

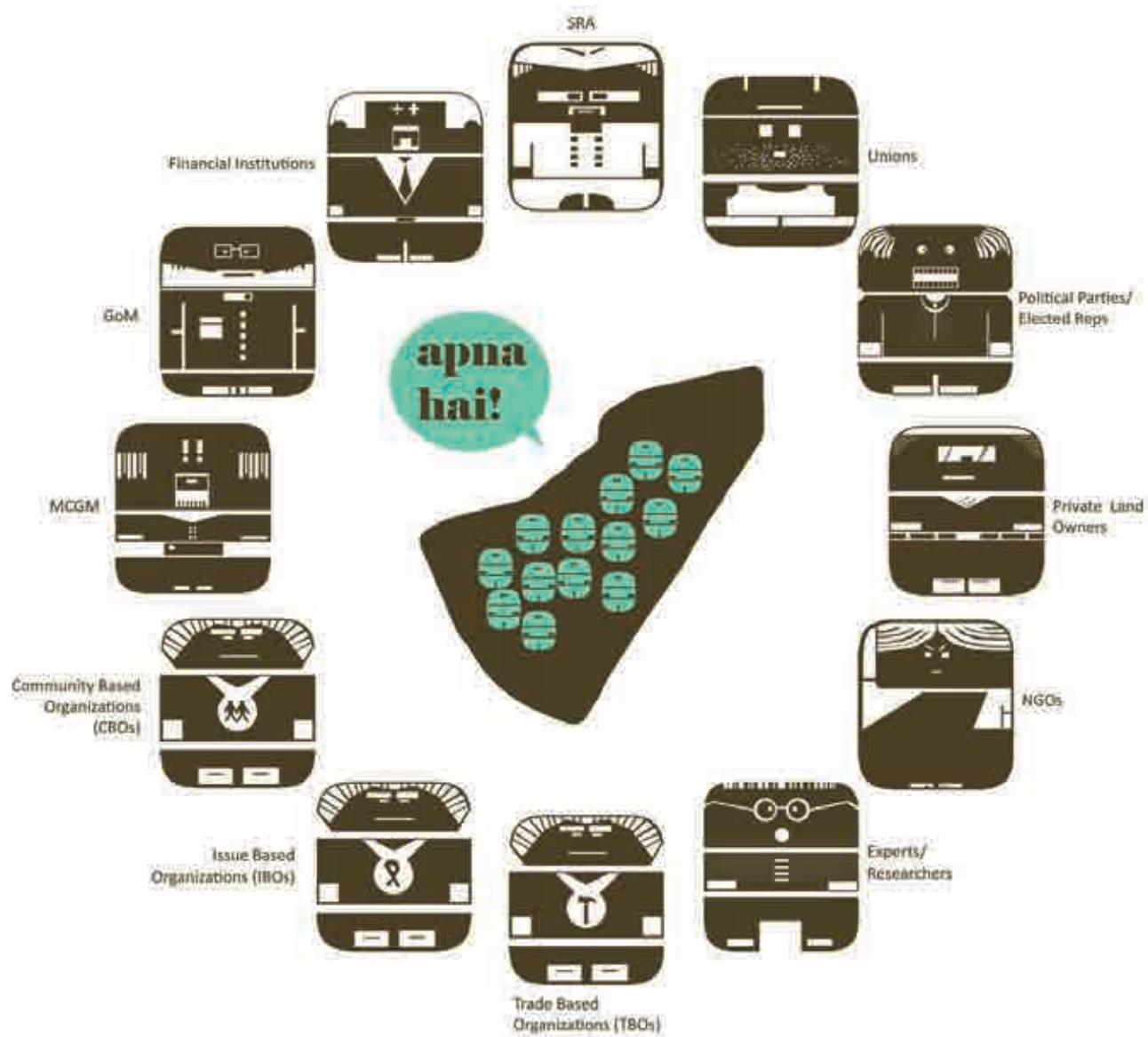
# Apna Hai!

# 14

SECOND PRIZE WINNER

Smita Singh, George Attokaran, Aman Luthra,  
Mike Hardin, Magdalena Gajewska, Pranay  
Manocha

The vision of this proposal to incrementally upgrade and be participatory are brought together under a proposed Dharavi Infrastructure Improvement Trust comprising of residents, sponsors, community based organisation, trade based organisations and issue based organisations. The DIIT proposes a series of big and small moves to intervene in Dharavi, financed from the sale of TDR and bonds in the open market. The jury found this to be a holistic proposal, with a detailed analysis of the DRP and the pros and cons of the redevelopment approach. The members particularly appreciated the allocation of rights to all residents depending on the duration of their stay in Dharavi.



## PREMISE

### Mumbai's Housing Dilemma

The Government of Maharashtra, under the SRA, has entrusted the redevelopment of Dharavi to private developers and increased the allowable FSI for Dharavi to provide more incentive. It is not surprising then that the highly valued land of Dharavi has come under immense redevelopment pressure. Today, the median household income of Greater Mumbai is around INR 20,000 per month while the lowest price for a single bedroom apartment in a public housing scheme starts at INR 1,400,000. Given that the cost of housing is much higher than the affordability range of a family's annual gross income, it is apparent that nearly half the population is unable to afford their own house. Around 130,000 homes are unsold and unoccupied, of which 52% are priced above INR 2 cr. Therefore, while today a migrant family in Dharavi can afford to rent a unit at INR 5,000, this will not be possible in a redeveloped Dharavi.

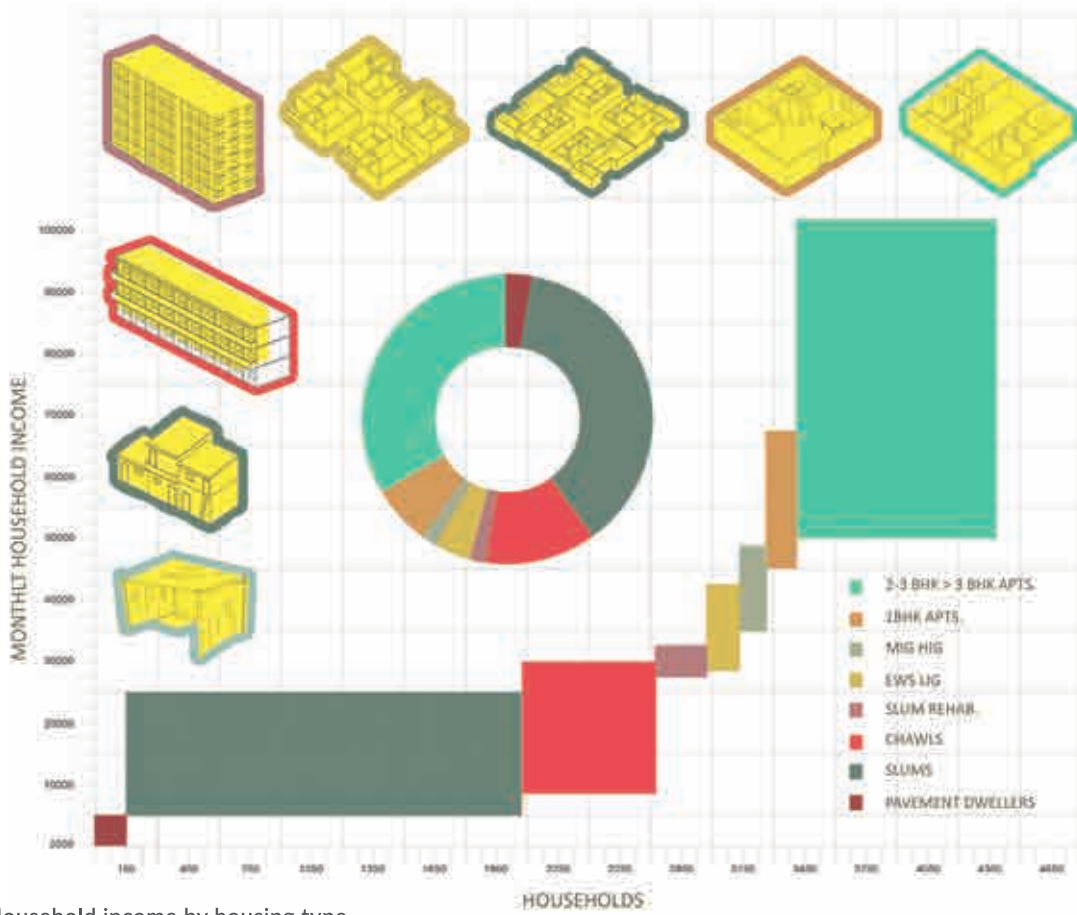
### Over Supply in Central Mumbai

Not only residential stock but around 4 million sq ft of grade 4 commercial space surrounding Dharavi stands unleased and unoccupied. When MMRDA was unable to sell land in the recent auctions (at INR 30,000 per sq m) they decided to sell FSI instead and raised their FSI to 4.0. As a result they have another 9 million sq ft of FSI left to sell over and above the 30 ha of land. It is unlikely that by putting Dharavi's land on the block, prices in central Mumbai will come down - in fact a substantial portion of Mumbai's affordable stock will disappear.

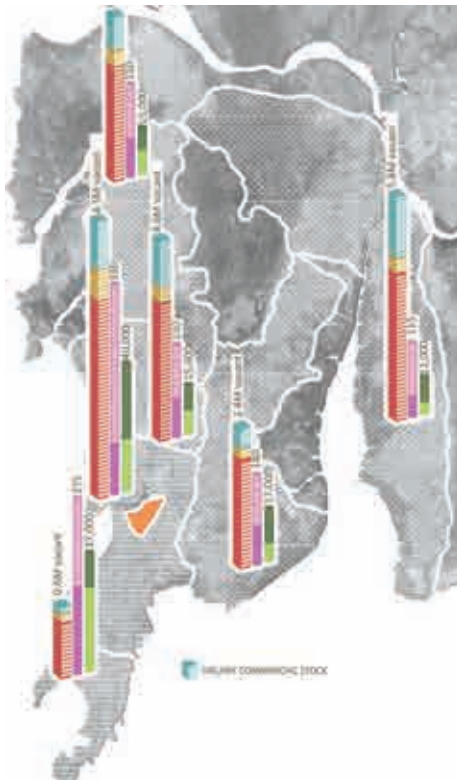
The State and Central Government has attempted to prevent slums through:

- Demand and supply side subsidies
- Inclusion of Economically Weaker Sections and Low income groups in private development and MMRDA rental housing schemes (to be built by private developers).

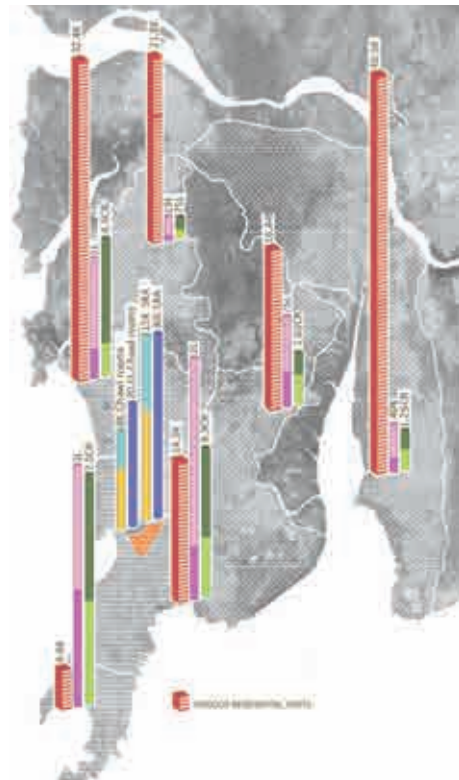
However, affordable housing as defined by the Reserve Bank of India, Ministry of Housing and Poverty Alleviation still remains out of bounds for the poor. Secondly, MMRDA/MHADA schemes set up eligibility criteria that exclude groups. Most housing is also provided far from the city centre.



Household income by housing type



Vacant stock



Unsold units



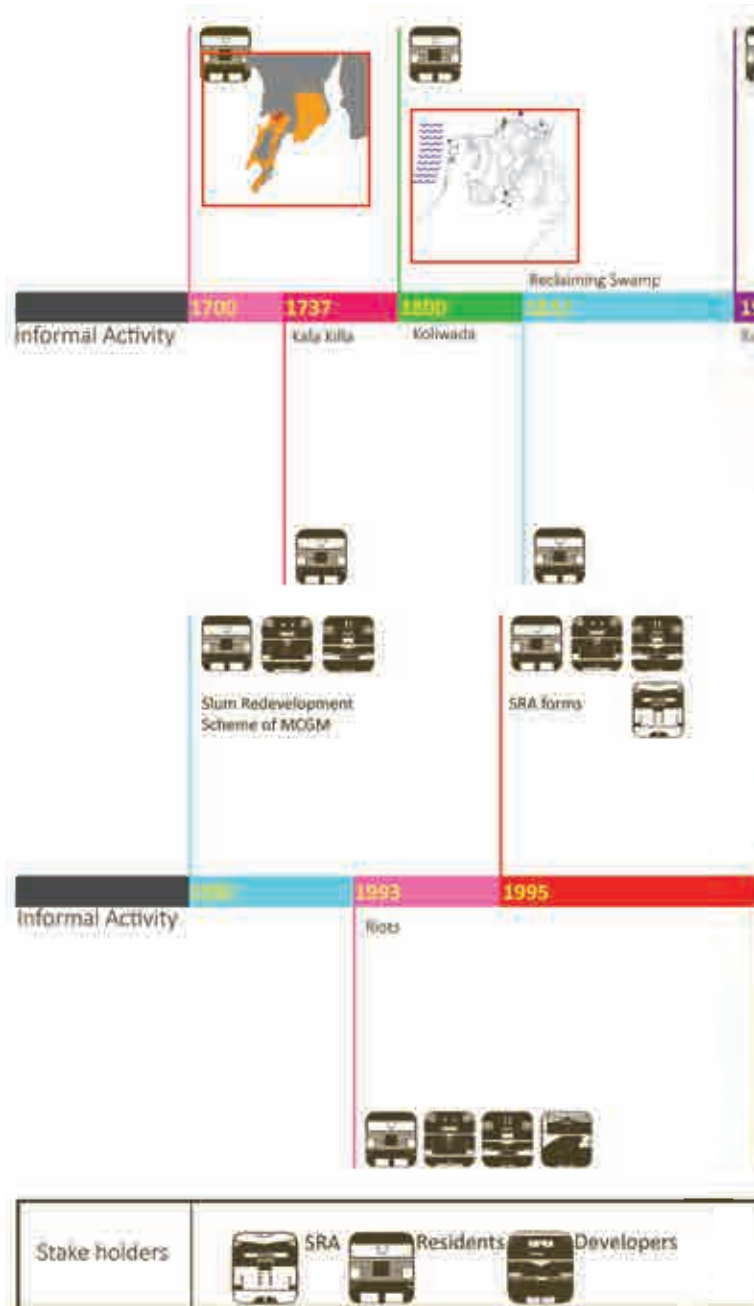
**Dharavi is a Special Economic Zone**

Dharavi produces goods and services worth USD 600 million to USD 1 billion per annum which is 1% of Mumbai's GDP. The trade activities are linked with Mumbai and around the world, yet it is excluded from the MCGM plan. Dharavi's real estate is valued more than its contribution to employment, goods and services.

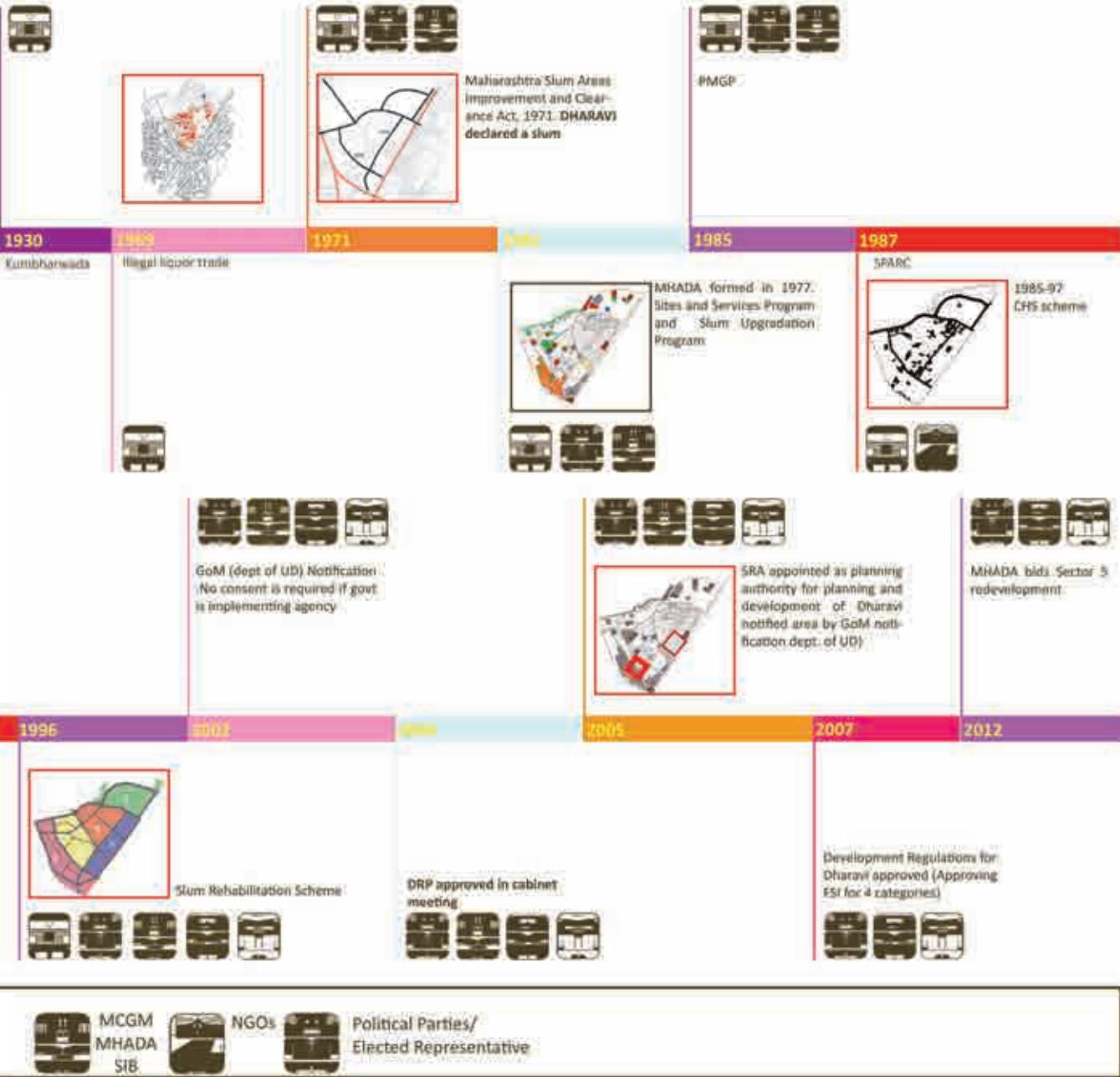
**Existing Redevelopment Policy**

The policy regime for slums in Mumbai (under the SRA) makes the private developer the main stakeholder in the process of redevelopment. The broad brush of redevelopment destroys the organic fabric created through years of layering of people, investments, space, activities and networks.

The eligibility criteria and cut-off date squeezes out households who are left to fend for themselves once again. To squeeze in the saleable component, the development has to be vertical (minimum Ground + 7 floors) and is fundamentally different from the previous organic typology (Ground + one or two floors). While the organic typology can sustain multiple activities for work, living, play - the new housing typology is only a stacked filing cabinet for people. Redevelopment with an FSI of 4 as proposed under the DRP would cause overcrowding of Dharavi. The new saleable component would bring more population to the area that is already fairly dense (2,500 people/ha gross density). Assuming that the new area added would have larger units (20 sq m/person) it would still add 217,092 persons to the area making the Gross Density **5,800 people/ha**.



Evolution of the Dharavi Redevelopment Plan



## GUIDING PRINCIPLES

1. Target incremental improvement as policy, a middle ground between a greenfield approach and a conservative approach.
2. Infrastructure to be funded by leverage and not redevelopment.
3. Areas of Incremental improvement to be outlined by the community.
4. The community should be incentivised to use low cost innovative building techniques/typologies.
5. The institutional process for improvement should place ownership on community.
6. Tenure security should remain as a target with 100% coverage for people and structures.
7. Roles of Government / Non Government agencies should be crafted with the intention to build capacity, dispute resolution and assistance in external local and global networking.
8. Larger state led infrastructure improvements should be undertaken post community feedback/interaction.



### Redevelopment Approach

### Pros

### Cons

free pukka house  
 free pukka title  
 step up in status  
 toilets for all  
 market financed  
 supported by institutional mechanism  
 huge income for government  
 profit for developer  
 more efficient infrastructure  
 maintenance funded by developer  
 creates more housing

psychologically stressful  
 already influenced or partially convinced  
 feel entitled to 4.0 FAR  
 connection to ground for old people lost  
 lose livelihood  
 low maintenance of common areas  
 inclusion is partial (tenants ignored)  
 gentrification  
 no element of participation  
 top/down socialist approach  
 element of manipulation by developer  
 saleable FAR creates unviable densities  
 loss of ID/sense of community



Incremental Approach	Pros	Cons
respects organic process	lack of models/examples	
vibrant	time consuming	
exciting for thought	does not serve formal agenda	
sustainable/low carbon footprint	poor housing stock	
livelihood sustenance	hard to build consensus	
pride of place	no institutional mechanism	
protects capital already invested	no capital	
community maintained public spaces	unsafe living environments	
accommodates growth/change/adaptability	lose FAR/not entitled to FAR legally	
low crime rates	no title	
social milieu/sense of community	poor infrastructure	
democratic/participatory	poor toilet coverage	
source of cheap informal housing	high cost of basic amenities	

# GOVERNANCE

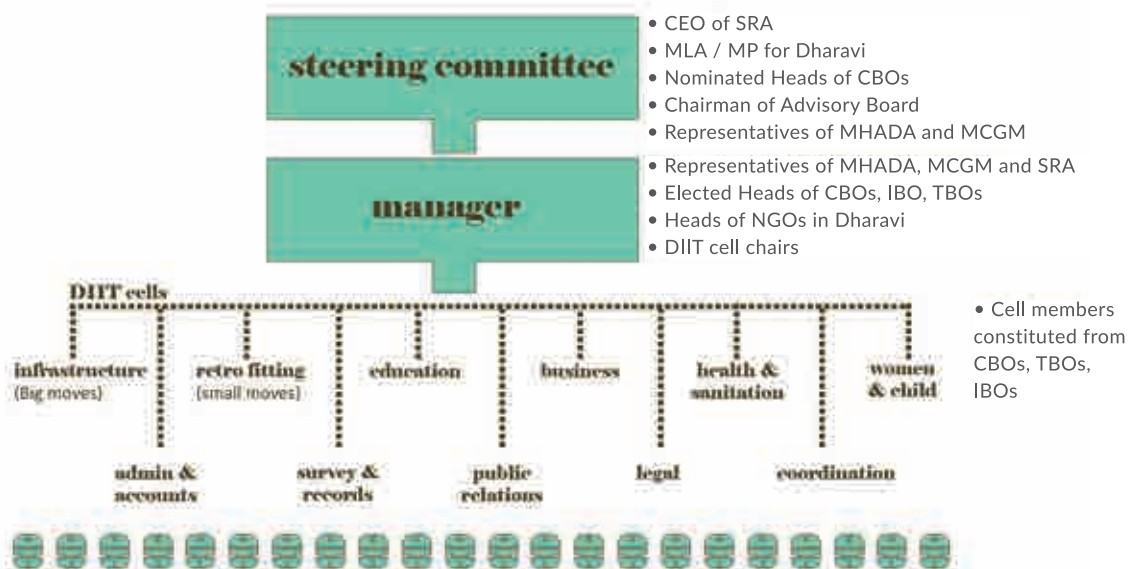
The proposed Dharavi Infrastructure Improvement Trust (DIIT) provides for the Government to name residents as beneficiaries and link tenure to units in the trust. Through this, various types of groups could come together, structure themselves and with the help of Government, technical experts and NGOs undertake self-improvement plans and activities. The trust can leverage to raise capital for improvement without necessarily redeveloping. For example - the trust could use the unbuilt saleable FSI component sanctioned by the DRP as collateral and issue long tenure infrastructure bonds to raise money. The Government acts as the guarantor. In doing so, the trust represents the voice of the people on whose behalf infrastructure improvements are made. Dharavi residents, thus, become owners of their property and consequently, share or unit owners of DIIT.

Shareholders or the people of Dharavi own the DIIT but it is administered by cell chairs and supported by government, NGOs and technical experts.

Cell chairs represent the interests of their cells in the administration of the DIIT. They are elected by cell members.

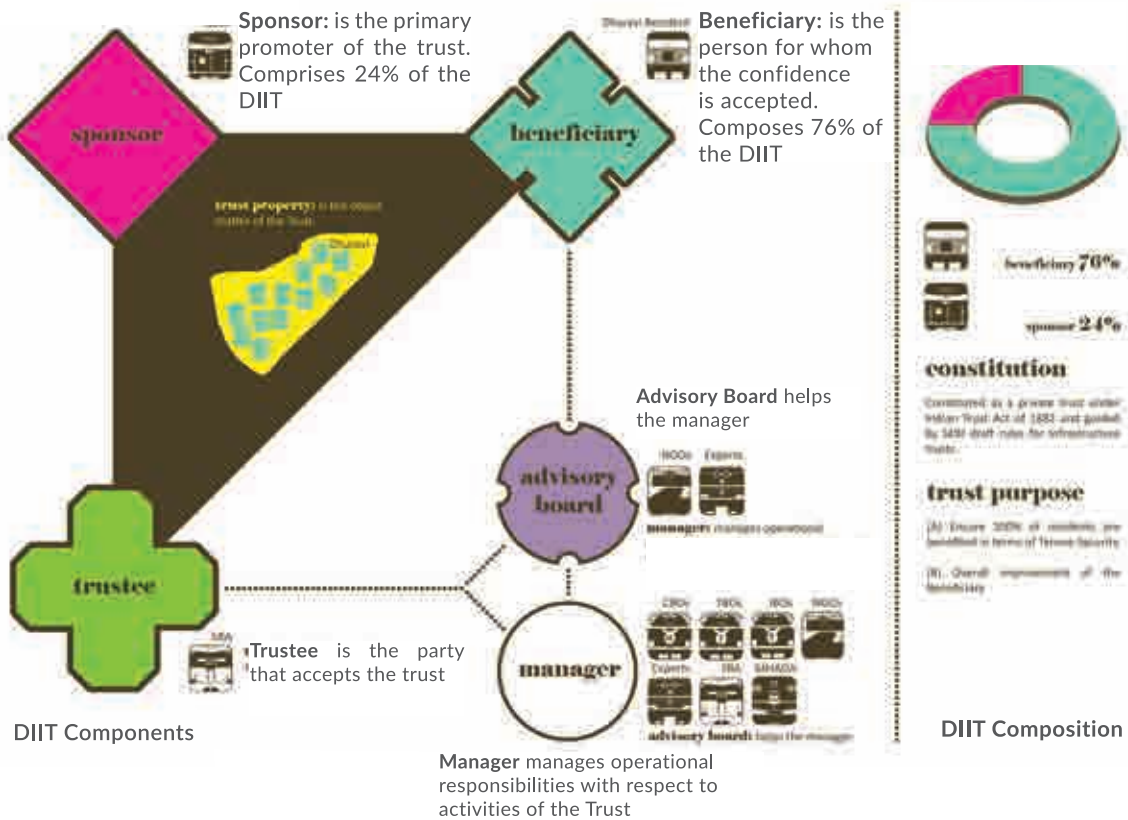
Cell members are nominated and elected by the shareholders. They manage the agenda and priorities of projects in their cells and call upon government and non-government advisors for technical expertise.

Shareholders elect cell chairs, set the agenda by bringing in project ideas and vote on projects that the trust should pursue.



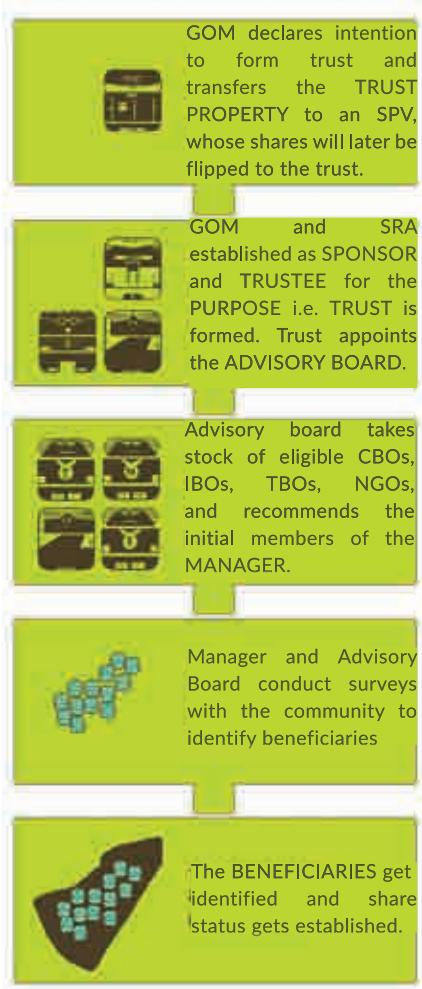
DIIT Administration





**DIIT Establishment**

- CBO: Community Based Organisation**
- Post code based, for example - nagar, chawl, compound
  - Have a geographic extent
  - Mandatory in nature
  - Formulate physical incremental improvements including housing, sanitation, redevelopment
  - Work closely with infrastructure (Big Moves), cell and retrofitting (Small Moves), cell of DIIT
- IBO: Issue Based Organisation**
- Set priorities for the issues they address
  - The cells in the figure are purely notional and designed to serve as an example of the kinds of issues that they could address
  - Aside from providing support and guidance at the Trust level, various Government and non-Government organisations provide issue-based support directly to the IBO's and concerned cells as needed
- TBO: Trade Based Organisation**
- Profession / trade based
  - Formulate projects as per priority areas
  - Work closely with Business Cell of DIIT





# FINANCE

## RAISING CAPITAL FOR INFRASTRUCTURE

### Dharavi Special Purpose Vehicle

Special Purpose Vehicle (SPV) for Dharavi where 100% shares owned as per existing land ownership (Government agencies and private).

### Initial Capital Raise

SPV raises initial capital through Bonds subscribed by GoI. The collateral is the saleable FSI of Dharavi Notified Area under existing DRP.

### Shares Flipped to Trust

Trust is established and SPV shares flipped to Sponsor (24%) and Beneficiaries - Dharavi Residents (76%). Residents start paying property tax/fee.

### Trust Issues Bonds

Trust issues bonds in the open market to raise capital for Infrastructure.

Collateral = "Saleable FSI" of Dharavi Notified Area under DRP

Collateral Value = 2 x of capital raised.

GoM would be guarantor. Tenure = 20 years.

Rating and interest rates benchmarked with other Government bonds. The interest and repayment is borne by sponsor and beneficiaries

## BUDGETING STRATEGY

### Infrastructure

**Expenditure:** Invest in "Big Moves", Services Loan, Repays Loan

**Income:** Bond Receipts, Property Tax, ECB, Govt. / MCGM Planned Expenditure Budgets

### Improvement

**Expenditure:** Loans, Incentives, Insurance reimbursement (Health / Life)

**Income:** Bond Receipts, Interest from and Repayments of Loans, Insurance Premium Receipts, Redevelopment Premium, GOI Incentives/Reimbursements

### Growth

**Expenditure:** Start Up Capital, Loans

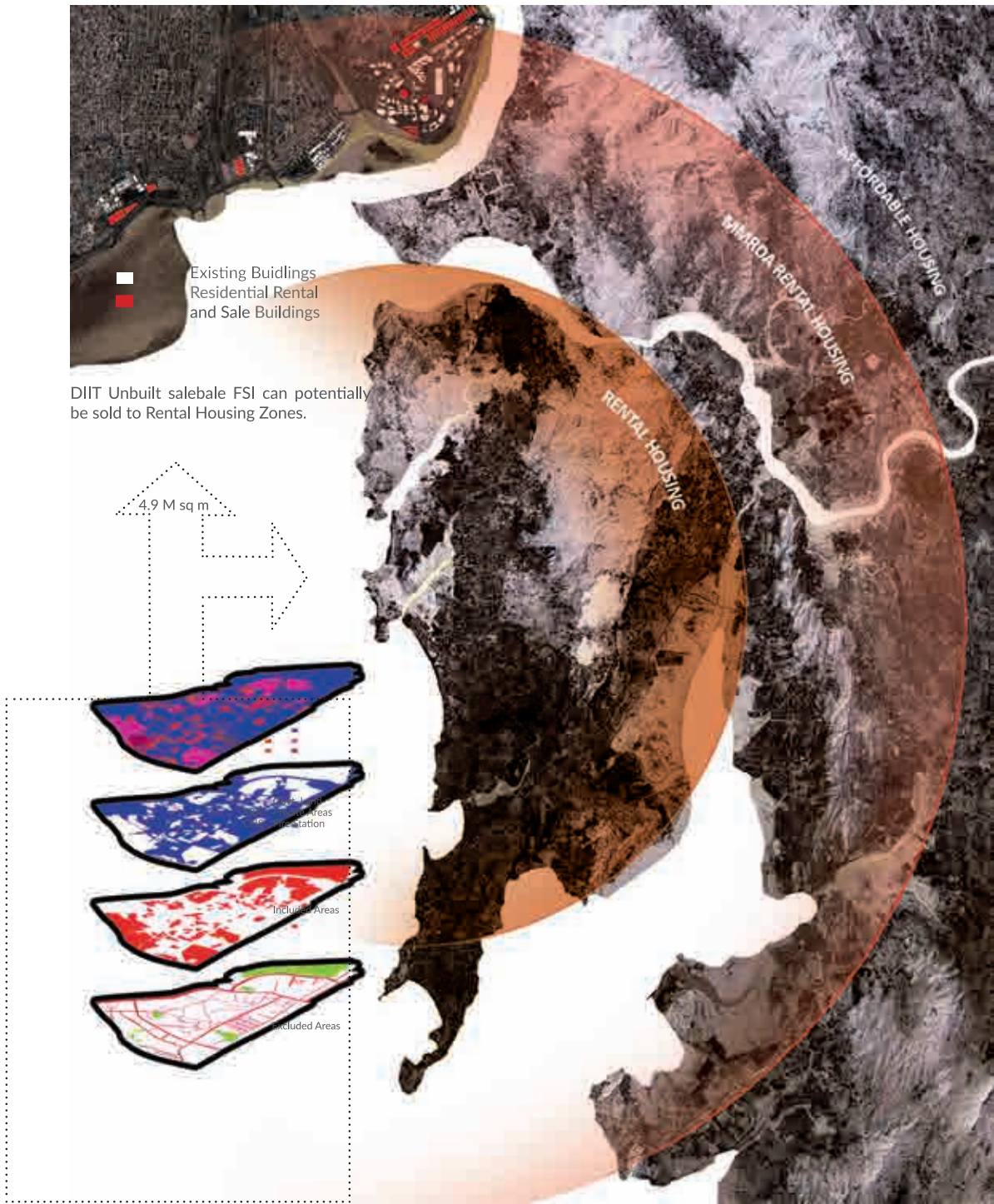
**Income:** GoI Budget For Entrepreneurs, Private Investments, Profit/Income Share, Repayment of Loan And Interest

### Sustenance

**Expenditure:** Maintenance, Salaries and Fees

**Income:** Property Tax, Surplus From Investment, Loan Interest And Repayment

DIIT's Investment for profit ideas		
Small and large scale commercial initiatives that have quantifiable social good for Dharavi residents	Entrepreneurial Support	Apply for managing GOI funds for entrepreneurs
Incubate	Waste to Wealth Incentives	Can take other private investments including CSR
Provide Start-up Capital	Scholarship	Ensure Borrowers meet Quality Assurance and work place safety
Provide Working Loans	Work Space	Will seek profit share / revenue share









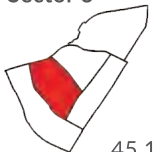













DIIT can leverage its unbuilt FSI of 4.9 million square meters that we can estimate is worth INR 4,900 cr.

This saleable FSI could potentially be sold to zones that are identifiable for rental and affordable housing in the Greater Mumbai and MMRDA region.

### Raising Funds for Infrastructure

DIIT would leverage its asset of the unbuilt FSI sanctioned under DRP.

Sector and area (ha)	Excluded area (ha)	Included area (ha)	Residential	Commercial	Industrial
<b>Sector 1</b>  59.38	SRA -3.68 Private -18.97 Others -6.92 Total -29.57	29.81			
<b>Sector 2</b>  39.81	SRA -3.12 Private -0.14 Others -3.82 Total -7.08	32.73			
<b>Sector 3</b>  45.16	SRA -6.08 Private -2.13 Others -1.41 Total -9.08	35.36			
<b>Sector 4</b>  45.16	SRA -4.78 Private -3.8 Others -1.84 Total -10.42	23.52			
<b>Sector 5</b>  59.38	SRA -3.68 Private -18.97 Others -6.92 Total -38	24.1			
<b>Grand Total</b>	<b>Total -94.87</b>	<b>145.52</b>			

### Funding Infrastructure - Leverage saleable FSI

1. 4.3 million sq m of saleable FSI in DRP
2. Can potentially be sold for rental housing projects in Greater Mumbai
3. Actual sale of FSI would be a last option in event of default

	Total Structures (Mashal Survey)	# of units per structures (assumed)	Total hutment units
Residential units	43,588	2	87,176
R/C	555	1	555
I/C	11,534	0.5	5,767
Religious	438	1	438
Amenities	138	1	138
Total	56,253		94,074
Population to be rehabilitated	470,370 persons (as per SPARC)		
Total rehab units	94,074 (assuming 100% inclusion)		
Minimum carpet area per unit	27.88 sq m (as per DRP)		
Loading	40% including wall and common area		
Total rehab component	3,671,896 sq m (as per DRP)		
Multiplier for sale component	1.33		
<b>Total Saleable FSI</b>	<b>4,883,622 sq m or 488 ha</b>		

Infrastructure cost vs DIIT Fee / Property tax burden	
*Infrastructure cost - 2008 (INR cr)	535
Infrastructure cost - 2014 (INR cr)	753
Sponsor: stake in DIIT (%)	24
Government planned expenditure (%)	26
Beneficiary share: Infrastructure cost (%)	50
Beneficiary share: Infrastructure cost (INR cr)	376
Tenure (years)	25
Moratorium (years)	5
Interest rate (%)	8
Total repayment	786
(Loan + Cost) (INR cr)	
Annual EMI (INR cr)	30
Population	430,000
Number of households (@HH size of 5)	86,000
<b>Annual Household Property Tax Burden** (INR)</b>	<b>3,481</b>
*To be finalised upon assessing peoples paying capacity and area occupied	

# PLANNING

The plan for Dharavi is structured into Big Moves and Small Moves comprising the following elements:

## BIG MOVES

### Urban Design

- Create a "pride of place"
- Strengthen nodes and pedestrian paths
- Integrate new nodes into existing paths
- Stitch edges
- Install bathroom towers

### Transport

- Protect Dharavi's predominantly pedestrian nature
- Remove through traffic from Dharavi's 60 Feet Road and Station Road
- Integrate proposed Dharavi metro station
- Resolve areas of conflict between pedestrian paths and roads
- Junction upgrades and traffic management measures
- On street and off street parking solutions for commercial and industrial

### Infrastructure

- 100% sewage and water connections for households
- Plan and integrate water and sewage network with trunk lines
- Make high tension electricity lines underground
- Rainwater harvesting at site level and solar roof panels for Dharavi

## SMALL MOVES

### Retrofitting ideas

- Retrofitting at a house and community level to include bathrooms and septic tanks
- Improving and upgrading the municipal and community run bathrooms
- Rainwater harvesting at a house and lane level
- Identifying areas for temporary health camps
- Inserting play pens for children

### Adaptive reuse ideas

- Using schools for alternate uses during the night
- Identifying buildings to use as rehabilitation centres during natural disasters
- Identifying buildings of cultural and historical significance

### Redevelopment ideas

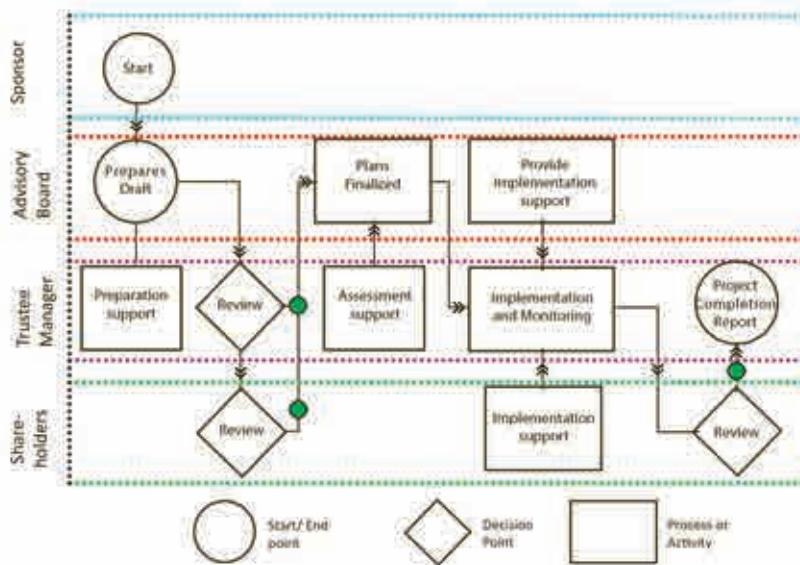
- Redevelopment on the basis of densities or communities who desire it
- Redeveloped densities should sustain incremental improvements and economic activity
- Housing typology chosen for redevelopment should accommodate existing densities and incremental increases
- Use of low cost, high speed innovative methods



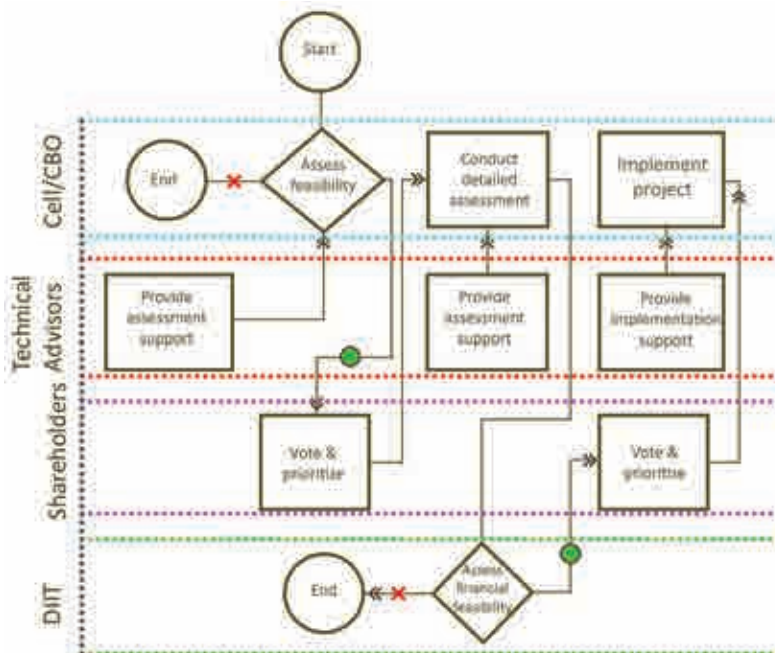
The institutional process for Big Moves or larger infrastructure initiatives, funded largely by the loan raised by DIIT, will be initiated by the Sponsor.

Planning and implementation is entrusted to the manager acting on behalf of the beneficiary. Shareholder approval is mandatory. The sponsor interacts with Government and seeks approvals.

Small Moves or incremental improvement will be initiated by CBOs, IBOs and TBOs. The process will begin with an idea submission whose feasibility is determined by the cell with technical support. Projects will be prioritised for implementation. The CBO or TBO may undertake the project themselves.



Institutional process for Big Moves







Institutional process for Small Moves



## POLICY

Tenure security for 100% : Allocation of share status based on duration of stay/ownership

Duration	Status	Under DIIT
Owners		<ul style="list-style-type: none"> <li>- Awarded legal Title (Leasehold tenure 60/99 years).</li> <li>- Liable to pay Property Tax proportionate to area occupied</li> </ul>
+10 years		<ul style="list-style-type: none"> <li>- Awarded legal Title (Leasehold tenure 60/99 years).</li> <li>- Liable to pay Property Tax proportionate to area occupied.</li> </ul>
5-10 years		<ul style="list-style-type: none"> <li>- Awarded legal Title (Leasehold tenure 60/99 years).</li> <li>- Liable to pay Property Tax proportionate to area occupied.</li> <li>- Eligible for status upgrade to 'A'</li> </ul>
0-5 years		<ul style="list-style-type: none"> <li>- Awarded legal Title (Leasehold tenure 60/99 years).</li> <li>- Liable to pay Property Tax proportionate to area occupied.</li> <li>- Eligible for status upgrade to 'B' and then 'A'</li> </ul>

### Checks and Balances

- Residential status is considered based on the duration of stay within Dharavi
- Property tax collected will be used to service debt raised for the Big Moves
- In addition to the status, all residents will be issued 'shares' in DIIT based on the area (sq ft) occupied/owned presently

The value of these shares will be realised when business initiatives started by DIIT will start to generate profit

- Neither status nor shares can be traded. Only property can be traded, after the pre-stipulated period of the loan. Status and shares will be transferred to the new owner on sale of property.

### Retrofitting / In situ / Small Moves

- Eligible for loans from DIIT or other lending agencies.
- Collateral Value = 'X' x 'V' x {1· [(10 · 'Z')/ 10]}
  
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- Collateral Value = 'X' x 'V' x {1· [(10 · 'Z')/ 10]}

### Redevelopment

- Treated as owners in redevelopment.
- Eligible for units of 320 sq ft carpet area.
- Can buy additional up-to a max of 480 sq ft
- Units payable at cost of construction.
- Loans available.
  
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- Units payable at cost of construction.
- Loans available.
  
- Eligible to rental housing in redevelopment.
- Rent payable to the DIIT.
- Eligible to status upgrade from 'B' to 'A'.
- Eligible to units of 320 sq ft carpet, on attaining 'A' status, @ a higher rate to original A status holders as per:
- New apartment cost = {'W' x 'V' x [1 +('Z' /10)] x 1/2}
  
- Eligible to rental housing in Redevelopment.
- Rent payable to the DIIT.
- Eligible to status upgrade from 'C' to 'B' and then 'A'.
- Eligible to Units of 320 sq ft carpet, on attaining 'A' status, @ a higher rate to original A status holders as per :
- New Apartment Cost = {'W' x 'V' x [1 +('Z' /10)] x 1/2}

$$\text{Collateral Value} = \{ 'X' \times 'V' \times \{ 1 \cdot [ (10 \cdot 'Z') / 10 ] \} \times 1/2 \}$$

'X': Present market value INR/sq ft  
 'V': Unbuilt floor area - sq ft  
 'Z': Number of years lived in Dharavi up to a maximum of 10 years

.....

$$\text{New apartment cost} = \{ 'W' \times 'V' \times [ 1 + ('Z' / 10) ] \times 1/2 \}$$

'W': Cost of Construction· INR/sq ft  
 'V': Unbuilt floor area - sq ft  
 'Z': Number of years lived in Dharavi up to a maximum of 10 years

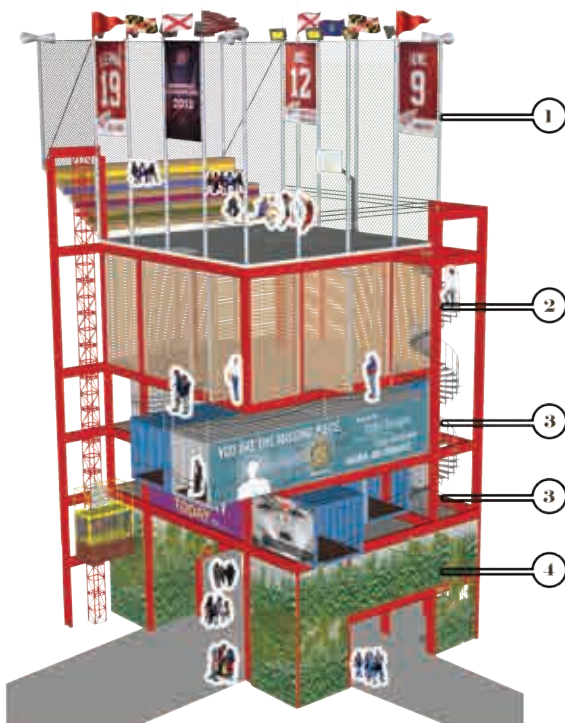
# SERVICE INFRASTRUCTURE

## BIG MOVES

- 100% sewage and water connections for households
- Plan and integrate water and sewage Network with trunk lines
- Make high tension electricity lines underground
- Rainwater harvesting at site level and solar roof panels for Dharavi

## SMALL MOVES

- Retrofitting at a house and community level to include bathrooms and septic tanks
- Improving and upgrading the municipal and community run bathrooms
- Rainwater harvesting at a house and lane level



### 1. Dharavi Arena

A multi-purpose 24hr arena. Expected uses include, sports, performances, cultural activities, tourism promotion

### 2. Healing Center

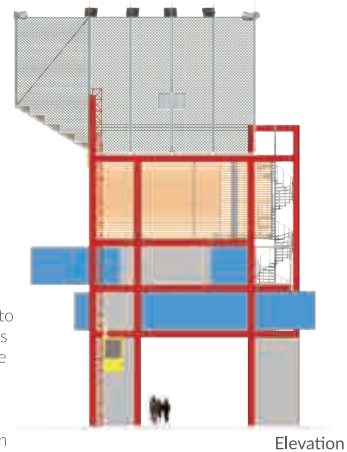
Center for rejuvenation and strengthening of the mind and body. Expected uses include cultural, indoor performance, CBO orientation.

### 3. CBO Office

Joint Office of community based organisations. Center for survey/data collection, awareness and conflict resolution.

### 4. Public Toilet

Public toilets on the ground and floor. Waste to be re-purposed as Bio gas and manure. Facade to be a green wall showcasing a sustainable approach to living. Also contains a Dharavi visitor orientation center.



## Bathroom Tower

The bathroom towers are located in underserved areas and used in conjunction with bridges to increase the convenience for pedestrians who commute daily along these paths.

Underground cabling of TATA high tension lines along Central Rail right of way. This is to avoid relocating the densely populated areas below the power line.

Increase capacity of main sewage lines along 90 Feet Road, 60 Feet Road and Dharavi Station Road. These lines are the trunk lines of Dharavi and increasing capacity would be required if the local network has to be connected to them.

Dredge the channel/nala from 60 Feet Road to the Bay. This is to remove blockage which currently causes back flow into Dharavi.





# TRANSPORT

## BIG MOVES

Dharavi's core is predominantly pedestrian and central to the way people travel and spend their leisure time. Dharavi has strong edges, reinforced by elements like the railway tracks and high traffic carrying through roads. This fortress like quality of Dharavi is broken at specific points where edges are transgressed. The open spaces inside Dharavi are made of pedestrian paths of all sizes that lead to nodes and squares of varying scales. The central idea is to protect and strengthen these existing pedestrian paths.

1. 90 Feet Road - This road serves as a local Dharavi road and is extremely vibrant during the nights and festivals. The proposal celebrates this "public place" by widening the footpath and reserving part of the right of way for hawkers. The carriageway is reduced and existing parking is not disturbed. The points where other paths converge are raised and treated to give a plaza-like quality.
2. Road connection between Eastern Express Highway and LB Marg along Western Rail right of way.
3. Road connection between BKC and Eastern Express Highway. 60 Feet Road and Sion Station Road serve as connectors between Eastern and Western Express Highway. The through traffic creates major pedestrian - vehicle conflict zones. The proposed connections would relieve traffic and restore the roads to Dharavi.
4. Edge Stitch - The design proposes specific bridges across edges where paths could potentially continue to railway stations/ metro station or other urban nodes.





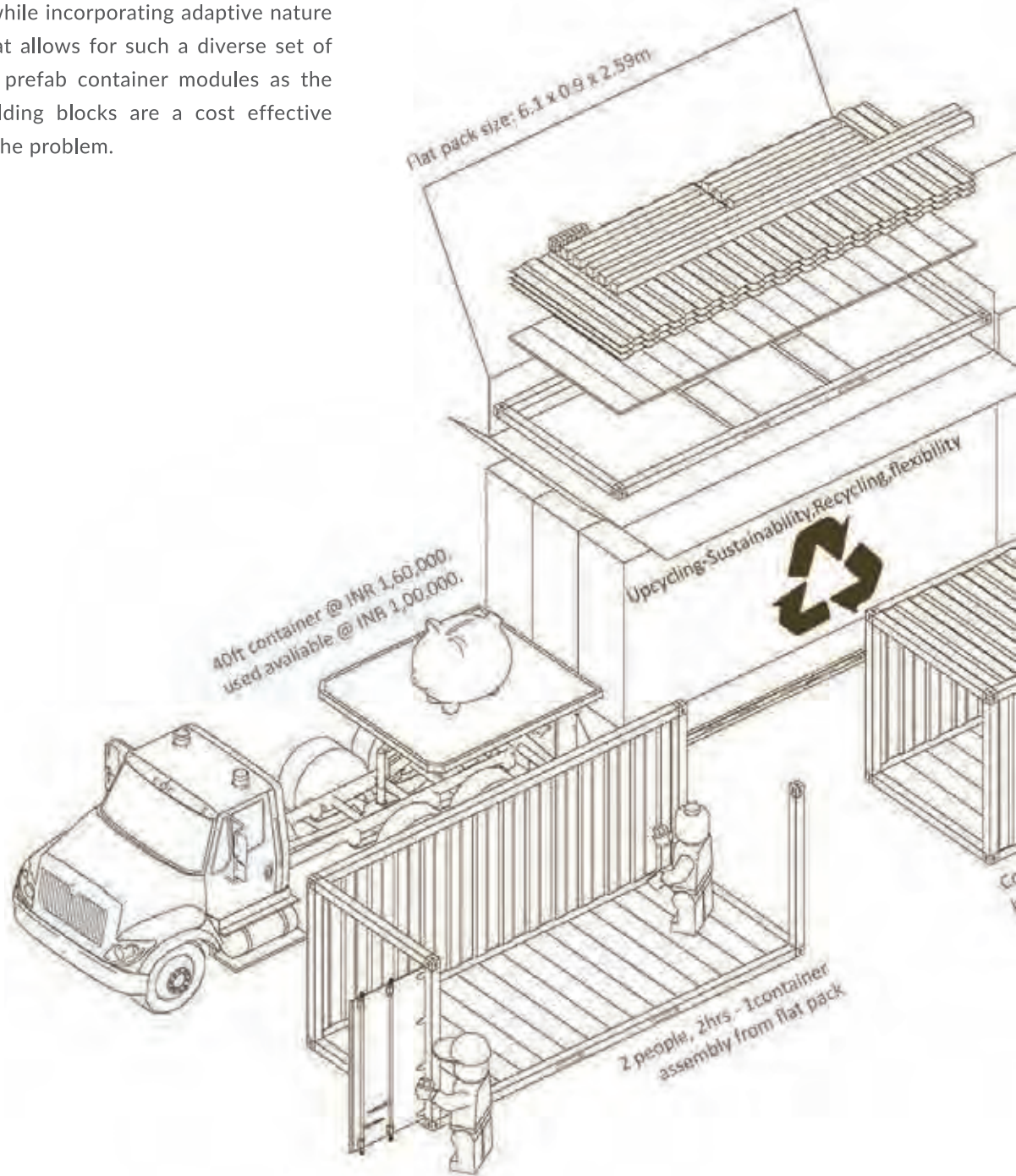


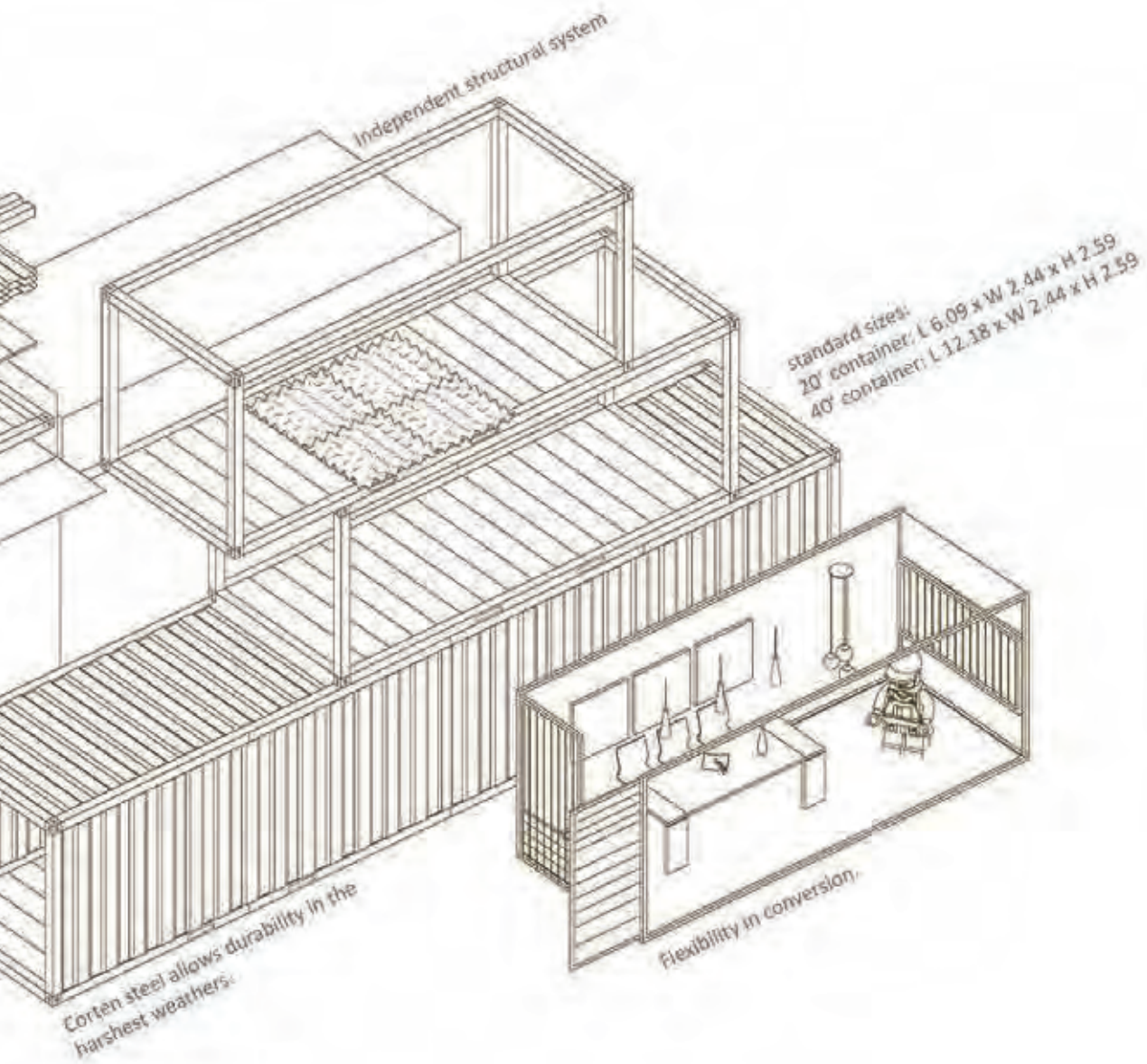


# HOUSING

## REDEVELOPMENT : Alternatives to compact urban living

Livelihood and the built environment are inextricably linked in Dharavi. Attempts at redevelopment must address both speed of construction, to avoid loss of continuity of livelihood, while incorporating adaptive nature of space that allows for such a diverse set of uses. Using prefab container modules as the primary building blocks are a cost effective solution to the problem.

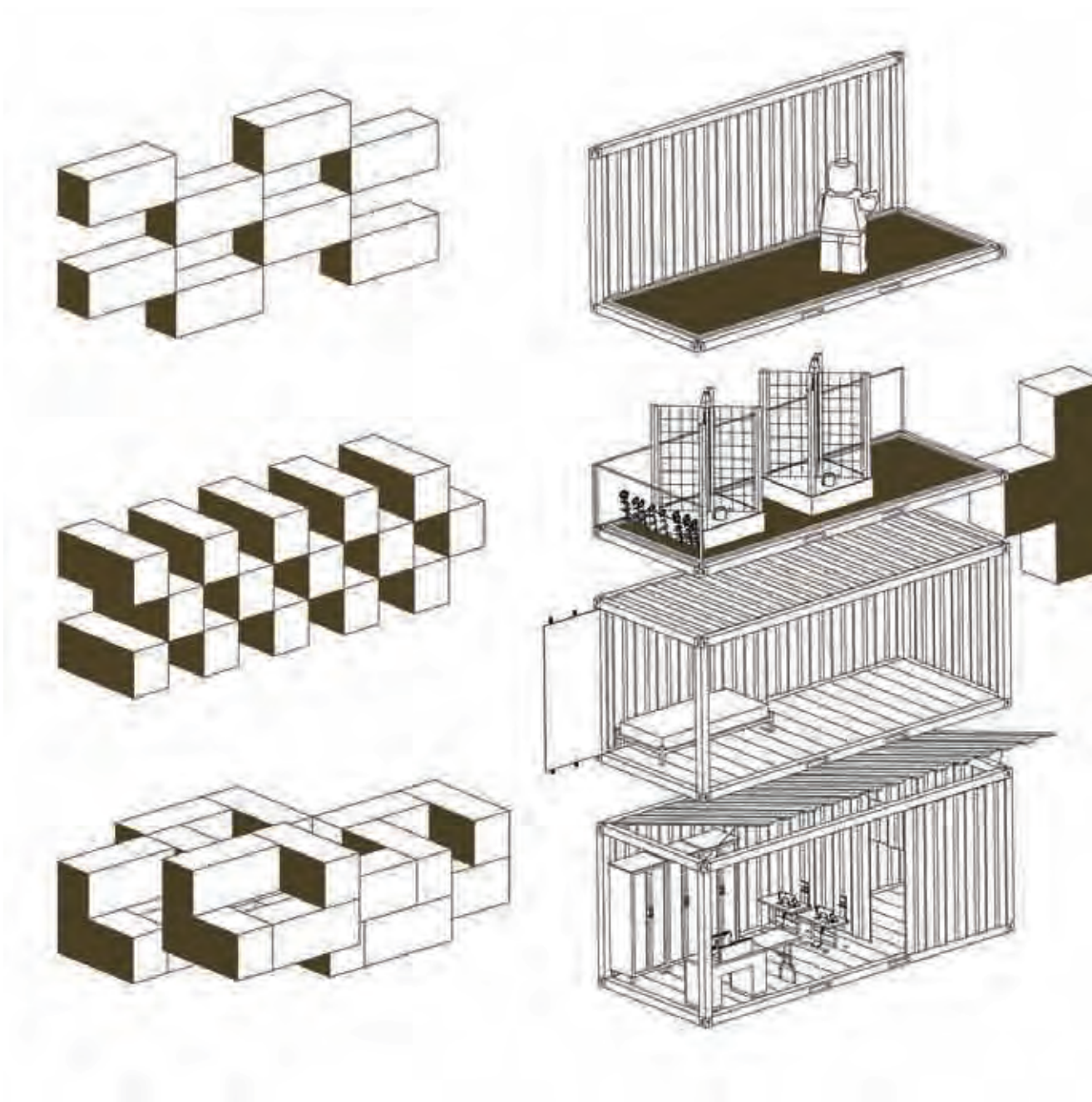


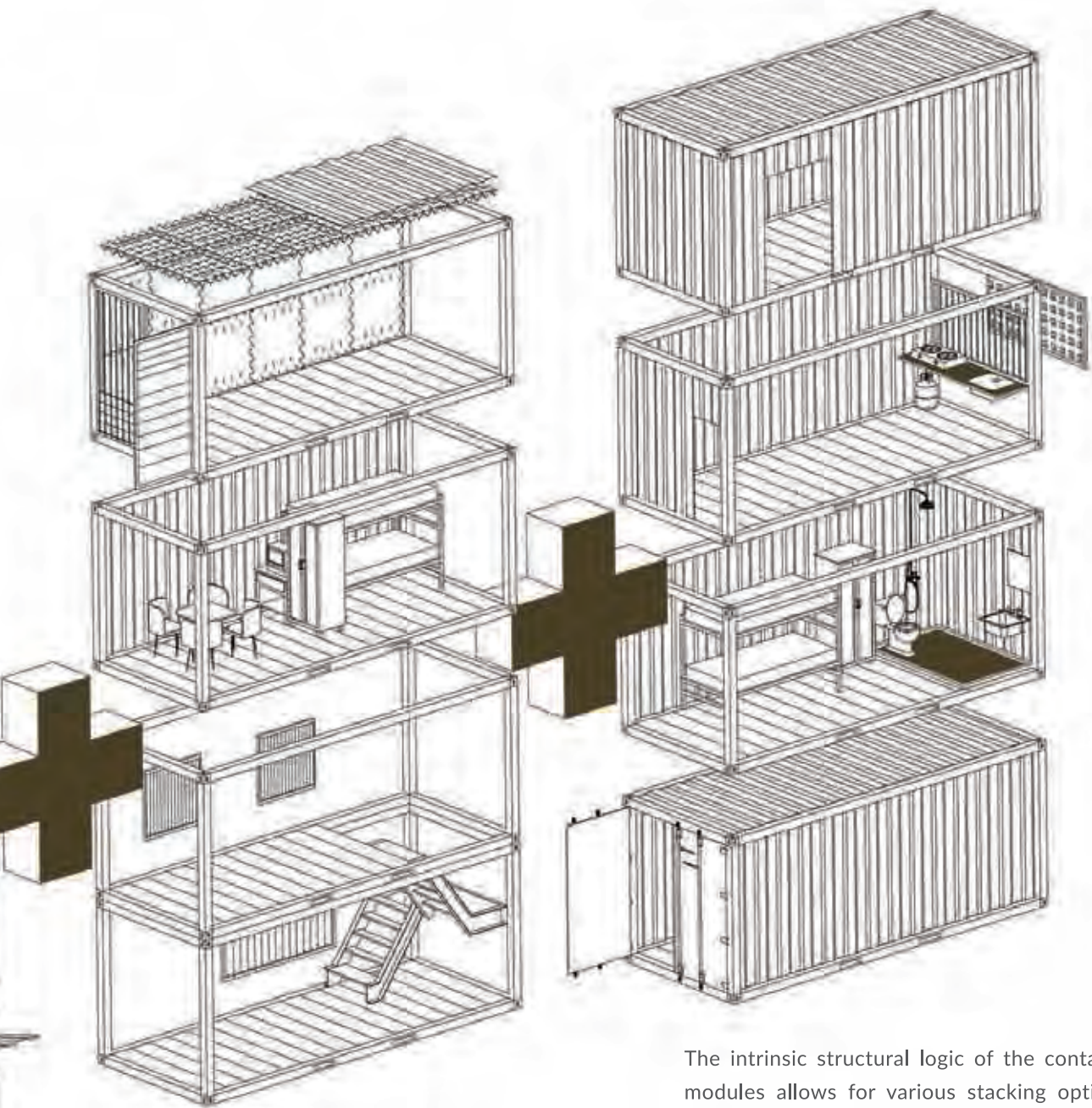




**REDEVELOPMENT:**  
**Alternatives to compact urban living**

Every unit owner is given 320 sq ft of carpet area (internal space) and 160 sq ft of semi open area. The availability of retrofittable equipment aids infinite possibilities in creating one's own space.





The intrinsic structural logic of the container modules allows for various stacking options. Owners can easily reconfigure their units to aptly suit the lifestyle and livelihood. This adaptive nature is further capitalised through market ready cost effective plug and play solutions like toilets, doors and windows which will be available to the residents of Dharavi at subsidised rates.







