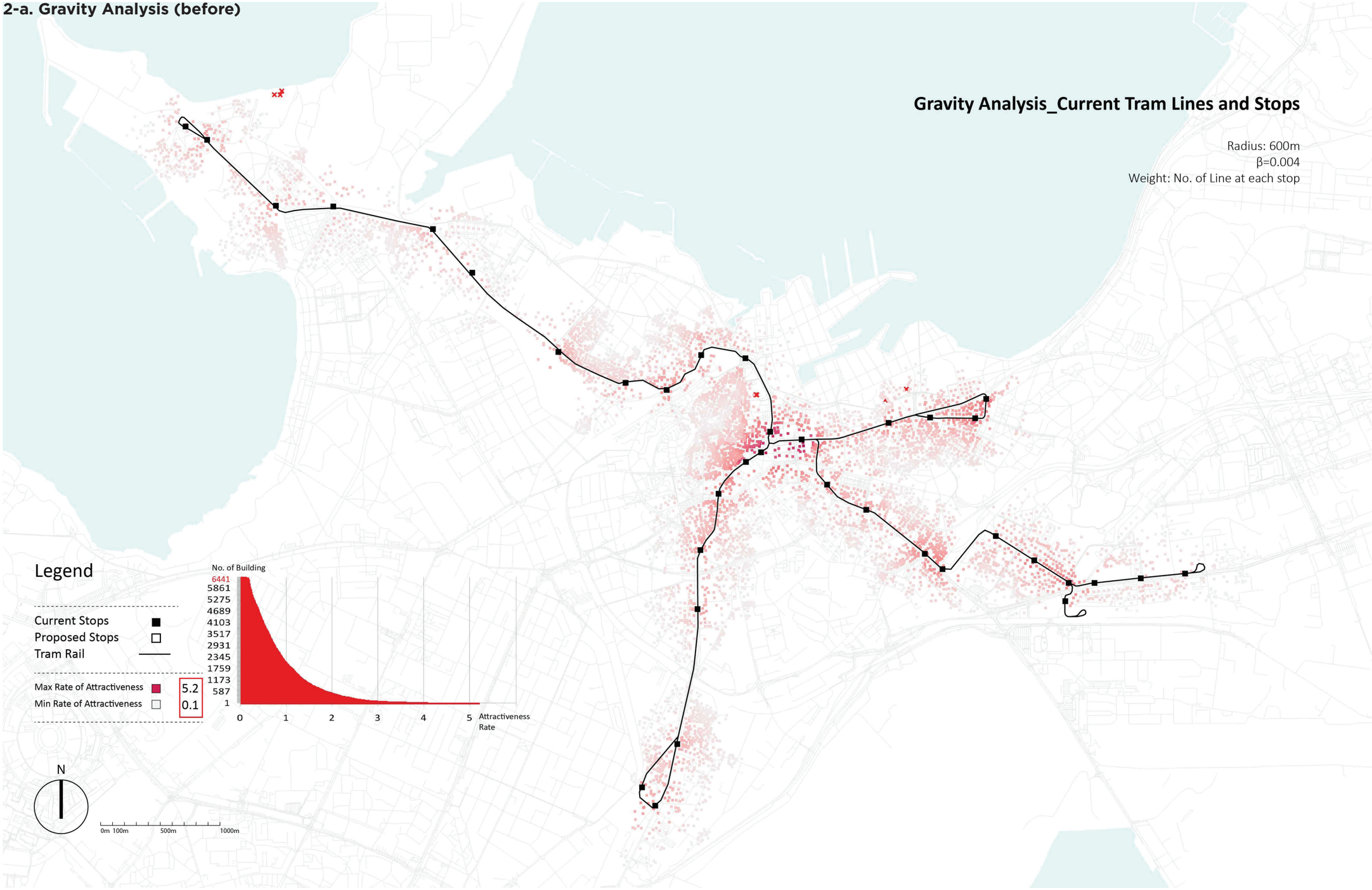
1-a. Reach Analysis (before)



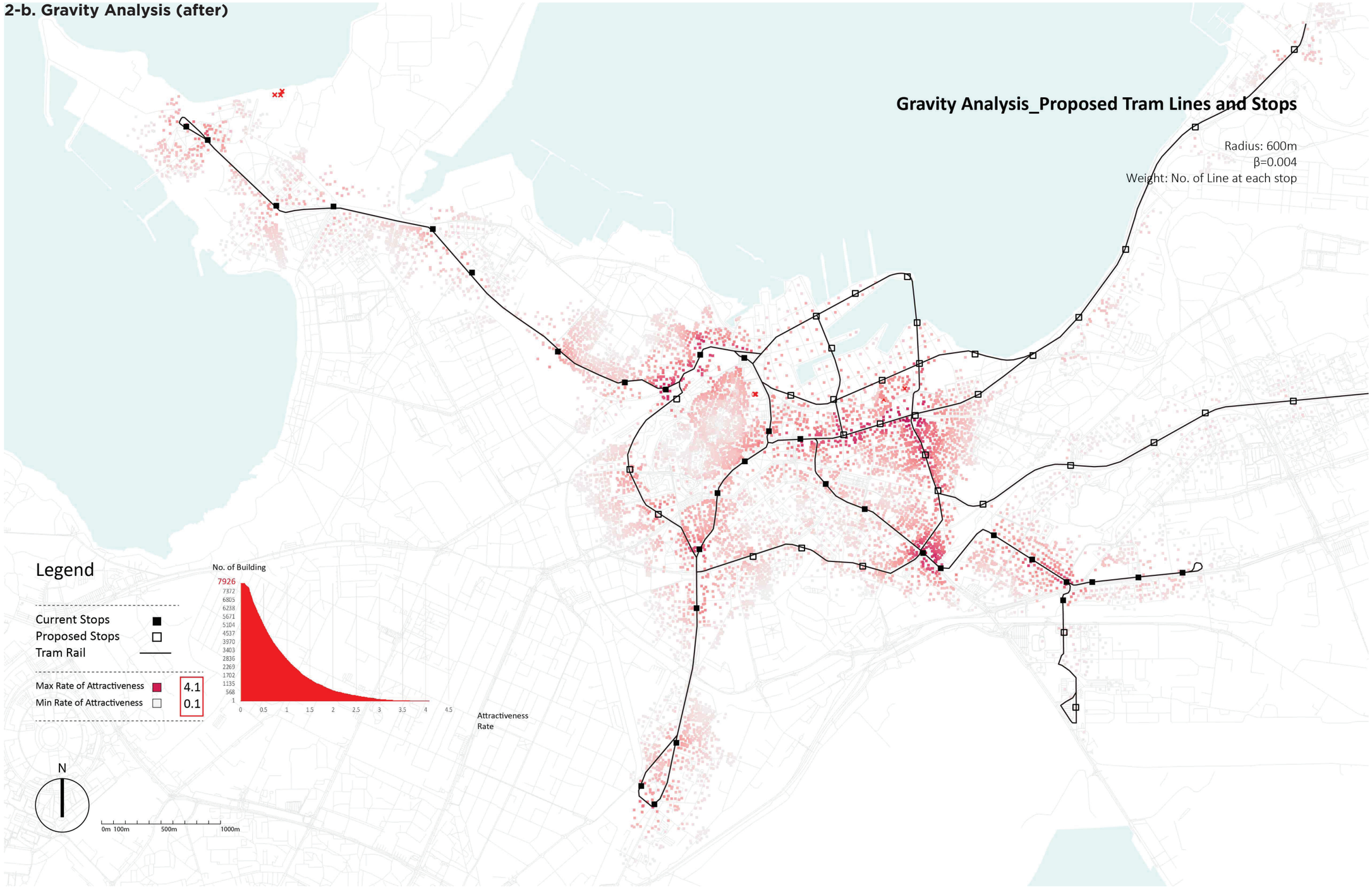
1-b. Reach Analysis (after)



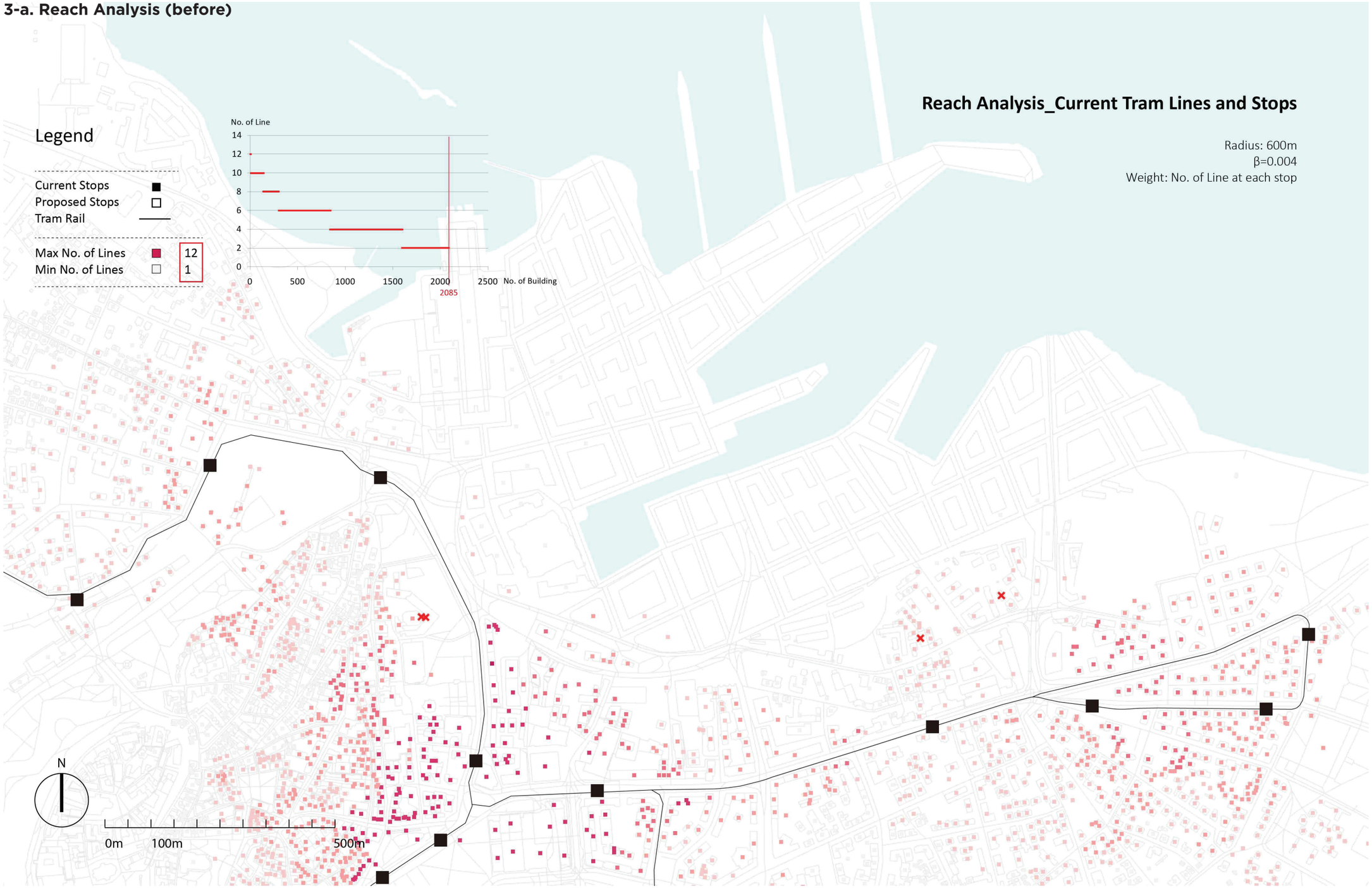
2-a. Gravity Analysis (before)



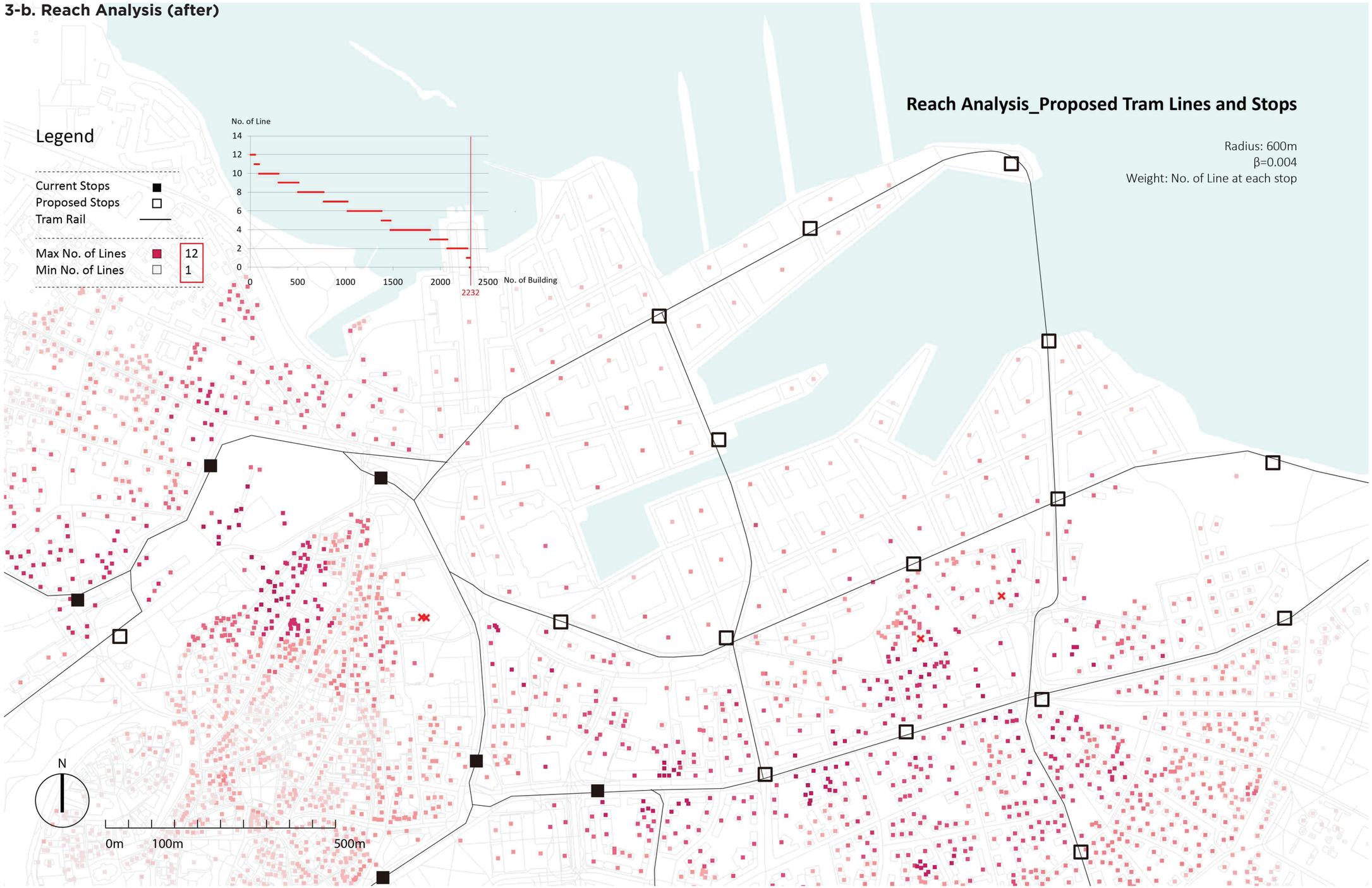
2-b. Gravity Analysis (after)



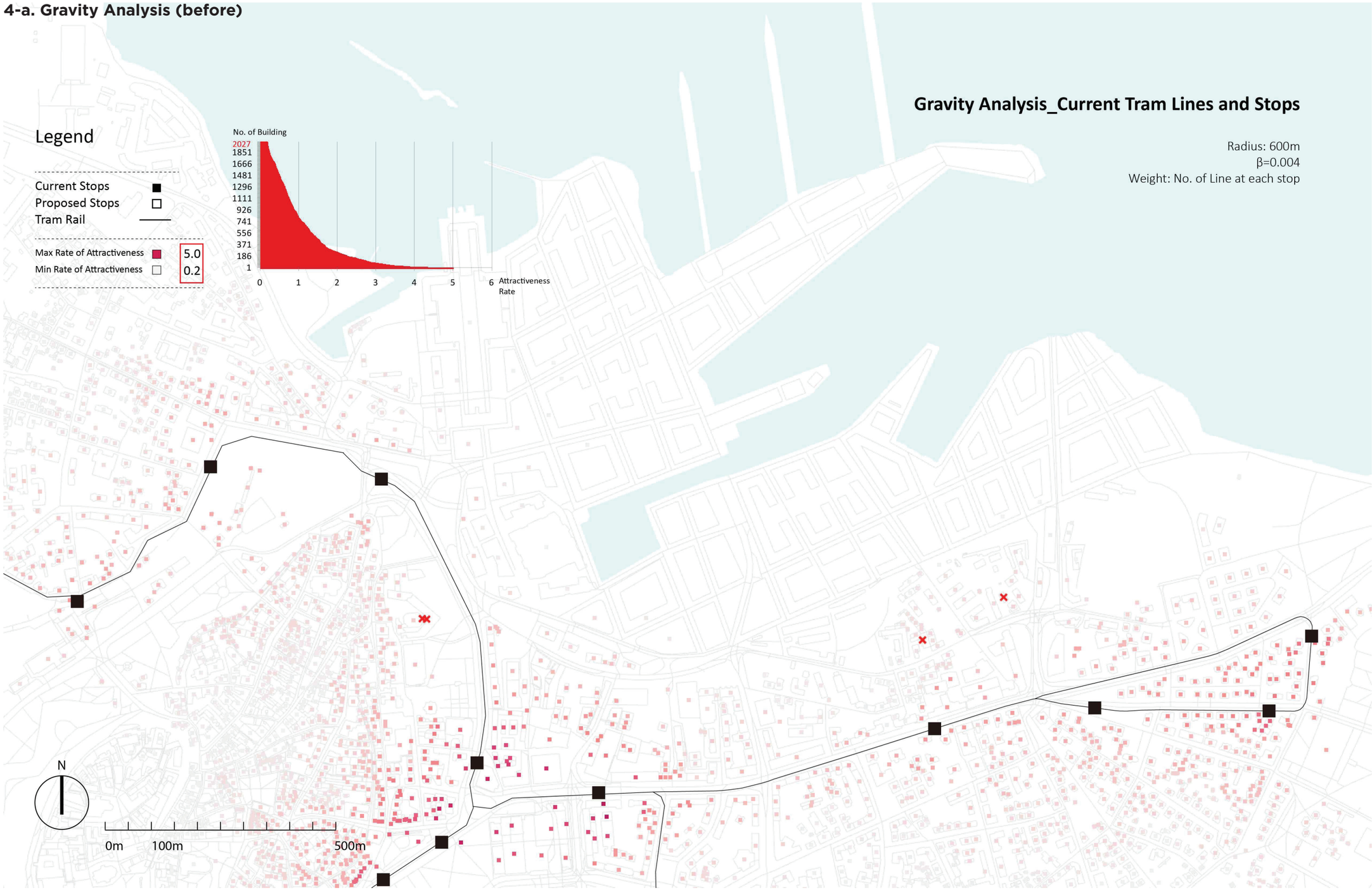
3-a. Reach Analysis (before)



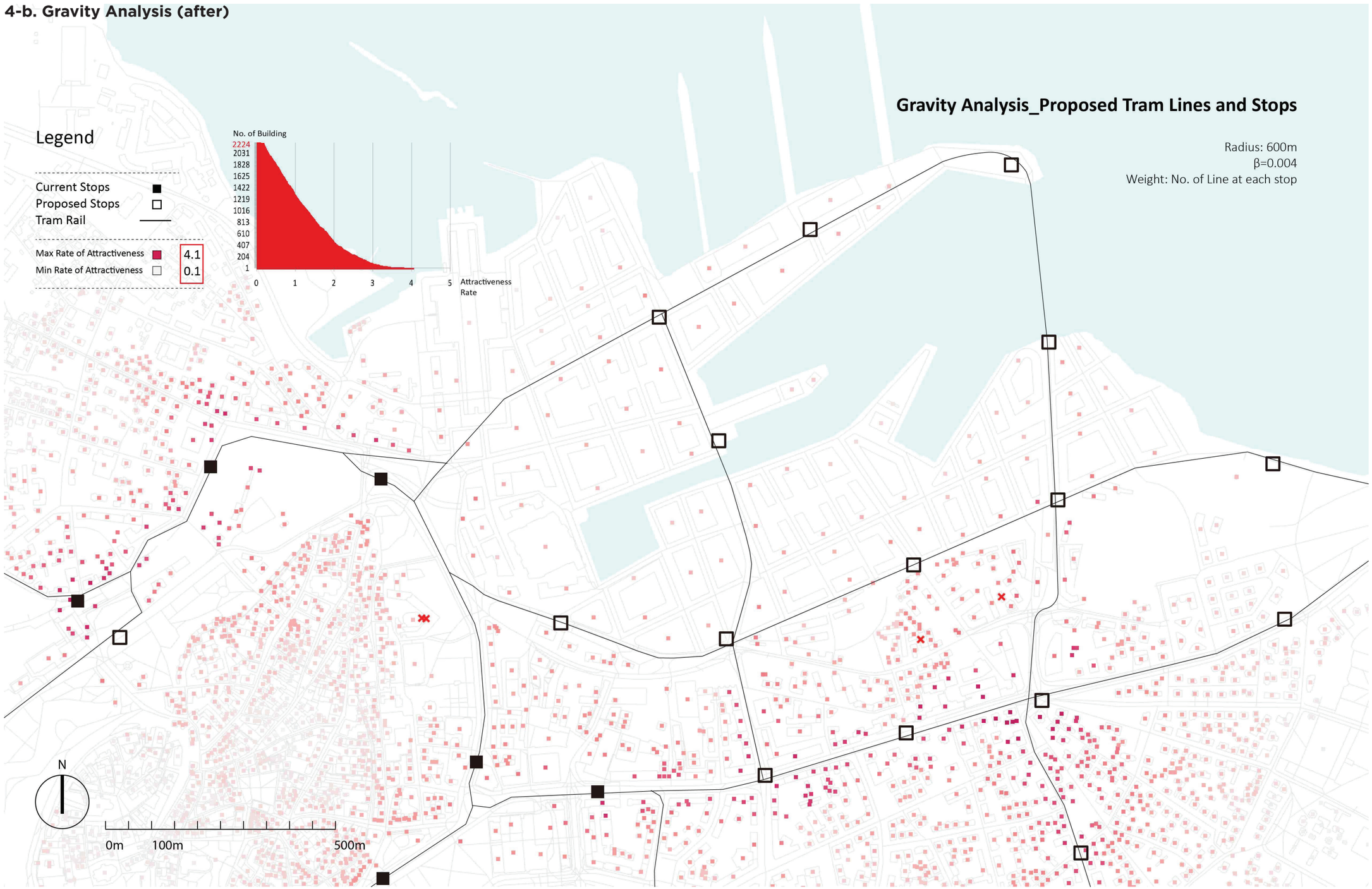
3-b. Reach Analysis (after)



4-a. Gravity Analysis (before)



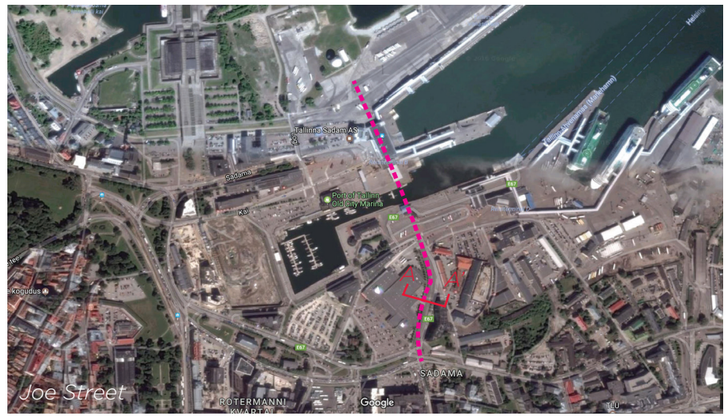
4-b. Gravity Analysis (after)

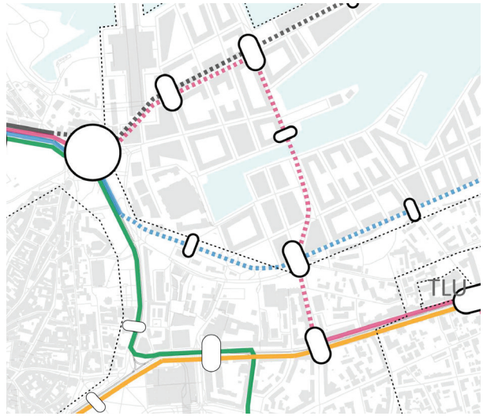


6. Street Sections and Design Ideas

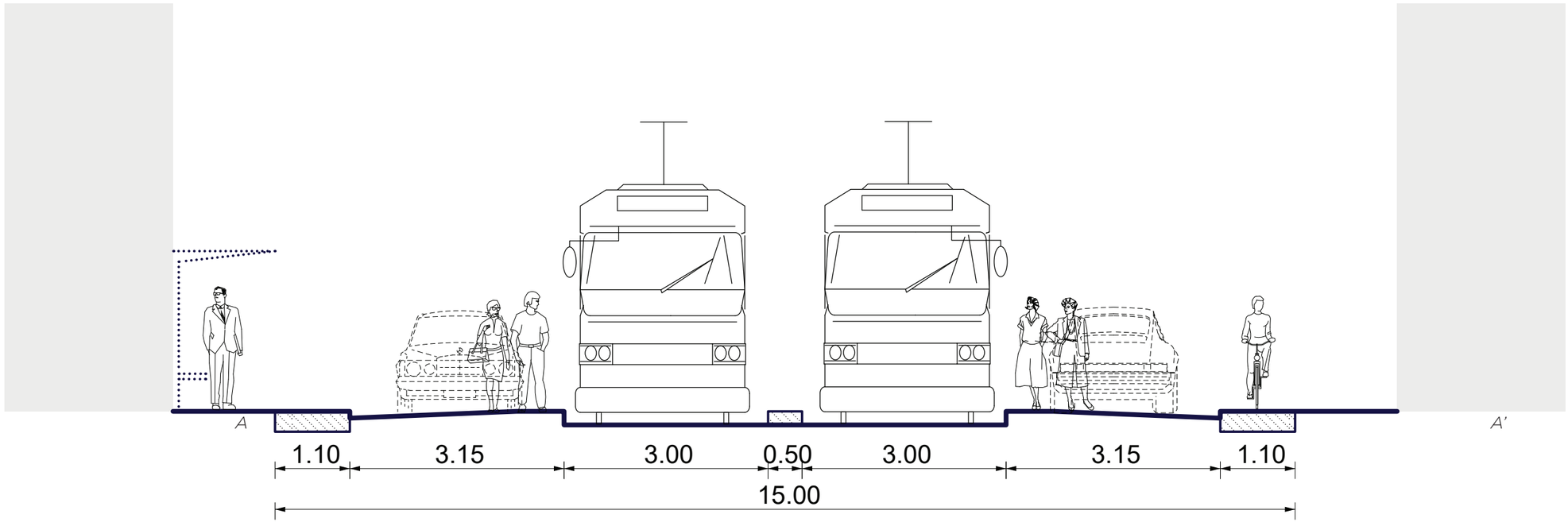
1. 15M Road

: Easy Access Stop (EAS) / Double-track / Center Running



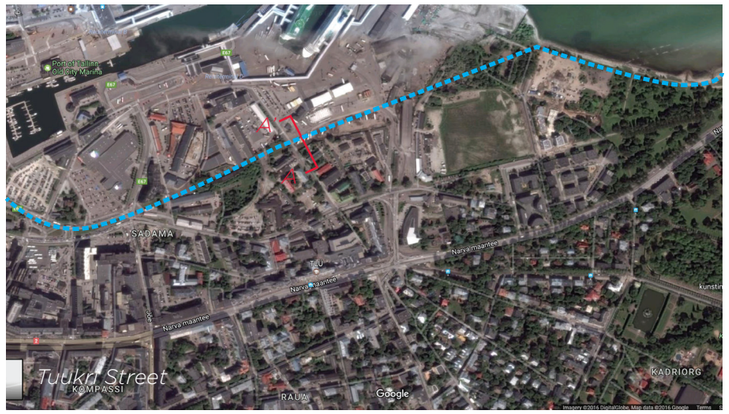


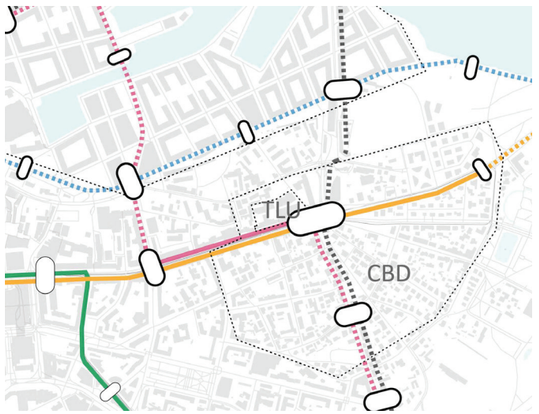




2. 20M Road

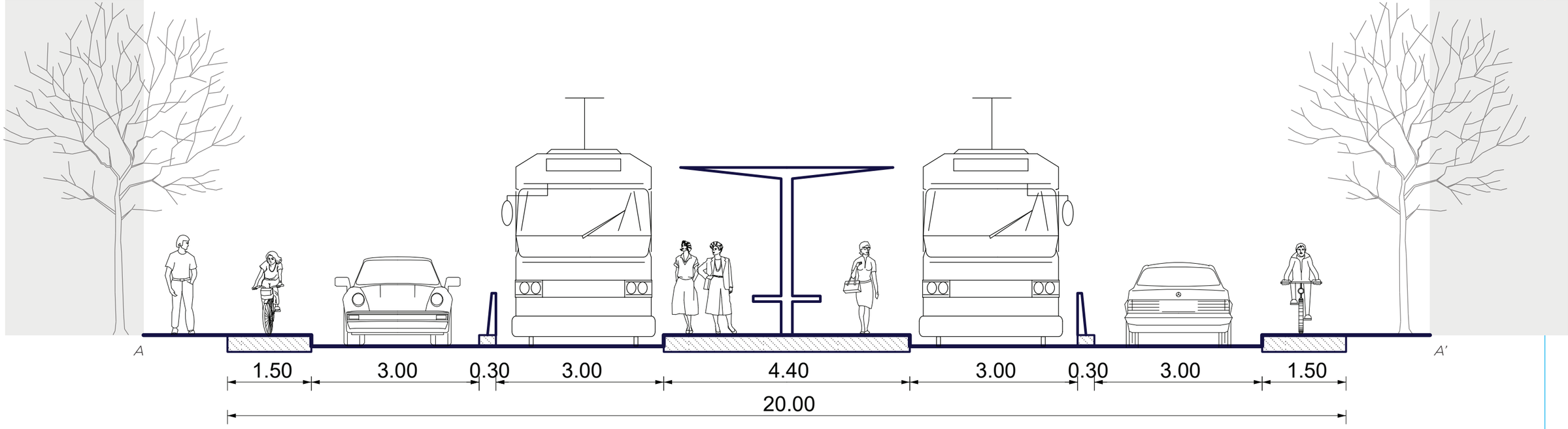
: Central Island Platform (CIP) / Double-track / Center Running







Yarra Trams , Melbourne's south-eastern suburbs

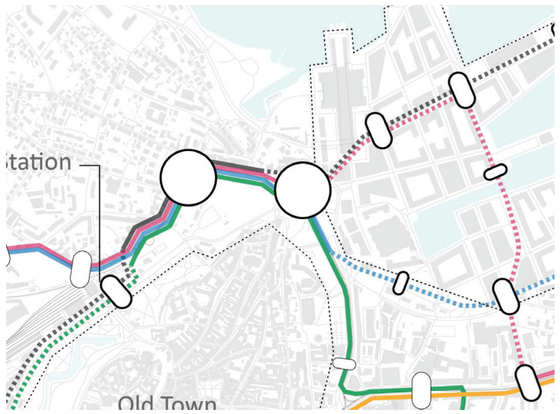


3. 30M Road + Public Plaza + 20M Road

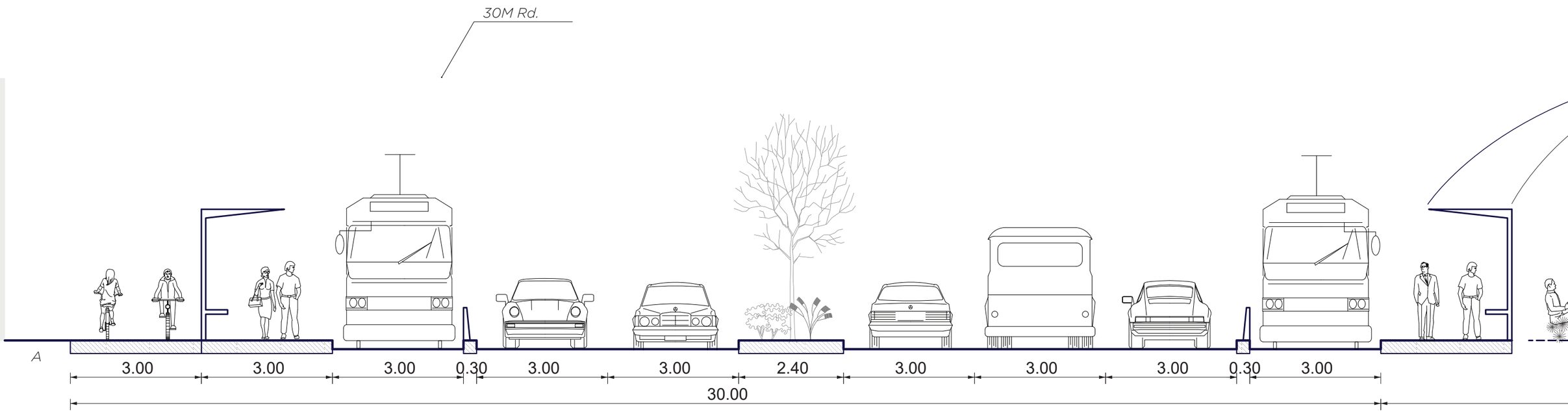
: Side Platform / Double-track / Side Running

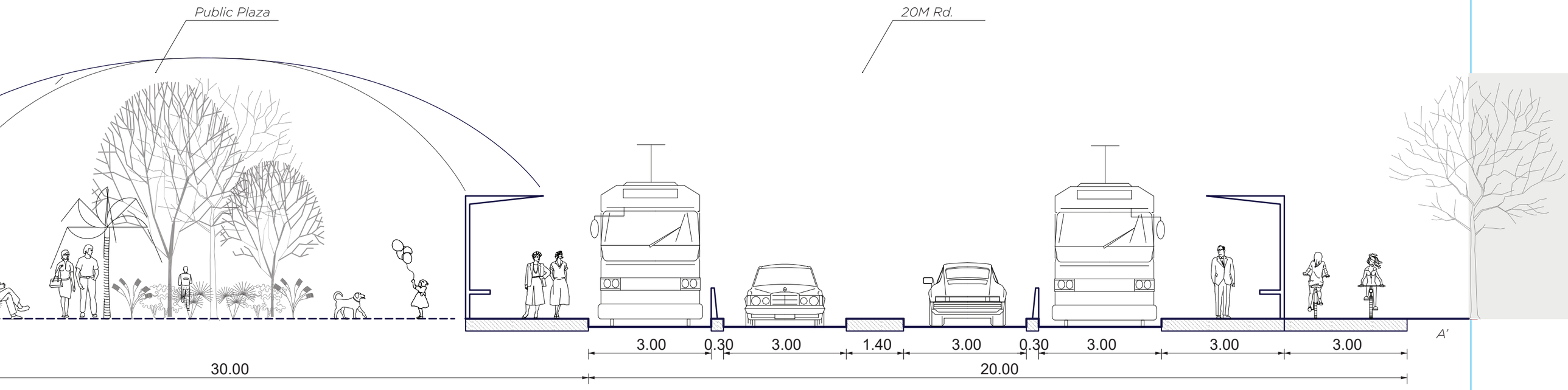


Põhja Puiestee Street, Mere Puiestee Street




Central tram interchange near the Zurich Hauptbahnhof




Public Plaza
20M Rd.
A'
3.00
0.30
3.00
1.40
3.00
0.30
3.00
3.00
3.00
30.00
20.00

7. Cost Estimation

1. Needs of A Number of Tramcars by 2030

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	**2020**	2021	2022	2023	2024	**2025**	2026	2027	2028	2029	**2030**
Annual ridership	25,200,000	25,830,000	26,475,750	27,137,644	27,816,085	28,511,487	29,224,274	29,954,881	30,703,753	31,471,347	32,258,131	33,064,584	33,891,198	34,738,478	35,606,940	36,497,114	37,409,542	38,344,780	39,303,400	40,285,985	41,293,134	42,325,463
Daily ridership	70,000	71,750	73,544	75,382	77,267	79,199	81,179	83,208	85,288	87,420	89,606	91,846	94,142	96,496	98,908	101,381	103,915	106,513	109,176	111,906	114,703	117,571
Pick hour risdership (10%)	7,000	7,175	7,354	7,538	7,727	7,920	8,118	8,321	8,529	8,742	8,961	9,185	9,414	9,650	9,891	10,138	10,392	10,651	10,918	11,191	11,470	11,757
No. of railcars [owned]	85																					
Spare of fleet service (15%)	1,050	1,076	1,103	1,131	1,159	1,188	1,218	1,248	1,279	1,311	1,344	1,378	1,412	1,447	1,484	1,521	1,559	1,598	1,638	1,679	1,721	1,764
Total railcar service demand	8,050	8,251	8,458	8,669	8,886	9,108	9,336	9,569	9,808	10,053	10,305	10,562	10,826	11,097	11,374	11,659	11,950	12,249	12,555	12,869	13,191	13,521
Railcar (150 pax): 0->30%	0	0	0	0	0	0	12	13	13	13	14	21	22	22	23	23	24	24	25	26	26	27
Railcar (125 pax): 50->30%	32	33	34	35	36	36	30	31	31	32	33	25	26	27	27	28	29	29	30	31	32	32
Railcar (110 pax): 50->40%	37	38	38	39	40	41	34	35	36	37	37	38	39	40	41	42	43	45	46	47	48	49
Needs of total no. railcars	69	71	72	74	76	78	76	78	80	82	84	**85**	87	89	91	94	**96**	98	101	103	106	**109**

Public transit demand growth rate 2.50%
in Tallinn (2014 UITP Statistics Brief Report)

2. Construction Cost for 20km new tracks

	milion USD	extension (km)
Arterial lane ($39mil/km)	429	11
with Median (+ $20mil/km)	413	7
sharing tramway line ($22mil/km)	44	2
Total construction cost	**886**	
Total new extension road		**20**

Walkability & Public Space

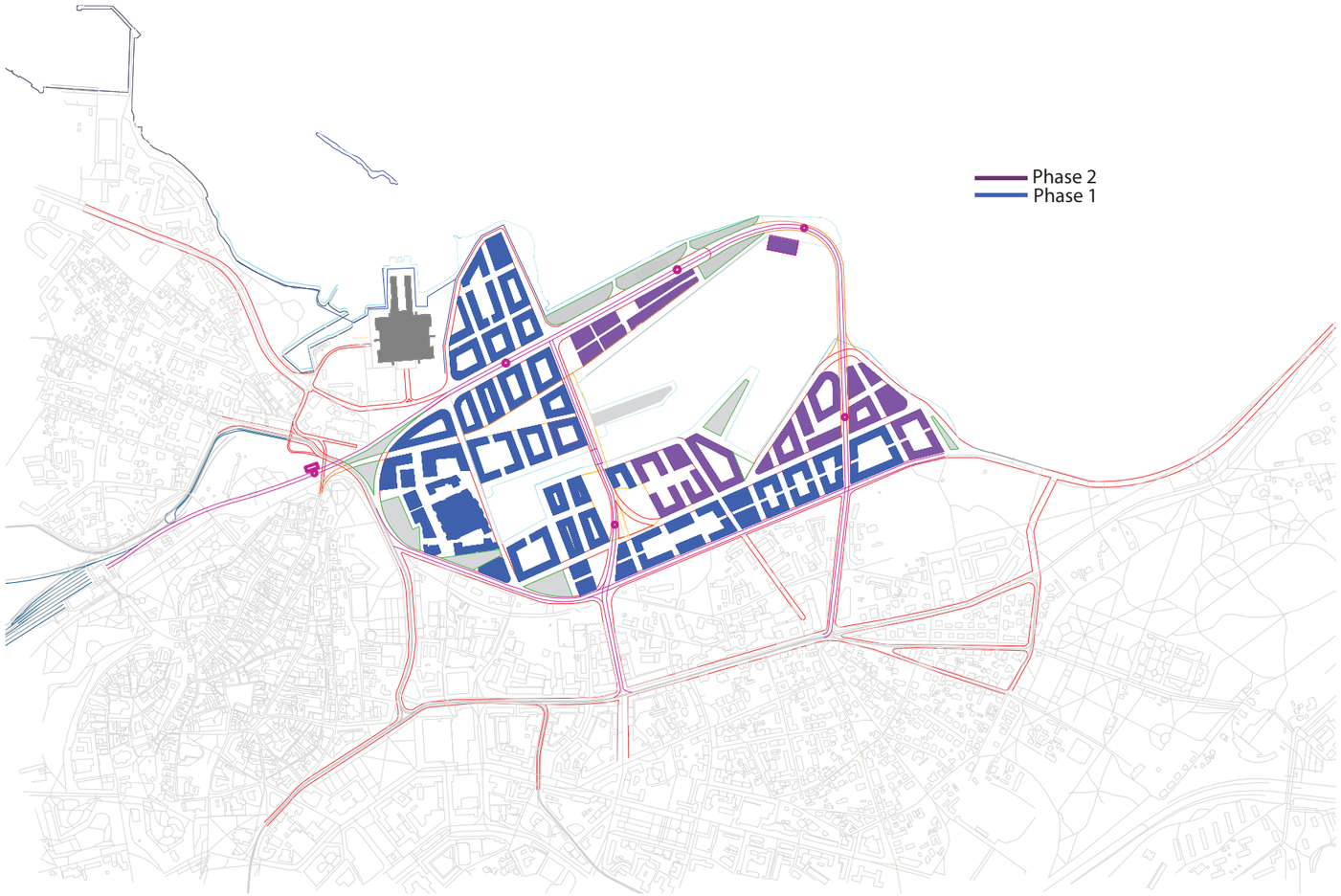
Djuro Bartulica | Ramon Gras Aloma | Yuyun Yin

Walkability and Public Space

Introduction:

An analysis of walkability and public space with respect to the port of Tallinn cannot be considered in the absence of other systems. Due to the extreme tabula rasa condition associated with the site, land use, built form and public transit proposals must first be taken into account before a substantial portion of walkability and public space can be addressed. Real estate development protocols as well as parking and roadways requirements also work part in parcel with walkability and public space considerations.

Having said this, one of the ways that an analysis of walkability and public space can begin absent these proposals is by the identification of major cultural nodes. These nodes and the space that surround them are useful starting points for the spatial and directional understanding of footfall that is crucial to the formation of a productive walkability and public space model. Identification of these nodes and a strategy for establishing a public space armature follows below. After taking these cultural nodes as starting points, our analysis then assembles the contributions made by the land use and built form, as well as the public transit proposals. Final residual walkability and public space plans are then purposed at 2 timescales: short-term and long-term. These proposals are made in conjunction with real estate and parking, roads and vehicular access perspectives.



Existing Nodes - Resulting Armature:

Cultural Mile

Sea Harbour Museum

Patarei Prison

Linnahalle

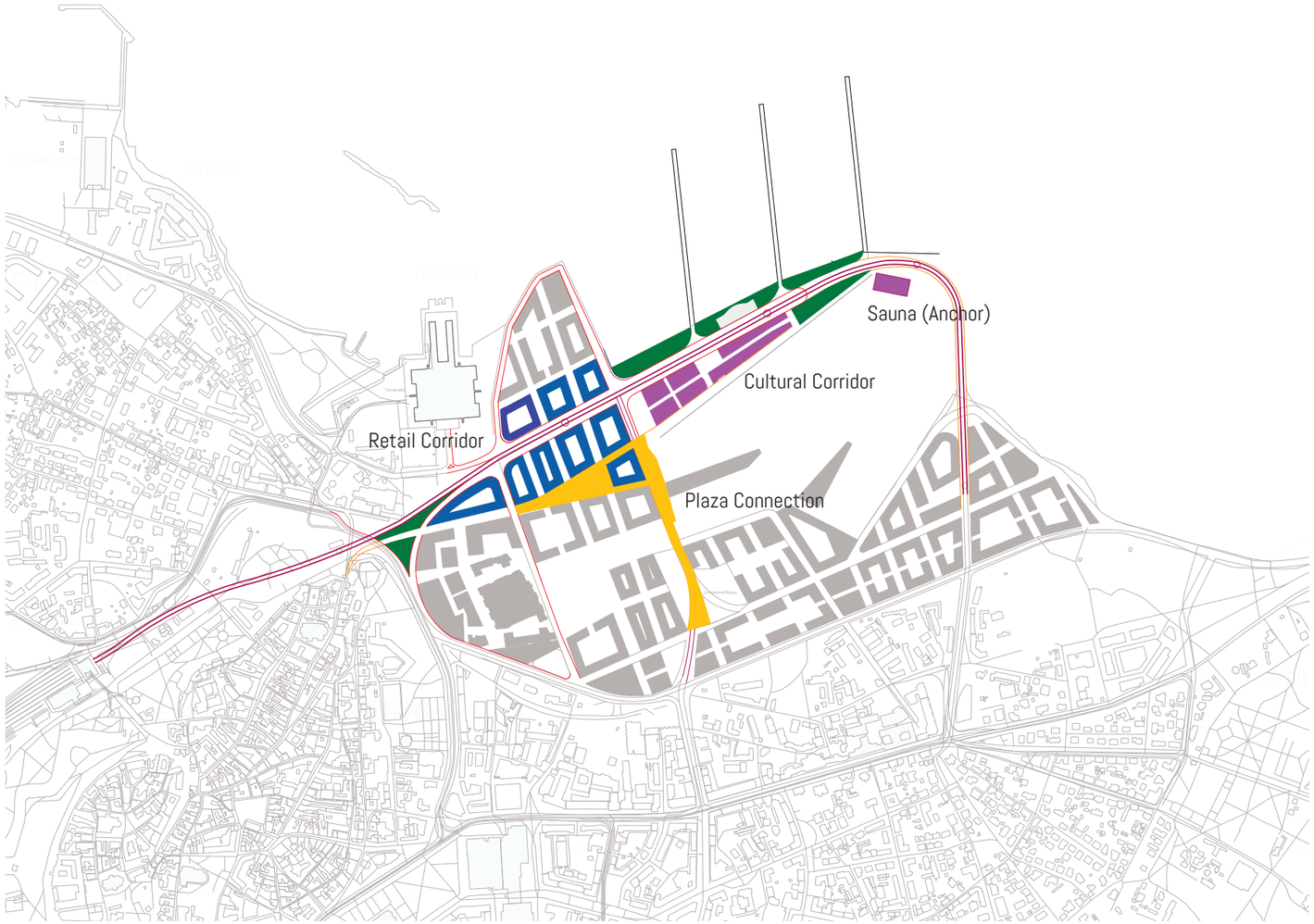
The Cultural Mile is a combination of destinations located on the western sea-side areas of the port of Tallinn. The former site of the Patarai Prison complex, the Sea Harbor Museum and Linnahalle complex all contribute to this destination. The strategy to link existing green spaces with paths along the sea-side is an effort not only to enhance walkability between these sites, but to contribute to the overall walkability of the larger sea-side path from the Cultural mile to the public beaches located on the eastern side of the port area. The connection of these green spaces is a key strategy in the revitalization of the larger coastal pedestrian system.



Old Town

Old Town Gate (Suur Rannavärav)

The Old City Gate (Suur Rannavärav) is the main destination for tourists coming from the cruise ships which dock on the northern edge of the port. This destination is ~1000m from the landing site, but as of now is served by an irrelevant 5 minute bus link due to the inhospitable conditions of pavement and unkept landscape existing between the gate and the port. The enhancement of retail program and the amelioration of green space along Sadama avenue which connects these disparate sites would greatly impact pedestrian accessibility from the port to the gate while also creating a main public thoroughfare for the port area. In addition to this, on the west end of Sadama avenue, pedestrian passage to Old Town Gate is hindered by a major highway intersection. To solve both of these conditions, a new infrastructure corridor consisting of tram line, vehicular and pedestrian access routes are proposed starting from the main dock areas—proceeding along Sadama avenue— culminating at a new tram stop located at the existing roadway intersection. Vehicular access along this corridor is to be rerouted along existing lines to more suitable areas. This is considered crucial to an effort to form multimodal access around a primary public space axis and to mitigate traffic in the process. It is also an effort for tram uses to compete with vehicular uses, allowing this system to function as an auto-equalizer for the area.



Main Dock

Extension of Sadama Ave

Cultural strip

Urban sauna

The proposed infrastructure corridor on the Main Dock is seen as a strategy to bifurcate the main port uses from recreational and commercial uses. Together this proposal forms a spatial solution that allows for each set of uses to exist simultaneously via a stratification of multimodal mobility infrastructure.

On the southern (sunny) side of the Main Dock area, space is reserved for a cultural commercial district which is serviced by a large pedestrian promenade and an urban sauna providing spectacular views to the skyline of the city. On the northern side of the main dock, a recreational harbor walk traces the boundaries of the port uses. In between these areas is the proposed multimodal infrastructure corridor. The vehicular layers of this corridor are curbed and exchanged at the intersection of the tram stop to coordinate traffic. Only the tram and pedestrian access is continued beyond the peninsula onto the proposed bridge connecting the port to the new office and residential areas on the mainland. An overall land use plan is established in conjunction with the infrastructural corridor provided on the Main Dock. The site at it's full build out is broken down into 5 areas consisting of a high end residential zone in the north, the Main Dock area, Porto Franco, a residential area promixate to the new road to the south and the proposed entrepreneurial area on the west end. Vehicular access is mainly provided by the infrastructural corridor from the Main Dock and also by parallel avenues located on the southern portion of the site.

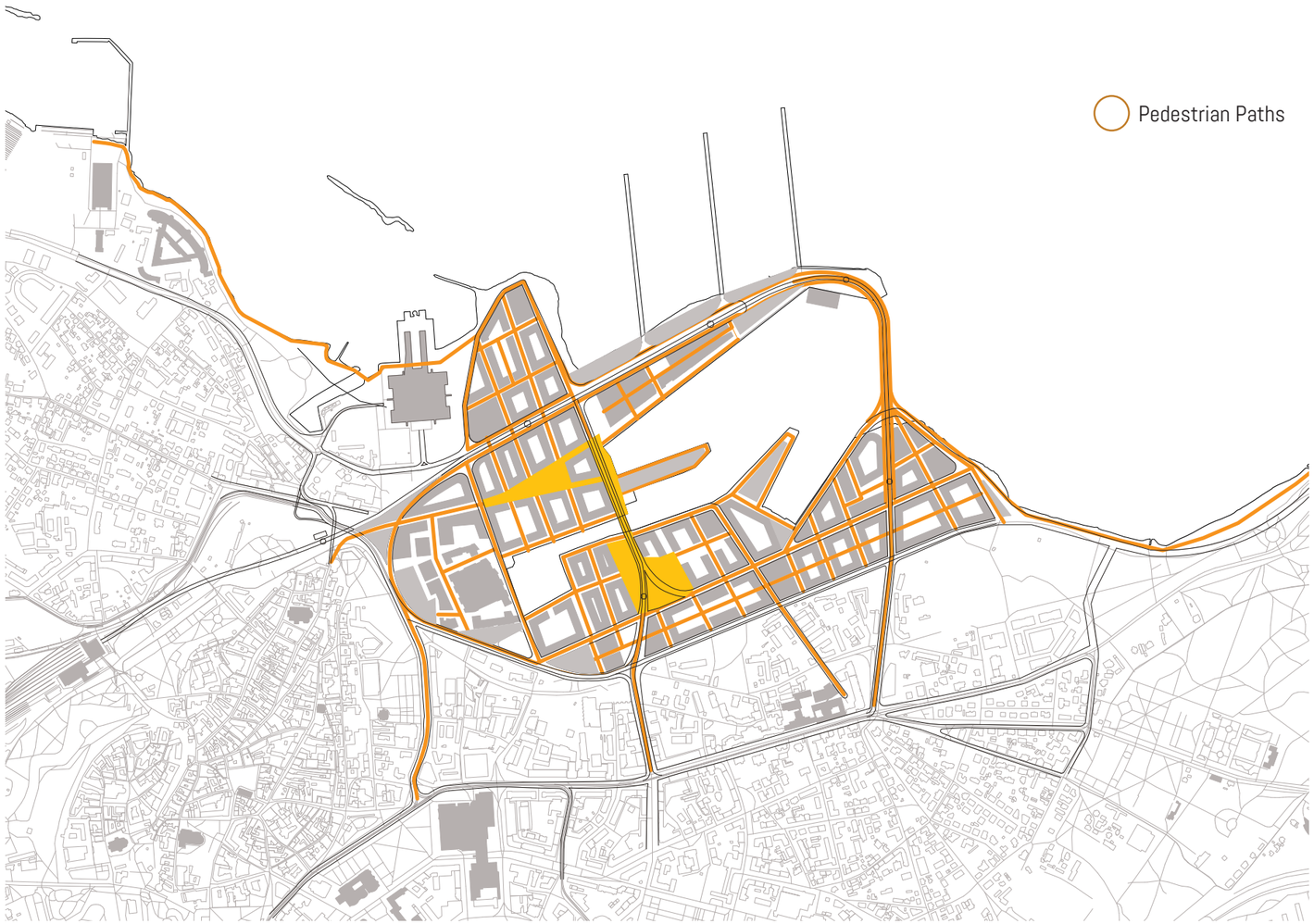


Porto Franco

Admiralty Basin

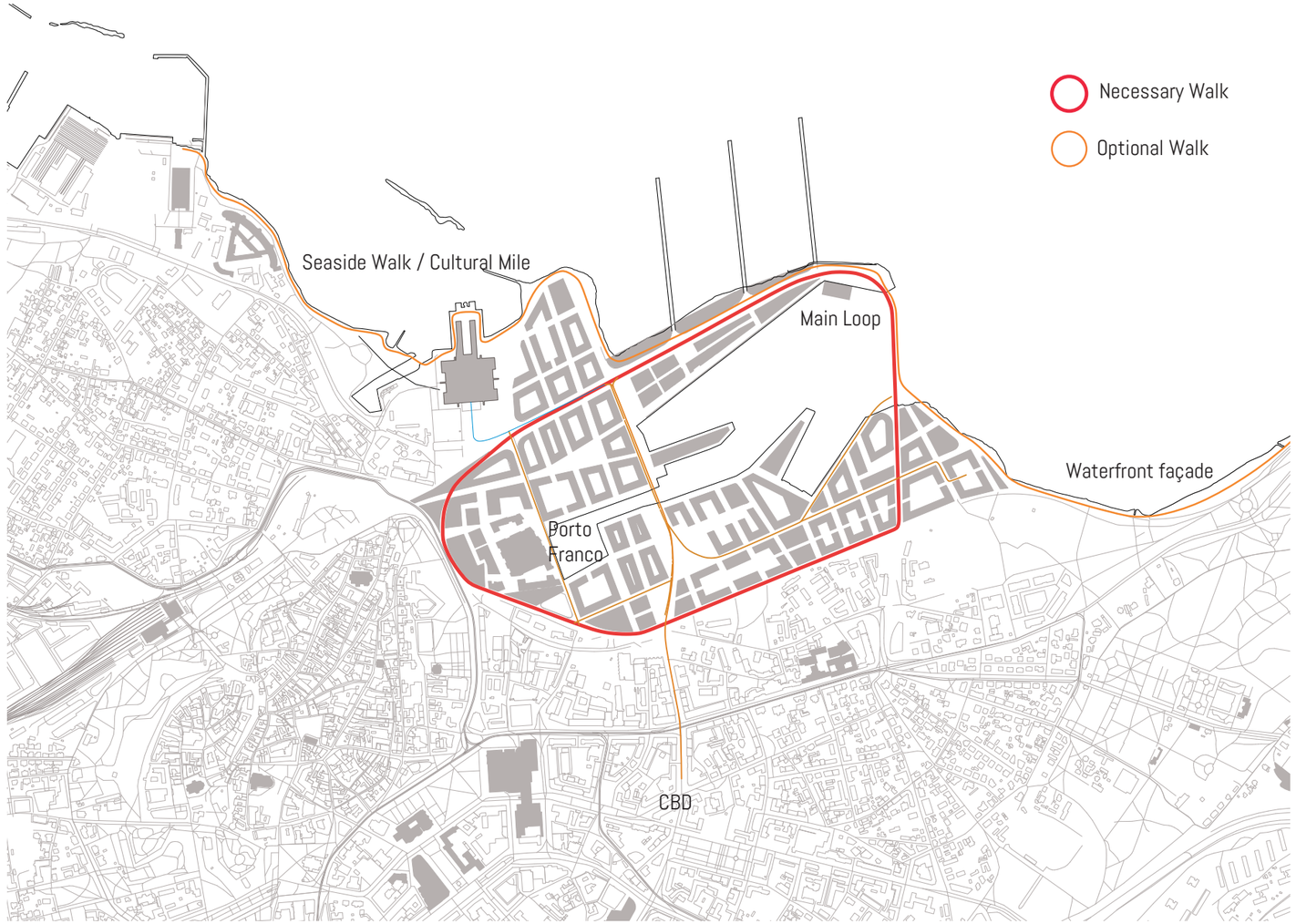
Historic Warehouse

Apart from the Main Dock proposal that is associated with planning efforts in the long-term, Porto Franco is recognized as the main focal area within the port from the perspective of both walkability and public space in the short term. Its central location relative to major uses, including major retail nodes and large public areas such as Admiralty Basin exemplify is development potential. A pedestrian bridge connection is proposed connecting the neck of the basin at it's shortest distance. This connection would facilitate pedestrian movement on the N-S axis which is also seen as a strategy to connect the city to the port and vice versa. Crossing Porto Franco this route culminates in a central plaza space with a proposed new tram stop at the site of a historic limestone warehouse existing in the area. The space of this central N-S axis, the area south of the Main Dock and north of the limestone warehouse, an area of about 25,000 sq.m. becomes the main 'mixing' area of the port and is seen in this respect as the most central public space in aggregate.



This interior axis is, however, only central in aggregate due to the larger access loop that exists around it. This larger access loop consists of the Main Dock multi-mobility system to the north, the existing retail corridor running N-S behind the Porto Franco development to the west, the proposed street and residential block form to the south, and the proposed commercial and civic blocks that are framed by the continuation of the tram and pedestrian bridge that crosses the harbor to the east. Beyond the confines of the port and along the sea-side, a larger is recreational access system is proposed in conjunction with the infrastructure corridor provided by the main dock and by green space connections between the cultural mile and Linnahalle to the west and by the connection of the civic-commercial district to the public beaches on the east. This loop, the N-S 'mixing' area that is convex to it, and the larger recreational area along the sea-side together make up the main public access armature for the site.x Each of these areas could be classified with respect to Jan Gehl's 'types of walks'. Gehl concludes that to achieve a greater sense of holistic walkability, 3 types of walks need to be satisfied: the necessary, the optional, and the social.

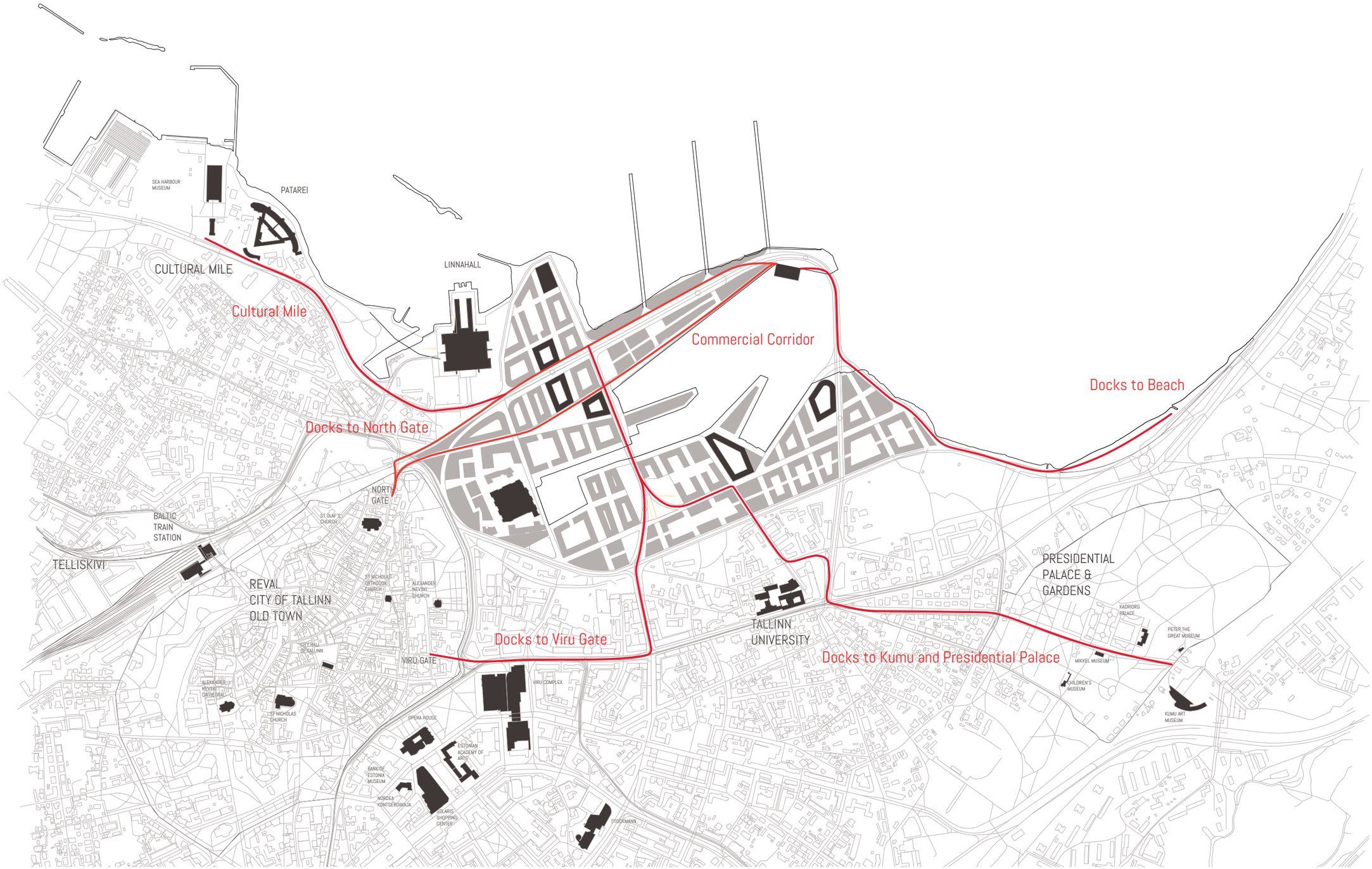
In this scheme, the necessary walk is afforded by the Loop, with major traffic nodes and populations accounted for. The social walk is accounted for by the N-S axis, particularly the exchanges between major population groups accessing the site. The third optional walk is exemplified by the larger recreational pedestrian system that, through use of a sea-side path, connects public spaces that was once impeded by the port.

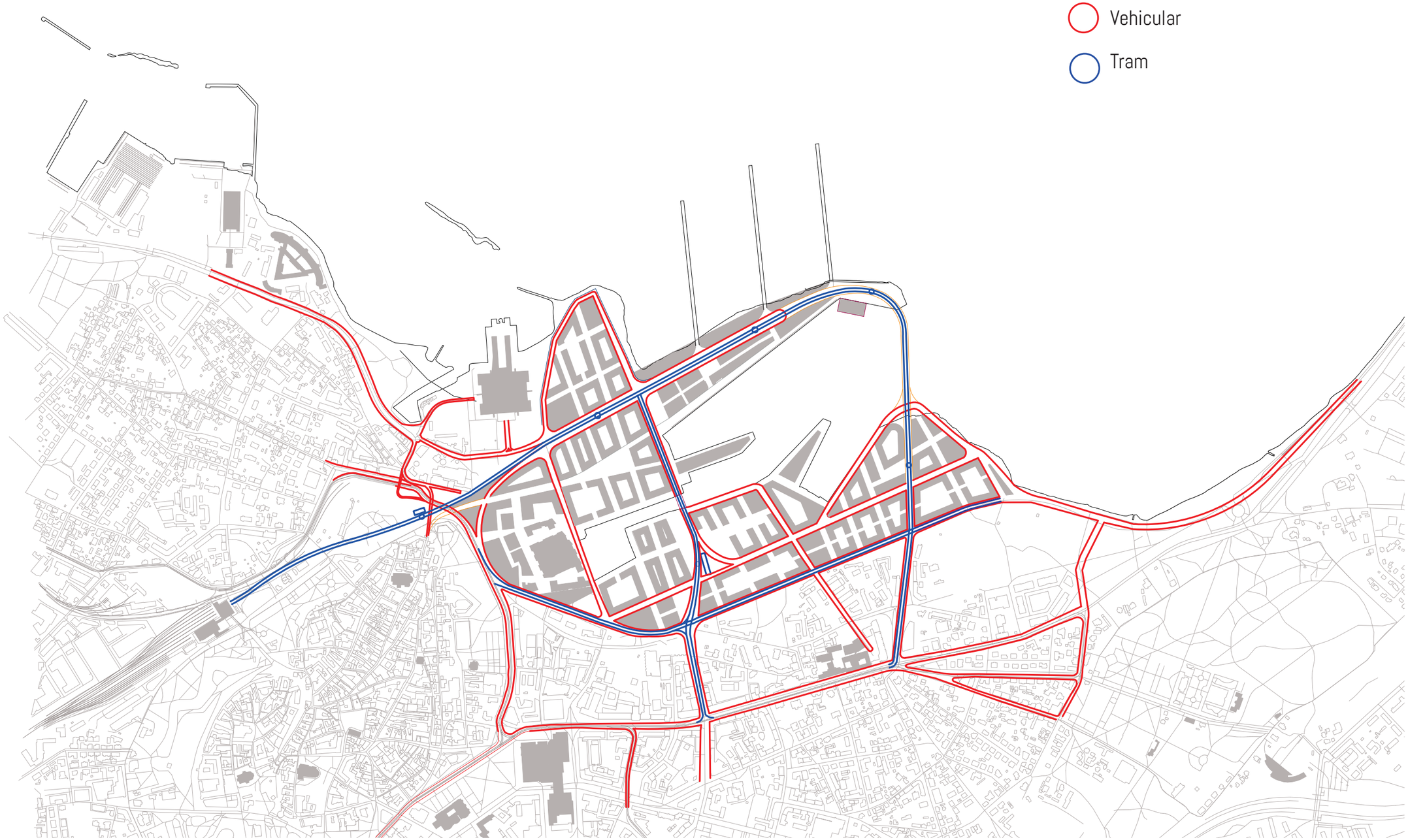


This armature, however, does not exist in isolation. It is our suggestion that walkability is as much a matter of large public space planning as it is a matter of small public space planning. In truth, very significant improvements and be made when a network of smaller green-spaces, superimposed onto existing green spaces, can leverage existing conditions. The implementation of suitable smaller public green space networks is also a major goal from a real estate development perspective in the event that these spaces add value to the properties with which they are attached. A residual open space network for the site is provided with proposed built forms.

Predominant routes from the Main Dock to Viru Gate, Cultural Mile, Commercial Corridors, Central Business District, the beaches located on the eastern portion of the site, and to the Presidential Palace are also included.



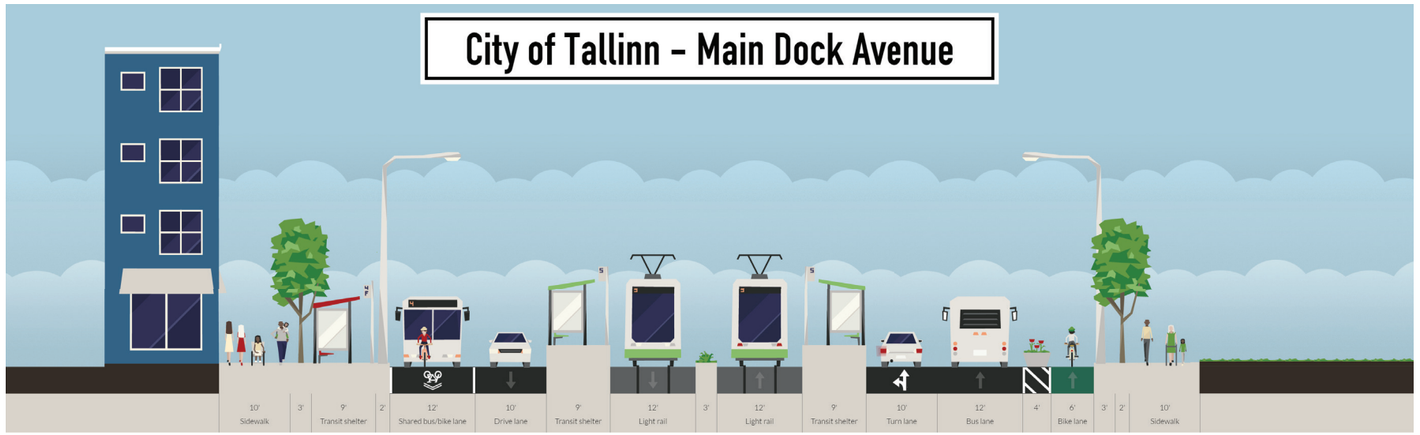

SEA HARBOUR MUSEUM
PATAREI
CULTURAL MILE
Cultural Mile
LINNAHALL
Commercial Corridor
Docks to Beach
Docks to North Gate
NORTH GATE
BALTIC TRAIN STATION
ST OLAF'S CHURCH
TELLISKIVI
REVAL CITY OF TALLINN OLD TOWN
ST NICHOLAS ORTHODOX CHURCH
ALEXANDER NEVSKI CHURCH
ST MARY'S CATHEDRAL
ST NICHOLAS CHURCH
TOWN HALL OF TALLINN
VIRU GATE
Docks to Viru Gate
VIRU COMPLEX
OPERA HOUSE
ESTONIAN ACADEMY OF ARTS
BANK OF ESTONIA MUSEUM
NORDEA KONTSERDIMAJA
SOLARIS SHOPPING CENTER
STOCKMANN
TALLINN UNIVERSITY
PRESIDENTIAL PALACE & GARDENS
KADRIORG PALACE
PETER THE GREAT MUSEUM
MIKKEL MUSEUM
CHILDREN'S MUSEUM
KUMU ART MUSEUM
Docks to Kumu and Presidential Palace


Vehicular
Tram

Conclusion:

In conclusion, despite its predominant use as a commercial port, the port of Tallinn contains many cultural nodes. Initially one would presume that a formerly commercial site would face walkability challenges due to fragmented access. The challenges facing the port of Tallinn, however, are mainly associated with the aesthetic quality and wide open expanses of the surrounding landscape although mobility infrastructure capacity within the port area is also severely lacking.

In the consideration of a short term plan, the area must be programmed with respect to a multimodal infrastructure system that can support new uses on the site — even if this would initially only sustain one avenue or central space. Long range planning, including the adoption of a large recreational path from the eastern beach to the Cultural Mile should be bold and should consider goals that would have the effect of completely reevaluating the role of the port as a central urban space. The proposals shown in our analysis take both timescales into account, allowing for port uses to remain in operation for the next decade or so in the short term and for port uses to be completely confined to the northern shore and the remaining areas to be fully built out by 2040.



Real Estate Potential

Betty Vuong | Cesar Castro

Tallinn Real Estate

Overview

With a population of nearly 500,000, a healthy GDP per capita of $30,000, and a decreasing unemployment rate of about 8 percent, Tallinn provides a unique opportunity for developers interested in a stable market with the potential for high returns in the immediate and long term. The redevelopment of the port area near the historic district and established commercial corridor will allow the city not only to re-imagine the entire city and for developers to explore ways to integrate the existing spatial fabric and create new building typologies for the area.

With a housing stock of nearly 200,000 units as of 2012, a 97% private ownership rate, and absorption rates during 2015 ranging from 90-95% for residential and office uses, the market as whole extols a high level of confidence and success for potential new investors and developers in the area.

Overall, construction for residential and commercial buildings has picked up since a brief slowdown in 2013. Though new office and commercial buildings had outpaced the construction of residential buildings in the last few years, despite the healthy demand for new units coming from young professionals and family opting for more space or closer proximity to job centers, during 2015 that trend appeared to shift as more residential buildings came to the market.

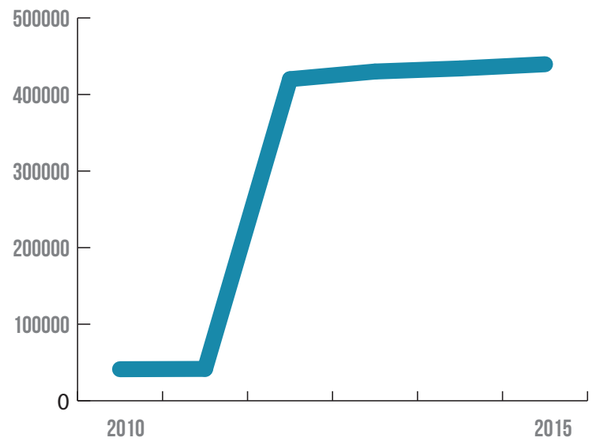
While the job centers continue to be near the traditional Commercial Business District of Tallinn, over the last few years companies have started to form clusters closer to the airport and a burgeoning tech center.[1]

The opportunity to bring and keep jobs and residential construction near the CBD area is there with the right mixture of zoning and incentives for developers.

1 Source Open Street Maps and Statistics Estonia

Housing Stock		
Number of dwellings		195,145
Total area of living space		11,526,381 m²
	State- and city-owned %	2.12%
	Private ownership %	97.07%
Average area per resident		27 m²
Souce: Statistics Estonia		

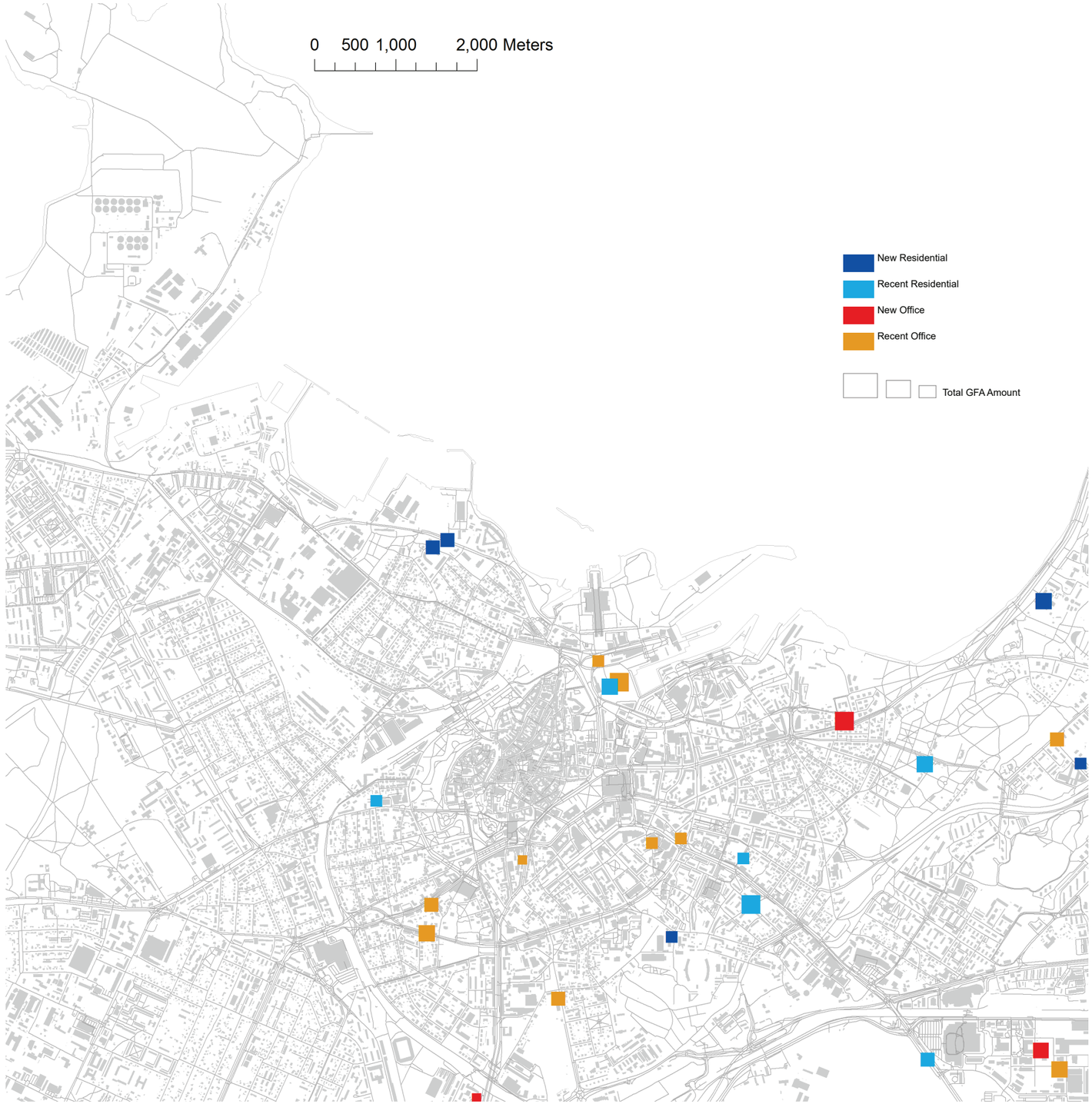
Volume of construction	2009	2010	2011	2012	2013	2015
Residential Buildings						
Number of dwellings	1,591	1,266	1,021	908	713	1,800
Area of dwellings (m²)	124,082	102,284	86,561	84,650	69,460	175,000
Non-residential buildings						
Total useful space (m²)	477,744	180,236	39,321	75,251	101,613	166,100
Office						20,500
Retail						45,600
Industrial						100,000



Population growth since 2010



A new vision for Tallinn

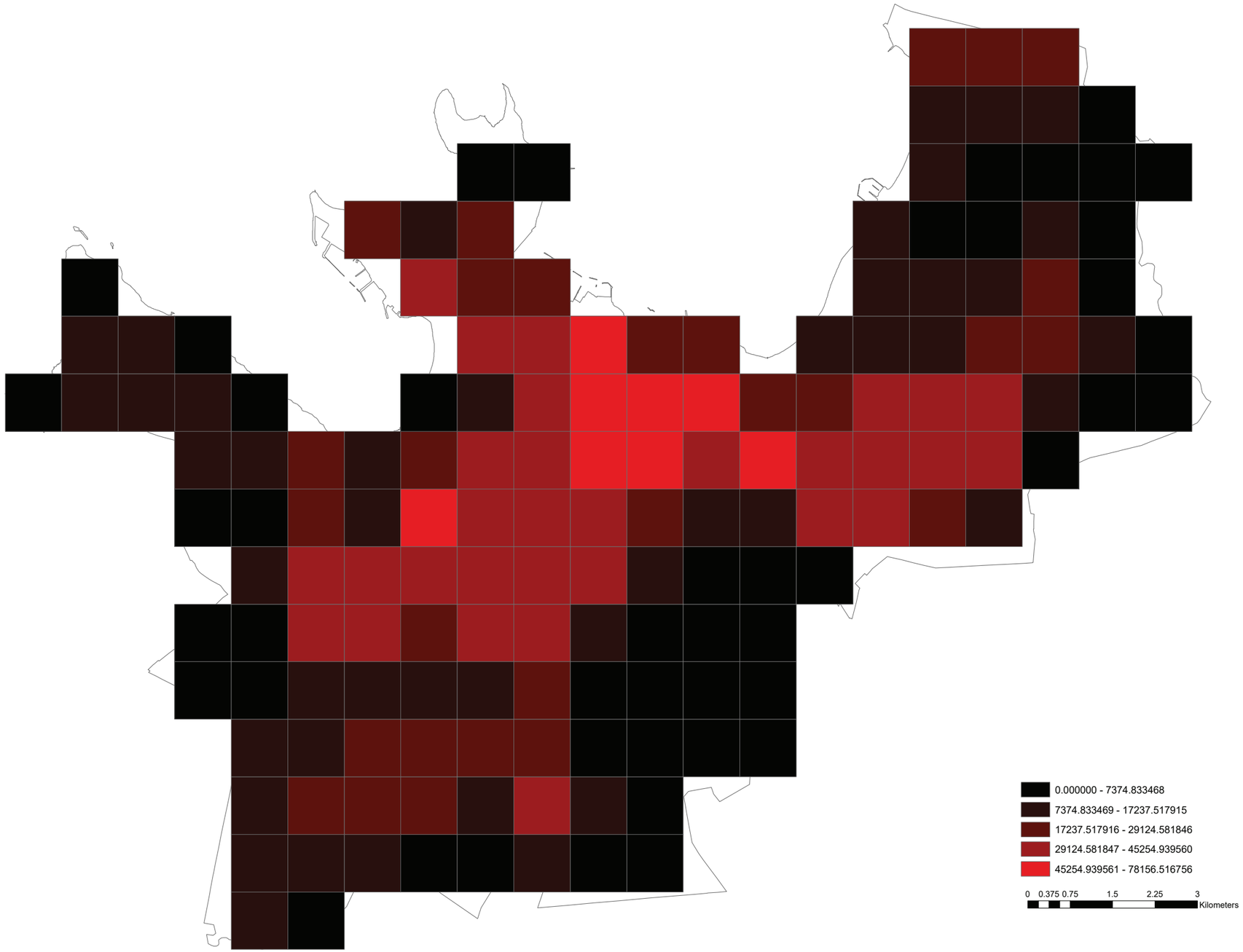




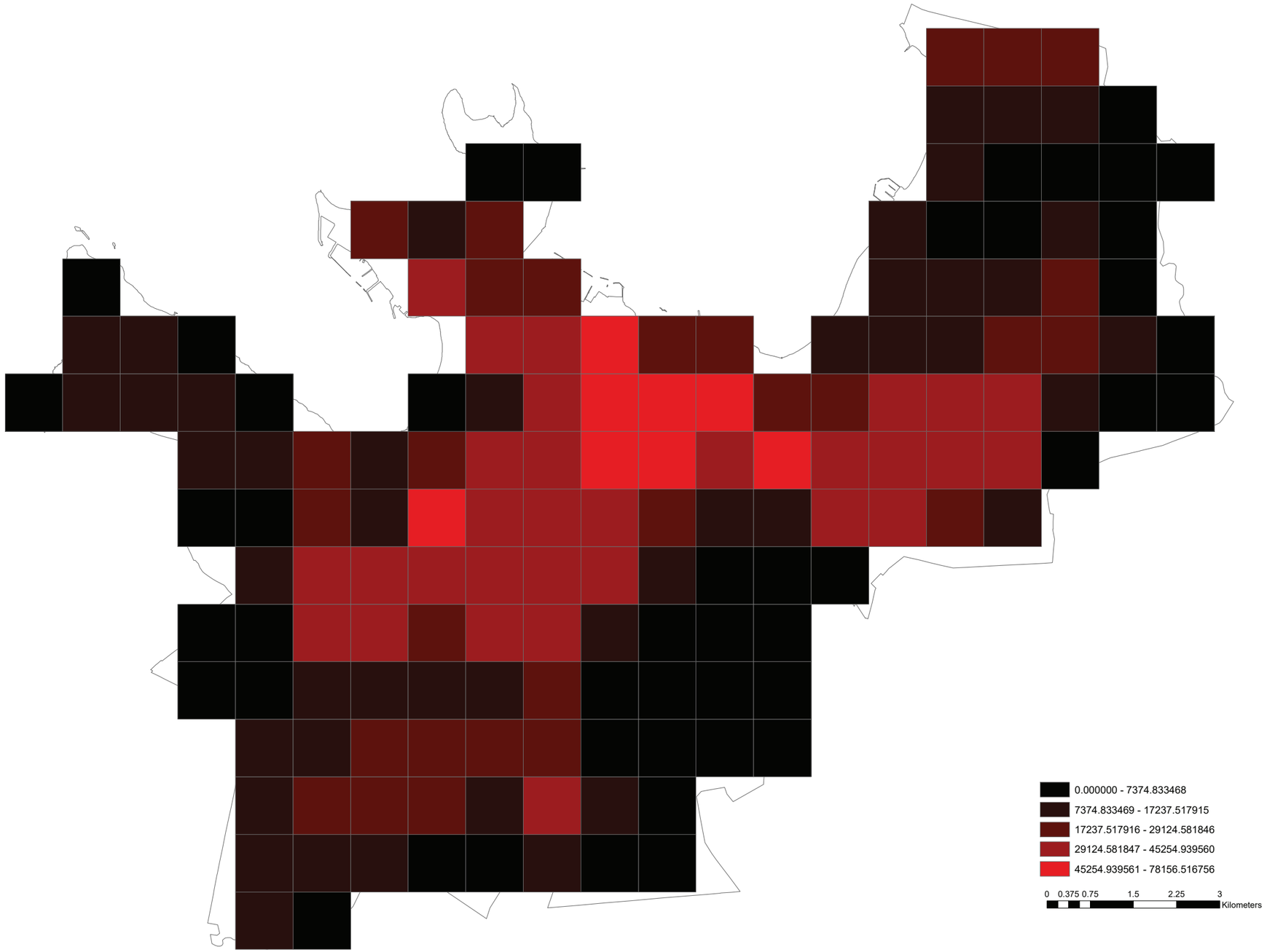


New and recent development in the area

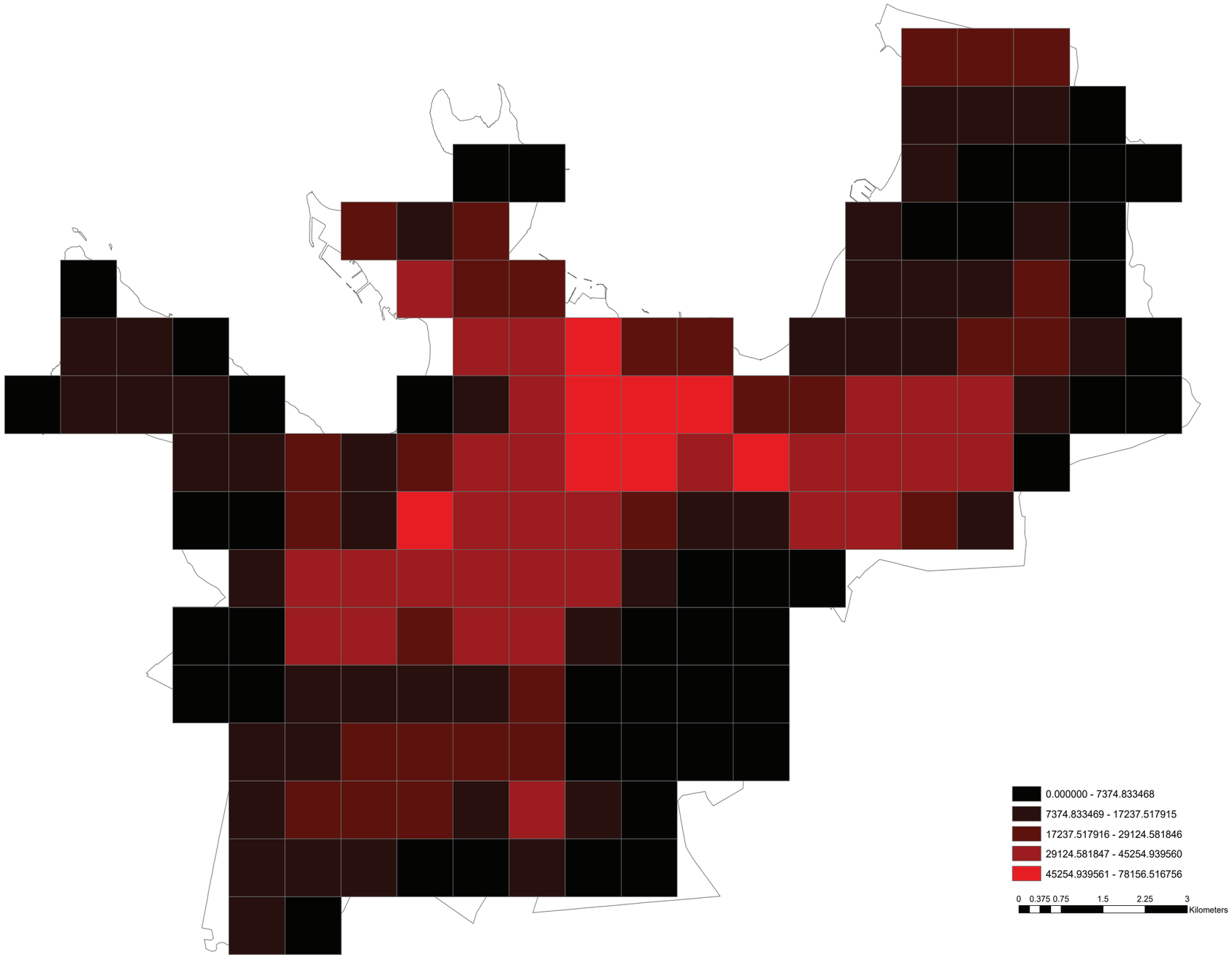
Population Estimates



Job Concentration (per 1 km)



Job Growth (per 1 km)



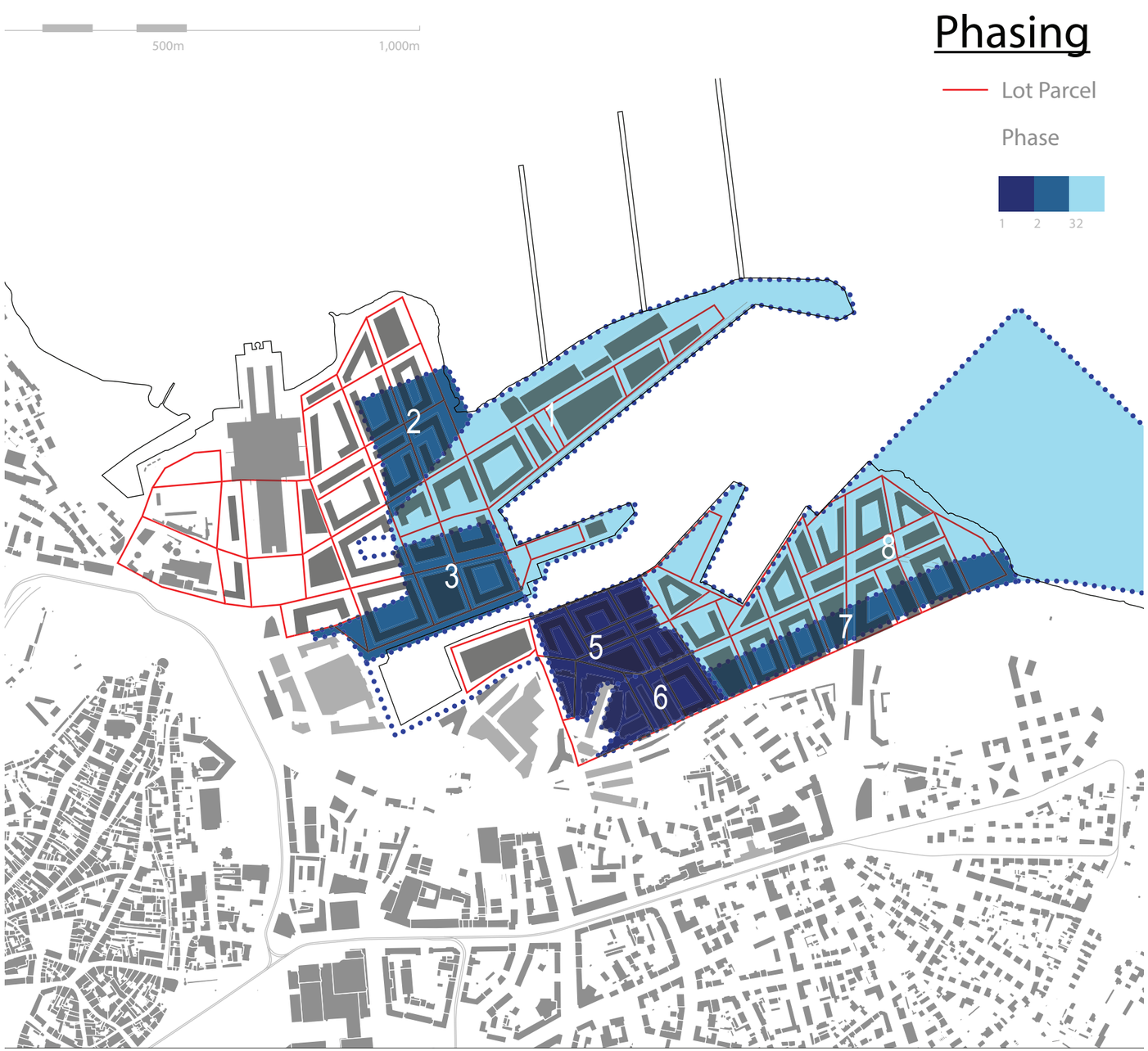
Approach

Phasing and Methods

Learning from Melbourne, Boston, Vancouver, and other relevant redeveloped harbor areas, we developed a planning tool that used zoning designations and policies, coupled with strategic phasing, to arrive at the potential land value area. This in turned allowed us to determine which potential use best served the different corridors from a real estate perspective and gave the project the opportunity to toggle between different scenarios.

Based on other precedents, particularly Melborne, Australia, and current market trends in Tallinn, we determined that serving the retail and housing market first complimented not only the existing spatial topology of the area, but also allowed the potential interests of developers. Moreover, the proximity to existing commercial zones and residential areas that are currently or would likely be within a five minute walk to public transit reinforced the potential development of those sectors. With that in mind, we envision the development of Districts 6 and 5 first, followed by 3, 2, and 7. Finally, Districts 8 and 1, the active harbor districts, would be the last to be developed from a land value and use and perspective.

In regards to the method through which we arrived at our phasing, we considered existing forces, and then strategize ways to inject new development projects that would synergize the entire area district by district. Moreover, we took into consideration the impact posed by both public and private stakeholders, such as the need to balance the needs of tourists and local residents. Lastly, we attempted to use a hierarchy of commercial activity appropriate for each of the district's characteristics. Such characteristics included: convenience goods and service for the immediate neighborhood and pedestrian; convenience goods and services to the larger neighborhood.; diversified commercial environment serving larger markets.



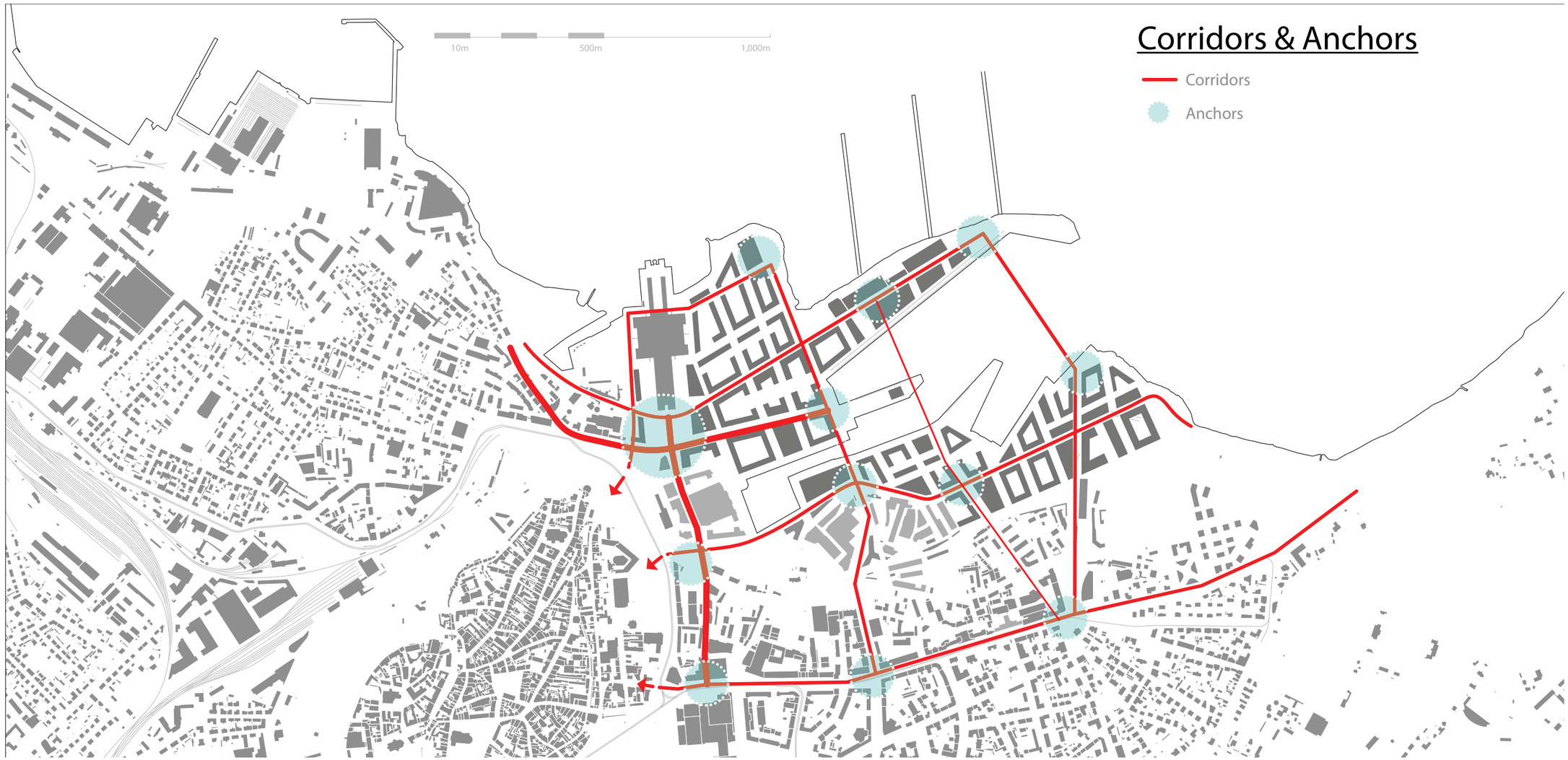
Proposed Big Picture Plan

Key Elements

In addition to the characteristics of the proposed phased plan already discussed, special note should be taken on the key elements introduced. To start, one can point out to the introduction of a High-End Retail Area that will inject a new commercial typology to the area and allow potential tenants to capture as many eager visitors and shoppers as possible. Another key feature to take into account is the introduction of bigger residentials units that may cater to the needs of local families. Moreover, the introduction of student housing and Class B Office Use introduces a sense of innovation and vibrancy to the area.



Phasing and Nodes of Interest



Sensitivity Analysis

In order to test the different scenarios a qualitative analysis for proximity to tram was conducted using the gravity index, at 400m radius and 0.004 beta variable. Moreover, a qualitative analysis for walkability to the water edge were conducted using the gravity index, at 400m radius and 0.004 beta variable. Lastly, Qualitative analysis for accessibility to retail offerings was conducted using the betweeness analysis, at 1.5 detour ratio, with building origins weighted to the number of people.

Additional metrics used:

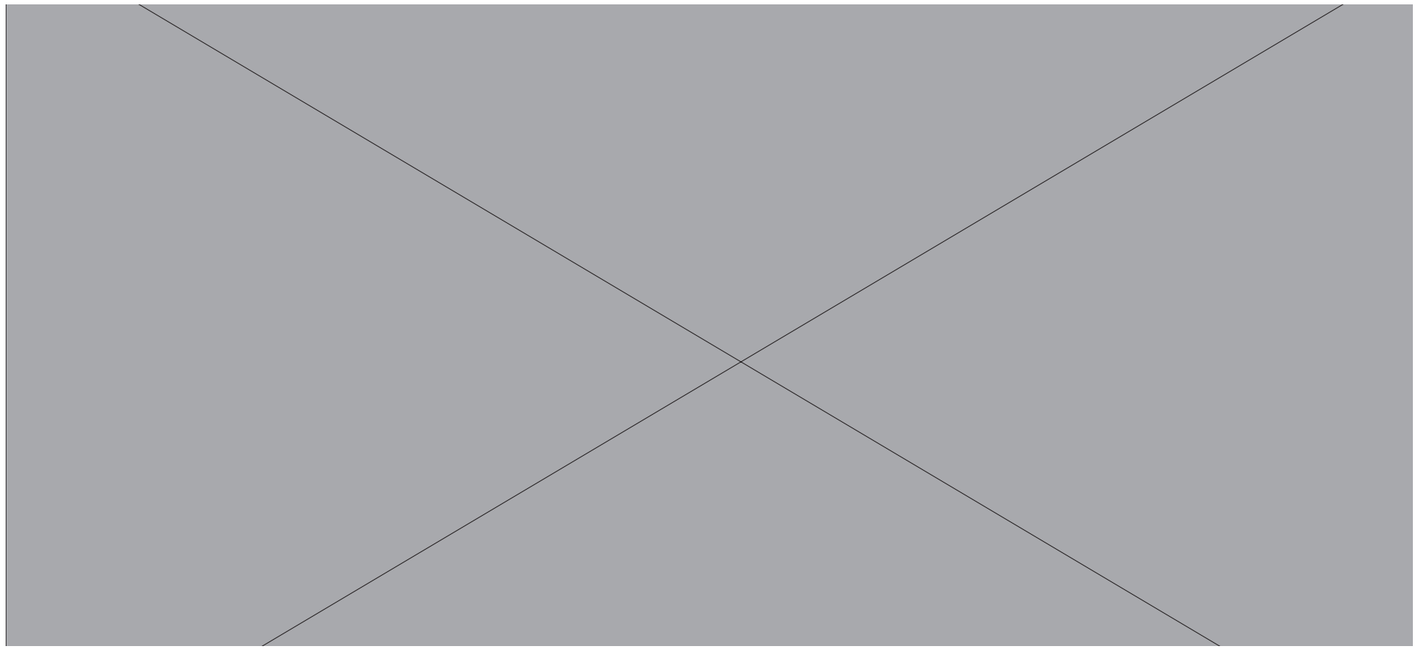
--People calculated at approximately 20sqm / person
--Extrapolated from GFA, at maximum 6 stories
--Each lot receives the summation of the betweeness results according to its street frontage

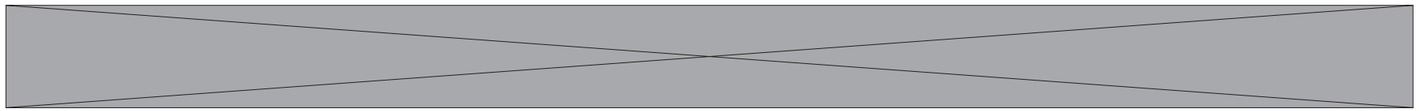
Additional consideration should be noted for scenario involving tourism season, the number of people offloaded from cruises and boats can significantly increase the betweeness analysis along lots located in the north pier. Furthermore, water edge destinations were given equal weight, but this metric when weighted against “feature public spaces” can have an effect on the potential rent premiums.

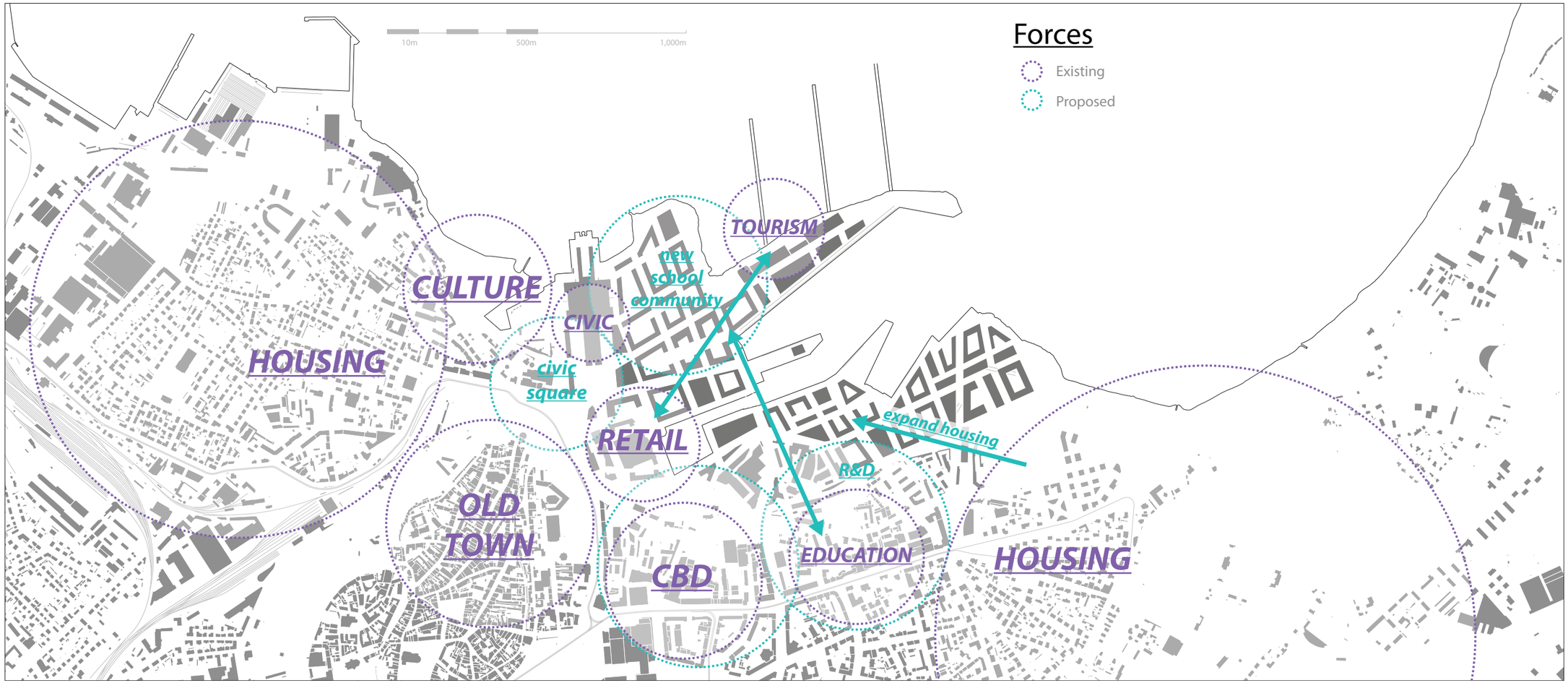
The combined qualitative results were blended equally to yield a premium percentage that can be applied to and/or inform an appropriate rental rate within the broader Old Town/City Centre submarket range.

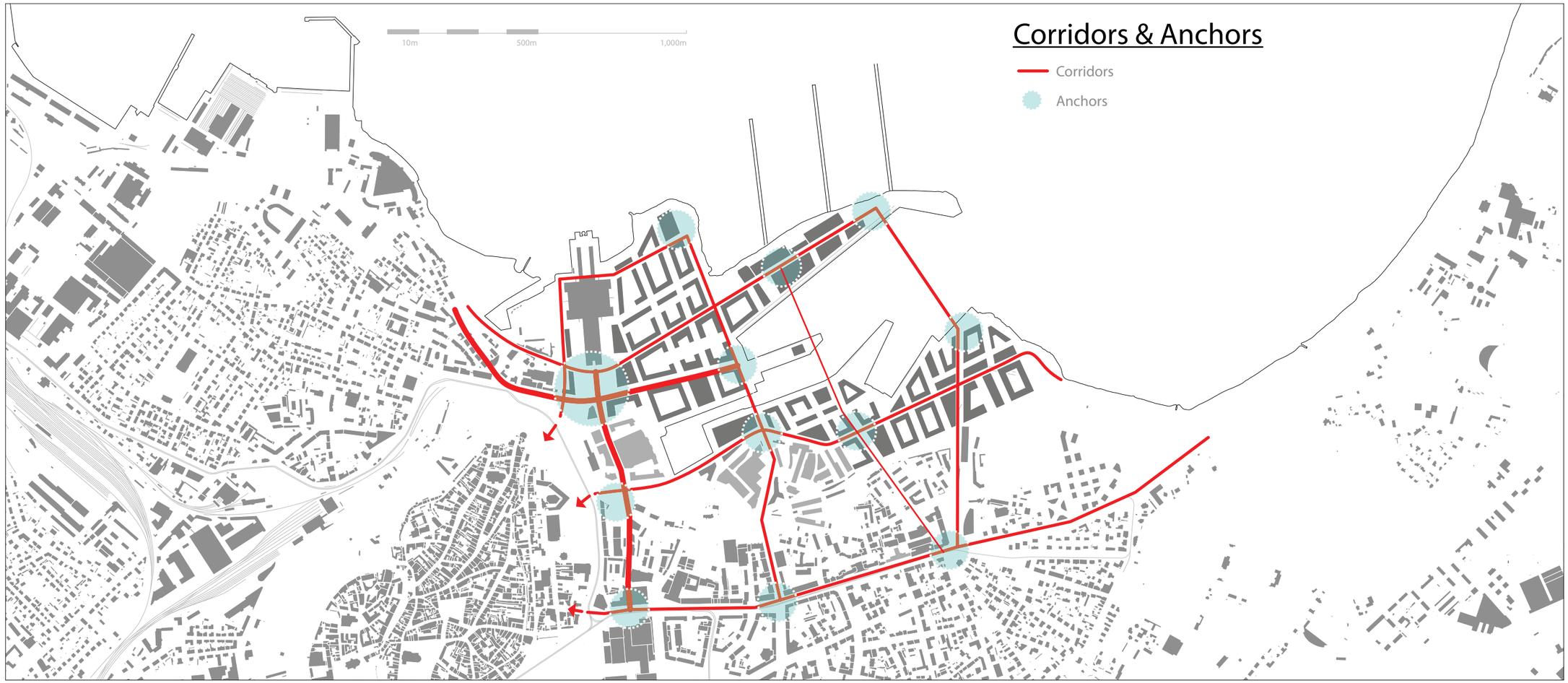
Overall the analysis concludes that although the qualitative premiums have an evident correlation to the residual land value, the main driver of residual land value is the designated program use of the building. Therefore, using zoning regulations and policies can be used to drive land value.

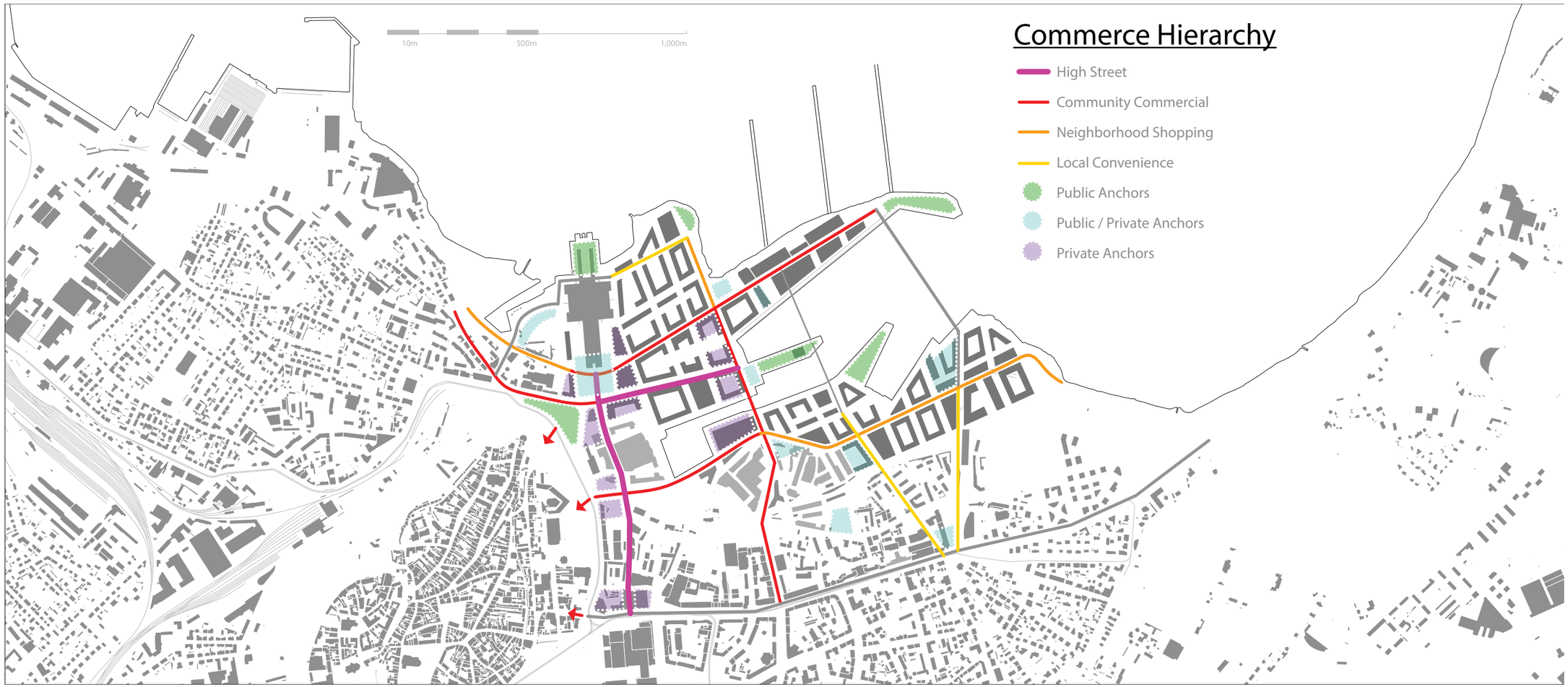
[Scenario 1] Residential:	**25% Rental**	**75% For Sale**	**0% Affordable Rental**
[Scenario 2] Residential:	**50% Rental**	**50% For Sale**	**0% Affordable Rental**
[Scenario 3] Residential:	**30% Rental**	**50% For Sale**	**20% Affordable Rental**
[Scenario 4] Residential:	**75% Rental**	**25% For Sale**	**0% Affordable Rental**





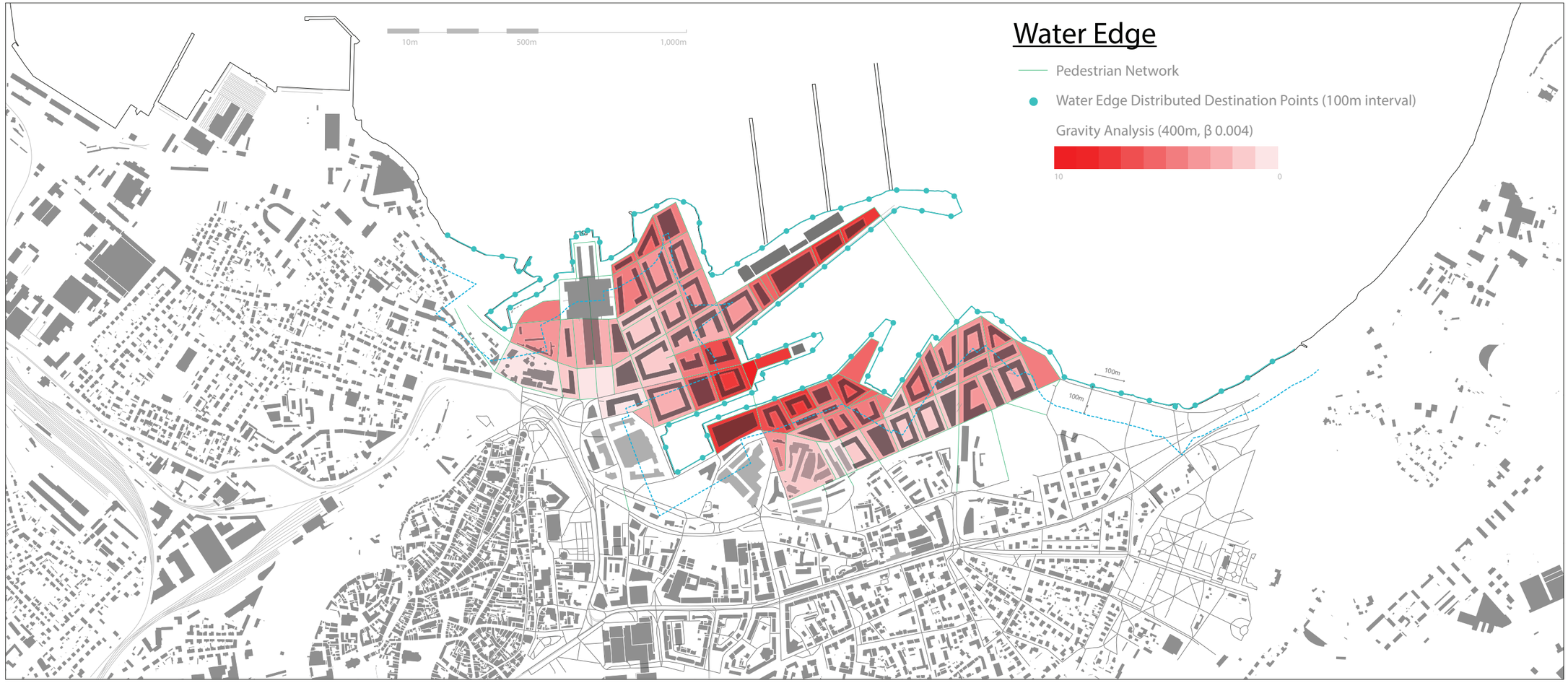

10m
500m
1,000m
Forces
Existing
Proposed
CULTURE
HOUSING
CIVIC
civic square
new school community
TOURISM
RETAIL
expand housing
R&D
OLD TOWN
CBD
EDUCATION
HOUSING

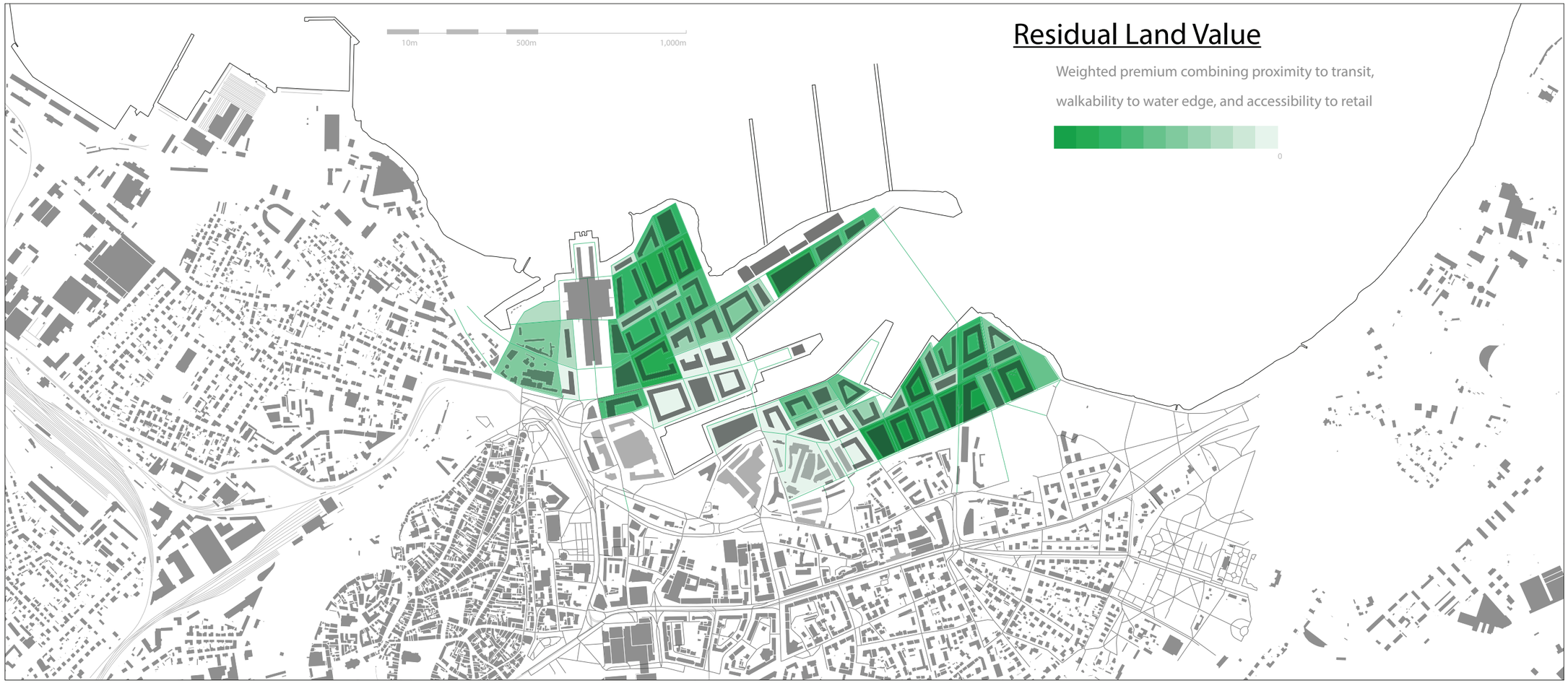

10m
500m
1,000m
Corridors & Anchors
Corridors
Anchors

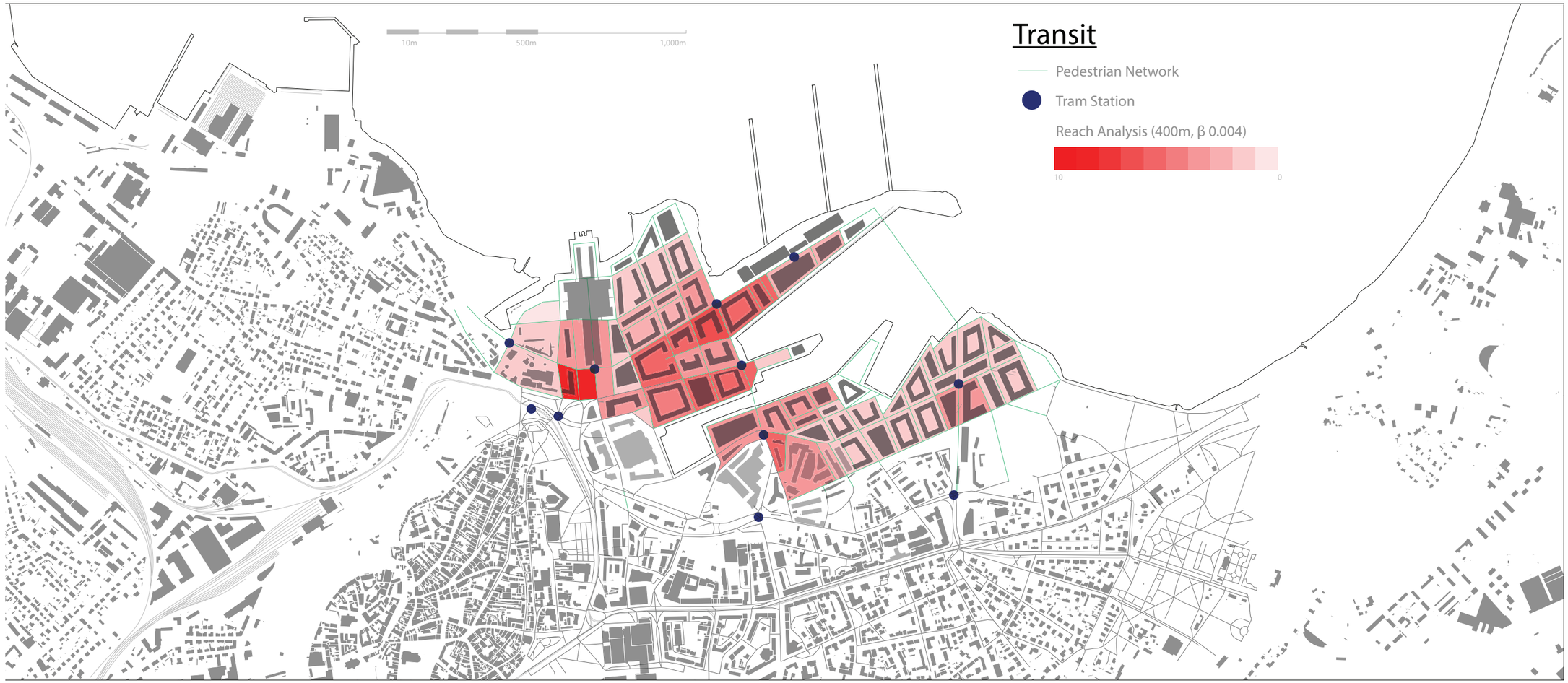

10m
500m
1,000m
Commerce Hierarchy
High Street
Community Commercial
Neighborhood Shopping
Local Convenience
Public Anchors
Public / Private Anchors
Private Anchors

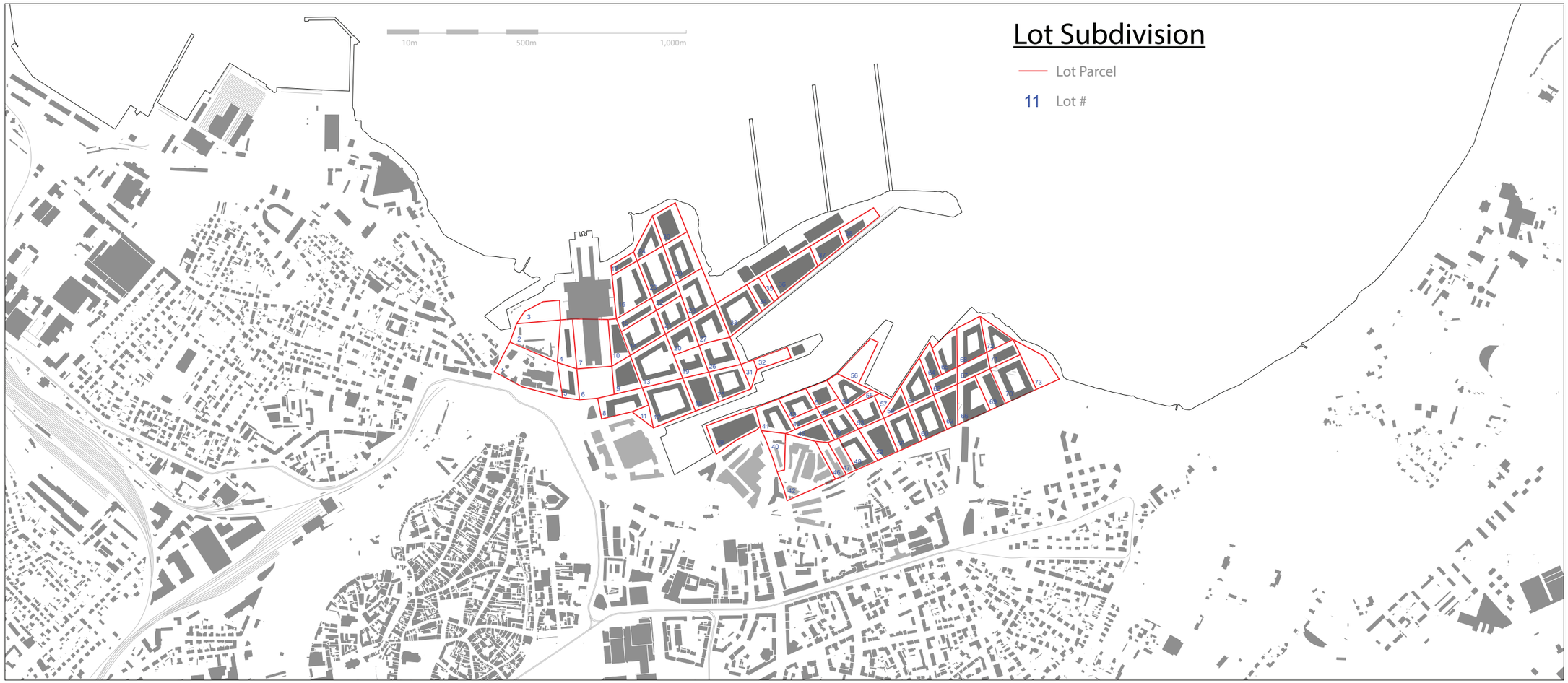

10m
500m
1,000m
Qualitative Premium
Weighted premium combining proximity to transit,
walkability to water edge, and accessibility to retail
5%
0%

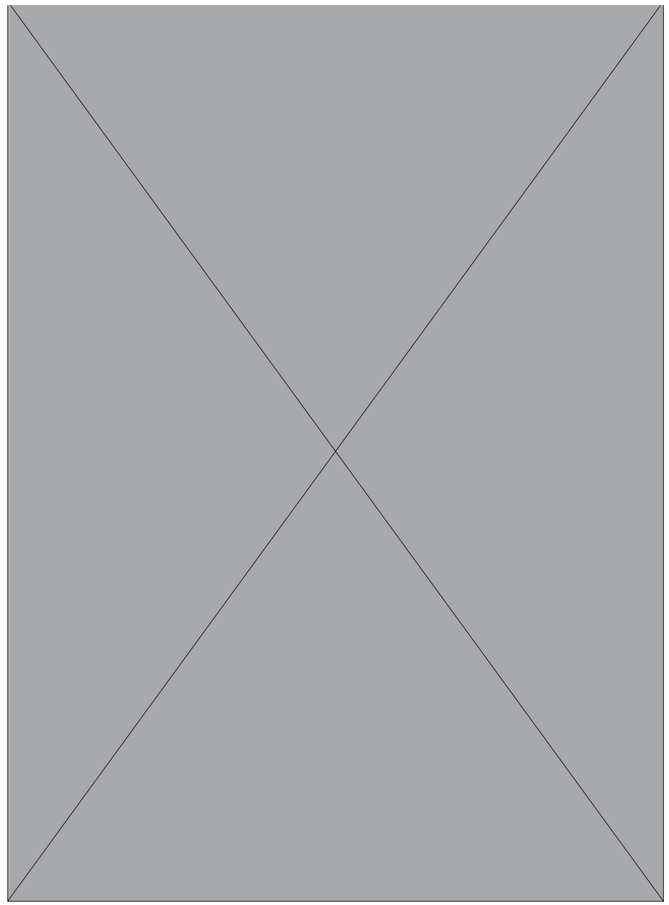

10m
500m
1,000m
Destinations
Pedestrian Network
High Street
Community Commercial
Neighborhood Shopping
Local Convenience
Betweeness Analysis (1.5 detour ratio, weight=people)
6500
0

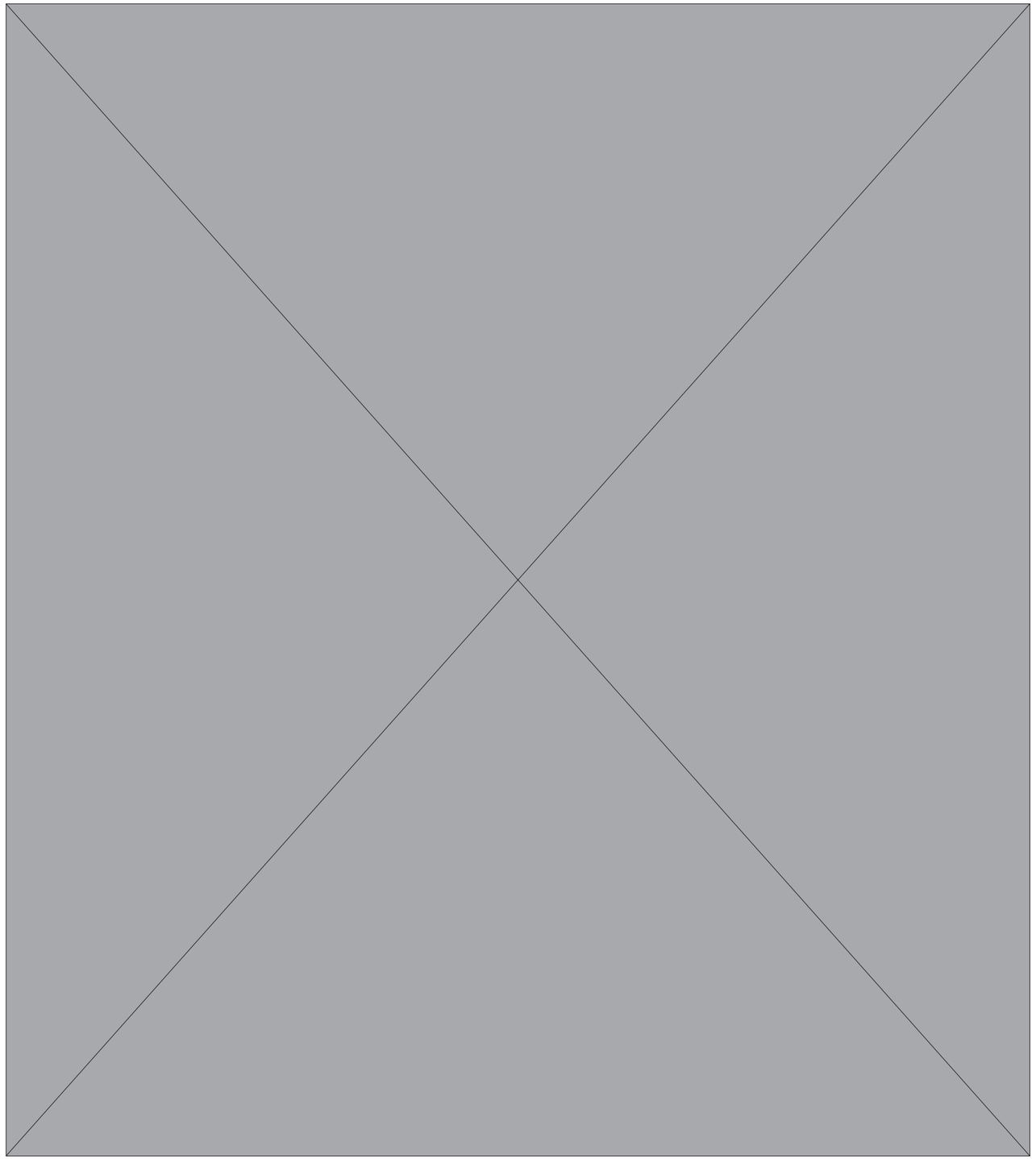

10m
500m
1,000m
Water Edge
Pedestrian Network
Water Edge Distributed Destination Points (100m interval)
Gravity Analysis (400m, β 0.004)
10
0
100m
100m

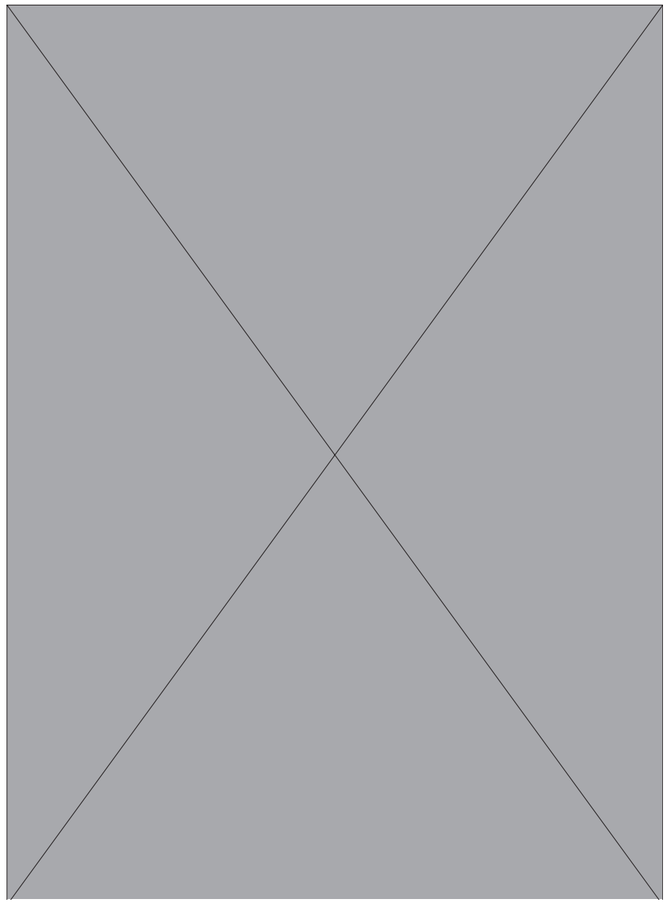

10m
500m
1,000m
Residual Land Value
Weighted premium combining proximity to transit,
walkability to water edge, and accessibility to retail
0

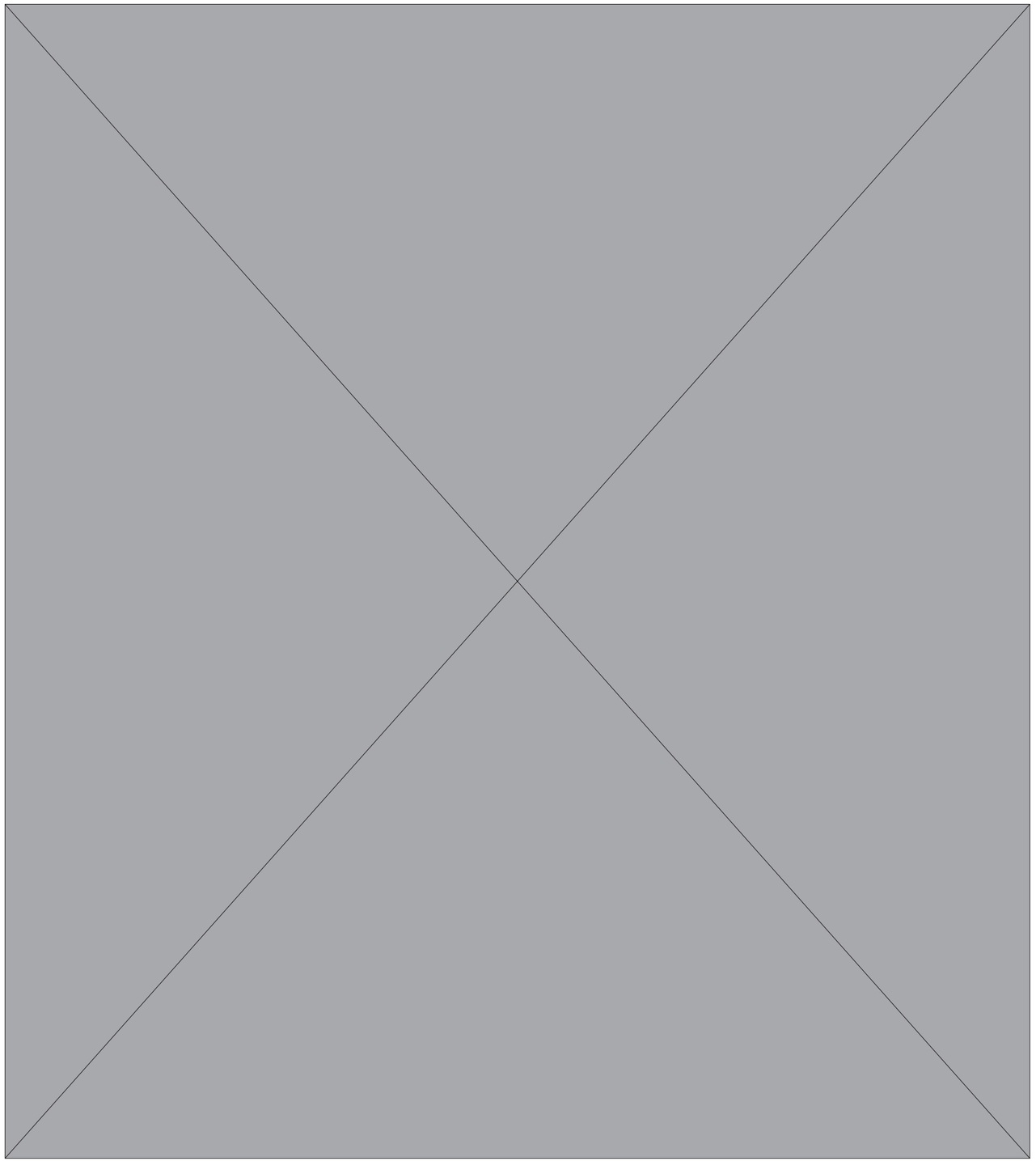

10m
500m
1,000m
Transit
Pedestrian Network
Tram Station
Reach Analysis (400m, β 0.004)
10
0

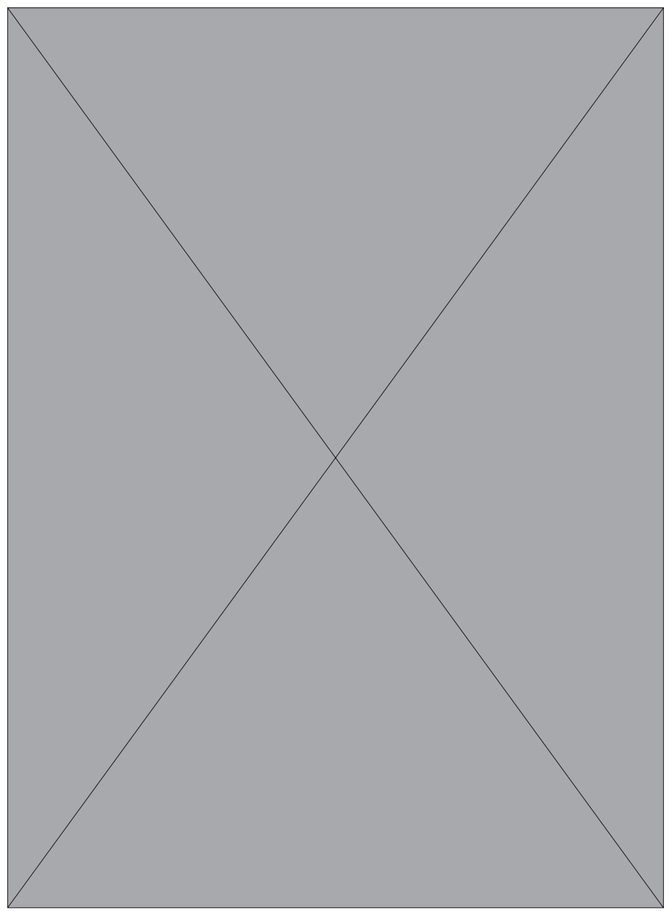

10m
500m
1,000m
Lot Subdivision
Lot Parcel
11 Lot #

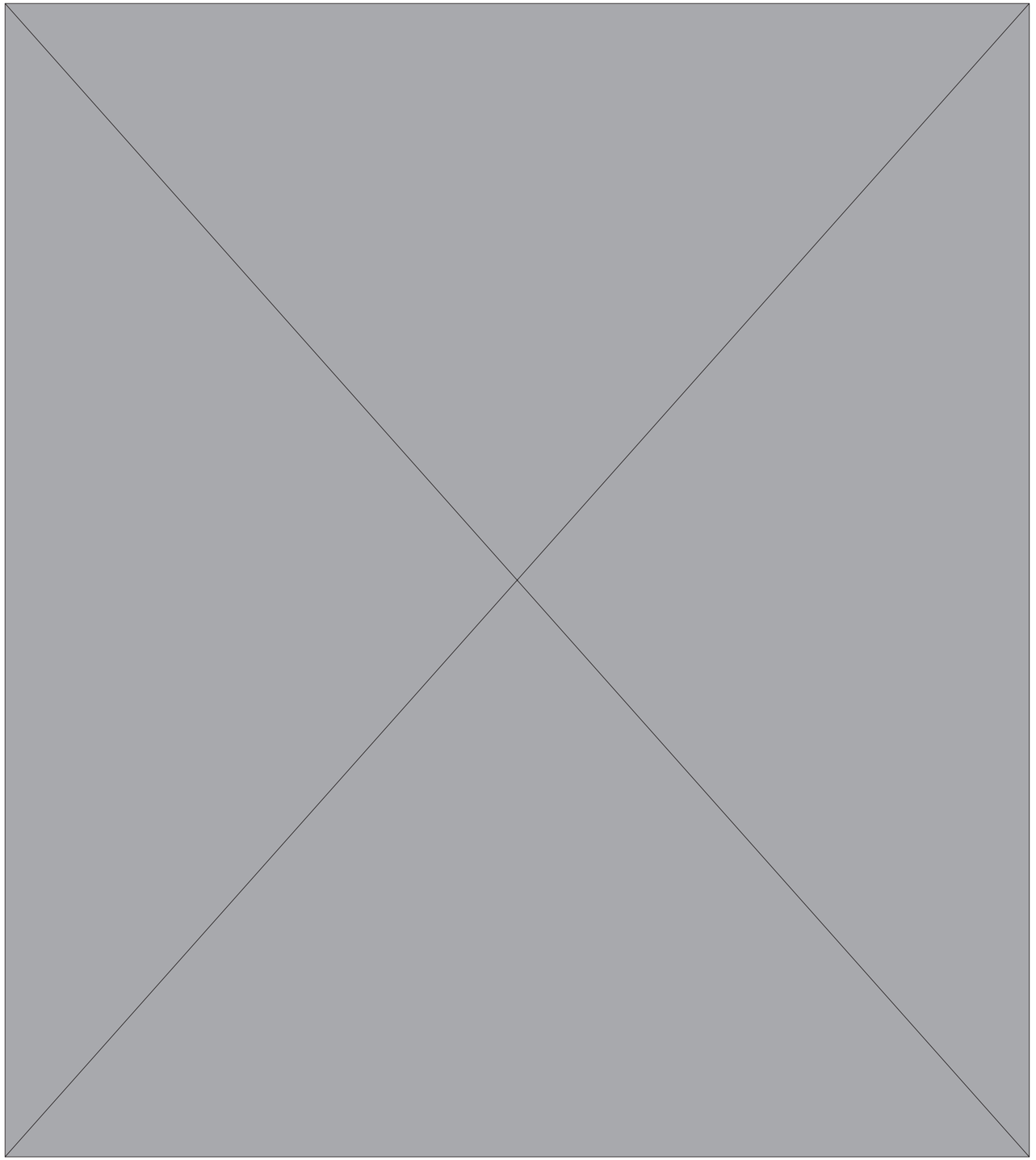


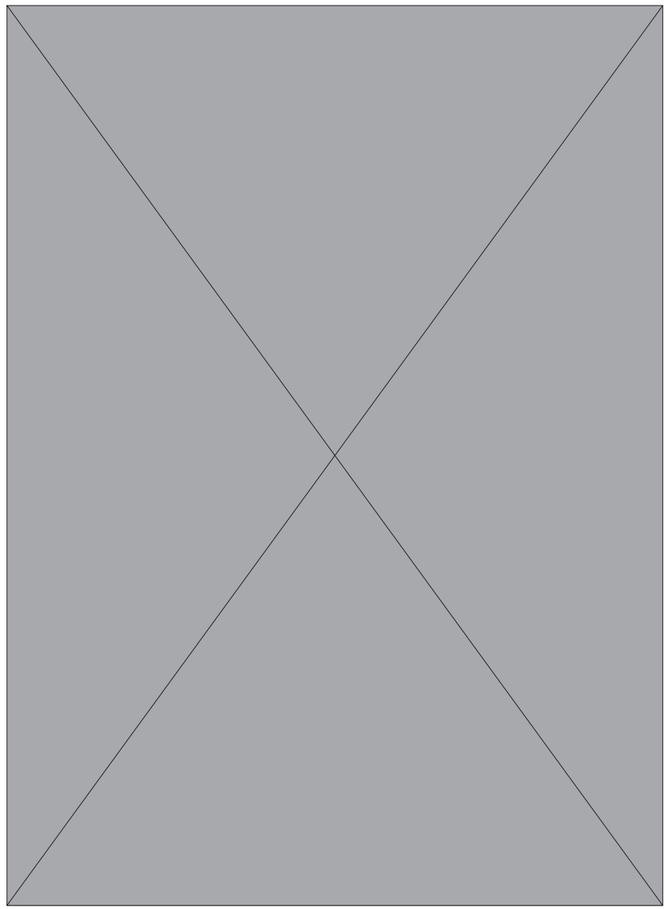


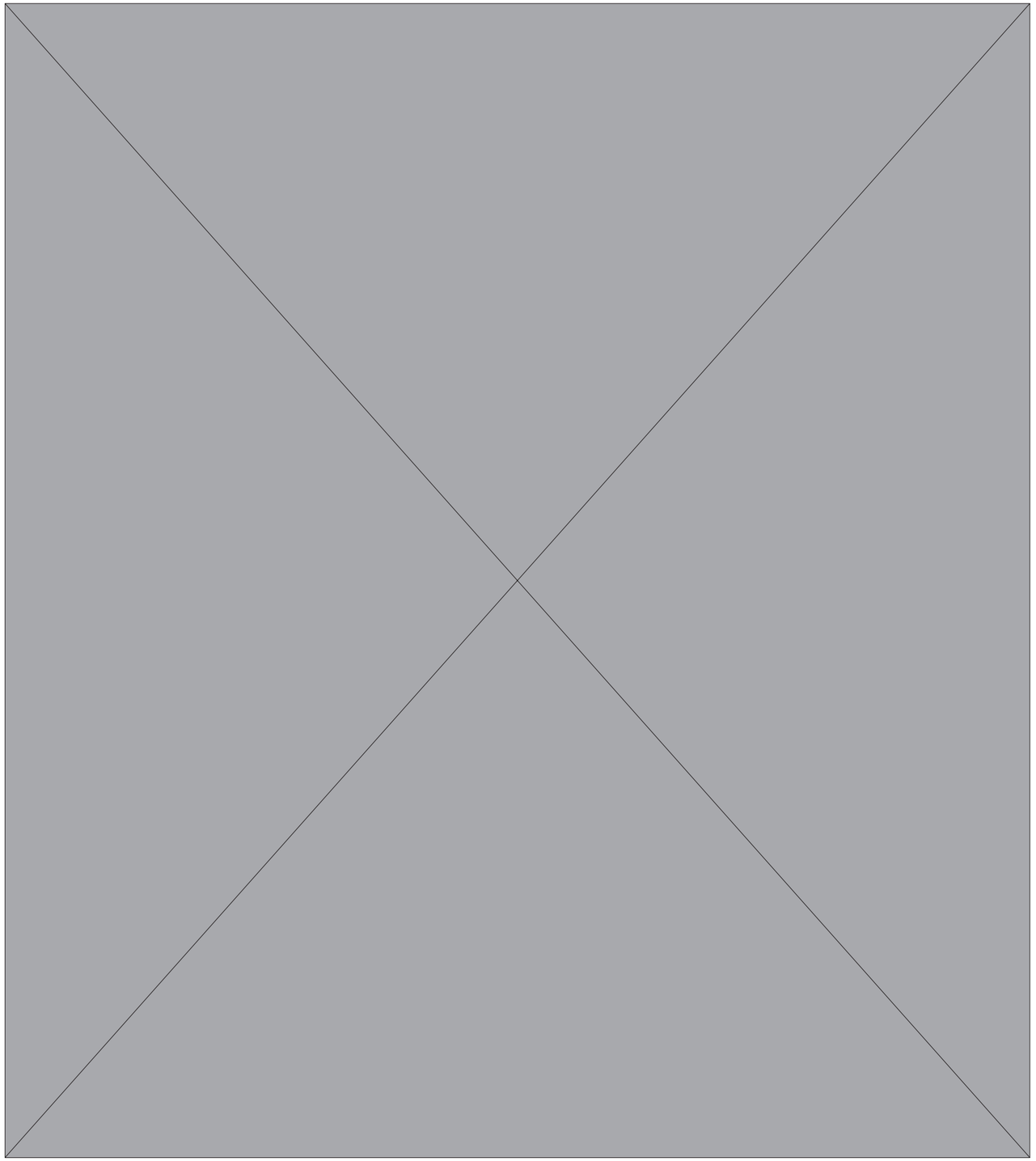












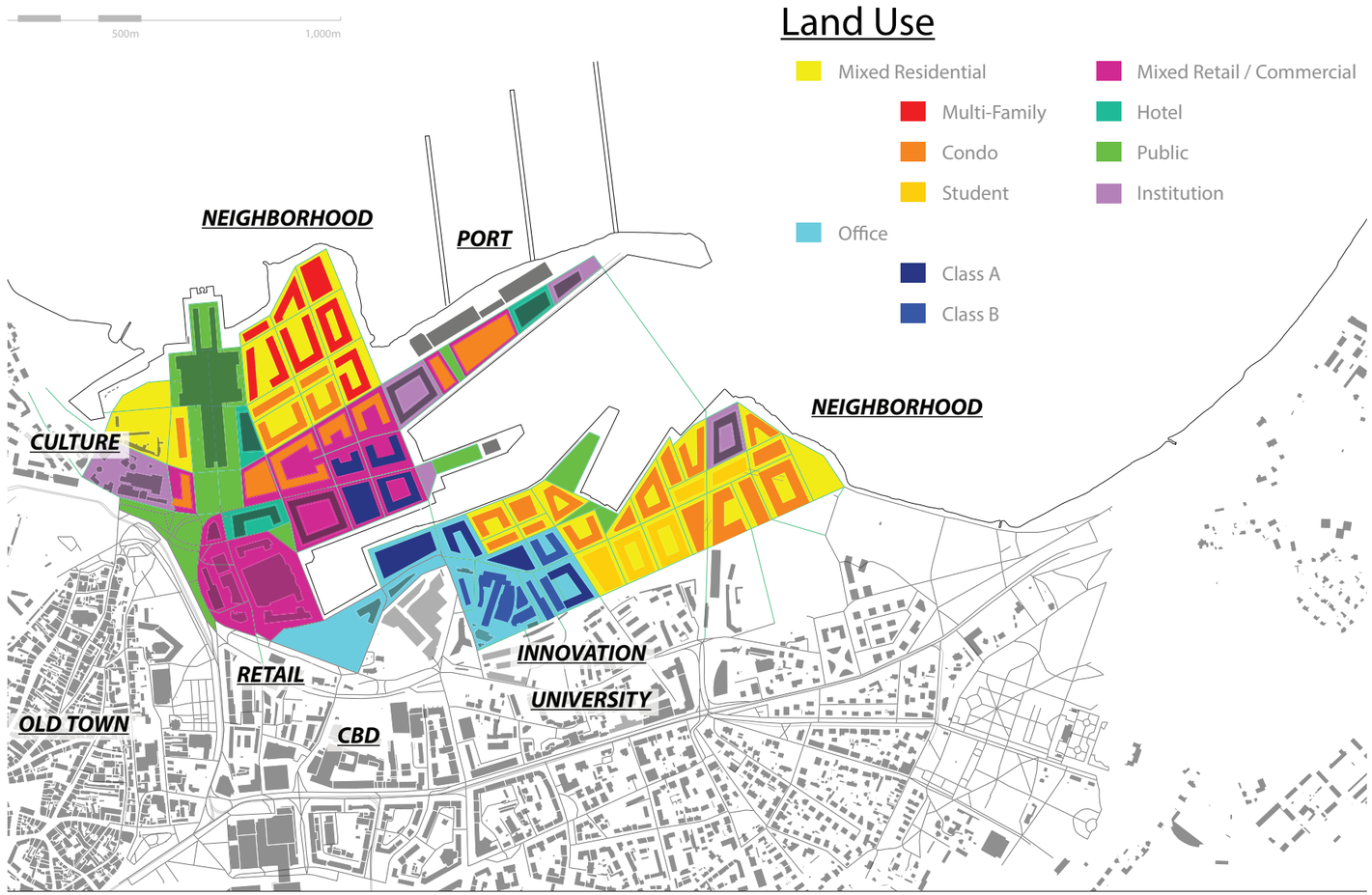
Conclusion

While our analysis concludes that zoning regulations can indeed be utilized as a planning tool to drive the land value of the corridor, particularly if the zoning complies with certain qualitative assumptions of location, lot size, and market forces that further refine the potential uses of the block and parcel.

Using this methodology we can arrive at a new vision of the port area of Tallinn that not only takes into account the potential needs of current residents and anchors, but also the expectations and necessities of newcomers and tourists. The end result is a new spatial fabric that merges the old with the new, incorporates families with students, taps into the innovation of the growing tech center and university, and results in a potentially vibrant and diverse built environment.

Our approach can achieve such vision while not only meeting the aspirations of local community and stakeholders, but also the financial expectations of developers.

These method and approaches are not only based on the best practices our study observed in ports across the globe, but also took account local expectations regarding height and overall typology. While hurdles will remain, particularly around the attempts to maintain some level of affordability to the area, our proposal and tool tackle those issues head-on and provide some scenarios that may help ease those concerns. Lastly, while our proposed tool and method does not analyze the difference of a ground lease or parcel sale for the area, such concerns and issues should examine further not only to determine the potential land value of the parcels and area, but also allow the port authority to fully understand what options work best for them and Tallinn as a whole.



Cars, Roads, & Parking

FAN WANG | MARIA GLORIA ROBALINO

Structures and Questions to Address

Questions to Address

1. Metro Stop Parking for Suburban Household

2. Local Development Parking Strategy

3. Port Terminal Parking Strategy

Strategy # 1

Metro Stop Parking



Parking Spaces: 2,733

Average Weekday Availability: <5%

Parking Rate: $7.00/ first 14 hours

$15.00 after 14 hours

$15.00 for each additional day



Strategy # 1

Metro Stop Parking

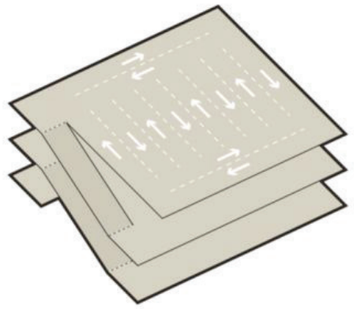


Strategy # 1

Metro Stop Parking



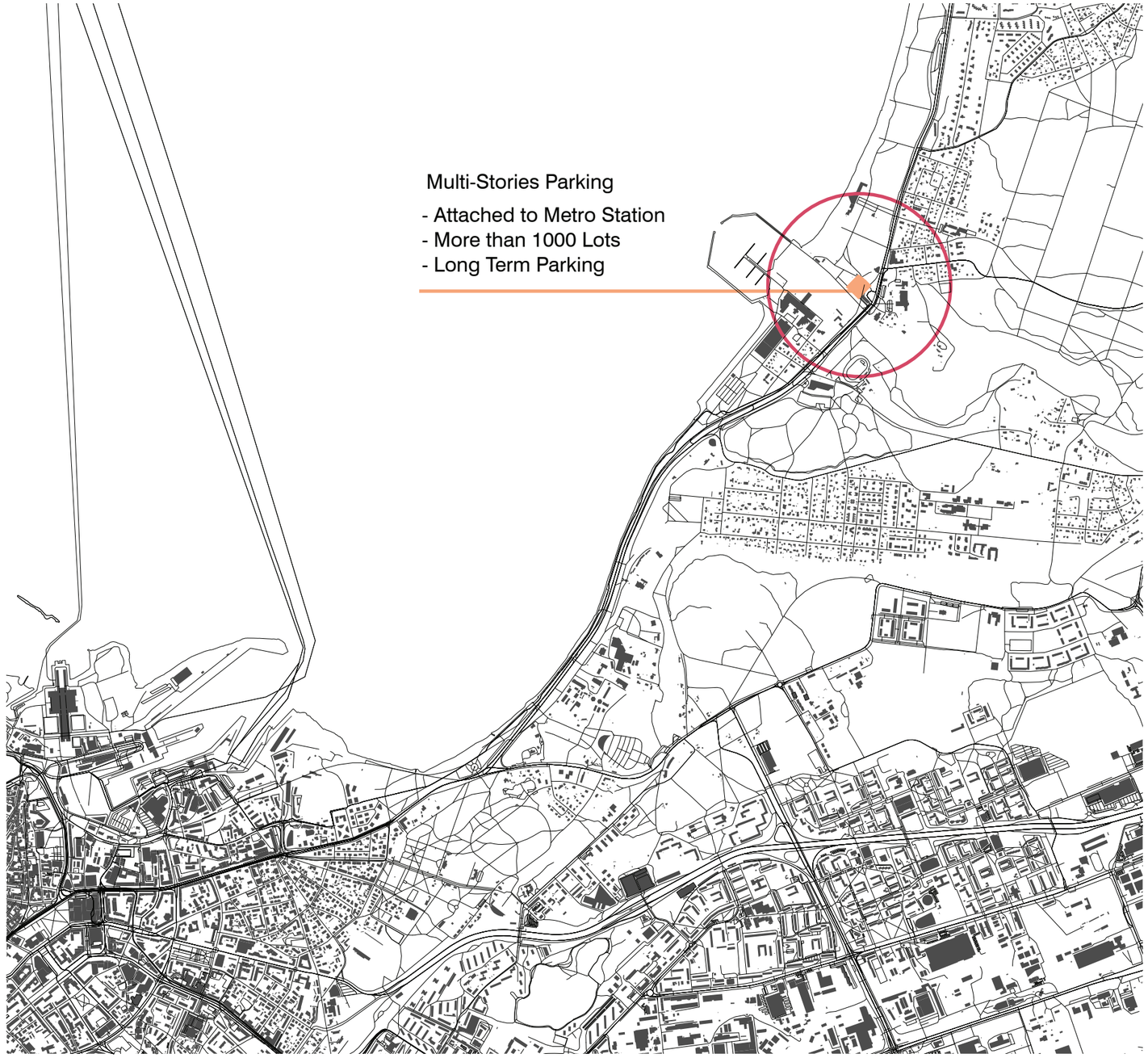
Current Condition



3 Floor Multi-storey Parking

Multi-Stories Parking

- Attached to Metro Station
- More than 1000 Lots
- Long Term Parking



Strategy # 2

Local Development Parking Strategy



Strategy # 2

Local Development Parking Strategy

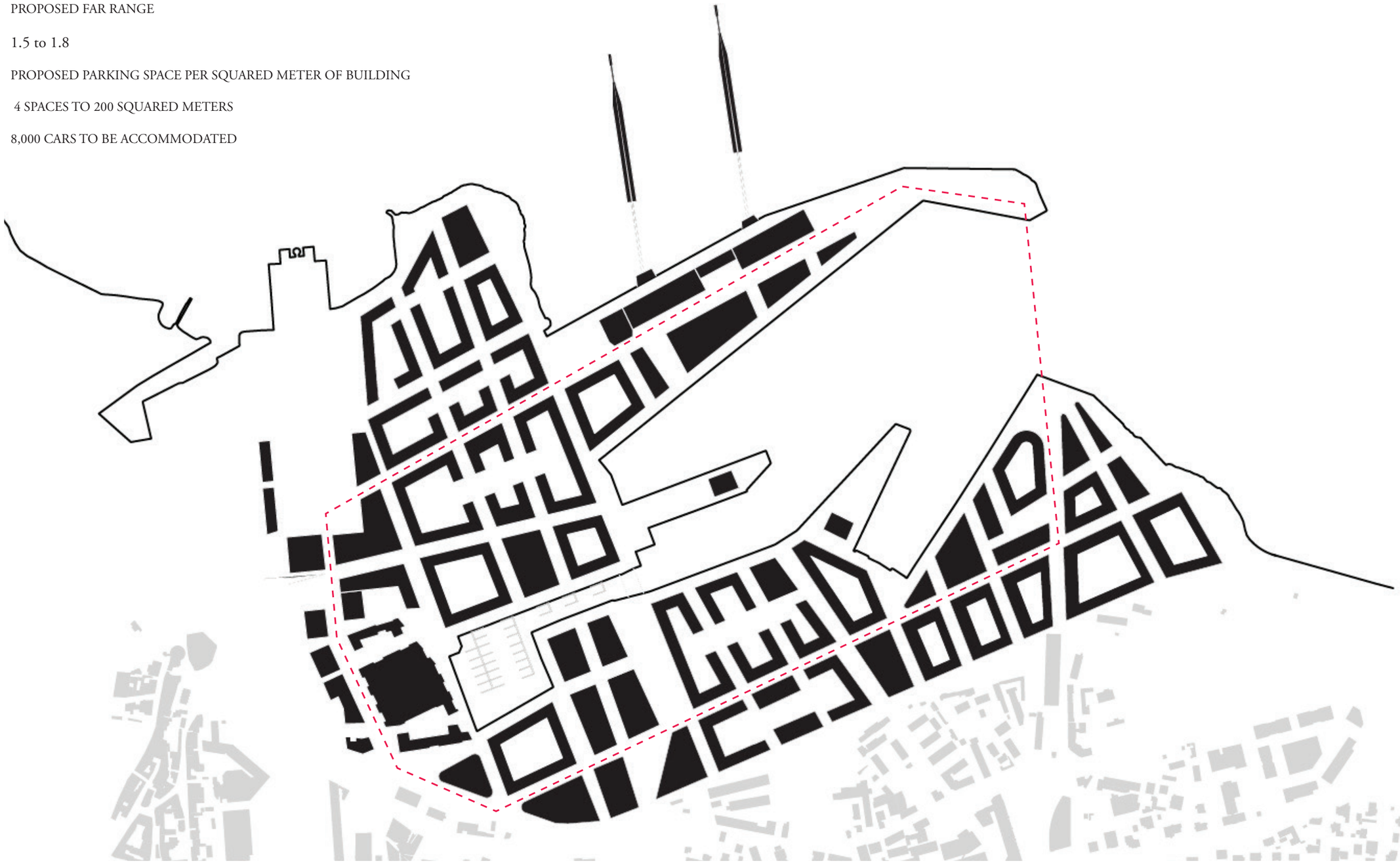
PROPOSED FAR RANGE

1.5 to 1.8

PROPOSED PARKING SPACE PER SQUARED METER OF BUILDING

4 SPACES TO 200 SQUARED METERS

8,000 CARS TO BE ACCOMMODATED



CAR DISTRIBUTION

75% GARAGE BOUND

-SEMI-PRIVATE MUNICIPAL GARAGES



Diaz & Diaz Arquitectos, Coruna Hospital



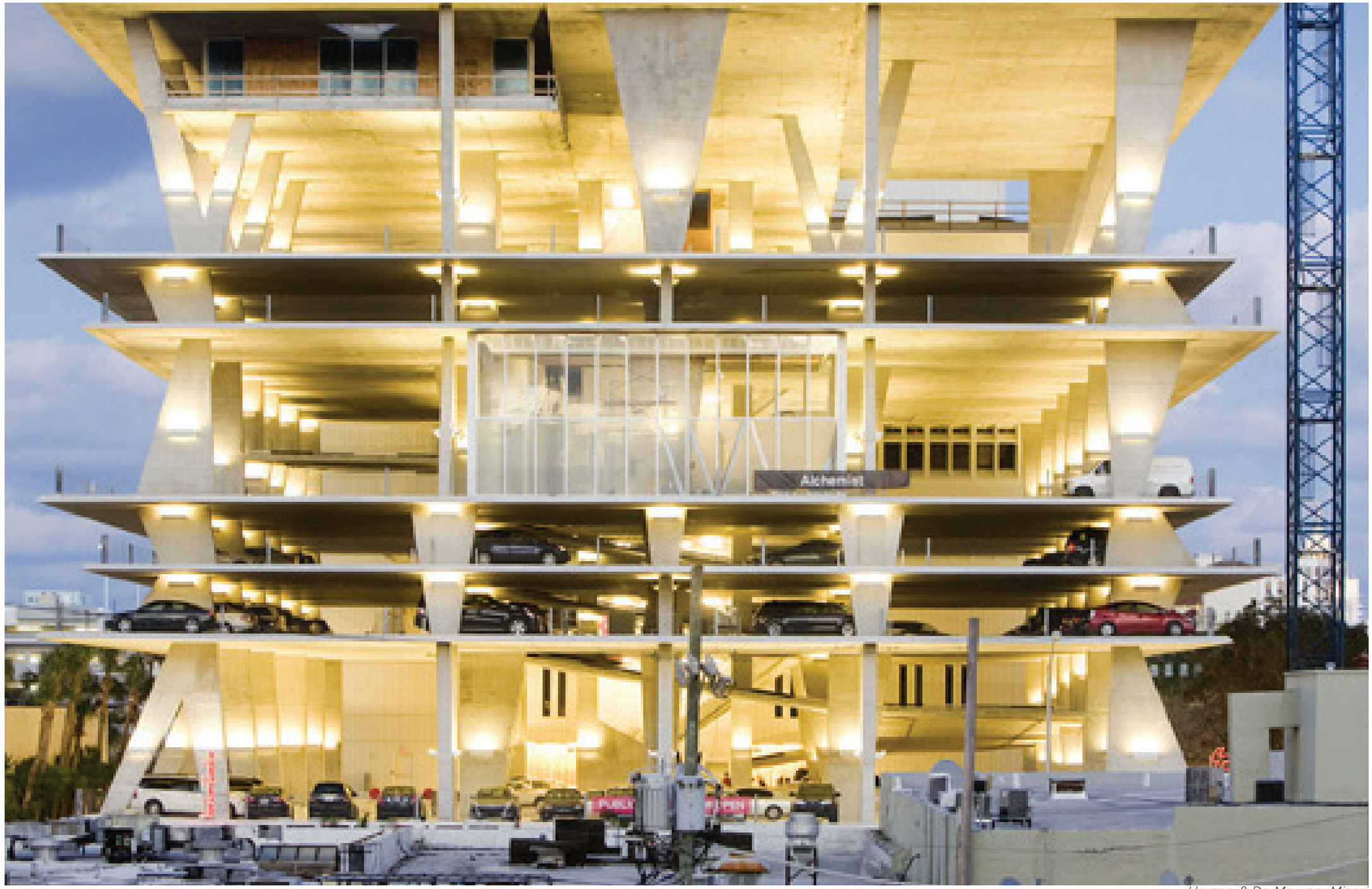
Abscis Architecten, Sr. Lucas Hospital



Brisac Gonzalez, Bordeaux City



Iwamoto Scott, Miami



Herzog & De Meuron. Miami

25 % STREET PARKING

- 2 TO 3 HOUR MAXIMUM STREET PARKING

-STRIPS LOCATED PERPENDICULAR TO THE PEDESTRIAN LOOP

- ALLOCATED FOR BUILDINGS FARTHEST FROM GARAGES

-ALLOCATED FOR USERS WITH SPECIAL NEEDS



Strategy # 2

Local Development Parking Strategy

Meter Parking vs. Mobile Parking





Strategy # 2

Street Parking Locations (For residents)





Special Needs/distant from garages

Strategy # 2

Local Development Parking Strategy





Multi-Stories Parking



Underground Parking



Permit Only Parking

Strategy # 3

Port Terminal Parking Strategy



Changi Airport, Singapore

Two-Story Taxi Pick-up Set



Strategy # 3

Port Terminal Parking Strategy

Cruise Ship Schedule 2016: Tallinn

Planeeritavad kruiisilaevade külastused Tallinnas 2016

Laev Vessel	Kuu Month	Saabumine Arrival	Väljumine Departure	Kell Time	Laevagentuur Ship Agency	Reisijad PAX
MSC Musica	5	4	4	0900-1600	Estma	2500
Regal Princess	5	6	6	0800-1700	CF&S	3600
Celebrity Silhouette	5	6	6	1000-1700	Inflot	2800
Marco Polo	5	7	7	0930-1615	Estma	725
Zuiderdam	5	8	8	1000-1700	Atlas	2000
Minerva	5	8	8	1200-1900	Estma	400
Aidamar	5	9	9	0900-1700	Estma	2200
Viking Star	5	10	10	0700-1600	Estma	900
Norwegian Star	5	11	11	0900-1730	Estma	2000
MSC Opera	5	11	11	1000-1600	Estma	1500
MSC Musica	5	11	11	0900-1600	Estma	2500
Aidadiva	5	12	12	0900-1700	Estma	2000
Costa Luminosa	5	12	12	0900-1700	Estma	2500
Magellan	5	12	12	1000-1615	Estma	1500
Aidavita	5	15	15	1000-1900	Estma	1500
Seabourn Quest	5	16	16	0800-1700	Atlas	450
Aidamar	5	16	16	0900-1700	Estma	2200
Viking Sea	5	17	17	0700-1600	Estma	1000
Regal Princess	5	17	17	0800-1700	CF&S	3600
Aidaaura	5	17	17	1000-1800	Estma	1400
Celebrity Silhouette	5	18	18	1000-1700	Inflot	2800
Costa Luminosa	5	19	19	0900-1700	Estma	2500
Viking Star	5	20	20	0800-2100	Estma	900
Zuiderdam	5	20	20	1000-1700	Atlas	2000
Amadea	5	20	20	1300-2000	Inflot	600
Seabourn Quest	5	22	22	1000-1700	Atlas	450
Aidadiva	5	22	22	0900-1700	Estma	2000
MSC Opera	5	22	22	0930-1600	Estma	1500
Aidamar	5	23	23	0900-1700	Estma	2200
Serenade of The Seas	5	25	25	0930-1730	Inflot	2000
Europa	5	25	25	1200-1700	Estma	700
MSC Musica	5	25	25	0900-1600	Estma	2500
Costa Luminosa	5	26	26	0900-1700	Estma	2500
Celebrity Eclipse	5	27	27	1000-1700	Inflot	2800
Norwegian Star	5	27	27	0900-1730	Estma	2000
Viking Sea	5	27	27	0800-2100	Estma	1000
Regal Princess	5	28	28	0800-1700	CF&S	3600
Marco Polo	5	28	28	1000-1630	Estma	725

- Operating from May to October

- Busiest Time May to August

- Up to nearly 4000 PAX

Strategy # 3

Port Terminal Parking Strategy



Taxi And Bus Pick-Up Deck

- Primarily needed from May to Aug.
- Capacity for up to 4 cruises at one time.
- 120 m x 40 m Footprint
- 3 Floors

Proposed Terminal Location

Strategy # 3

Port Terminal Parking Strategy

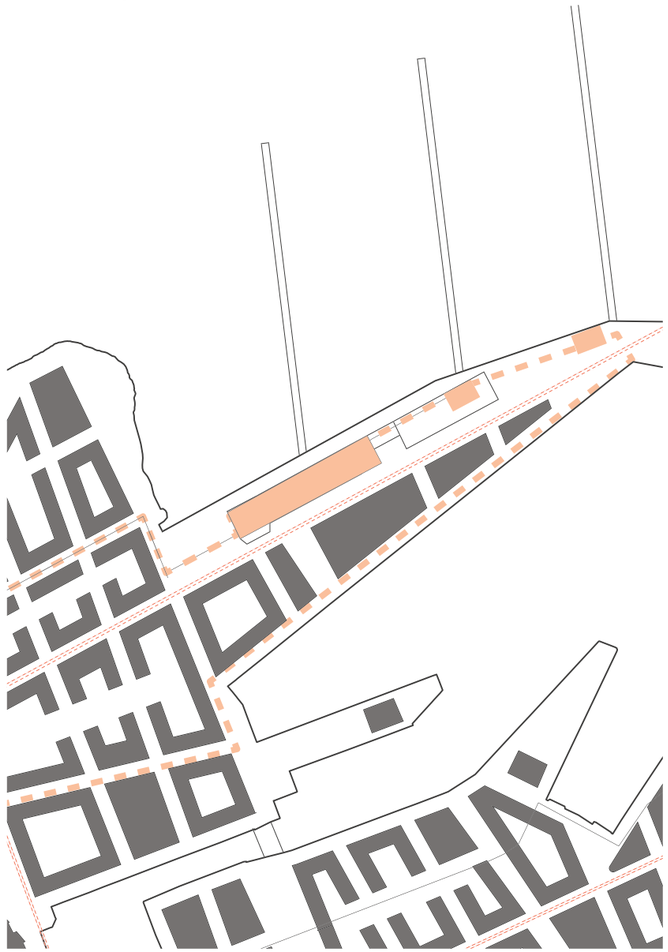
On Season Use

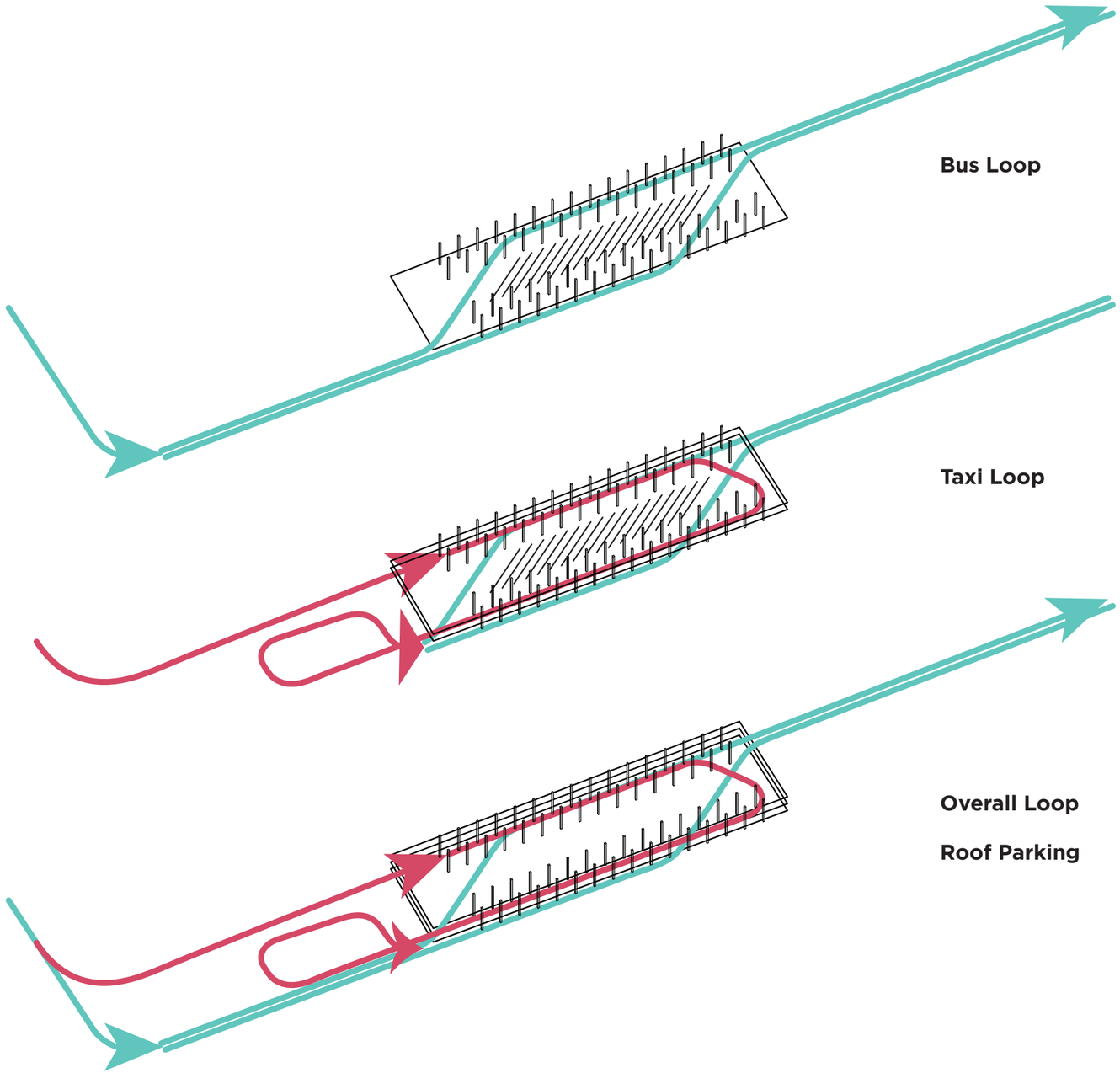
- 400 Long Term Parking Lots

- 20 Taxis and 10 Buses Pick-up

- 300 Taxis Waiting area

Proposed Terminal Location





Strategy # 3

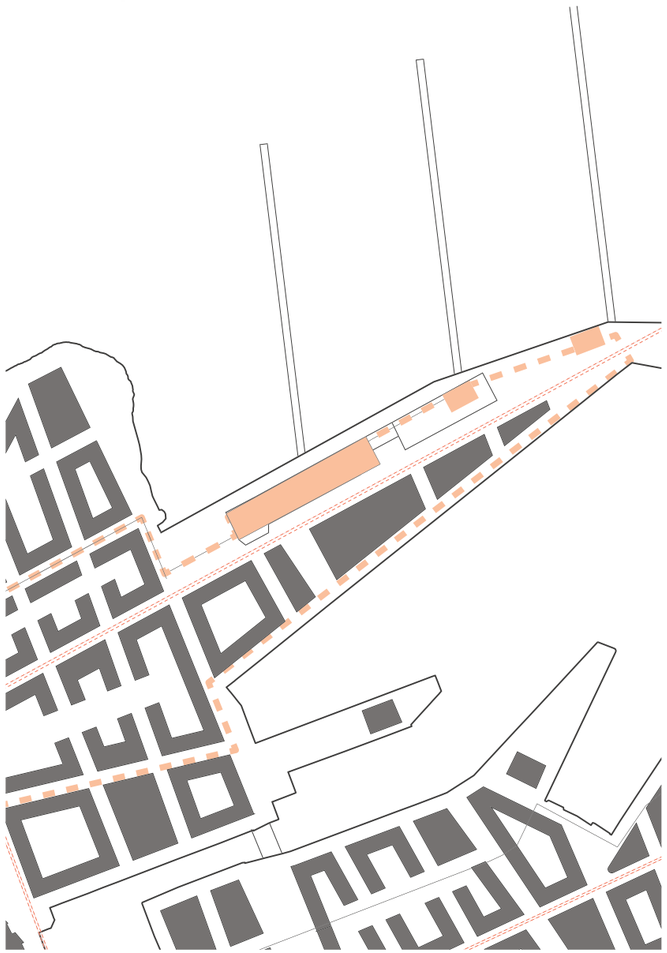
Port Terminal Parking Strategy

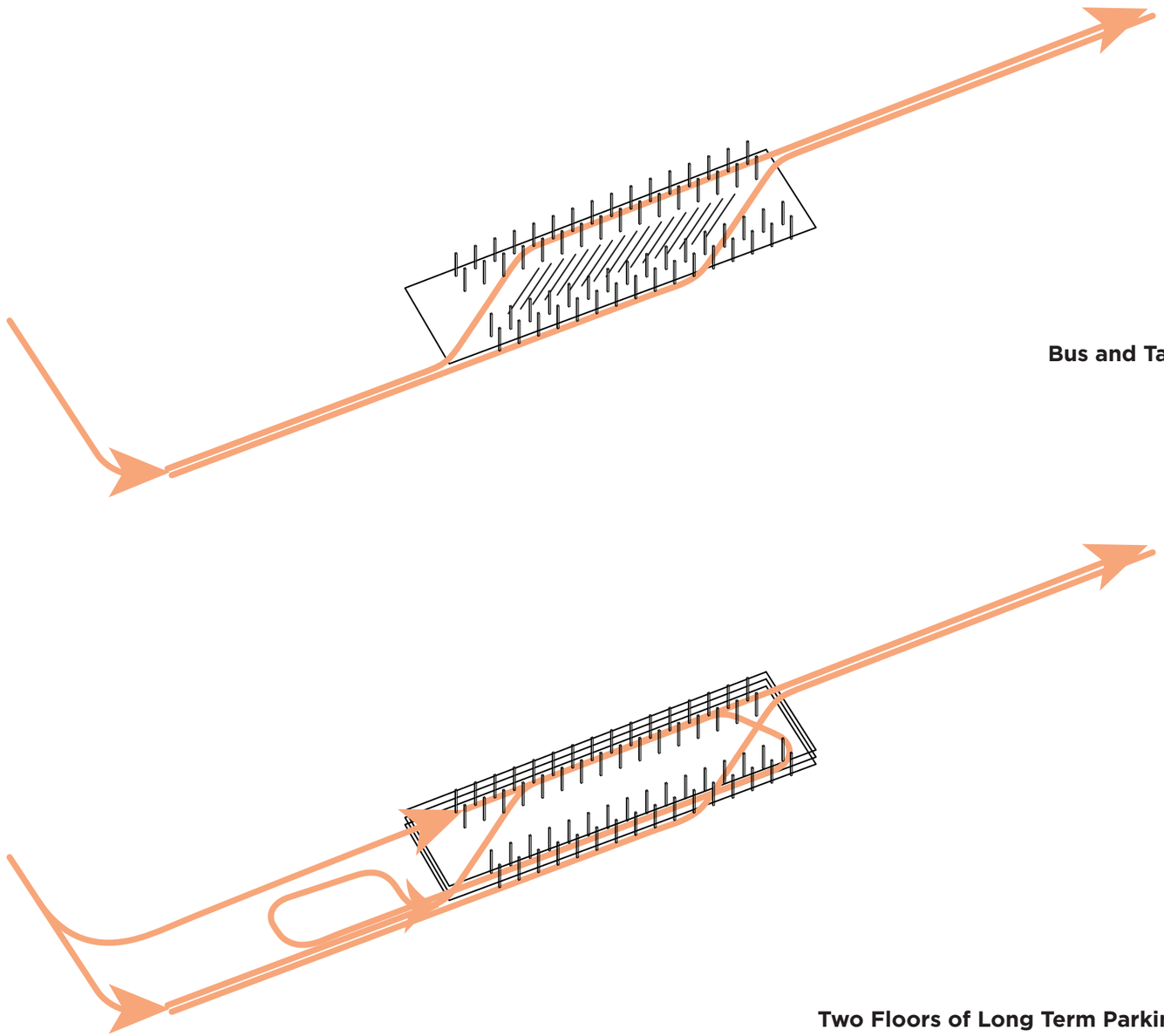
Off Season Use

- 800 Long Term Parking Lots

- 10 Taxis and 5 Buses Pick-up

Proposed Terminal Location





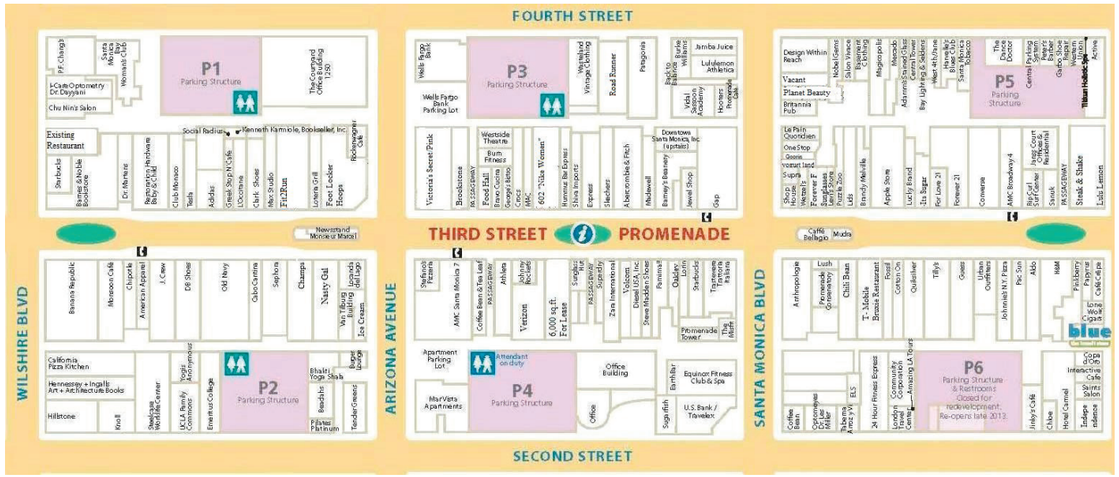
Bus and Taxi

Two Floors of Long Term Parking

Strategy # 4

Commercial Boulevard Parking







3rd Street Promenade

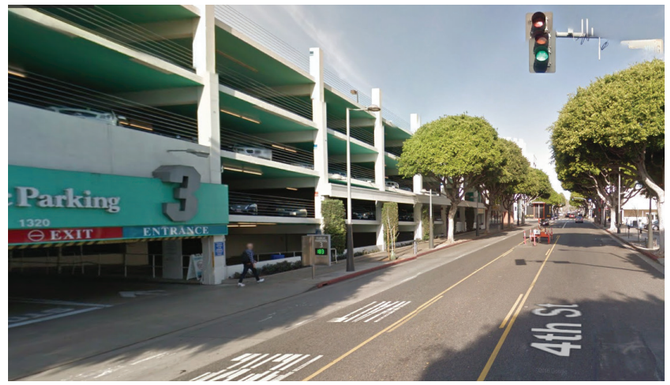
Strategy # 4

Commercial Boulevard Parking Strategy

Proposed Muti-Storey Parking



- 4000 lots if fully occupied

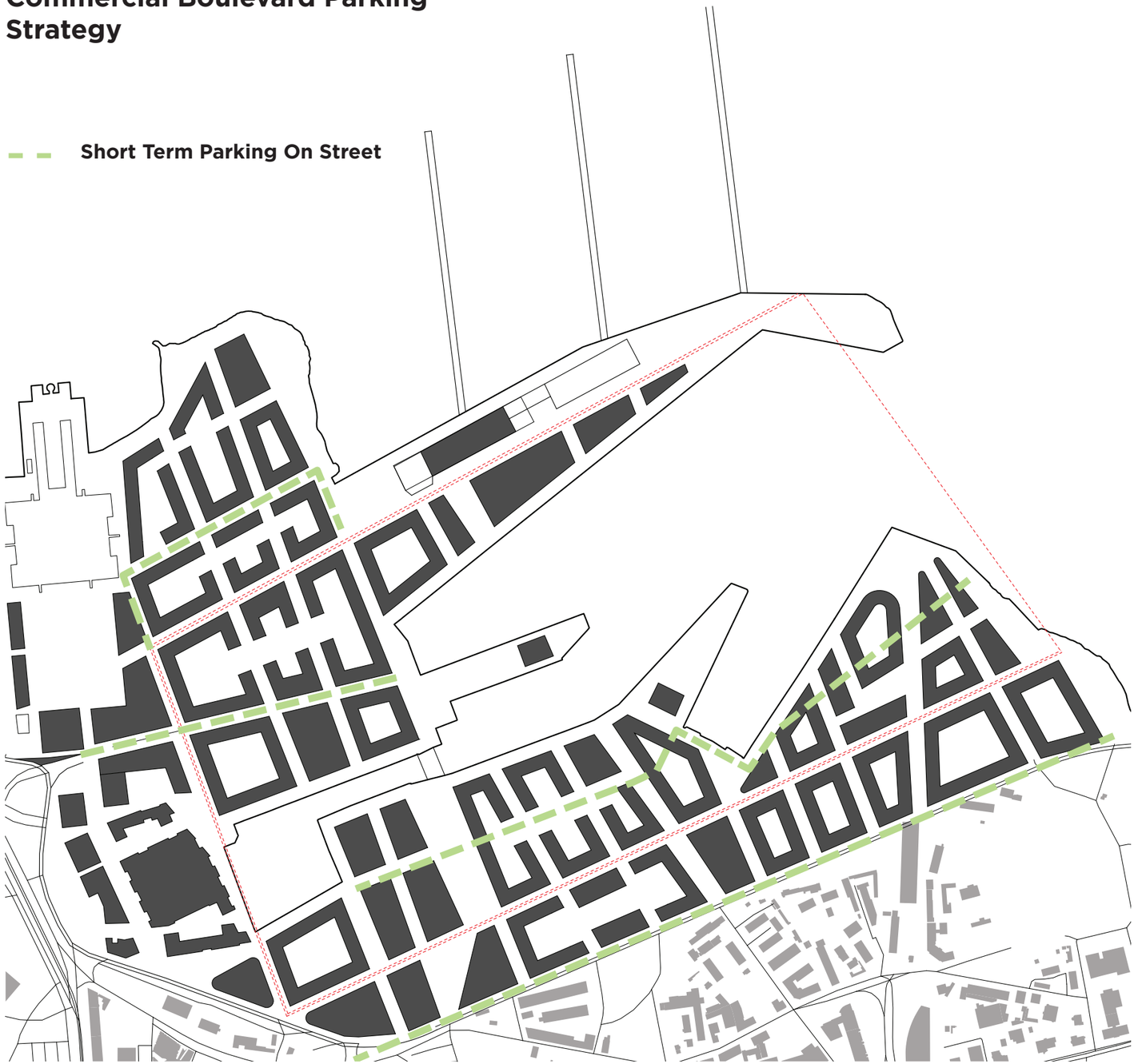


Multi-Stories Parking

Strategy # 4

Commercial Boulevard Parking Strategy

Short Term Parking On Street

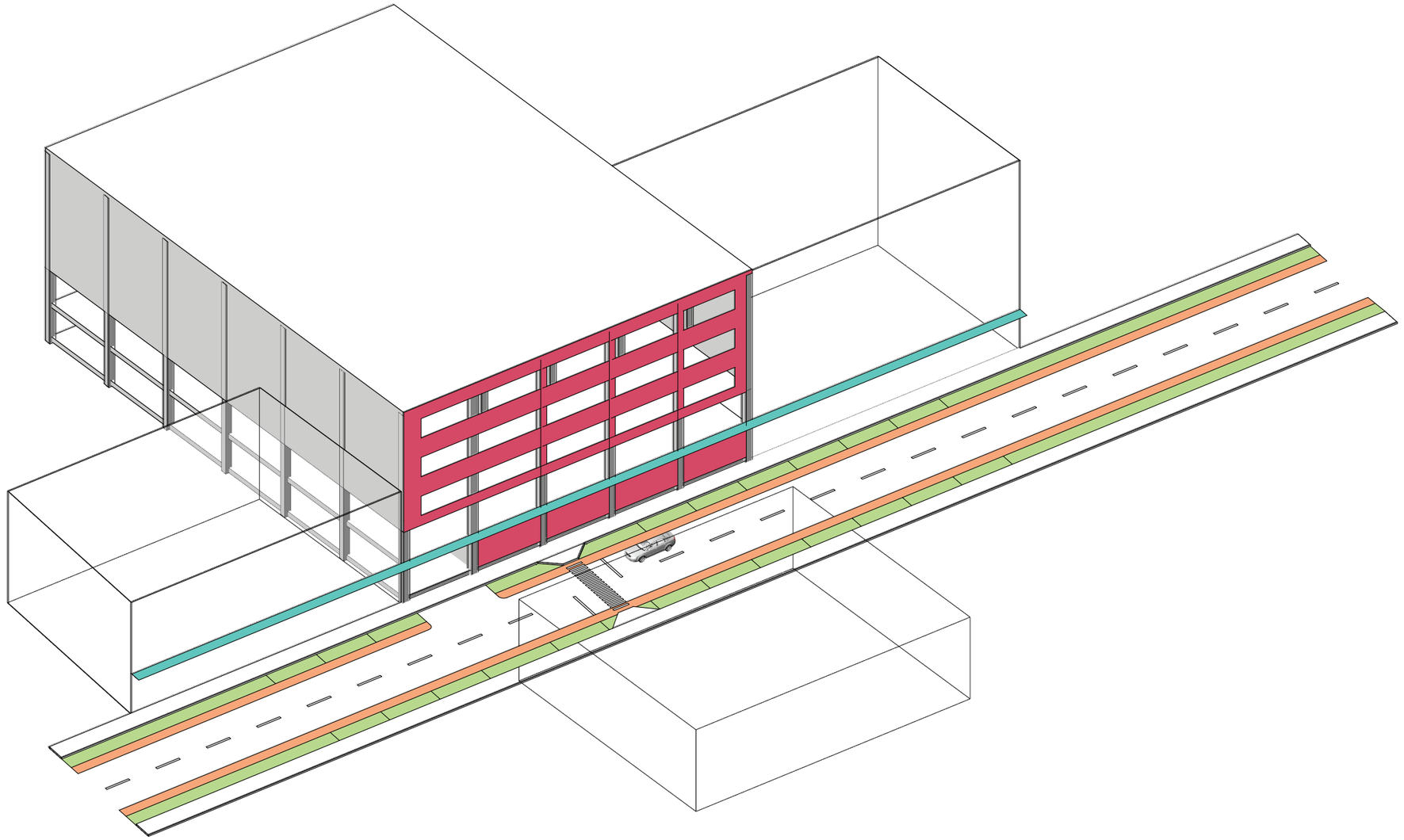


- Short Term Parking On Street

(15 to 30 Min During Working Hour)

Strategy # 4

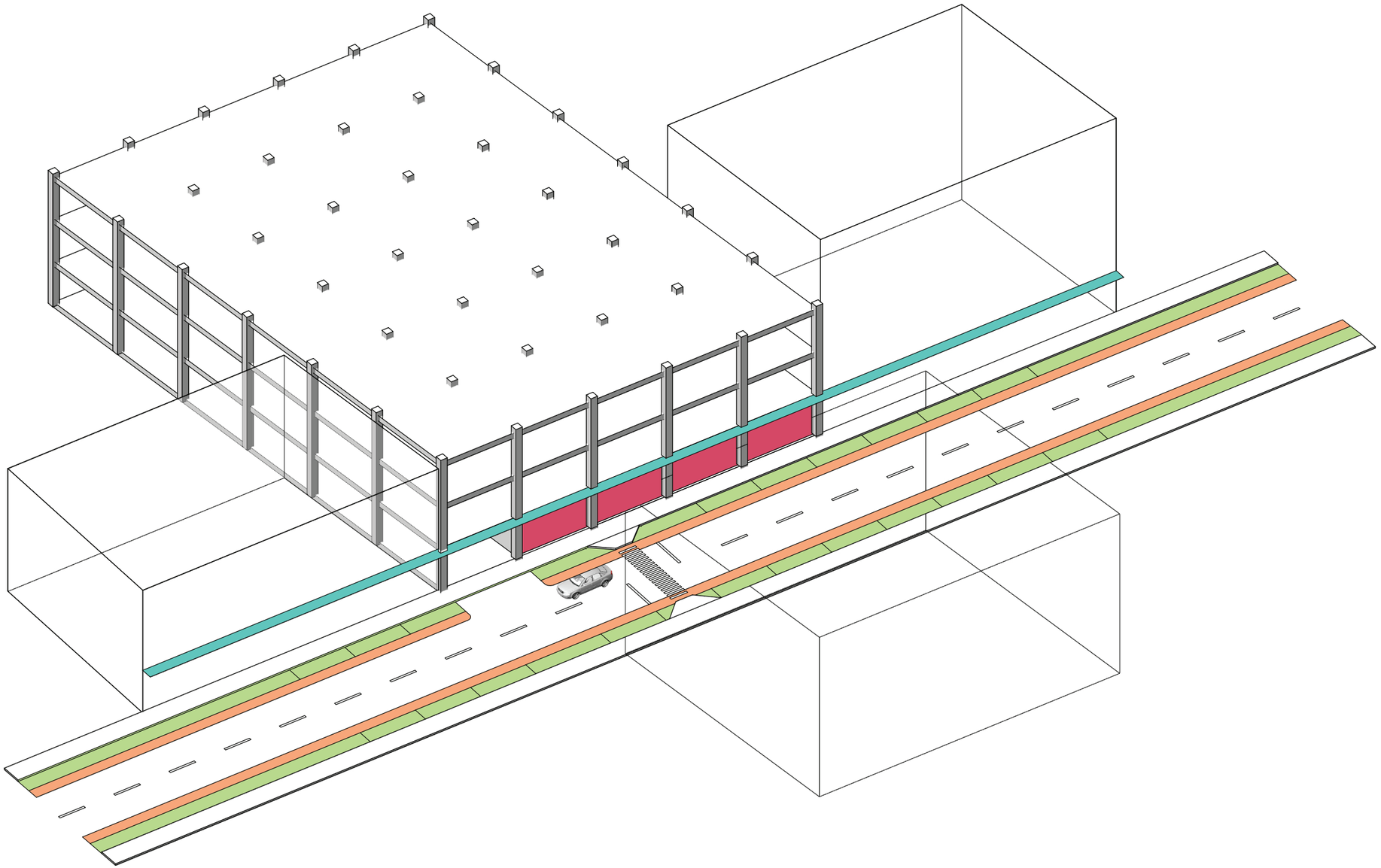
Commercial Boulevard Parking Strategy



Multi-Story Parking Typology 1

Strategy # 4

Commercial Boulevard Parking Strategy

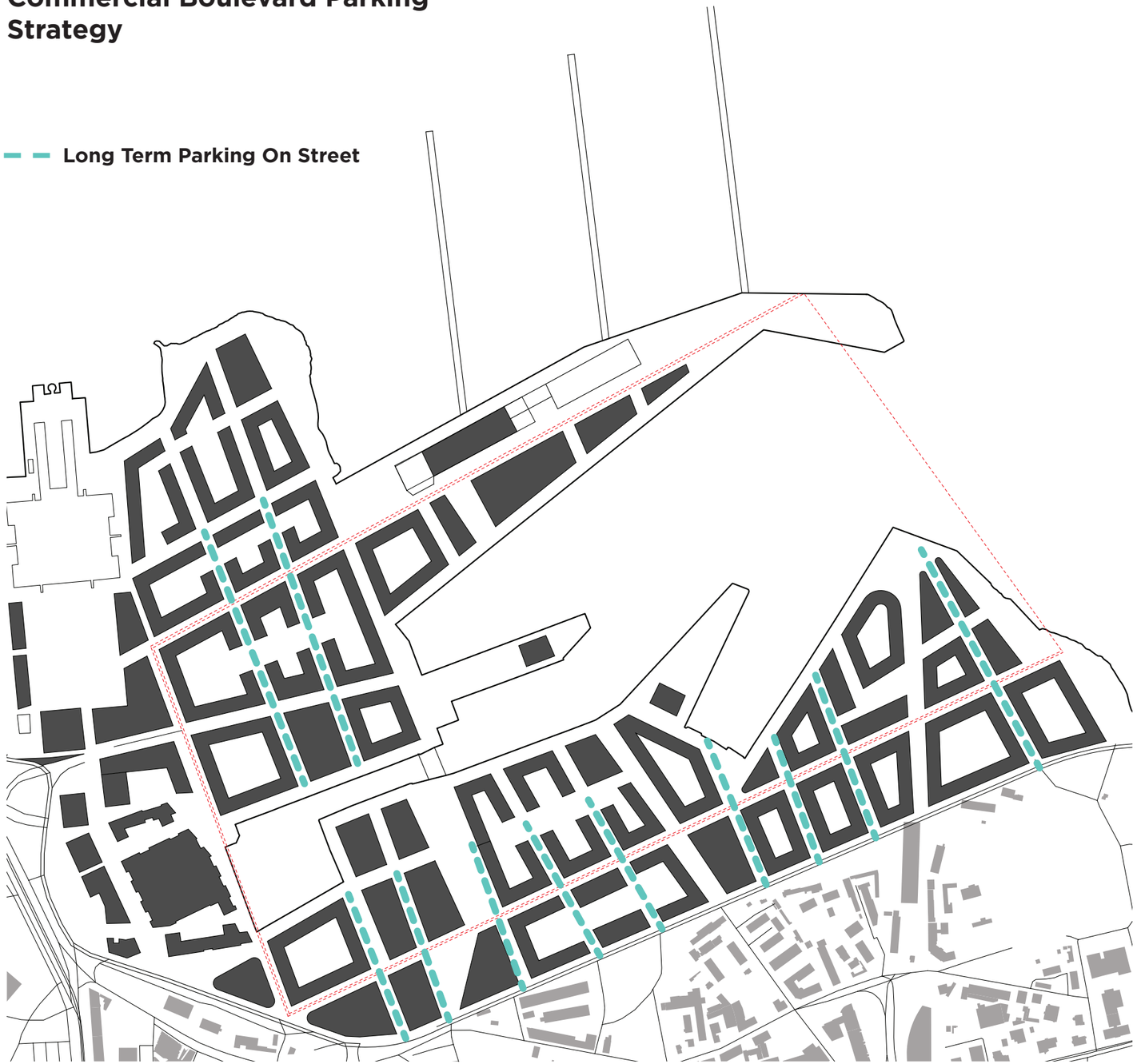


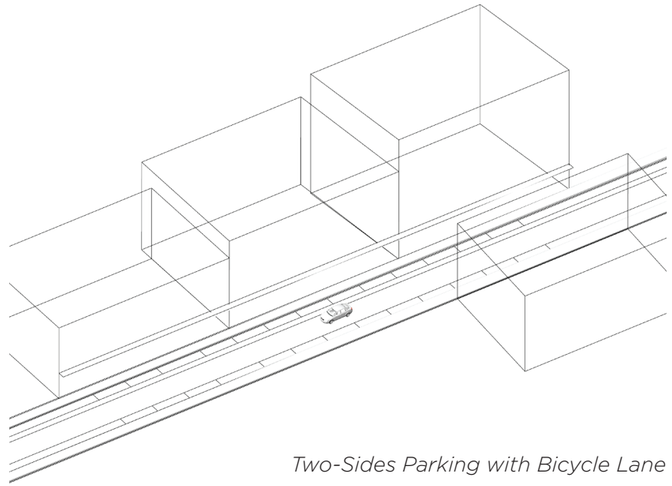
Multi-Story Parking Typology 2

Strategy # 4

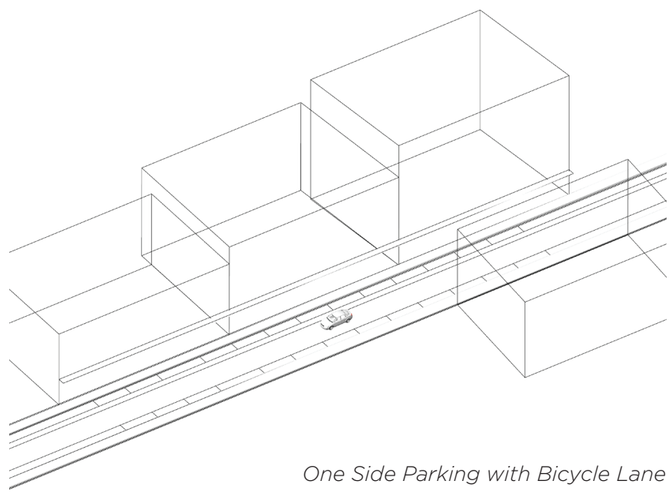
Commercial Boulevard Parking Strategy

Long Term Parking On Street





Two-Sides Parking with Bicycle Lane



One Side Parking with Bicycle Lane

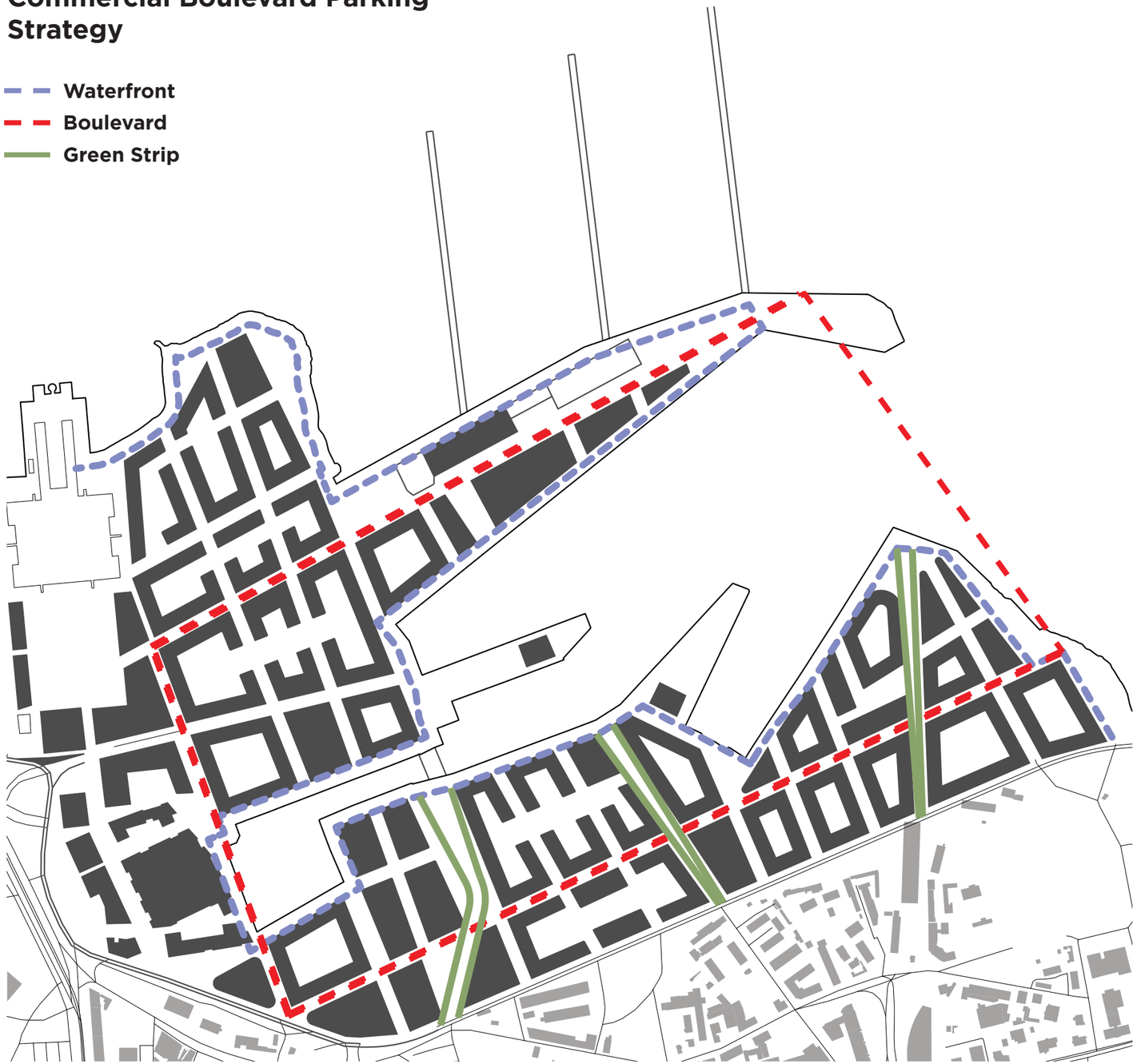
- Long Term Parking On Street

(2 to 3 Hour During Working Hour)

Strategy # 4

Commercial Boulevard Parking Strategy

- Waterfront
- Boulevard
- Green Strip



Overall Parking Strategy

-No Parking Streets

Strategy # 4

Commercial Boulevard Parking Strategy

- Long Term Street Parking
- Municipal Street Parking
- Short Term Parking
- Multi-Story Parking
- Municipal Muti-Story Parking
- Port Terminal Parking with Pick-up/Drop-off Deck



Overall Parking Strategy

- Can accommodate 5000 cars

Strategy # 4

Vision for Self-Driving Cars

