



Light Rail Transit is a greener alternative to driving and takes a load off high density traffic areas

without an identity. Transit and cross-transit programme has been adopted in Barcelona for a compact and transit-oriented development. As compared to Los Angeles, Barcelona's urban transit is 10 times more cost-effective and carries 10 times more passengers per km, with only one-tenth of carbon emissions. De-clogging of roads in Johannesburg, Singapore and other cities has been achieved by car ownership control and better public transit, including high quality BRT (bus rapid transit).

In Toronto, the creation of PATH, a 29-km long underground pedestrian walkway, interlinks major shopping, cultural and financial districts. In New York the derelict Chelsea Railway line has been converted into a linear park cutting through the Downtown. In Seoul, the river stream (Cheonggyecheon) has been recovered by demolition of flyover, which has given back the riverfront to the public.

Another example of sustainability is the German town of Vauban. All buildings here have the lowest energy consumption possible. The settlement harness solar power and utilise some while the excess of electricity produced is sold to the grid, generating an income for the residents. The design of the city encourages walking and cycling; nearly 70 percent residents do not own a car at all.

"It is inter-disciplinary transgression among the sociologist, economist, architects, engineers, NGOs, etc., which are coordinated by urban planning. A city is the manifestation of cultural affinity to a place. A smart city has a circular metabolism, which gives as much to the environment as it takes out. It should offer resilience against climate change reduces its ecological impact by minimising the use of energy and carbon emissions. To make a city smart and energy efficient, renewal/solar energy should be compulsory for buildings of more than 1000 sq. m. floor area. Enforcing use of solar energy must be mandated for outdoor advertisements and hoardings, as well as for cooking in the large eating establishments, such as canteens, hotels, hostels, railway stations etc.," explains Jain.

Future Road Map – Urban Transect

"It is found that an average density of 10,000 people/sq. km. is sustainable and conducive to city life; notable examples being cities like Paris, Barcelona and Singapore," explains Rahul Kadri, Principal Architect and Partner, I M Kadri Architects. "According to our present town planning norms, we do not permit high density development in most of Maharashtra. This brings us to the next idea—an urban transect."

Rahul Kadri proposes mixed-use developments

With transit-oriented development, Barcelona's urban transit is 10 times more cost-effective and carries 10 times more passengers per km, with only one-tenth of carbon emissions

neighbourhoods with residential, commercial and recreational zones. The central idea is to reduce travel time between home, work recreation, daily and convenience shopping. A smart and sustainable neighbourhood is pedestrian friendly so that most needs are met within

a 5 - 10 minute walk. "Urbanisation should allow for a wide variety in form by varying the FSI from 0.25 to 8 – with the rural zones having an FSI of 0.25 and the urban core a density of eight. This Urban Transect should span across a radius of five kilometre.

Such distinct densities in the urban scope will allow every resident access to nature and forest land within walking distance of their home," explains Kadri. "Every citizen should have access to the countryside within a 15-minute cycle ride and this is quite possible when cities are

CASE STUDY III

The Uttorayon Township, Siliguri MORPHOGENESIS

This 393 acre township was planned for Ambuja Neotia & Luxmi Township which serves a model for low cost development in India. The key concept explored is the formulation of a new urban system addressing issues of settlement identity, dynamic and

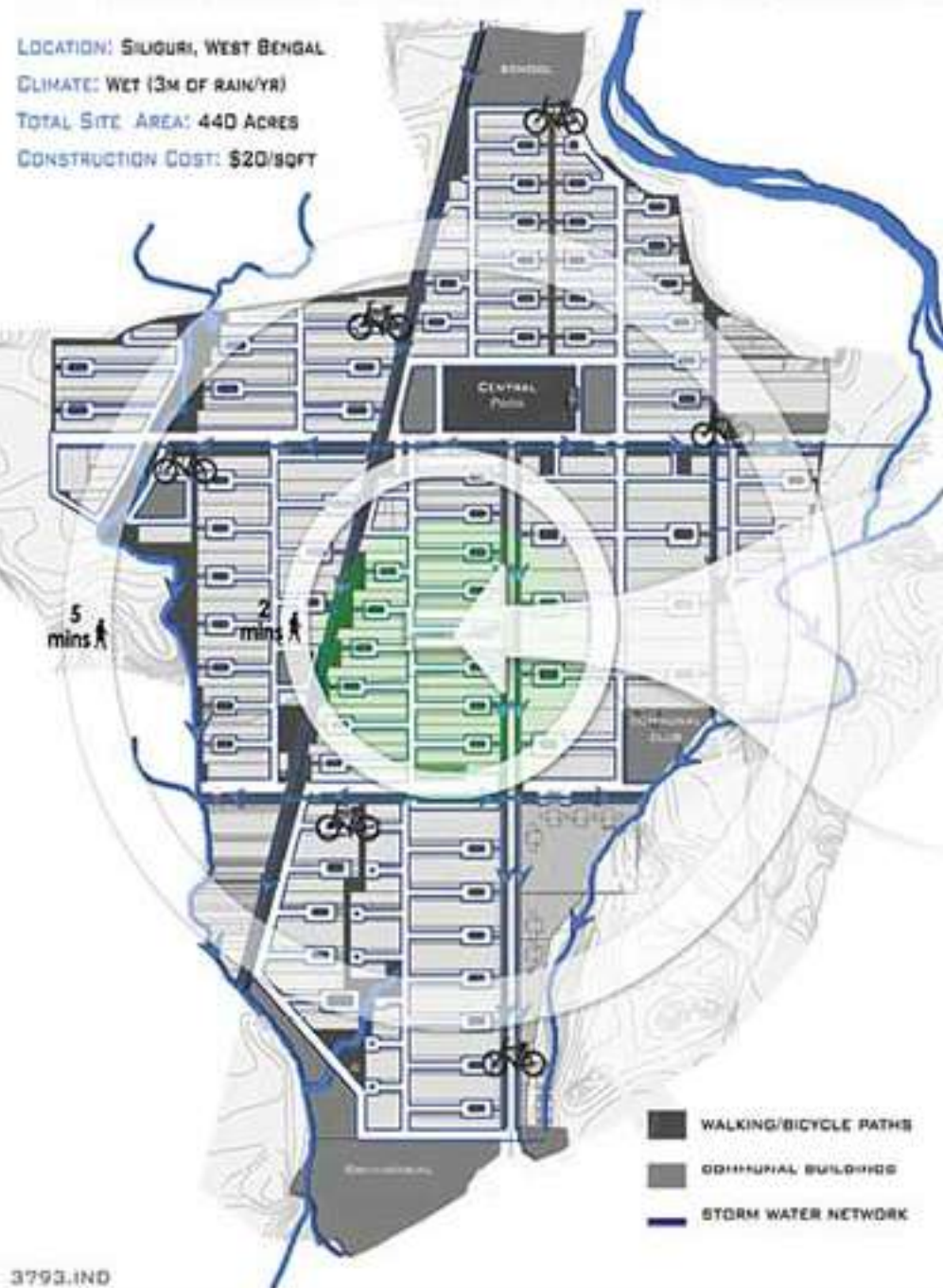
flexible infrastructure, landscape and open space distribution, and perceptual paradigms.

This is achieved by dividing the site into smaller neighbourhood clusters of 20 plots varying in size but structured around a communal green space. The cluster organisation is designed for multiple configurations that can respond to changing social demands and this as a system has successfully fostered a close immediate community.

To further encourage social interaction, each cluster is also linked to a pedestrian and bicycle network which connect to important communal areas such as schools, shops and the peripheral greens. To keep development costs low at \$6/sq m, the main strategy was to respect the natural topography of the site and to use it for an integrated surface drainage system.

A LOW COST SUSTAINABLE MODEL FOR TOWNSHIPS OF TIER 2 CITIES IN INDIA

LOCATION: SILIGURI, WEST BENGAL
CLIMATE: WET (3M OF RAIN/YR)
TOTAL SITE AREA: 440 ACRES
CONSTRUCTION COST: \$20/SQFT



COMMUNITY/WALKABILITY



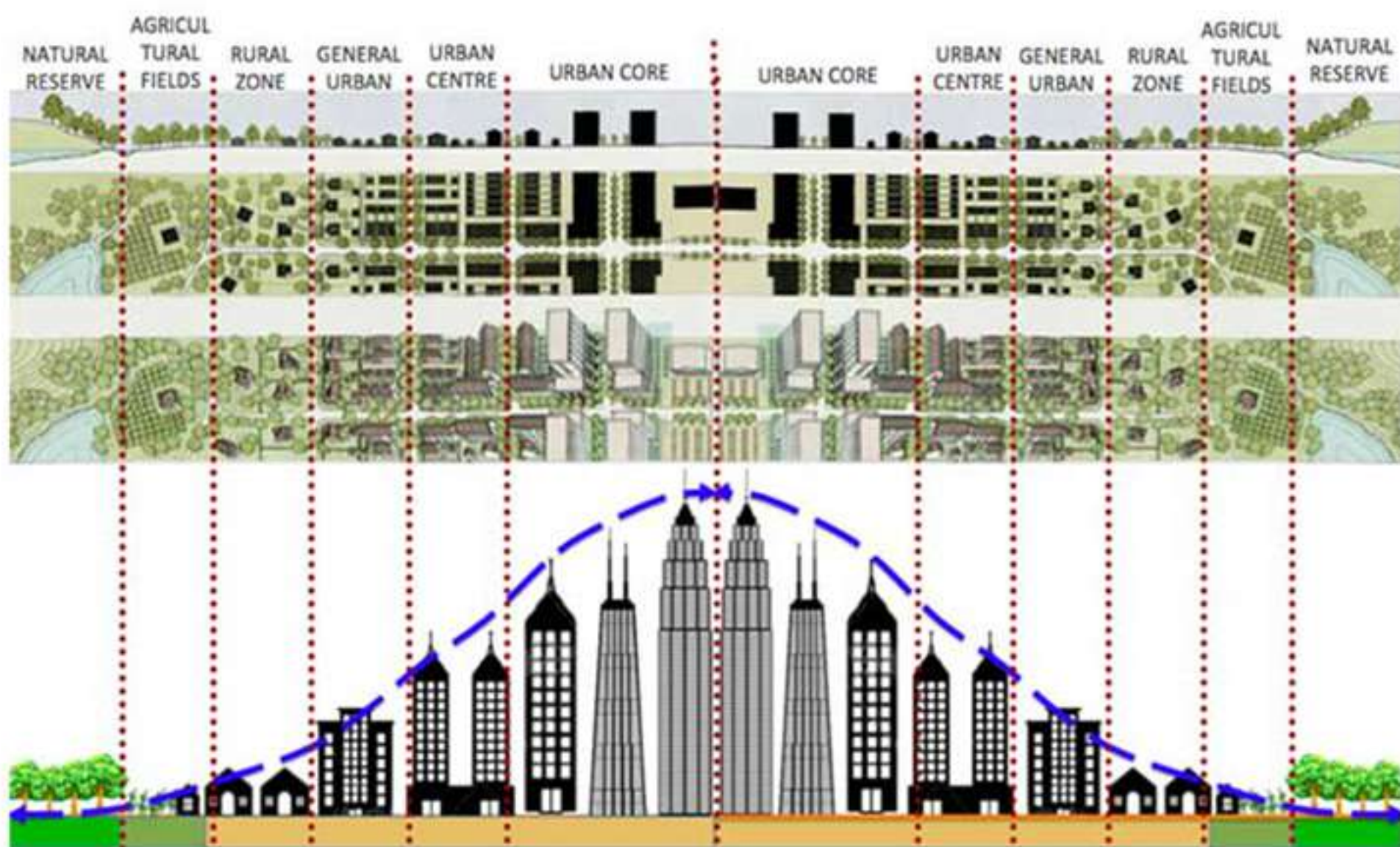
SURFACE DRAINAGE SYSTEM



NATURAL VENTILATION



PASSIVE SOLAR DESIGN



Rahul Kadri

planned along transit corridors so the city is linear but not wide. If the urban system is restricted to being not more than five kilometre wide, then the agriculture or natural zone can be a linear strip along the edge of the city."

Effectively high densities can only be achieved when efficient transportation is available. The three main components of effective transportation are: inexpensive for consumers; less consumption of energy and pollution-free; fast and comfortable mode of transport. "Rail-based transport systems fulfil all the above criteria. Maximum rail based transportation of all speeds and sizes must be promoted. Dense urban settlements need to be planned along rail corridors with high density nodes around stations," says Kadri.

A McKinsey report on Vision Mumbai also supports the above statement by stating that local railways must increase capacity and ensure people travel more comfortably. The public transport is being funded by the World Bank in the second phase of the long-delayed Mumbai Urban Transport Project, as well as by the Mumbai Urban Infrastructure Project. McKinsey

Every citizen should have access to the countryside within a 15-minute cycle ride and this is quite possible when cities are planned along transit corridors so the city is linear but not wide

specifically states, as the very second item in its eight-pronged programme, its mission to improve and expand mass and private transport infrastructure, including linkages to the hinterland.

The concept of sustainable urbanism should serve as a guideline to create a self-sufficient and self-sustaining city. "A sustainable and smart city should be able to engage with its citizens, especially the poor, women and children. It should be able to create jobs, and provide security and dignity," mentions Jain. "A smart city should guarantee housing, water and electricity to all. It should reserve space for slum dwellers, informal sector of trade, (vegetable vendors, weekly markets, repair shops, dhobi ghats, tea stalls, food outlets etc.) It should provide dedicated facilities for the pedestrians, intermediate public transport and non-motorised transport.

In retrospect, India's city urban planners must strive to create a self-sufficient township for existing cities and ongoing smart cities with ample green spaces, better connectivity and well-defined utility spaces. It is, therefore, very important to understand and emulate western examples that follow sustainability as a guiding principle to relieve congested, high density spaces and create a township for human interaction and accommodate future developments. d

evolve. If you become highly prescriptive about how a city should be, it doesn't allow for the changing nature of human interaction. And we cannot predict for how that will evolve over the next hundred years," avers Manit Rastogi, Co-founder and Managing Partner, Morphogenesis.



Teddy James Dsouza

The cities must be planned and developed around public parks and green zones, social amenities, services and public transit. A common networked platform interlinking all police stations, fire stations and security systems can make the city safer. Even eco-friendly construction practices are gaining an upward trend. "India has become a lucrative

market for all green products. Although eco-friendly construction is a voluntary move, it should be adopted conscientiously. The end-user must be educated by the stakeholders about the pros and cons and they should evaluate the overall benefits in terms of environment, human welfare and social well-being," adds Teddy James Dsouza, Operations Head (India & South Asia), Knauf AMF India Pvt Ltd.

International Well-Planned Cities

There are many other international townships that can provide a template for a new approach



ENSAARA
I M KADRI CONSULTANTS

"An integrated and vibrant mixed-use community featuring a school, a hospital, a shopping mall, arcade and local shops, an entertainment complex and sports facilities and more"

Spread over 312 acres of land the Ensara Metropark project is sited close to the inner and outer ring roads in the heart of Nagpur. The design was conducted in collaboration with master planners HOK, landscape architects Cracknell & Infrastructure consultants Feedback Infra. In the first phase of the project, an area of 20 lakh sq. ft. was planned as a residential development and 5 lakh sq. ft. as non-residential development.

Around 150 acres of land is devoted to open space. All apartments have been oriented to optimise the shade from trees and utilise environment friendly techniques to significantly cool the houses in summer and warm them in winter. Nearly every apartment is provided with its own

private garden terrace and family kitchen gardens.

It is designed as walkable, pedestrian friendly communities with wide roads for pedestrians, drivers, cyclists and public transport users. All amenities are at a three-minute walkway keeping in mind the harsh climate of Nagpur. The orientation of buildings and the use of pergolas create shaded areas throughout the development for meeting up, outdoor dining with trees lining the roads and gardens.

Ensara is designed as a sustainable, integrated township—rainwater harvesting systems is employed across the metropark, a fully integrated water recycling system which would provide water for flushing and irrigation is set up, roof mounted solar panels are proposed to conserve energy and effective sewage treatment practices are implemented. Energy-efficient buildings are planned with thermal paint and double glazing. Ensara is designed based on the Gold Certificate guidelines for the Indian Green Building Council (IGBC) and the entire metropark has been envisioned integrated, sustainable concepts, solutions, initiatives and materials.