

***Buildings and towns:
Addressing environment
impact***

Conclave of Green
Architecture
Centre for Science and
Environment

New Delhi September 22-23,
2014

Game of town making...



New rhetoric --- 'chaos' 'poor planning' 'crowding' and 'stressed infrastructure' in older cities to justify sprawl and gated development – demand for private townships...

Private integrated townships with area of 40 ha to 400 ha each and more than 200 townships planned, under approval and construction. (IDFC's India Infrastructure report 2009) -- especially around the metros.

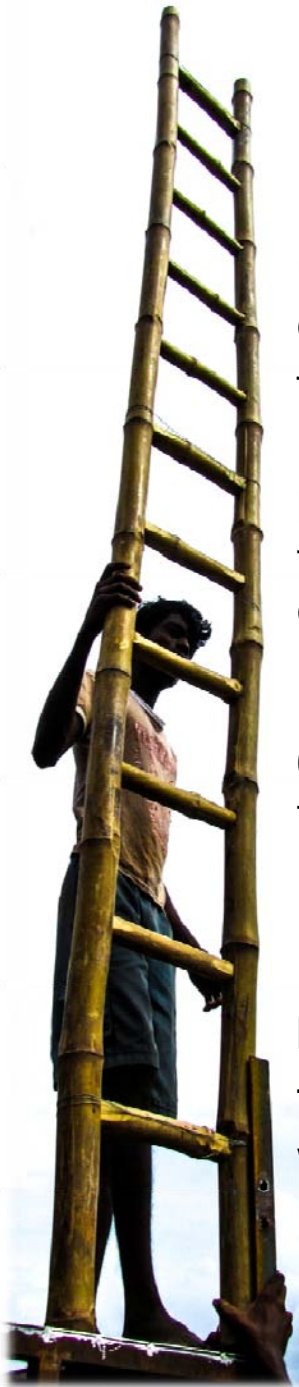
6 private townships along DMIC corridor in the first phase and 18 in the second phase.

Under public private partnership

Enormous real estate business in suburbs, peri-urban and hinterland. FDI in real estate...

Touted as Walk to Work Green Towns – without green benchmark

Developers are also asking for special residential zone...



Towns invade resource scarce areas



War over water: Several builders have stopped advertising 24x7 water supply for their projects (Bengaluru etc)

Punjab and Harayana High Court put a moratorium on use of ground water and fresh water for construction

Pollution liability of towns: The challenge of waste dump and disposal...

Large scale conversion of agricultural land

Pressure on forests , biodiversity





Weak regulatory framework



Environment Impact Assessment (EIA) for large buildings and townships. Only comprehensive legal instrument that addresses environmental and resource impacts of high impact buildings and developments – land, water, energy, waste, pollution, etc... Weak instrument

EIA not working effectively

In buildings -- Construction can precede consent
Escape routes ... the phenomenon of 19,999 sq mt.....
No clear siting policy Weak post construction monitoring
No follow up on compliance reports
No public consultation
Inadequate resources and staff and many more...
No clear numbers and benchmark
No traffic impact assessment of new development in cities

Weak regulatory framework



EIA for township -- Often no integrated land use and transportation planning in cities with adequate legal back up that can be the basis for environmental clearance.... Piecemeal clearances.....

Master Plans under Town and Country Planning. All cities do not have Master Plans and most are outdated.

National Habitat Standards – Do not have legal back up.

City development plan, and city mobility plan to decide investment priorities in cities. Mainly investment plans

Transit oriented development nascent stage

Challenge of design and planning.....



New towns: Governance challenge...



Several State governments (Maharashtra, Gujarat etc) framing legislation to regulate townships and apartment buildings. These define area criteria, incentives for developers, provision of affordable housing, role and responsibilities of RAWs etc....

Civic authorities, and developers caught up in messy battle over resource allocation and service management in new townships.....

Poor clarity about roles of developers, city governments, and local residents in planning, maintaining and operating these towns.

Case study of Gurgaon in Haryana show many flash points. Haryana Apartment Act etc have tried to address these but not adequate. This undermine delivery of services, infrastructure and quality of life.



Gurgaon: slum of the rich.....

Privatised new towns.....

- Town of affluent but infrastructure of poor
- 70% of water needs from ground water; Groundwater table falling at a rate of 1 to 1.2 meters annually; dropped by 16 meters in last 20 years
- Only 40% of the DLF area connected by sewer line
- Only 70-75% of solid waste transported; No landfill site
- Poor public transport connectivity. Transport is responsible for more than half of energy intensity of the town
- Due to acute power shortage heavy dependence on generator-sets
- Violation of development rules related to open spaces and community services



Principles of urban design and planning.....

New Delhi: Population Density 3820



NE Delhi: Population Density 37346



Something not right in older cities too...

Only 1 per cent of Delhi's population live in Lutyen's Delhi.

Most part of urban boom –pushed to the sides and periphery

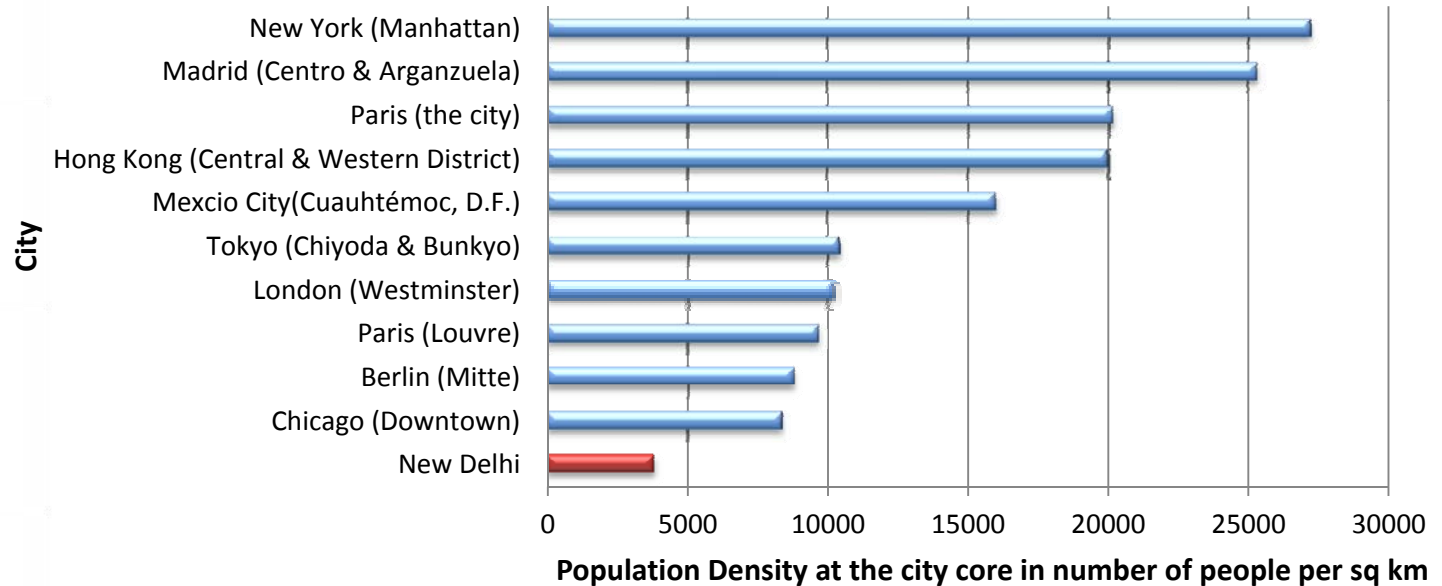
Delhi has not maximised the use of land to provide for its teeming million – Delhi needs 70,000 houses a year to meet the housing deficit

About 40% in informal settlements

Density control in Delhi has pushed people out of the city core



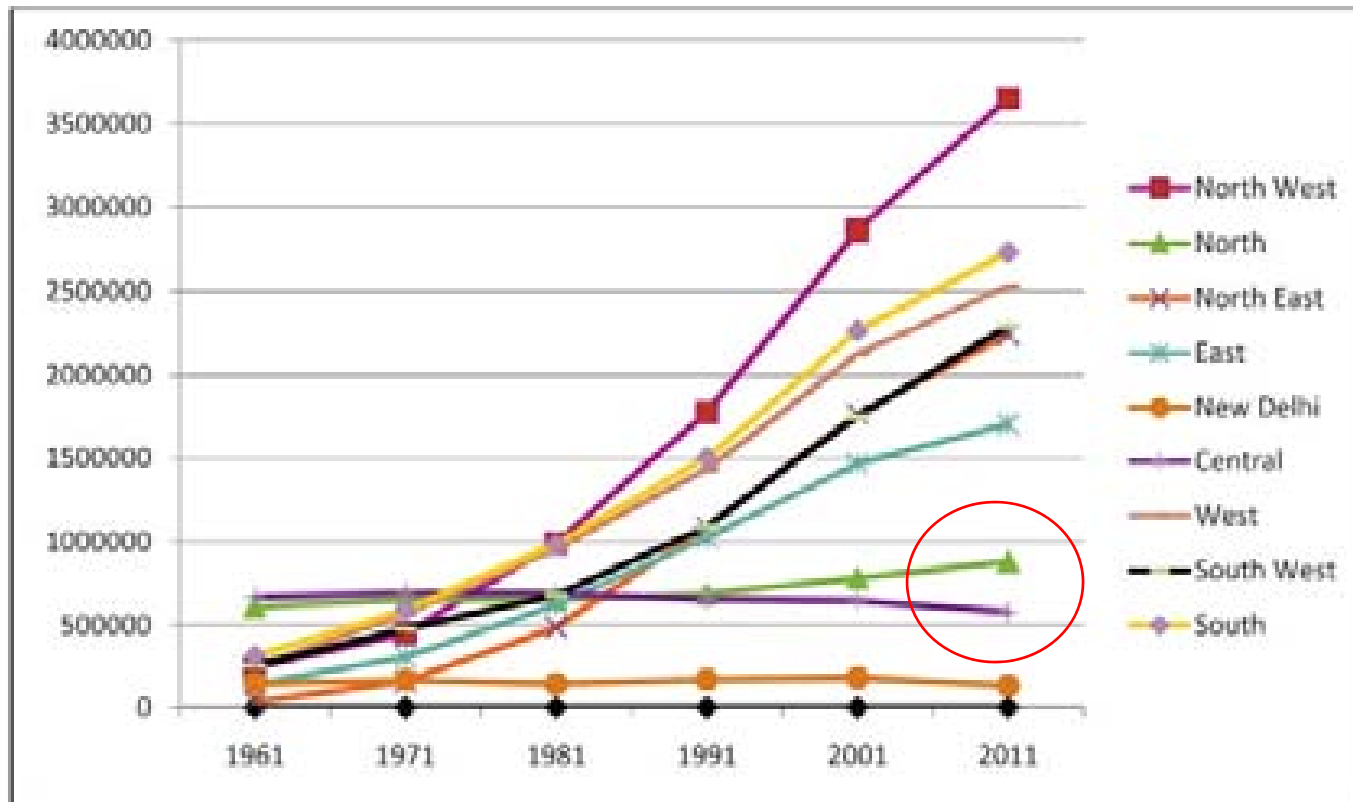
Density of Administrative Cores of Global Metros



- Delhi has one of the most sparsely populated core in the world.
- New Delhi's density is more than six times lower than core administrative regions of New York and Madrid
- Even the heritage Louvre of Paris is 2.5 times densely populated than New Delhi



Delhi: The core stagnates and declines



Graph 2: District wise population, from 1961 to 2011

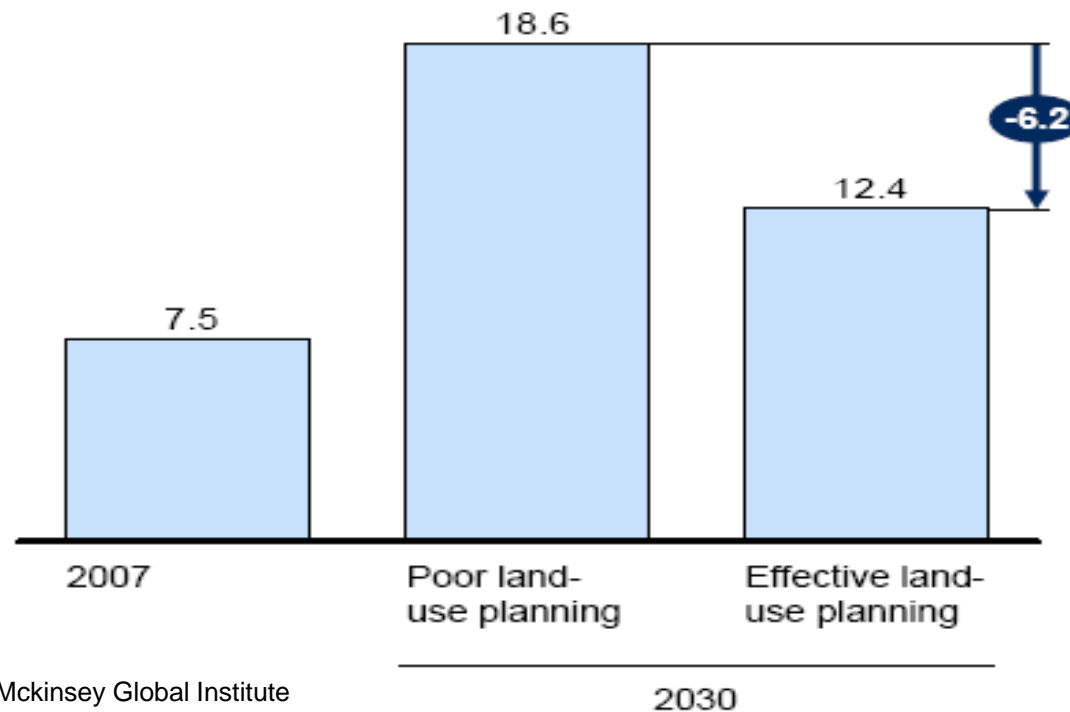
*Space affluence vs
unliveable peripheries*



Effective land use planning in CBD can potentially mitigate loss of land



Demand for urban land
Million hectares



Source: 2010, McKinsey Global Institute

McKinsey Global Institute estimate shows that India could potentially save 6.2 million hectares of arable land through effective planning for land use in cities in the next 20 years.



Changing urban form --- Moving away from strength....



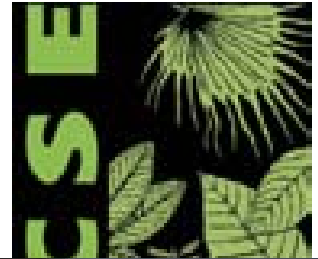
Central Kolkata: Dense network of streets with excellent connectivity. Small blocks with permeable streets....



New Town Kolkata:
Super blocks



**Towards gated development.....
Energy intensity of towns?
Efficiency gains lost in sprawled cities**



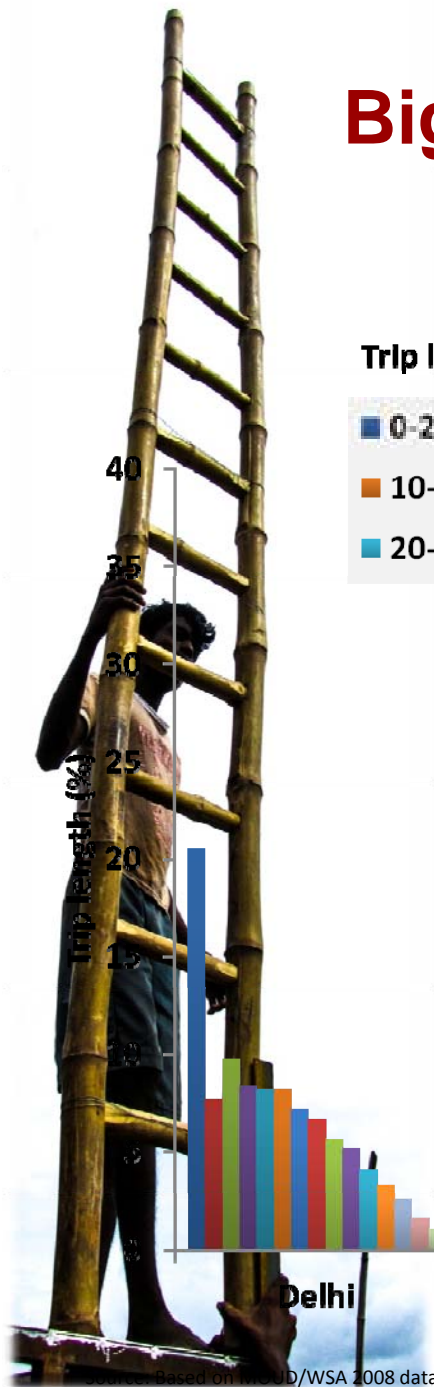
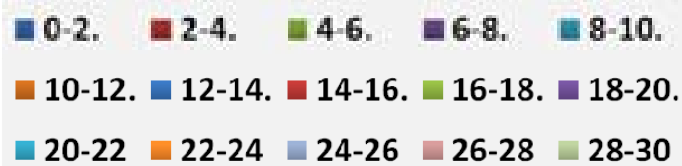
Source: CSE No mid block crossings for pedestrians – Advantage to vehicles

Sprawl effect

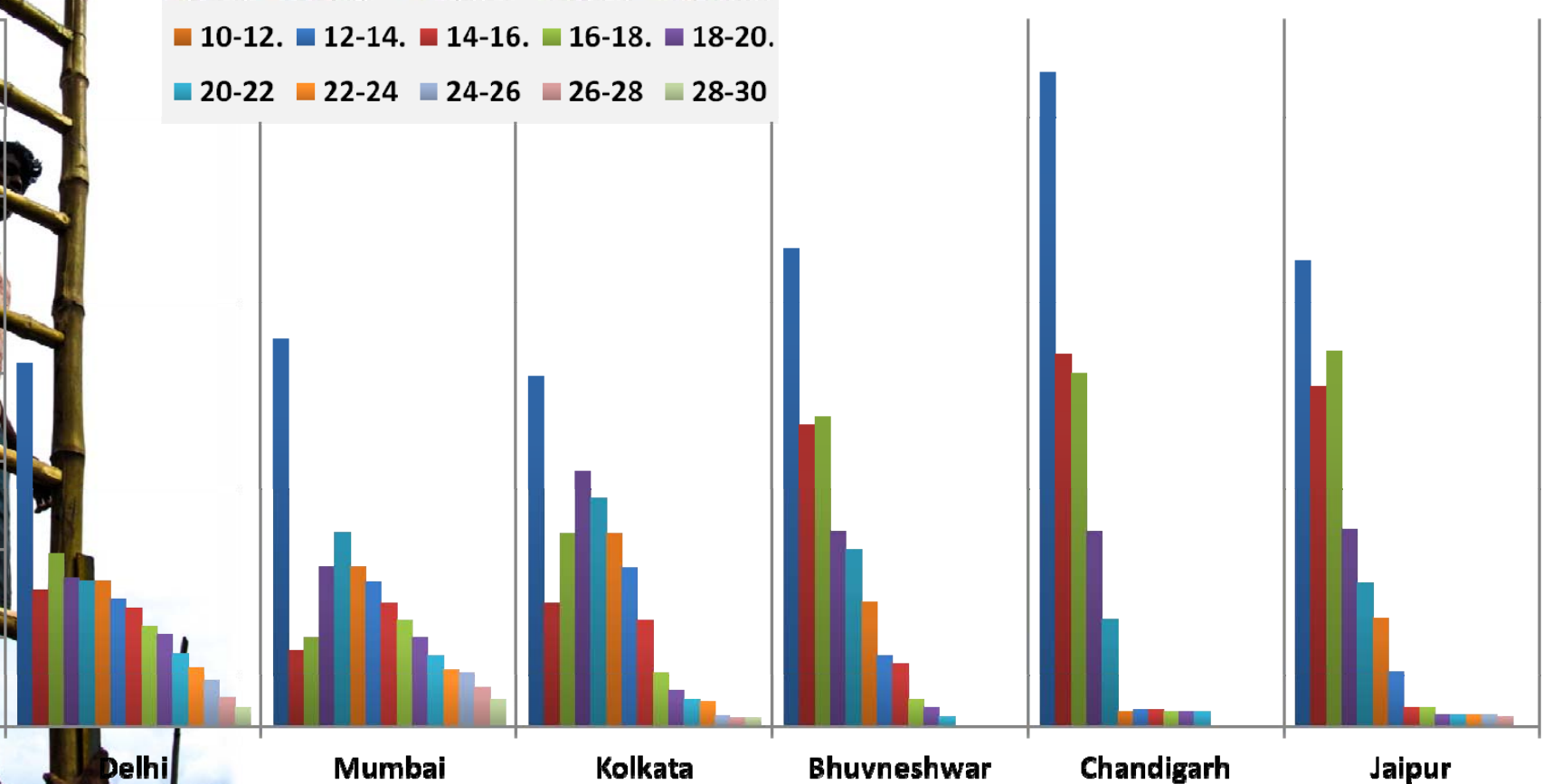
Bigger cities show more trips in higher distance range



Trip length in kms



Trip length (%)



Source: Based on Mob/WSA 2008 database

FAR/FSI another game in town.....



Source: KolkataSkyline.wordpress.com

Nationally policy is expected to incentivise 'high-density' development for optimal use of urban space and resource efficiency.

Higher FAR do not automatically result in densification.

-- Provision of large unit-sizes defeat the purpose of densification.

Link the FAR threshold with a minimum density requirement.

-- Maximum permissible FAR and densities to be based on the capacity of public transport, circulation network and the physical infrastructure thresholds of the area, other services – water, waste etc. .

Provide a variety of mixed-use, mixed-income housing, employment and recreation options within walking/cycling distance of each




Delhi setting norms for high density requirements

Delhi framing Transit Oriented Development Policy (DDA/UTTIPEC)

Density minimums as per the table below:

Gross FAR (site)	Minimum permissible density (with $\pm 10\%$ variation)	
	Residential dominated project (Residential FAR $\geq 50\%$)	Predominantly non-residential (Residential FAR $\leq 30\%$)
Below 1.0	Under-utilization of FAR (not permitted)	Under-utilization of FAR (not permitted)
1.1 - 2.0	200- 400 du/ha	100 - 200 du/ha
upto 3.0	400 - 600 du/ha	250 - 400 du/ha
3.1 - 4.0	600 - 800 du/ha	400 - 600 du/ha

* Site level FAR shall be based on Approved TOD Influence Zone Plan.



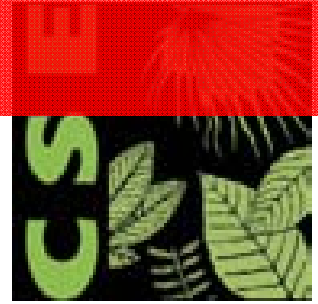
-- **Mixed land-use norms:** At least 30% residential and 20% Commercial & Institutional use of FAR is mandatory within the Influence Zone

-- **Several other cities including Surat, Pimpri Chinchwad .are incentivising densification along transit corridor. Linking up green building requirements**

Barcelona: High Density doesn't mean high rise



Barcelona has density ranging between 200 dwellings per hectare to 500 dwellings per hectare

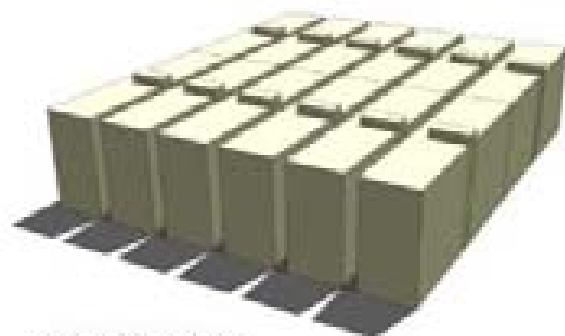


Source: In a rise, high density. Until what extent does density matter? - Prof. Joaquim Sabaté



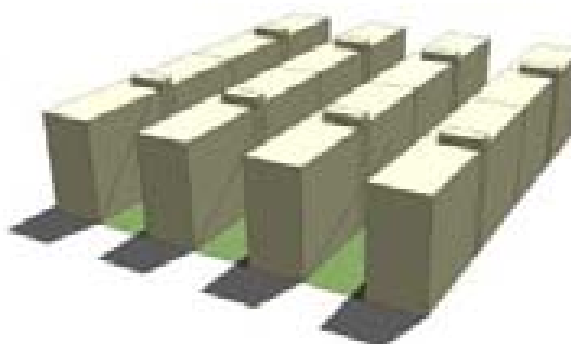
Barcelona

High rise vs high density.....

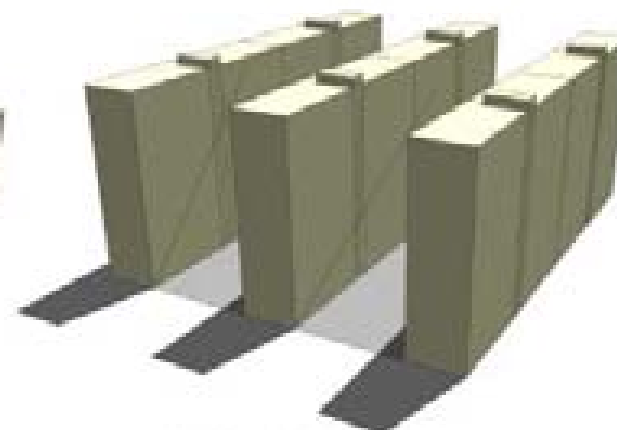


Images Source: Author

Net block level FSI = 6.5
Density = 2600 units/Ha @ 25sq.m. each



Net block level FSI = 4.4
Density = 1750 units/Ha



Net block level FSI = 6.0
Density = 2400 units/Ha



UNDESIRABLE OPTION

Current low-income housing complexes being constructed all over Mumbai Region.



DESIRABLE OPTION

Midrise housing with optimal spacing between buildings allowing daylight and airflow through public spaces and homes.




UNDESIRABLE OPTION

Taller buildings, when designed in rows, require larger spacing in between for adequate daylight access – creating an undesirable urban experience.



Enable change through design.....



Proposed UTTIPEC guidelines for building orientation: All dwelling units should get minimum 2-hour solar access in at least one habitable area (living room, bedroom or private open space) on the shortest winter day of Dec 21 (Winter Solstice).

EIA committee in Delhi setting norms for orientation, depth of the building, shading, day lighting etc.....

Source: UTTIPEC

Build compact city

.....Devil is in detail



National Habitat Standard Mission of the Ministry of Urban Development

Guidelines for compact mixed land use

- 95% of residences should have daily needs retail, parks, primary schools and recreational areas accessible within 400m walking distance.
- 95% residences should have access to employment and public and institutional services by public transport or bicycle or walk or combination of two or more.
- At least 85% of all streets to have mixed use development.
- Need small block size with high density permeable streets etc

UTTIPEC guidelines

Hierarchy of Facilities	Accessibility Standard from each home/ work place."
MRTS Station	Approx. 800 m or 10 min walk
Metro feeder/ HOV feeder Stop	Approx. 400 m or 5 min walk
Bus Stop	Approx. 400 m or 5 min walk
IPT/ auto-rickshaw Stand	Approx. 250 m or 3 min walk
Cycle Rickshaw Stand	Approx. 250 m or 3 min walk
Cycle Rental Stand	Approx. 250 m or 3 min walk
Shared private parking garage	Approx. 500 m or 6 min walk

**Avoid car feeders to buildings –
Public transport to define the urban form**



1a) High Density Mixed Use within 5-min walk of stations...



Reason for success of BRT in Curitiba:

**Maximum people Live, Work & Play
within 5-min walk of RAPID TRANSIT Stations**



Density disparity along metro line in Delhi....



- Chawri Bazar



- Race Course



- Green Park





Inequitous.....

Several states have framed favorable policies to boost affordable housing – mandate; FSI relaxation etc

New developments often filter rich residents as property values are high.....

Neighbourhoods get homogenised in terms of income etc.

This keeps poor people out

Legal norms and guidelines are needed for inclusive planning....

Provision for affordable housing not well planned – poorly designed, ghettos, building typologies....

Exclusion from formal finance system

Poor design and quality construction

Low priority to rental housing



Self constructed home -- major source of affordable housing -- ignored



These are self owned and self constructed houses incrementally built to allow pacing of construction as per the convenient of the owner

This will remain dominant strategy for the housing of the poor

Self constructed home is very neglected. This is the bottom up answer to the housing need of the poor

There are attempts to formalise these settlements through redevelopment – but have not worked well.. In terms of building typology, community space, meet the needs of space for artisan activities..quality is compromised, become unlivable, poor facilities and utilities.. High rise buildings become unaffordable

- Challenges -- Land availability and tenurial security
- No professional help on design and planning --- good practice examples from Thailand, Brazil etc



Rethink on environmental clearance for towns and buildings.....



Reinvent EIA -- Link with the building approval process....

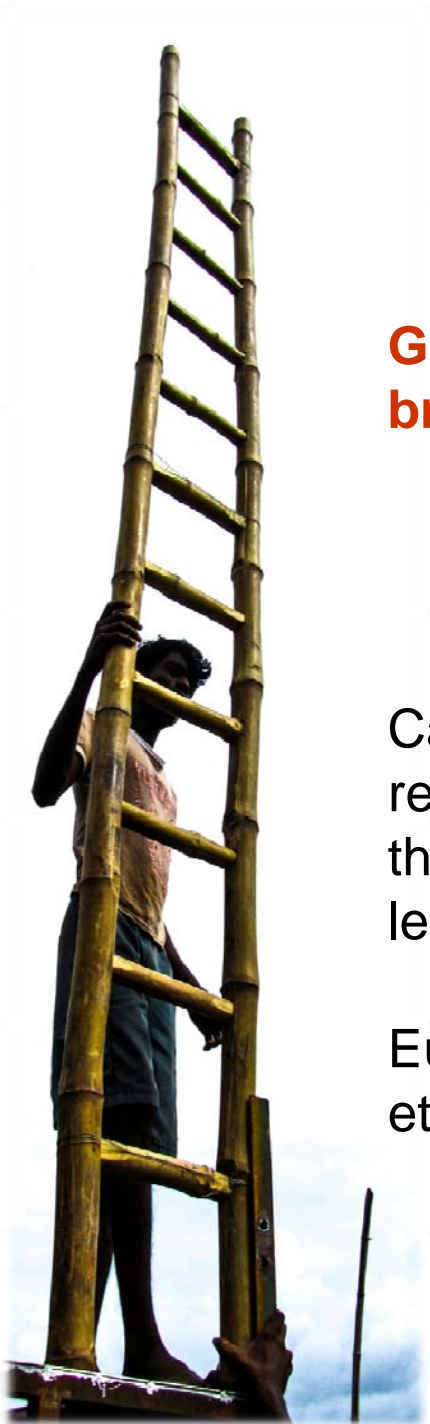
Building approval process cannot remain isolated from the master plan that pre-determine land use plan and reflects carrying capacity of the area...

Needs additional filters and appropriate standards and norms to screen large resource intensive buildings to minimize environmental impacts.

Harmonise with other environmental laws..

Need strong regulatory capacity to handle technically complex green building regulations...





Globally new urban design principles are bringing back principles of compact forms.

California: SB 375 law -- Bringing back that urban form -- requires jobs, recreation and housing planned in a way that people can live and work closer together, and drive less.

European cities adopting policies to retain compact forms etc



Get the principles right....



**Need clear guidelines and mandate to enable change ...
reduce footprints**

- Inclusive and equitable use of urban space
- Compact form – small block sizes, density norms, mixed land use, mixed income neighbourhood, affordable housing, dense and permeable streets with active edges, etc
- Design and implement sustainable infrastructure
- Decentralized water conservation and waste water management and reuse facilities
- Strategies to minimise waste
- Decentralized, sustainable energy management and renewable energy
- Public transport connectivity and the last mile
- Consumption based billing. Metered water and electricity supply etc
- Need integrated land use and transport plan with legal backing.....Reform municipal governance....