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Spring 2014

## The Urban Evolution: Sticking Mumbai's Eastern Waterfront with the Incremental Symbiosis- Part 2

Betsy Daniel

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e olution and the in between

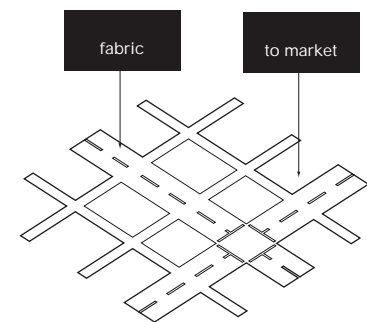
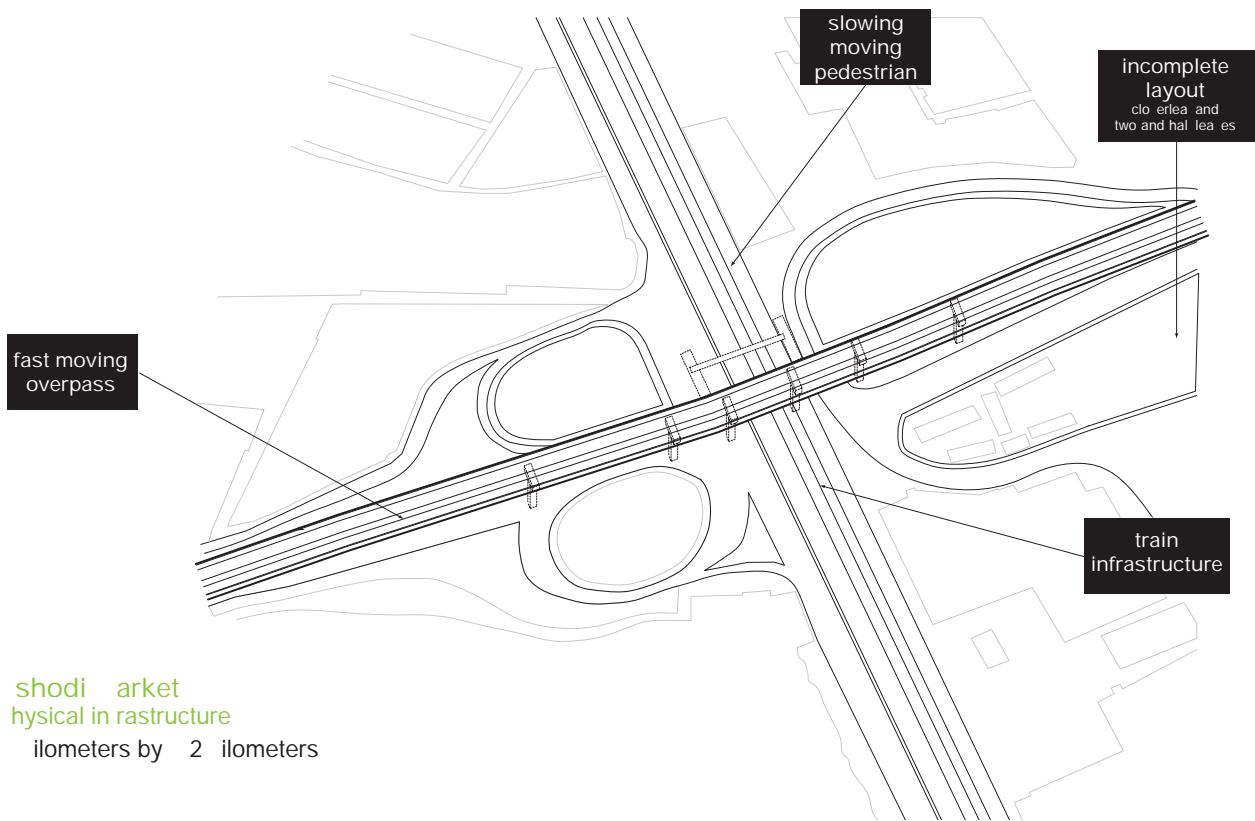
" patterns of occupation determine its form and perception. It is an indigenous urbanism, that has its particular local logic."

T T S S

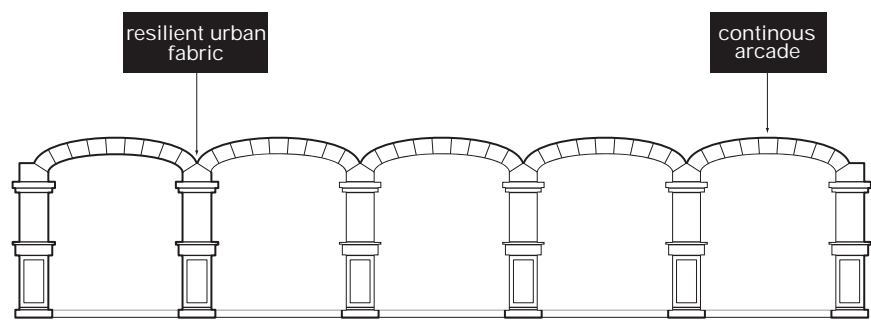
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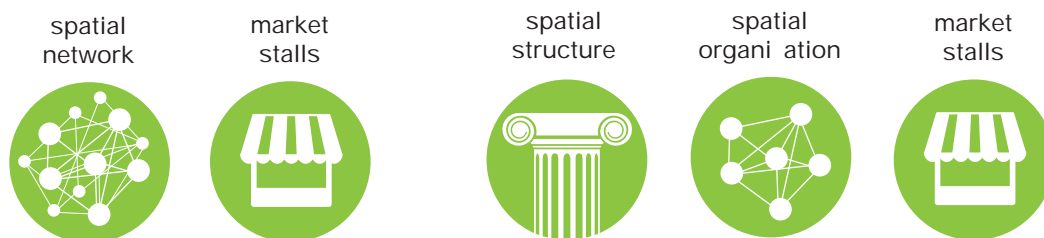


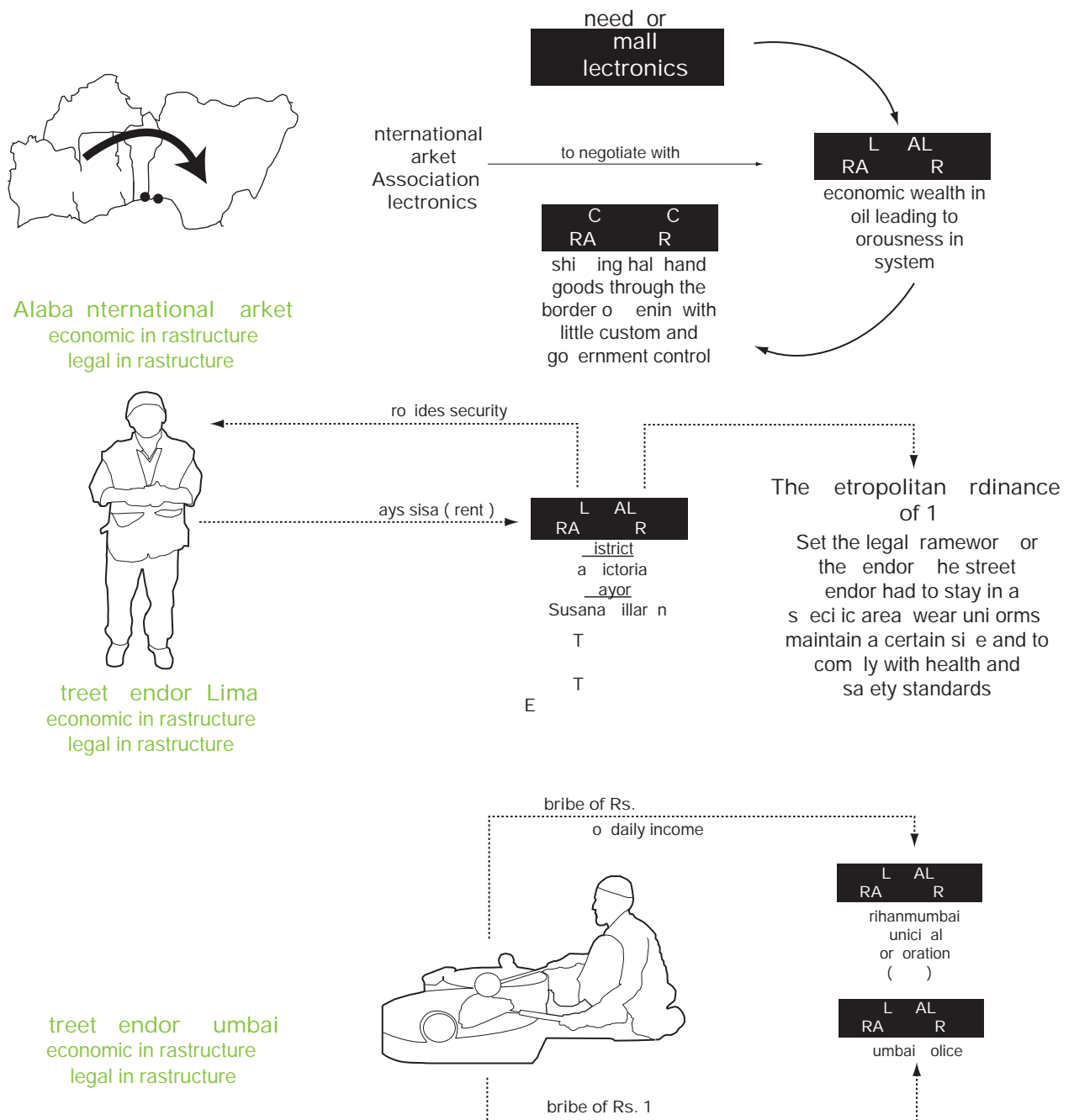


street endor  
physical infrastructure



Victorian Arcade Bazaar  
physical infrastructure





rameworks for occupation





making the case for Mumbai

stand the flows and nodes that  
S

I      I r e node

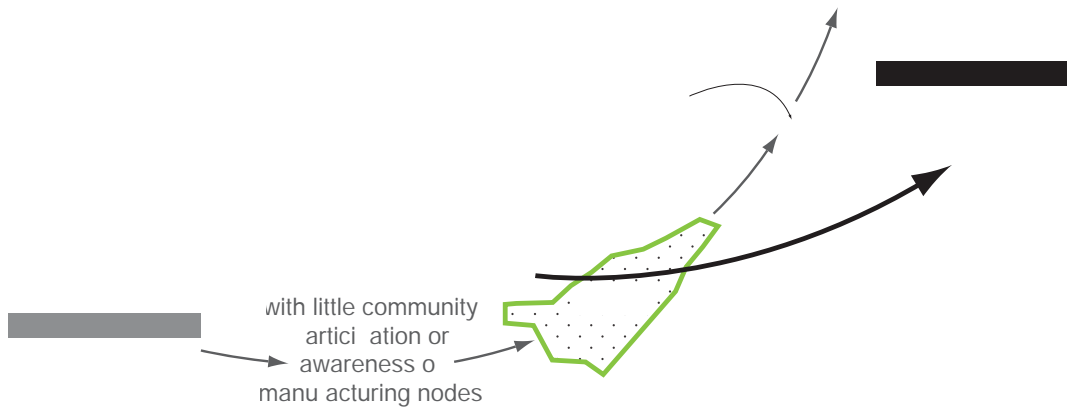
to be amplified. These relation

er ps ne r ni  
n e in ormed deri in rom  
e l im e ser ener ed  
i . Perhaps it is an  
evolutionary gesture of  
comple ifying the production  
**by subverting and finding the**  
new urbanisms in the lines  
between.

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I

there is to be a new urban  
ism it would be about se arat  
ing and identi ying entities but  
about disco ering unnameable  
hybrids it will no longer be ob  
sessed with the city but with the  
mani ulation o in rastructure or  
**endless intensifications and  
diversifications** shortcuts and  
redistributions the rein ention  
o sychological s ace Since  
the urban is now er asi e ur  
banism will ne er again be about  
the new only about the more  
**and the "modified."** *It will not be*  
about the ci ili ed but about  
underde elo ment

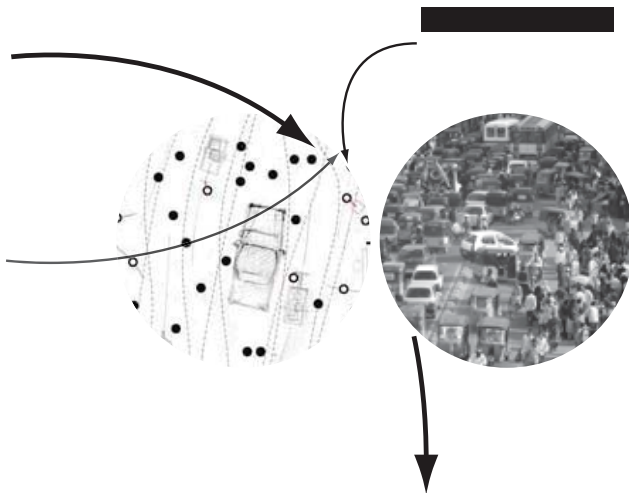


he hird one

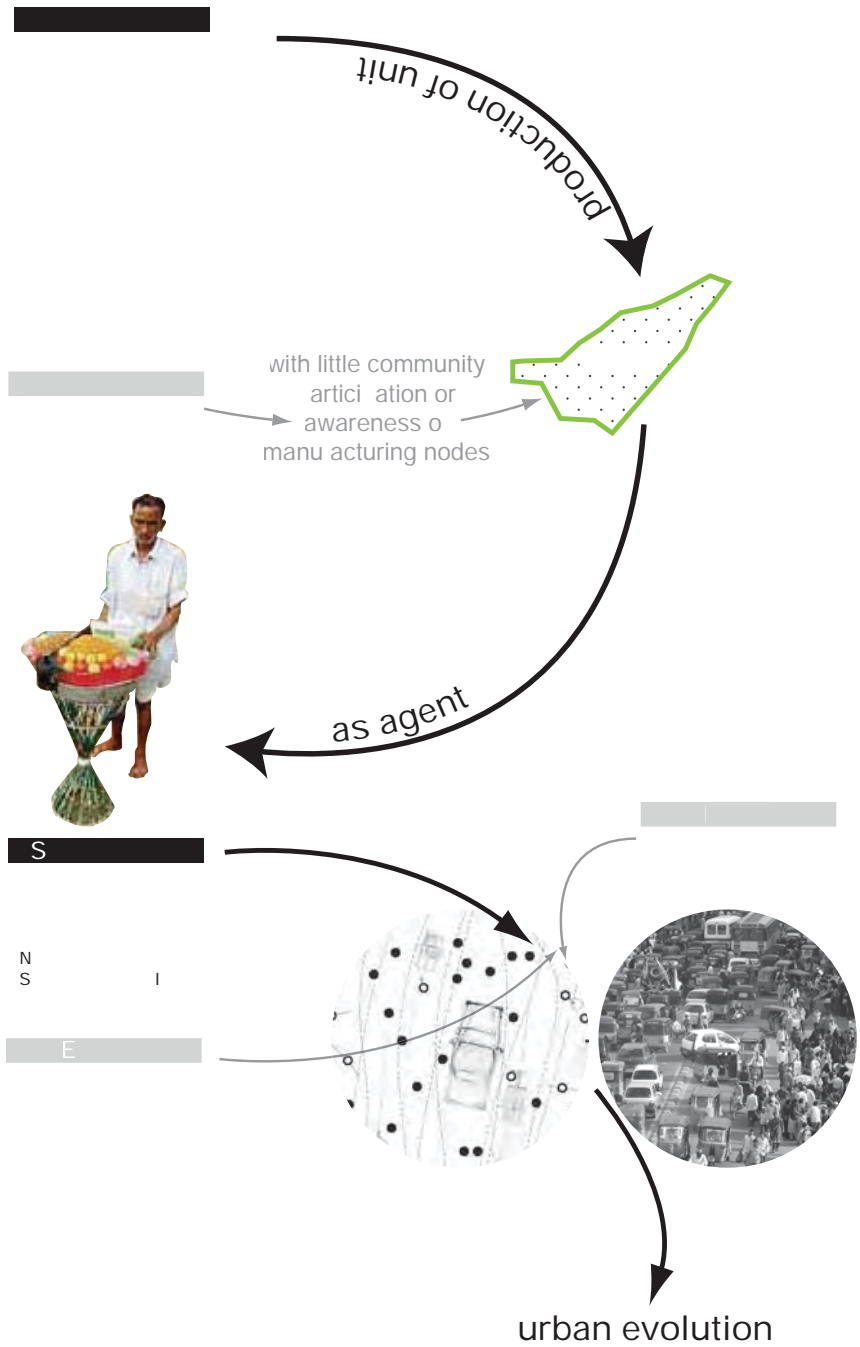


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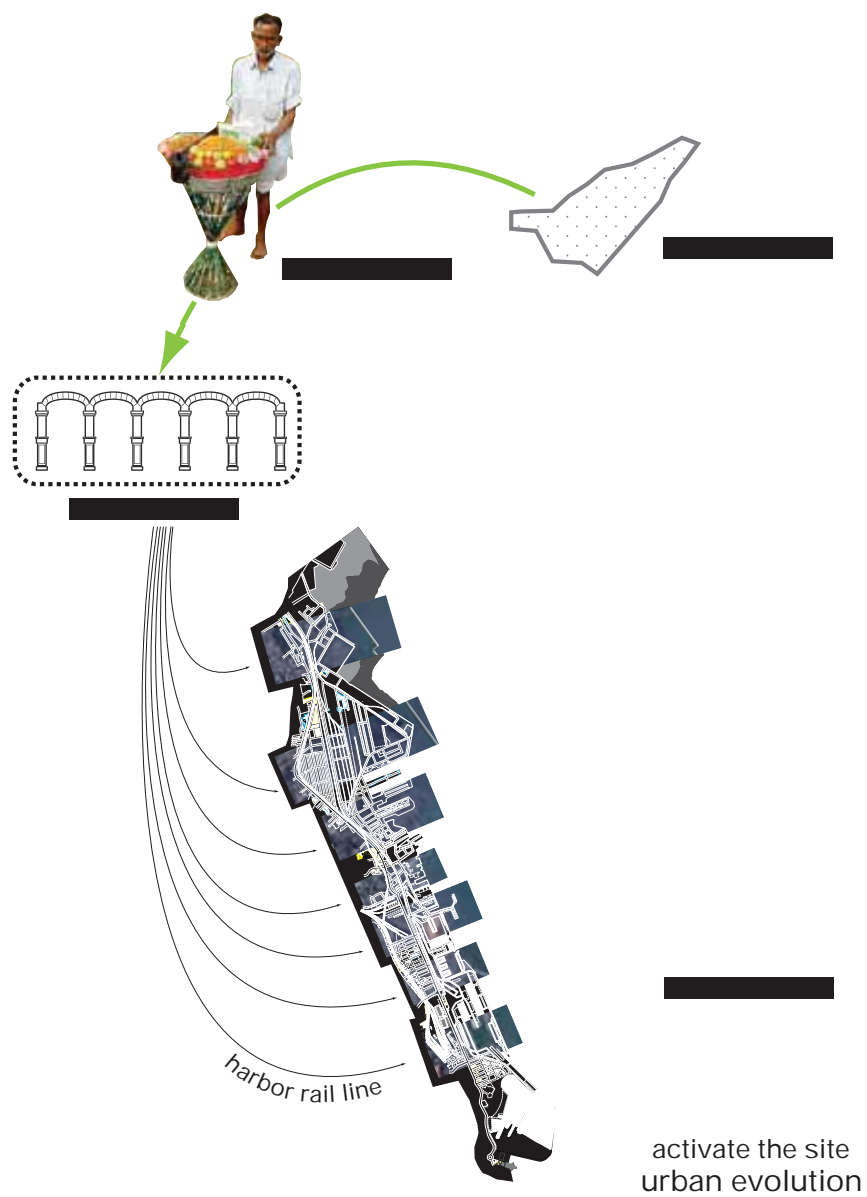
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will this lead to urban evolution



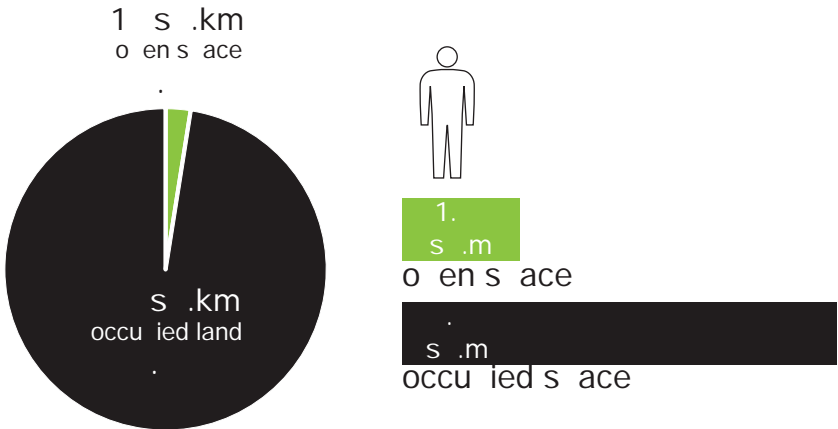
ow will this urban evolution  
happen T

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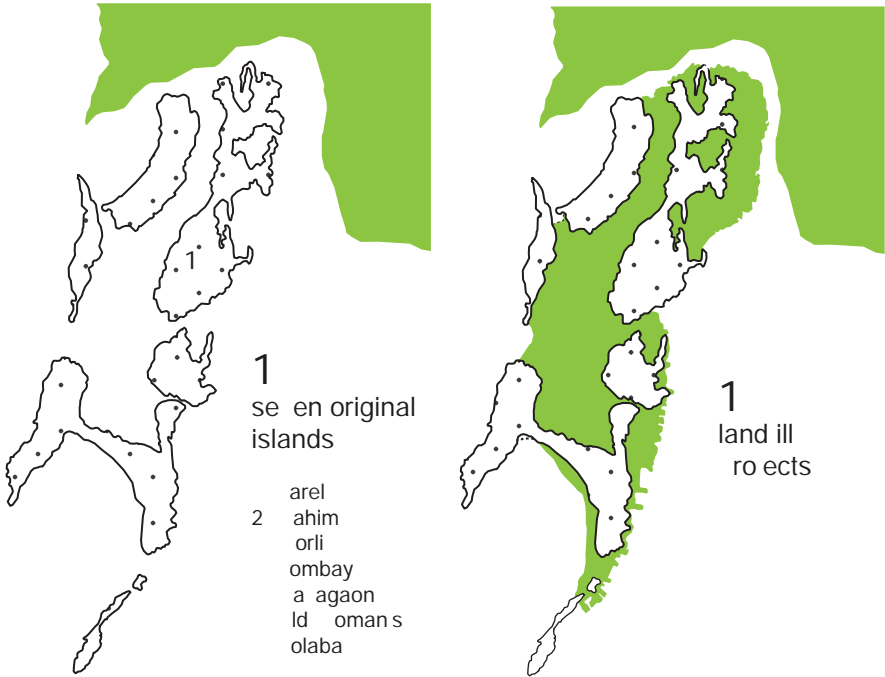
merely produce flexible frame

(reflecting the existing pattern of

density and  
congestion

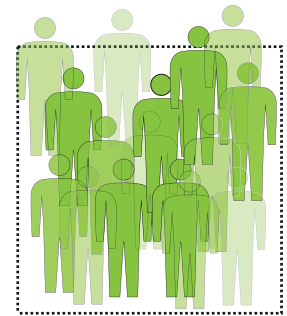
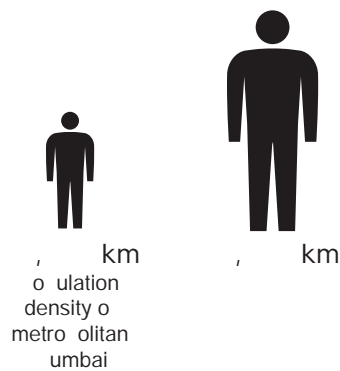
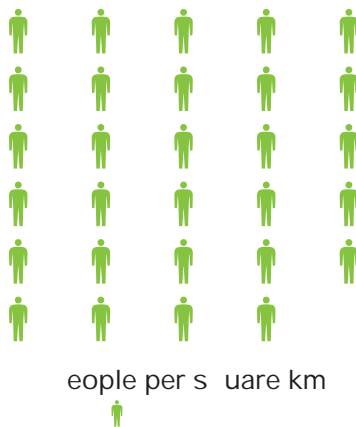


incremental  
growth of Mumbai



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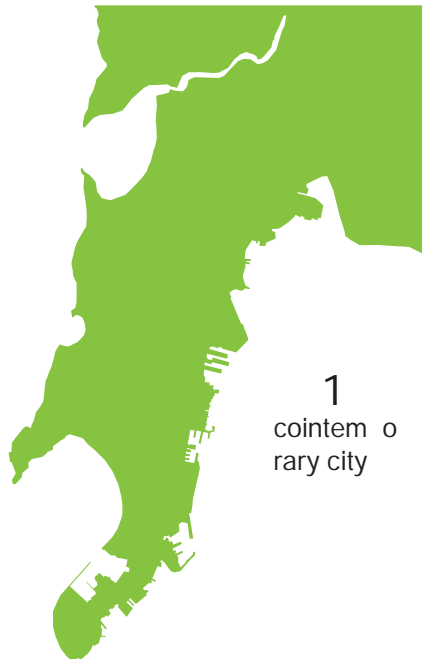


Rail passenger Density at Peak Times  
people per square meter

## cotton mill industry

A large portion of the manufacturing sector was the cotton industry and port activities along the eastern waterfront. Here are this waterfront is named as the port area the original source and start of Mumbai as the city we see today.

This bay was the center of production, transportation and shipping which fueled the start of Mumbai's economy.



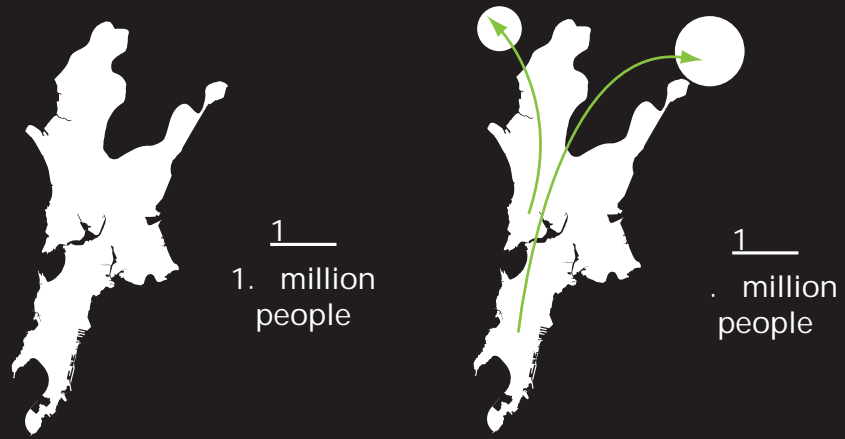
1  
contemporary city

## cotton mill industry

Mumbai Port Trust owns the eastern edge with complete control of cotton trade and most of the mills ceased production between 1960-70 but since these mills are located on prime real estate they are being erased for commercial and residential projects.

This edge remains industrialized and non-urban with existing national operations, large petrochemical and industrial facilities now sit on the eastern edge.

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 he ew nterstitial S ace



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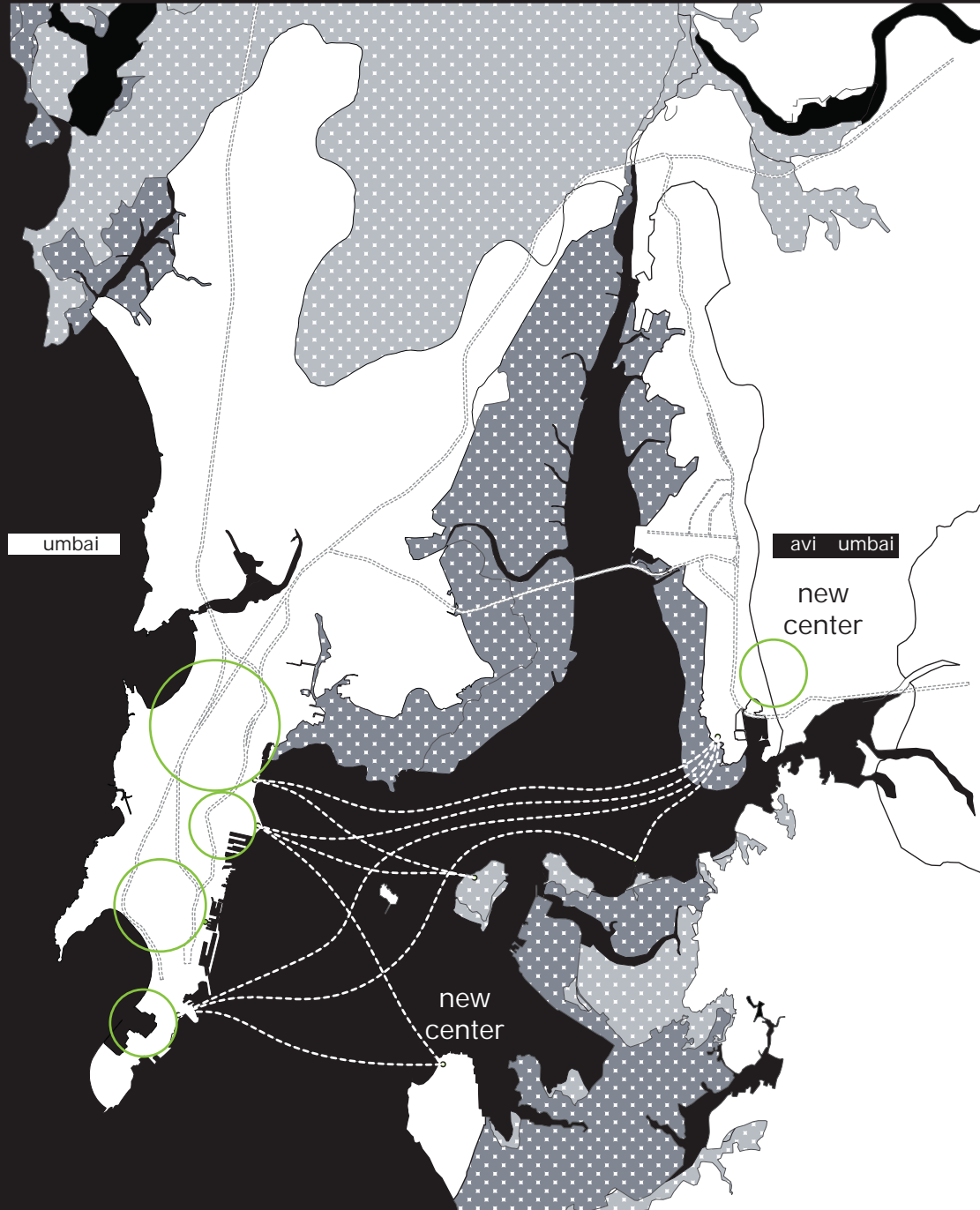
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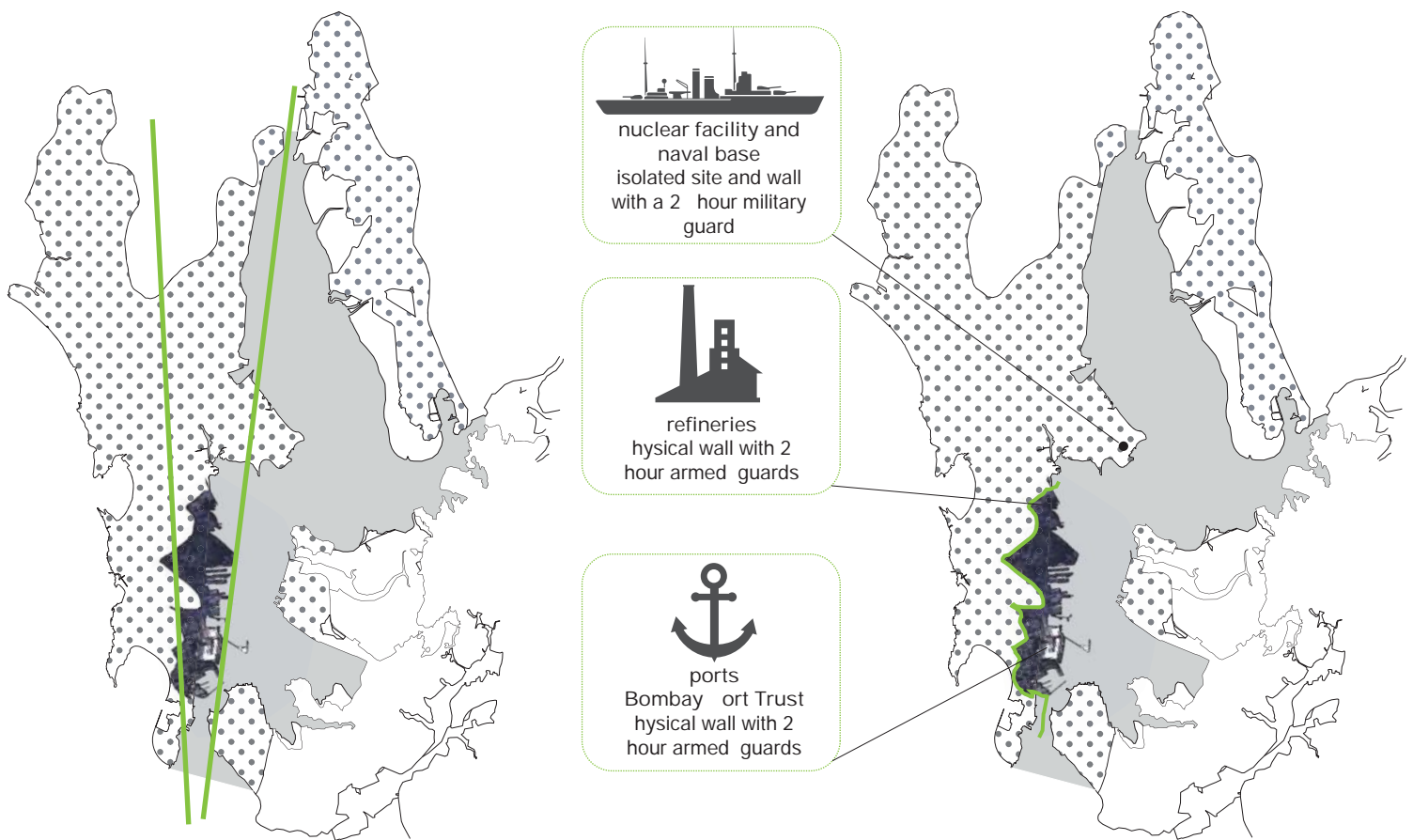
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hold or sustain this huge flux of

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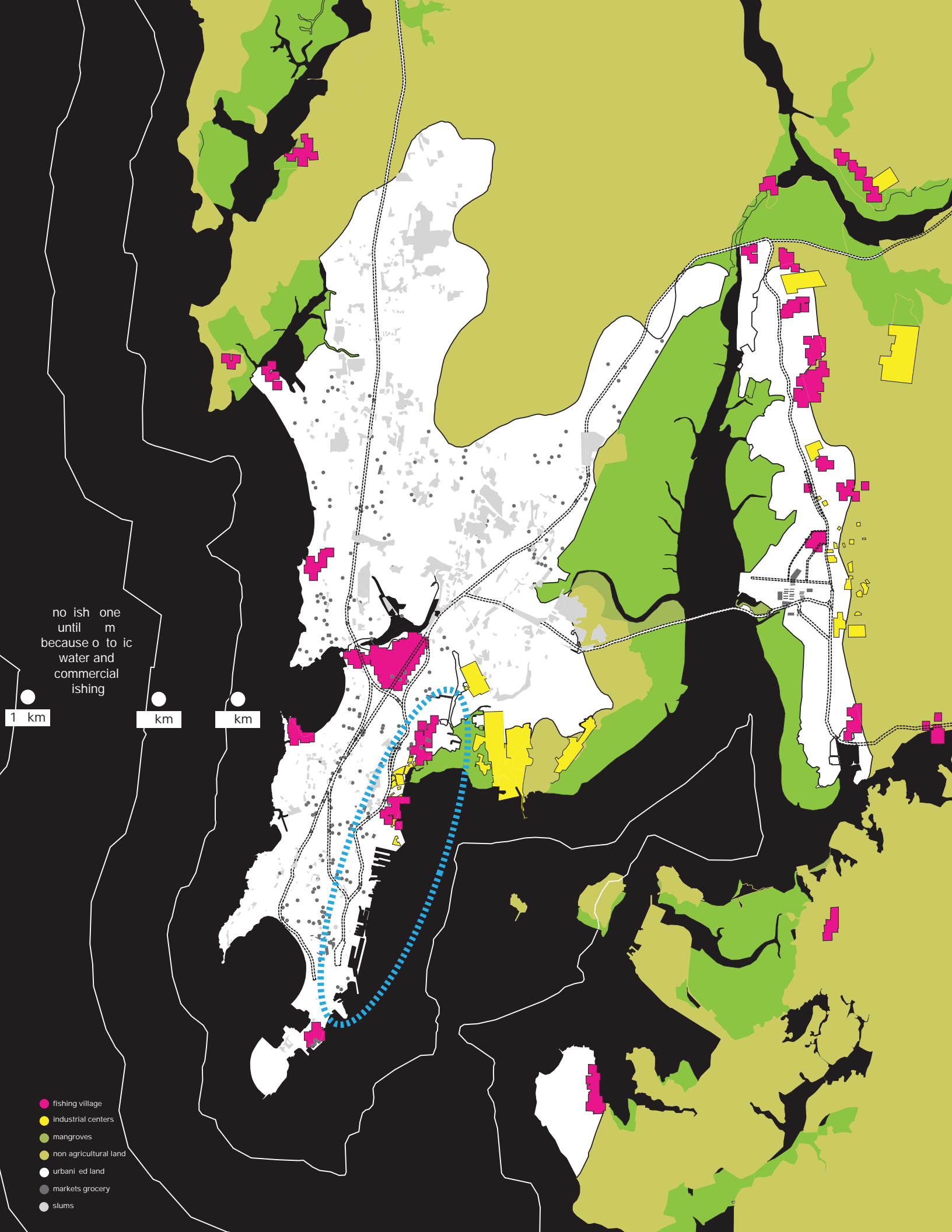
Correa created a Navi Mumbai across Mumbai's harbor. The urban plan was turning Mumbai to be centered around the harbor, centering the focus on a new eastern waterfront.

Navi Mumbai was built for 2 million people and has densified since its erection. However even with the eastern waterfront has become a large non space and interstitial one where disused and post industrial exists

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very day Mumbai is an assault on the individual's senses, from the time you get up, to the transport you take to go to work, to ***the offices you work in, to the forms of*** entertainment you are subjected to.



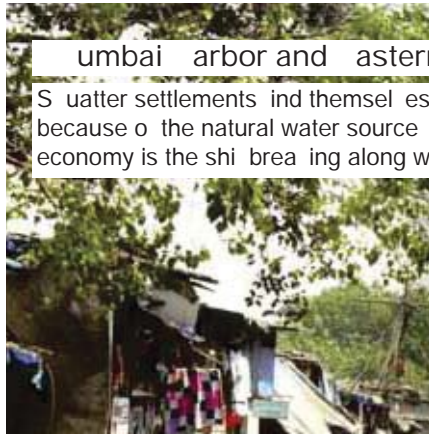
the scenario generator

An aerial photograph of a large port area. In the foreground, there are several long piers extending into the water. A large red crane structure is prominent on the left side. In the middle ground, there are several ships, including a large blue one. The background shows a hilly coastline under a cloudy sky.

originally called the  
“good bay”, it was not  
part of a preconceived  
master plan but rather of  
impulsive and  
incremental growth, built  
out of landfills and  
infrastructural services.

I T  
G G E  
G S

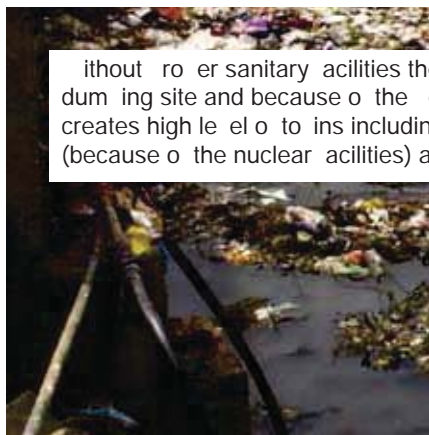




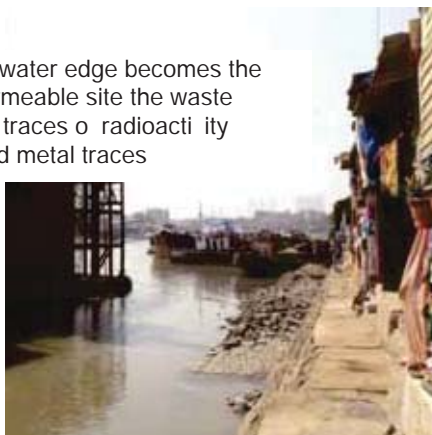
Mumbai harbor and eastern waterfront  
 Slum settlements find themselves along this edge condition because of the natural water source. A large source of the informal economy is the shi breaching along with fishing villages

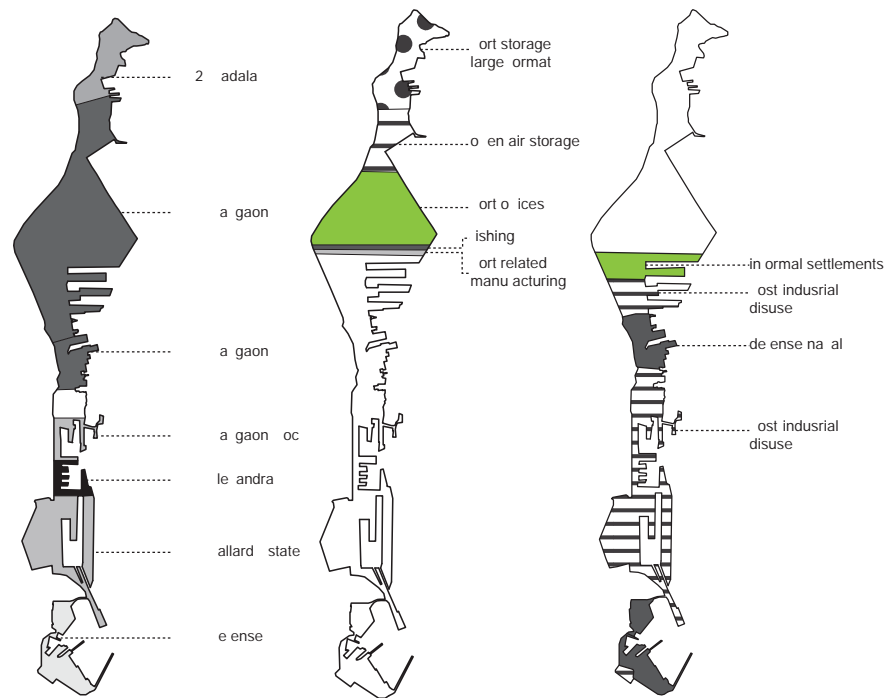


A large source of the informal economy is the shi breaching along with fishing villages. Abandoned mills occupy a hectare area. A large boat is moored along with sea food vendors on the eastern waterfront

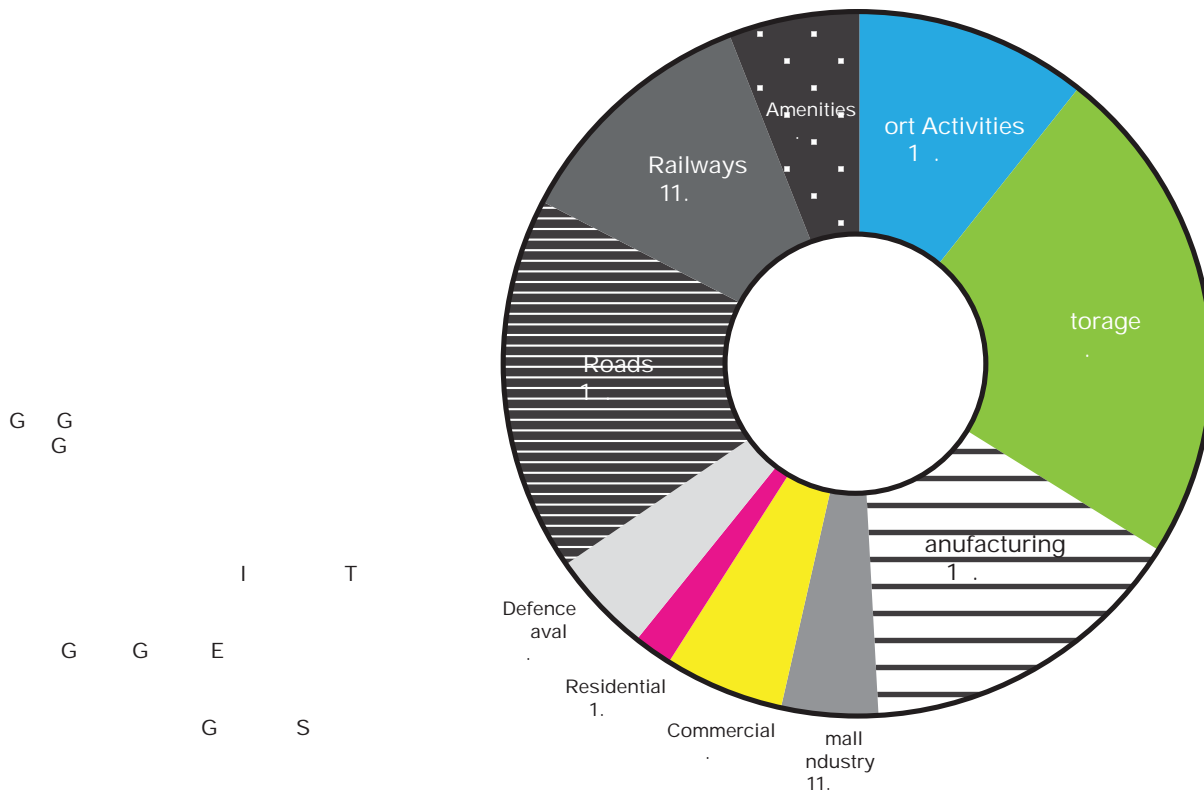


Without proper sanitary facilities the water edge becomes the dumping site and because of the permeable site the waste creates high level of toxins including traces of radioactivity (because of the nuclear facilities) and metal traces





The commuter rail and the harbor's waterfront are frameworks for occupation and adaptation.





...ewri

Cotton reen

Reay Road

Dockyard Road

...andhurst Road

as id Bunder  
tation

Chhatrapati  
...hiva.i Terminus

- industrial
- slum cluster
- green and mangroves
- residential
- commercial
- vacant land
- social amenities offices



figure .1  
 natural green space and adjacent  
 slum centers versus slum centers  
 along the commuter rail

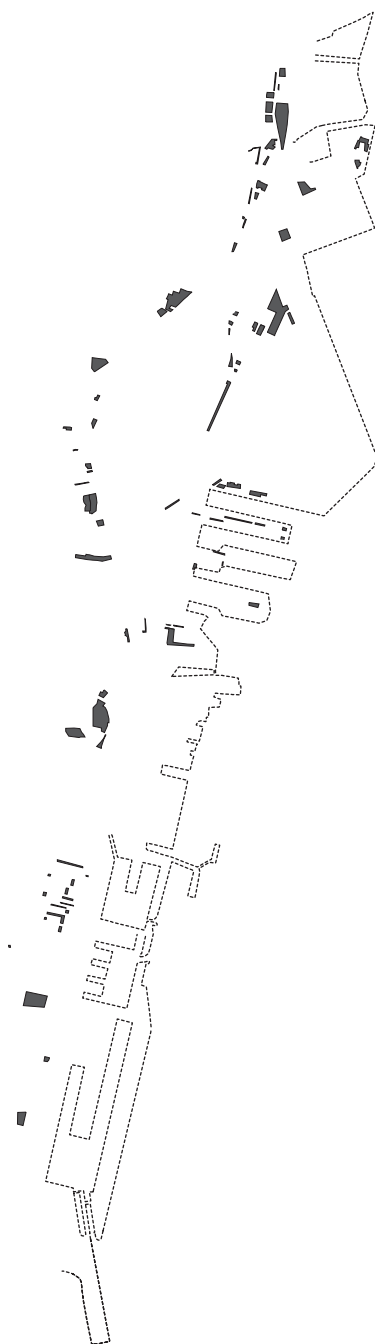


figure .  
 eastern waterfront edge and  
 slum centers

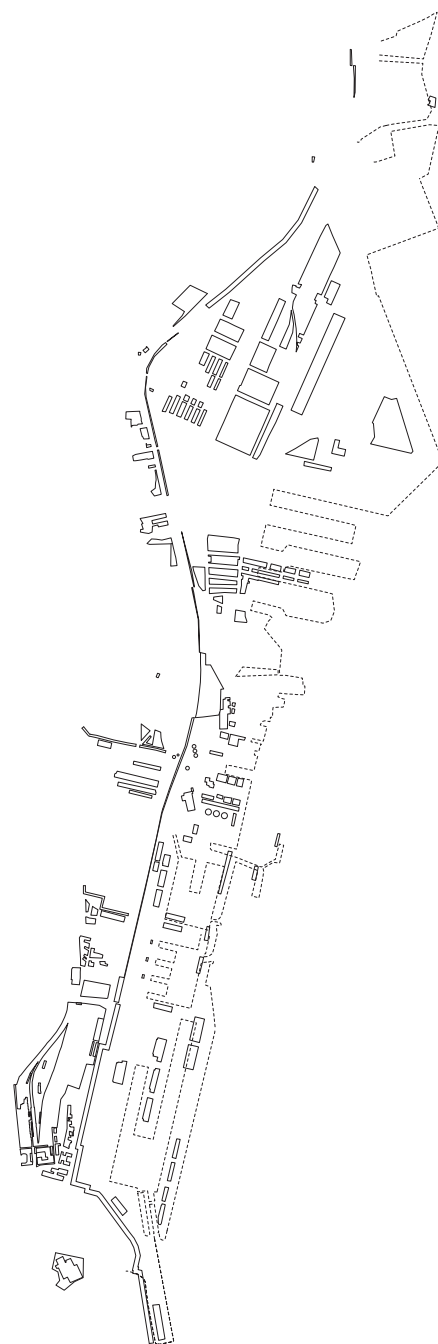


figure .  
 eastern waterfront edge and  
 industrial sectors (including mills  
 ports storage etc )

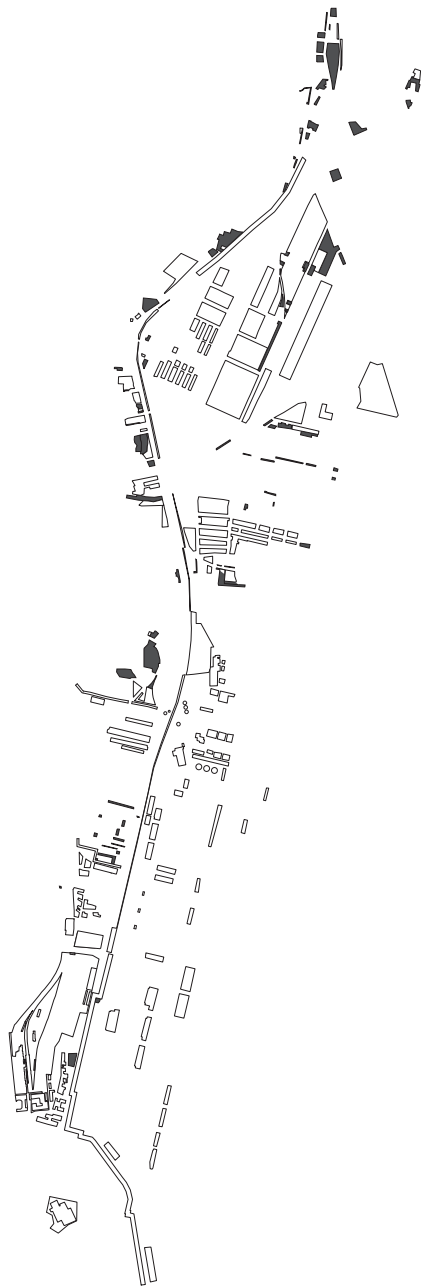


figure .  
Scale o the industrial sectors  
ersus slum sectors



figure .1  
he commuter rail ser es as a  
hard stream or slum sectors as  
well as a physical network for  
natural markets.

## ector

## Consituents

## nfrastructure and nformal



Sewri

industries petrochemical industries  
housing sewri oliwada chawls  
 nyaneshwar ahar Shi a i agar  
 ulmohar Society about am  
 hatwadi  
commerical Sewri a a ar et  
e tra lamingo migration

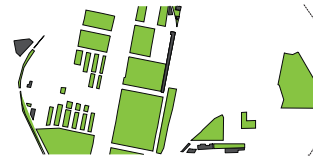


industrial  
 2 s t  
 slum sectors  
 22 2 s t



Cotton reen

cotton and grain storage buildings  
 disused number tbd

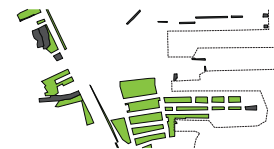


industrial  
 2 s t  
 slum sectors  
 2 s t



Reay Road

community haru hana  
industry traders or shi brea ing  
 industry orging mill steel mar ets iron  
 and steel storage in ormal scra metal  
in ormal shi brea ing



industrial  
 s t  
 slum sectors  
 22 s t



Dockyard Road

a goan oc rime shi yard  
 in ormal settlement

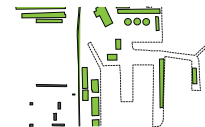


industrial  
 2 s t  
 slum sectors  
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andhurst Road

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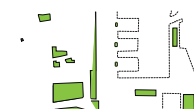


industrial  
 s t  
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as id Bunder tation

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industrial  
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 slum sectors  
 2 s t



Chhatrapati hiva i Terminus

istoric ort rea  
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industrial  
 s t  
 slum sectors  
 2 s t



## cenarios

### productive landscape

mangrove landscape urban arm  
new productive market

### urban shed infrastructure

dissolved cotton mill as a structure or  
new barrier center floating armature

### industrial symbiosis

steel arts recycling reduction of  
new products new barrier

### production

recycling and productive community

### extended market

armature extending further or new  
floating market

### armature market

extending the tensile raw order market  
onto docks spaces

### floating armature



ven with one controlling entity, the Bombay  
ort Trust, the eastern waterfront is a  
collage of communities, bodies, and entities  
that exist in various networks in a landscape  
of amazing disconnections of use and  
misuse.

***Therefore the first phase will be constructing***

and establishing new networks in this

disused landscape in the hopes that in the

second phase these productive symbiotic

networks will promote revitali ation.

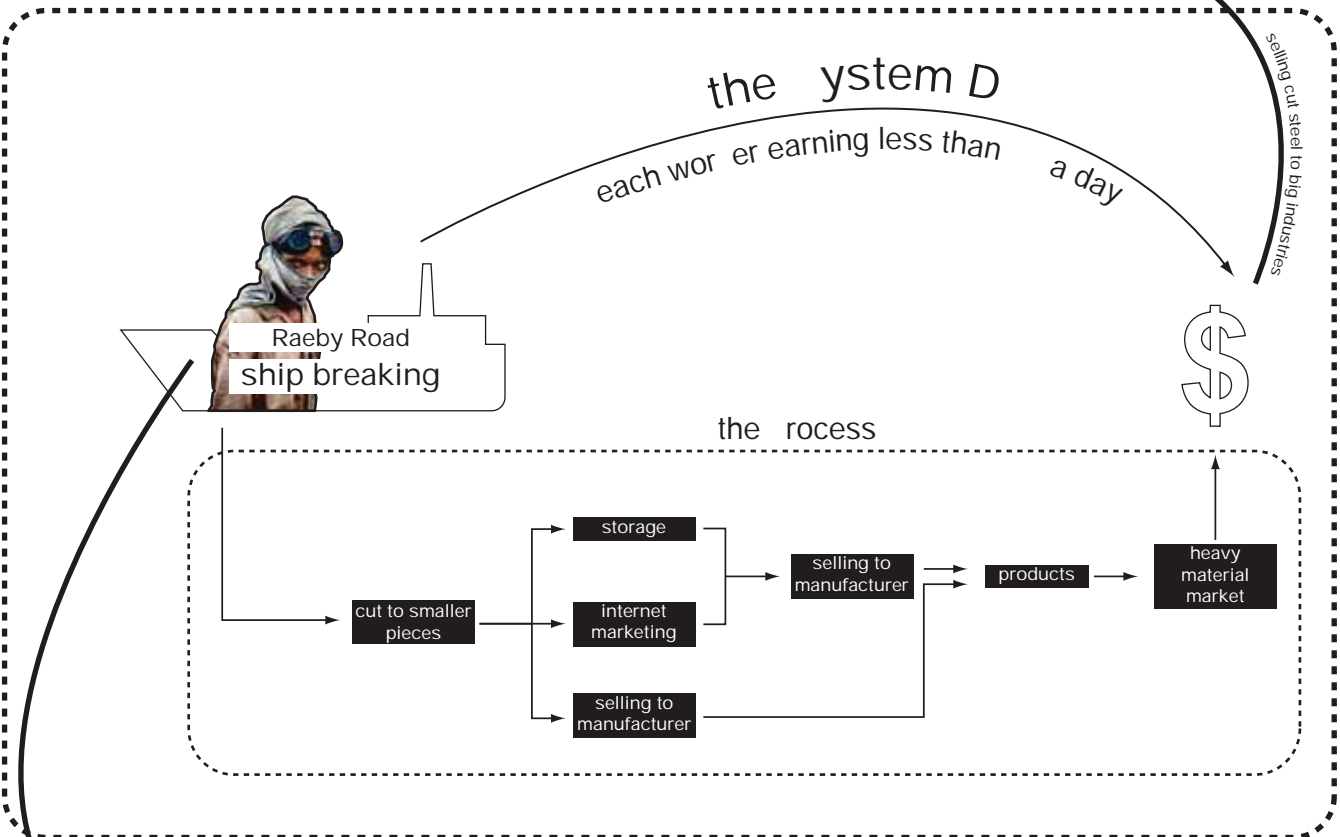


steel markets  
 Karachi steel  
 Darshan Enterprises  
 standard sale enterprises  
 national steel industries  
 nity steel Traders  
 steel storage  
 ssar steel  
 anesh steel  
 Indian steel  
 hradda steel

existing networks

Raeby Road

Dharukhana



Legal frameworks  
 Mumbai Port Trust  
 Occupational and General  
 Employees Union

the workers protected with

informal workers  
 live in dhukhana with  
 no access to physical  
 and legal frameworks of  
 sanitation and water



no formal system  
 of informal  
 garbage sorting or  
 sanitation

Dharukhana



## Big ndustry

TATA ower  
lectric ower o oration

oot rint  
e enue 2  
ro it 2

ut ut  
Unit oil  
Unit coal  
Unit coal  
gas  
tant ca acity  
Utili ation  
Unit coal 2

industan  
etroleum  
etrochemical e ining

Bharat etroleum Co. LTD  
etrochemical e ining

oot rint 2 2 combined  
e enue combined  
ro it 2 combined

anu actured rocessed  
igh s eed diesel uel  
urnace oil otor s irit  
a htha  
e ane en ene  
oluene oly ro ylene  
eedstoc  
iation turbine uel ight  
diesel uel  
inerat tur entine ube oil  
base stoc  
ow sul hur hea y stoc  
Sul hur itumen  
Sol ent 2 erosene

Bhaba Atomic  
Research Center  
uclear esearch

oot rint  
e enue  
ro it

Sterili ed y irradiated  
medical de ices  
Sterili ed ood roducts  
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botanical culti ars  
ritical assembly nuclear  
wea ons com onents  
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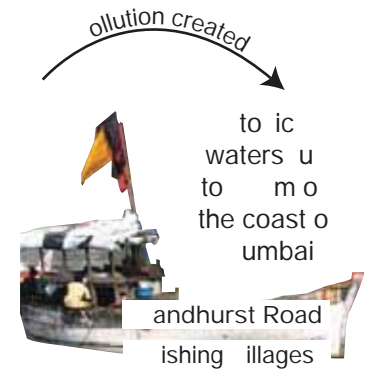
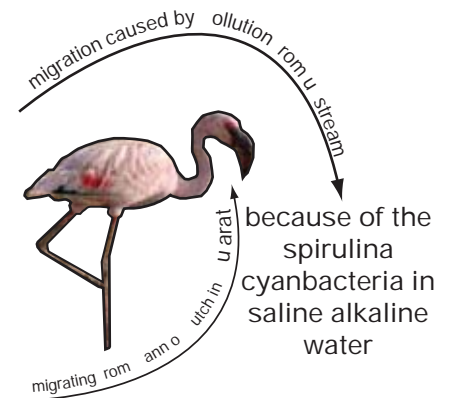
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iation turbine uel erosene  
a htha n ara in  
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isobutanol ethyl he anol  
ethyl ben ene ben ene  
toluene ylenes  
orthonitrotoluene  
n he ane cyclohe ane  
cumene rubber sol ent  
acetone oly ro ylene  
tetramer  
styrene monomer  
ethylene dichloride  
ethyl isobutyl etone  
monoethylene glycol  
diethylene glycol

Rashtriya Chemicals  
ertilizer anu acturing

oot rint  
e enue 2 2  
ro it 2

blended agricultural ertilizer  
andhydrous ammonia  
urea methanol  
methyl amines  
sodium nitrate  
sodium nitrite  
ammonium nitrate  
ammonium bicarbonate



isting etworks

ewri

andhurst Road



Raeby Road

teel arkets  
arachi teel  
Darshan nterprises  
tandard ale nterprises  
ational teel industries  
nity teel Traders  
teel torage  
ssar teel  
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hradda teel

ew cenario

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Raeby Road

Dharukhana

Cotton reen

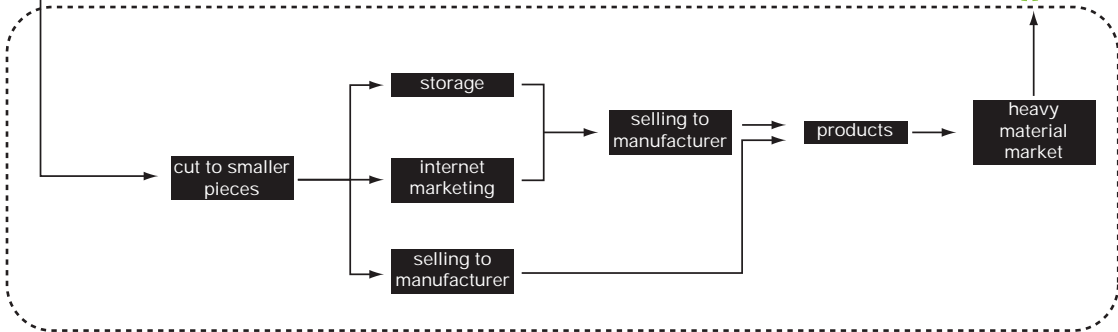
the ystem D

each wor er earning less than a day

selling cut steel to big industries



the rocess



the wor ers roected with

Legal rameworks  
umbai ort rust  
oc and eneral  
m loyee s Union



informal workers  
li e in haru hana with  
no access to hysical  
and legal ramewor s o  
sanitation and water



no formal system  
of informal  
garbage sorting or  
sanitation

Dharukhana

## Big industry

TATA Power  
Electric power generation

Footprint  
Employee 2  
Road 2

Unit oil  
Unit coal  
Unit coal  
gas

Plant capacity  
Utilization  
Unit coal 2

Industan  
Petroleum  
Petrochemical refining

Bharat Petroleum Co. LTD  
Petrochemical refining

Footprint 2.2 combined  
Employee combined  
Road 2 combined

Manufactured processed  
High speed diesel fuel  
Nuclear oil motor spirit  
Aromatic  
Benzene  
Toluene  
Xylene  
Feedstock  
Turbine fuel  
Diesel fuel  
Inert turbine fuel oil  
Base stock  
Low sulfur heavy stock  
Sulphur  
Solvent 2  
Kerosene

Bhabha Atomic  
Research Center  
Nuclear research

Footprint  
Employee  
Road

Sterilized irradiated  
Medical devices  
Sterilized food products  
Genetically modified  
Botanical cultures  
Critical assembly nuclear  
Weapons components  
Radioactive material and  
Special use metals  
Elements  
Boron  
Sulfur  
Oxygen  
Uranium

Aegis Logistics  
Logistics handling

Footprint  
Employee  
Road

Turbine fuel  
Kerosene  
Aromatic  
Methanol ethanol  
Isobutanol ethyl hexanol  
Ethyl benzene  
Toluene  
Xylenes  
Ortho nitrotoluene  
Naphthalene  
Cyclohexane  
Cumene  
Rubber solvent  
Acetone  
Xylene  
Tetramer  
Styrene monomer  
Ethylene dichloride  
Ethyl isobutyl acetone  
Monoethylene glycol  
Diethylene glycol

Rashtriya Chemicals  
Fertilizer manufacturing

Footprint  
Employee 2  
Road 2

Blended agricultural fertilizers  
Anhydrous ammonia  
Urea  
Methanol  
Methyl amines  
Sodium nitrate  
Sodium nitrite  
Ammonium nitrate  
Ammonium bicarbonate



ewri  
angro e  
andsca e  
har esting clearing dumping



Natural siltation

pollution created

migration caused by pollution from stream



ewri  
lamingo  
migration  
migrating from

because of the  
spirulina  
cyanobacteria in  
saline alkaline  
water

pollution created

pollution created



to ic  
waters u  
to m o  
the coast o  
umbai

productive Landscape

ew cenario

ewri

Cotton reen

informal workers  
live in slums with  
no access to physical  
and legal frameworks for  
sanitation and water

introducing  
mangrove  
hatcheries  
to serve as  
a natural  
filter

water filter  
mega  
structure



productive landscape

mangrove hatchery  
floating markets  
floating villages  
floating farms  
nesting habitats  
for flamingos

new bazaar  
and market

goods from the  
productive  
landscape to be  
sold here