

Untitled Work

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The vision of this proposal is guided by a set of ten principles based on Intelligent Urbanism. A G+7 typology is presented and hazardous industries are proposed to be separated from the rest of Dharavi. The master plan is based on formalising the morphology to increase open space and amenities. The jury found governance missing from this proposal, in particular there was no suggestion for community involvement. It was also unclear how the residents would transition from the existing houses into the proposed development.



Balance with Tradition



Conviviality



Opportunity Matrix



Balance with Nature



Efficiency



Regional Integration



Appropriate Technology



Human Scale



Balanced Movement



Institutional Integrity

PREMISE

Dharavi is a city within a metropolis built on dreams and the need for survival. It is unique in the sense that it is not merely a “residential” slum but a slum which is completely self-reliant with active livelihoods. Since the creation of livelihoods is the priority of residents, it has generated a unique, multi-purpose space. The population of Dharavi comprises more tenants than owners. The owners depend on the tenants to work as labourers in the workshops and to pay rent. This is a relationship of mutual dependence and any break in this relationship will mean the end of this engine for creating livelihoods and economic growth.

The spirit with which the people of Dharavi approach their lifestyle defines their needs and these define how the space is used and this in turn defines how Dharavi takes form. The integral spirit of survival and endeavour through which Dharavi ebbs and flows is an outcome of deprivation of incomes and in turn tenure, basic facilities and services. This state outweighs the need to create an integrated and functional plan for the settlement.

The diversity that exists in Dharavi creates multiple and conflicting vested interests that make it even harder to come to a consensus in reinvention. This situation is exacerbated by the fact that planners and planning authorities do not create plans on the basis of the spirit of the place. They focus more on negating the genesis of the form instead of adapting it to the principles of planning.

Observation of the Work - Place - Folk relationship and the cycles that exist within it, enables us to link the principles of Intelligent Urbanism (PIU) to the lifestyle of Dharavi.

GUIDING PRINCIPLES

Principle 1: Balance with Nature

Existing ecosystems must be preserved as far as possible and integrated with the urban form.

Principle 2: Balance with Tradition

Balance with tradition is intended to integrate plan interventions with existing cultural assets, respecting traditional practices and precedents of style (Spreiregen: 1965).

Principle 3: Appropriate Technology

The plan must use the appropriate technology by understanding situations, settings and circumstances that are consistent with local context through study and social interaction.

Principle 4: Conviviality

Social interaction must be encouraged through public domains, in a hierarchy of places, devised for personal solace, companionship, romance, domesticity, neighbourliness, the community and civic life.

Principle 5: Efficiency

There must be a balance between the consumption of resources such as energy, time and fiscal resources, with planned achievements for comfort, safety, security, access, tenure, productivity and hygiene.

Principle 6: Human Scale

Pedestrian networks along streets and open spaces must link local destinations, amenities and facilities. A human scale must be provided by integrating open spaces, arcades and buffers.

Principle 7: Opportunity Matrix

Increase access to shelter, healthcare and human resources development as well as safety and hygiene.

Principle 8: Regional Integration

The city is an organic part of a larger environmental, socio-economic and cultural geographic system essential for its sustainability. The plan must take cognisance of the flows between region and settlement.

Principle 9: Balanced Movement

There must be integrated transport systems comprising of walkways, cycle paths, bus lanes, mass transit corridors and automobile channels. Nodal split points are places of urban conviviality and access to facilities and services.

Principle 10: Institutional Integrity

Governance and urban management must be accountable, transparent, competent and participatory, founded on appropriate databases, due entitlements, civic responsibilities and duties. There has to be a strong, rational institutional framework to define, channelise and legalise urban development.

GOVERNANCE

A Dharavi Development Authority, as a special purpose vehicle is proposed for the redevelopment.

PLANNING

By observing the morphology, it is seen that crowding lowers standards of hygiene and usable space (an average of 15 sq m /dwelling unit). This situation creates health hazards and also leads to inefficient delivery of services and facilities. Proper governance and economic development is hindered, decreasing the overall quality of life.

Most of the existing land use in Dharavi is mixed with industrial and residential uses. The proposed plan retains this character but also formalises the morphology, to increase the per capita green space, provide adequate parking and increase dwelling unit sizes to 45 sq m, leaving space for amenities and facilities.

Hazardous industries are segregated from the rest of Dharavi to ensure safety. The proposed land use plan improves upon per capita open space, road area and amenity space to bring these closer to UDPFI standards.

Crowding Index	Current	Proposed
Total living area	15 sq m	37 sq m
Total multi-use area	30 sq m	55.74 sq m
Sanitation	1,400 p/toilet	3-5 p/toilet
Water supply	13.63 lt/ person/day	67 lt/ person/day
Per capita open space	0.08 sq m	3.65 sq m
Per capita road space	0.81 sq m	0.28 sq m
Per capita amenity space	0.31 sq m	0.5 sq m
Per capita parking space	--	0.31 sq m
Gross density	1,963 p/ha	1,758 p/ha
Net density	3,089 p/ha	4,922 p/ha



Proposed master plan

Proposed residential and industrial units in Dharavi

Unit	Percentage	Occupancy	New Planned Units
Workshop + Dormitory	50%	5	28,645
Residence + Dormitory	48%	6	1,146
Convenience Shops	2%	6	27,499

The above units shall be allotted in the buildings in the ratios mentioned

Building Type	No. of Buildings	Types of Units
Mix	448	Residential + Dormitories + Workshops + Convenience shopping
Residential	215	Residential + Dormitories + Convenience shopping
Industrial	233	Dormitories + Workshops + Convenience shopping

Finance of commercial space for sale

Area	7.5	ha
Footprint area	3.75	ha
Number of floors	10	
Total built area	450,000	sq m
Construction cost	4,000	INR/sq m
Sale price	44,000	
Profit	40,000	INR/sq m
Total profit	18,000	INR (cr)

Cost of construction and other works

Cost of Construction	Cost (cr, INR)
Roads	21.63
Services	116.43
Renewable energy systems	122.19
Urban agriculture	156.80
Landscaping for open spaces, promenade	1,666.50
Subsidy for land prices (@150,000 INR/sq m)	12,412.50
Contingencies (@15%)	312.53
Total Cost	14,808.58

FINANCE

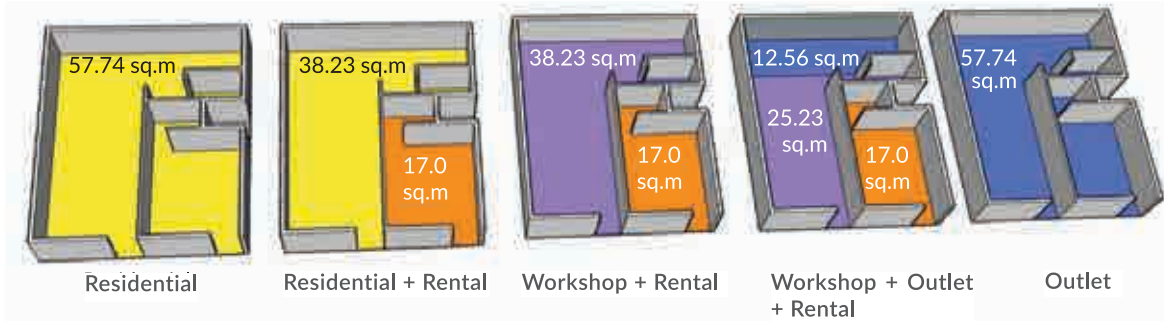
Stakeholders will participate in the redevelopment through economic contribution.

- 7.5 ha land would be dedicated to construction of 35.4 ha commercial office spaces at 4.72 FSI.
- Sale of commercial space would yield INR 18,000 cr which would cover the construction cost of about INR 4,800 cr including the subsidy of INR 12,412.5 cr for the land prices in sale of dwelling and industrial units.
- The cost of construction of buildings would be recovered and used as the

corpus fund for the Dharavi Development Authority, a proposed Special Purpose Vehicle (SPV).

The number of families owning properties is estimated at 17,490. The monthly income of owners is estimated between INR 15,000 and INR 36,000. Their ability to pay depends on income. The owners are expected to pay for construction cost of the carpet area of the unit and other costs including land price will be subsidised from the sale of commercial property.

HOUSING



Proposed habitation unit

Urban Agriculture (Terrace)	
Residential	Rental
Residential	Rental
Residential	Rental
Residential	Rental
Residential	Rental
Outlet	Workshop
Outlet Area	

Proposed use of G+7 typology

The habitation unit has been designed keeping in mind the need for flexibility of space to which the people of Dharavi and their livelihoods are adapted.

Rental income, a major contributor to livelihoods has propelled owners to utilise the same space for multiple purposes and to create additional rentable space, by stacking shelter one on top of the other.

The units are designed in a similar manner as the existing ones except for the introduction of open spaces and courtyards, with a view to improve the social scenario. Green spaces are arranged to formally link precincts to one another. Existing religious spaces have been retained and the units planned around them.

The current footprint of the dwelling unit is 15 sq m on an average which has been doubled, tripled or even quadrupled by stacking. Ladders are attached externally to give access to the rooms on upper floors. A metal overhang, between 0.5m to 0.75m, is used as the entrance.

The overall area of multi-purpose habitation unit is increased from 30 to 55.74 sq m. The area of living unit has been increased from 15 to 38 sq m. The new habitation unit leads to an increase in multi-purpose space per person from 2.7 sq m/person to 10.13 sq m/person.

Each habitation unit is provided with two toilets (bath + WC) and can be used separately by rental tenants. Thus, the person per toilet ratio decreases from 1,400 persons/toilet to 5 persons/toilet.

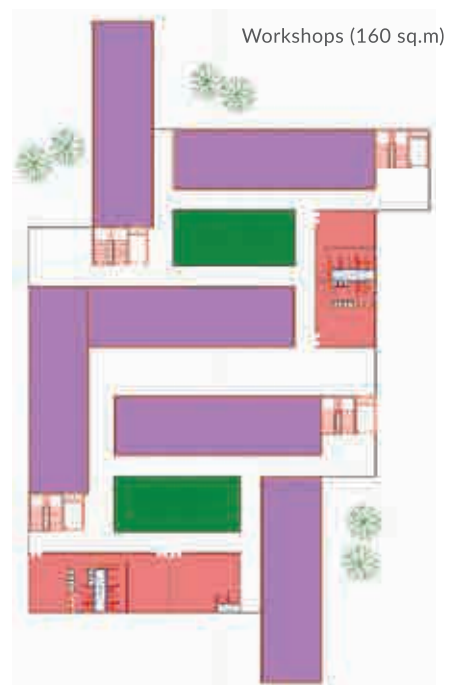


Proposed cluster plan

LIVELIHOOD

To ensure safe, secure and humane environments in industrial areas, a typical unit of workshops is designed. This unit includes workshops of 160 sq m area. This unit can be divided using partitions as per the needs of the people.

Also, provision of male-female restrooms and *balwadi* + crèche is made in this unit for children of labourers. The open courtyard provides a visual connection and open space for children and labourers.



Proposed workshop unit

SERVICE INFRASTRUCTURE

Grey Water Recycling

At present, sewage exists in the form of open drains which follow very random paths towards the creek. Other solid waste is also dumped around drains, thus causing clogging and increasing the chance of epidemics.

This issue can be addressed only by channelising a waste water system. With the help of soil scape filters developed by Shirshi Eco-Research Institute, Pune, sewage can be treated to required standards with low cost and controlled natural processes. This unit requires 1 sq m area to treat 1 kilo litre discharge (KLD) with installation cost of INR 18,000 to 20,000 per KLD. The annual maintenance is about 10% of installation cost. This treated water is reused for flushing and urban farming. Processing sewage at source reduces the cost of transporting it to a centralised sewage treatment plant (STP) and treating it with conventional methods.

Renewable Energy

It is proposed to offset the load on electricity supply by harnessing solar power. Solar water heaters are designed at 20 lt hot water per capita per day. Total installation costs amount to INR 58.9 cr and annual savings are estimated at 4.62 cr units (KWh) costing INR 18.40 cr.

Solar panels can also be used on rooftops to provide shade and generate electricity.





Storm Water Drains

Rainwater will be collected and directed to creeks via underground storm water drains. At the downstream of the pipes, no return valves are installed to avoid back-flow of seawater at high tide. Collected water will not be discharged in to natural streams. This reduces the risk of flooding. At high tide, water in the storm drains will be pumped into the creek.

Natural flow of water is identified in Dharavi and its banks are proposed to be developed as landscape gardens.

Solid Waste Management

Using the technique of segregation at source, managing solid waste becomes easy. Due to a high proportion of food and garden waste, it is an efficient way to produce compost from domestic solid waste. Other components of domestic waste are either recycled in Dharavi itself or sent outside for recycling. Inert materials are sent away to landfills.

