
Smart Cities in India & the need for
Big Data Analytics
Marutish Varanasi
Consultant - Tricad

Current situation on the ground in India

- ULBs/Municipalities in India are chronically short of resources. Yet within the existing framework, many of them, especially city municipalities, could do a far better job in exploiting existing revenue bases such as the property tax.

- International comparisons show that Indian cities are unusually deficient in raising revenue from property taxes, usually the prime source of income for urban local governments worldwide.

- Indeed, there are a range of revenue instruments that could be deployed for harnessing some of the soaring land values in urban locales to fund the necessary urban infrastructure.

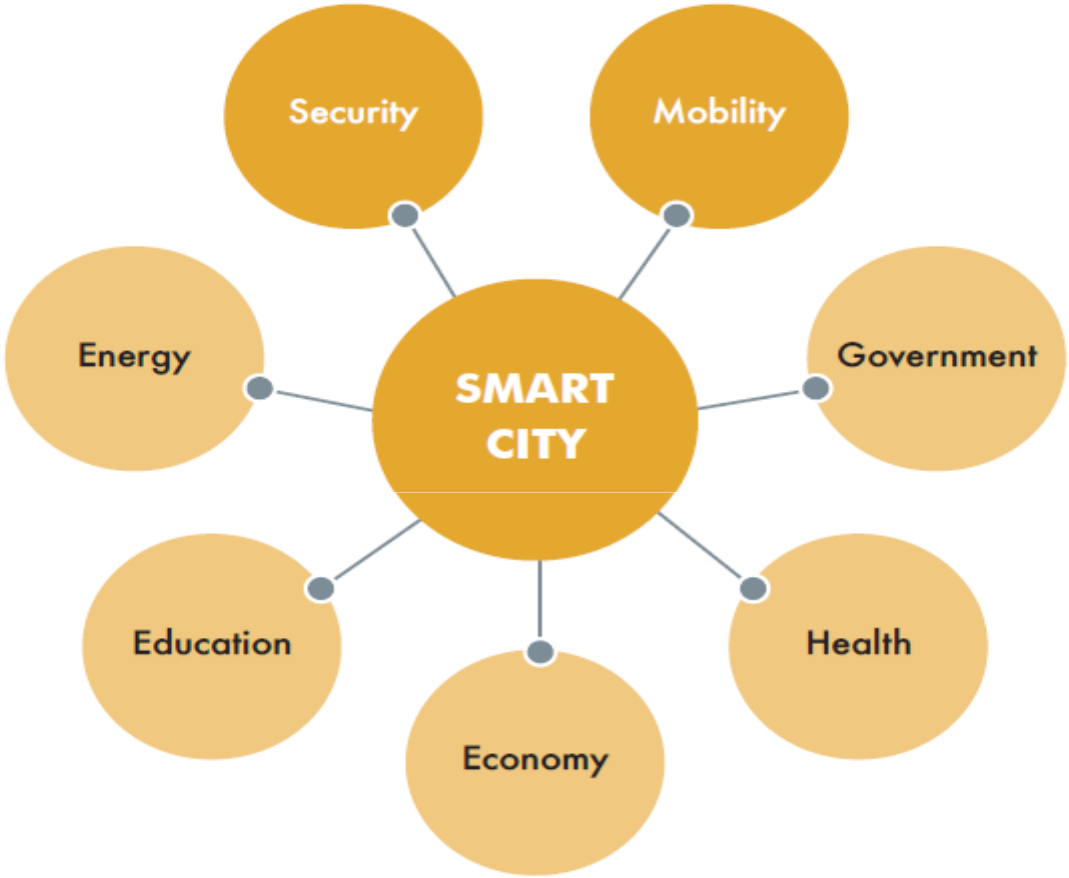
Current situation on the ground in India

- Third, user charges need to play a bigger role to fund provision of services such as water, electricity, bus services and waste disposal.

- Fourth, ULBs can improve - and have improved - resource mobilization and service provision through intelligent deployment of information technology.

- 74th CAA, JnNURM, Transformation of our cities, NITI, CRISIL, AMRUT, Sustainability Goals (not MDG)..etc..

What is a Smart City



It is a complex '**ecosystem**' in which multiple players are closely linked by processes that enable new models of business services, relationship with the surroundings.

Defining a Smart City

I define Smart City as a city which makes use of Electronics, Communication and Information technologies

- ❑ to manage infrastructures more efficiently,
- ❑ offer services provided rationally,
- ❑ provide a higher quality of service to citizens,
- ❑ wherein all its players (citizens, local companies and local Government) interact with each other
- ❑ to evolve and improve their quality and quantity of activity.

This interoperability requires the support of smart networks and platforms.

It is also a city (and its citizens) committed to its surroundings, across environmental, cultural and historical elements.

How does a Smart City Platform – look ?

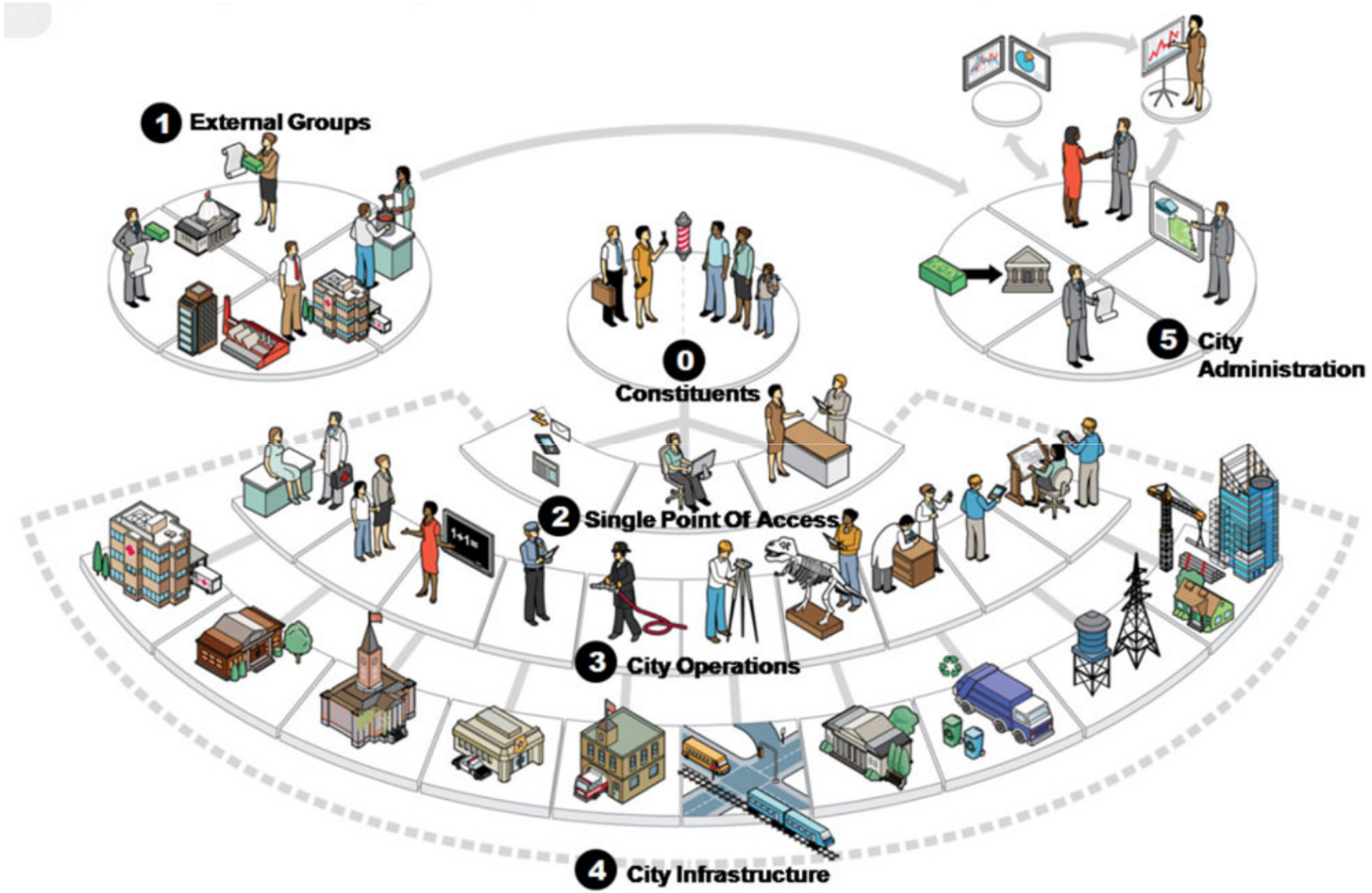
It involves collection of cities data in real time

• It involves collection of data in real time and delivering it centralized dashboards for city controllers who in turn deliver services including streetlights, gas, water and electricity to smart meters.

• As a part of a smart city project, the operator provides bidirectional full-mesh wireless sensor networks that enable the remote monitoring and centralized control of electrical, water and gas distribution systems for the Smart City of the future.

• The aim is to improve city services to make cities more livable while cutting operational costs, thus boosting the smart city's economy.

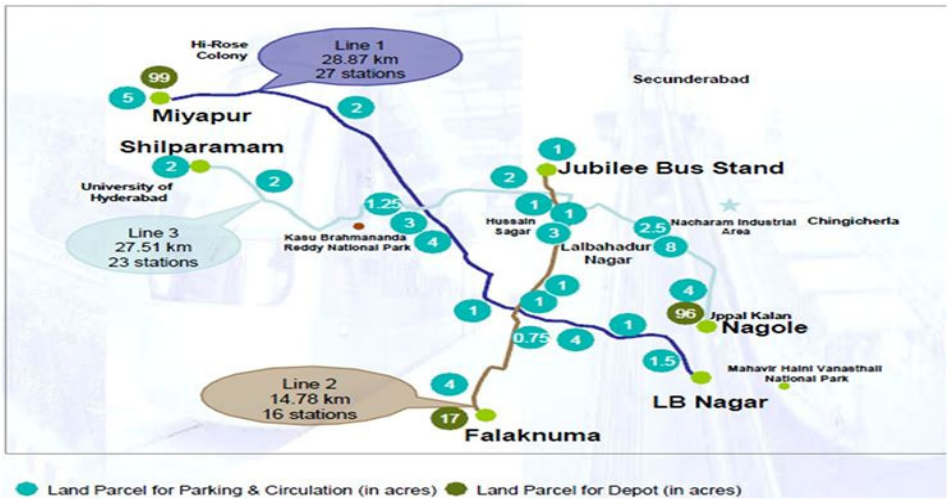
Smart cities – will boost the city's economy



Mapping democracy : We are getting street-view maps of cities and towns

Transportation needs in Urban India are changing

There is a need to review city transportation systems in India (including metros, BRT's, monorail, trams, waterways, walkways, bicycle tracks, etc.), to provide new and enhanced infrastructure for public transportation.

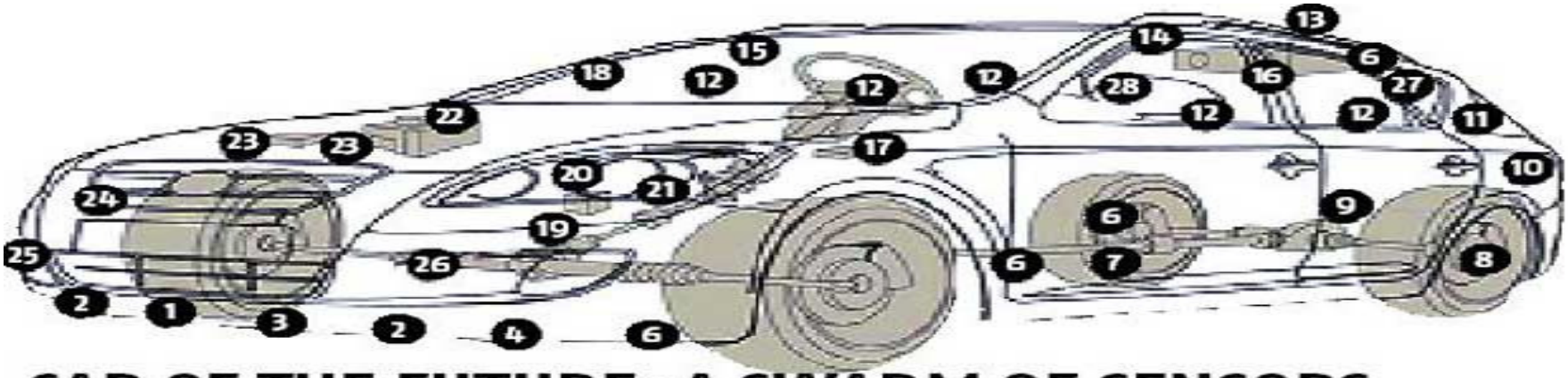


Urban transportation is an important element for smart cities.

The cars are changing : Driver-less and clean (electric and hybrid)

Google, Tesla, Uber and Apple Join the race for the driver-less car

Car of the future : A swarm of sensors



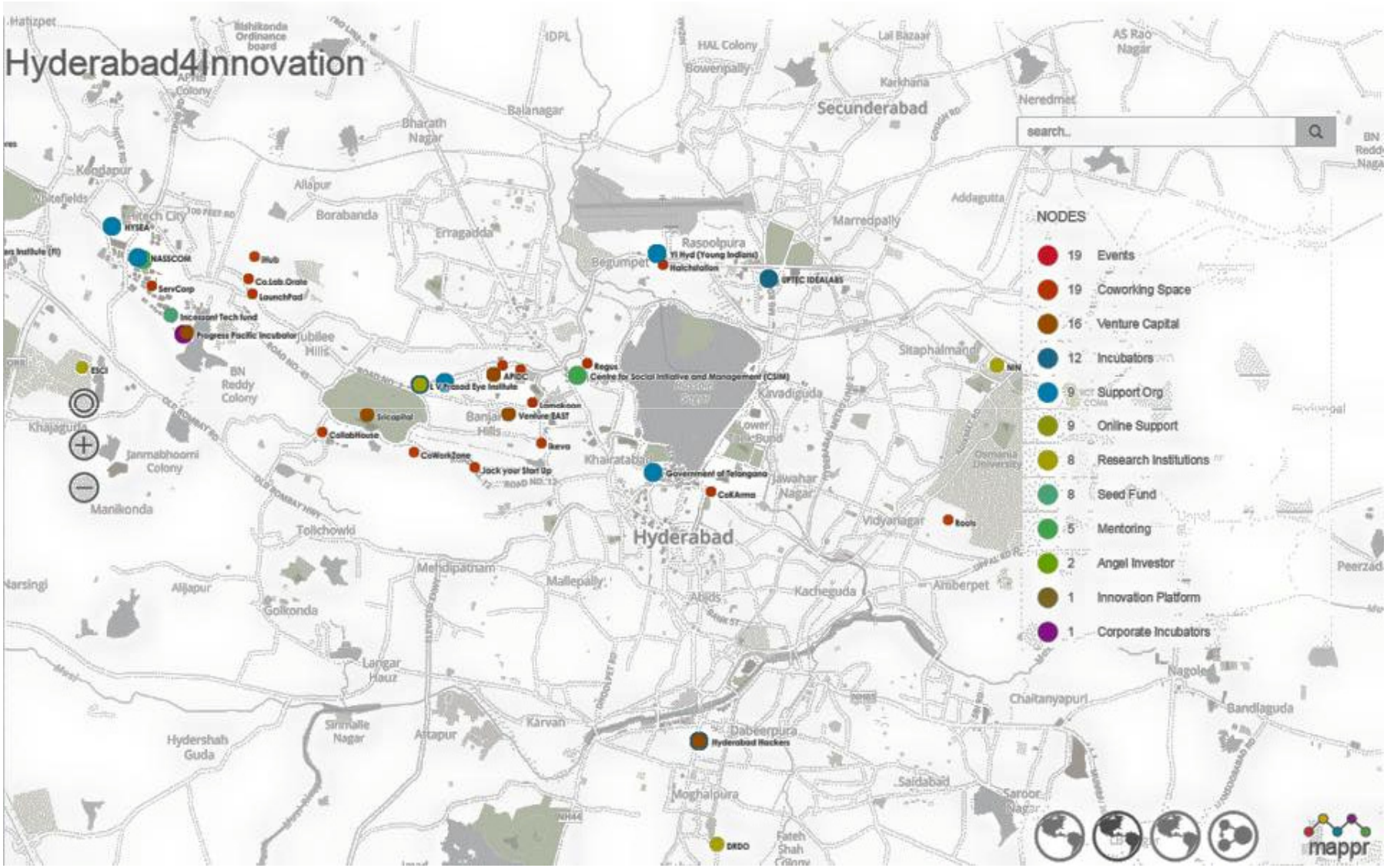
CAR OF THE FUTURE: A SWARM OF SENSORS

1	Road condition sensor	15	Water repelling windshield
2	Magnetic sensor	16	Seatbelt pretensioner
3	Vehicle distance sensor	17	Driver monitoring sensor
4	Forward obstacle sensor	18	Headup display
5	Blind spot monitoring camera	19	Steering angle sensor
6	Drive recorder	20	Electronic control throttle
7	Side obstacle sensor	21	Electronic control brake
8	Air pressure sensor	22	Fire sensor
9	Inside door lock/unlock	23	Vehicle speed sensor
10	Rear obstacle sensor	24	Collision detection sensor
11	GPS sensor	25	Pedestrian collision sensor
12	Airbag	26	Electronic control steering
13	Vehicle to vehicle communication	27	Message display system
14	Rear view camera	28	Hands-free system

Source: Cisco, PL Research

Do we have the cycling tracks across the city ?

Mapping : Innovation and enterprise in Hyderabad



TAKING THE LONG-TERM VIEW

A ROCKEFELLER FOUNDATION PROJECT AIMS TO MAKE CITIES RESILIENT TO SHOCKS AND STRESSES

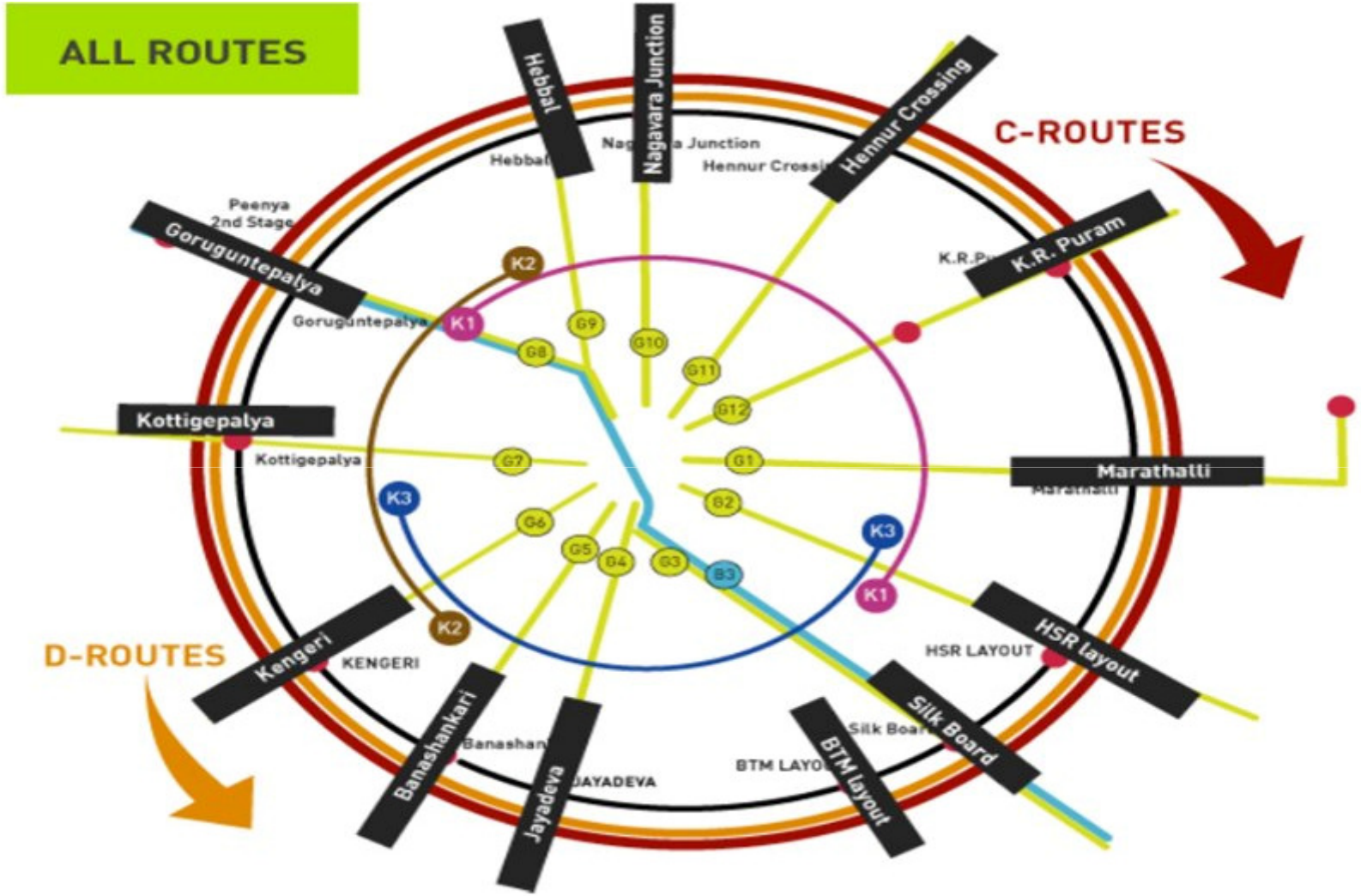
Poor transportation is one of Bengaluru's concerns. — File Photo

- Common challenges faced by the three Indian cities that made the list: **flooding, infrastructural inadequacies and pollution**

- Bengaluru also has to deal with **poor transportation** while Chennai has to contend with **overpopulation**. Surat has listed **disease-outbreak** and **rising sea levels** as challenges.

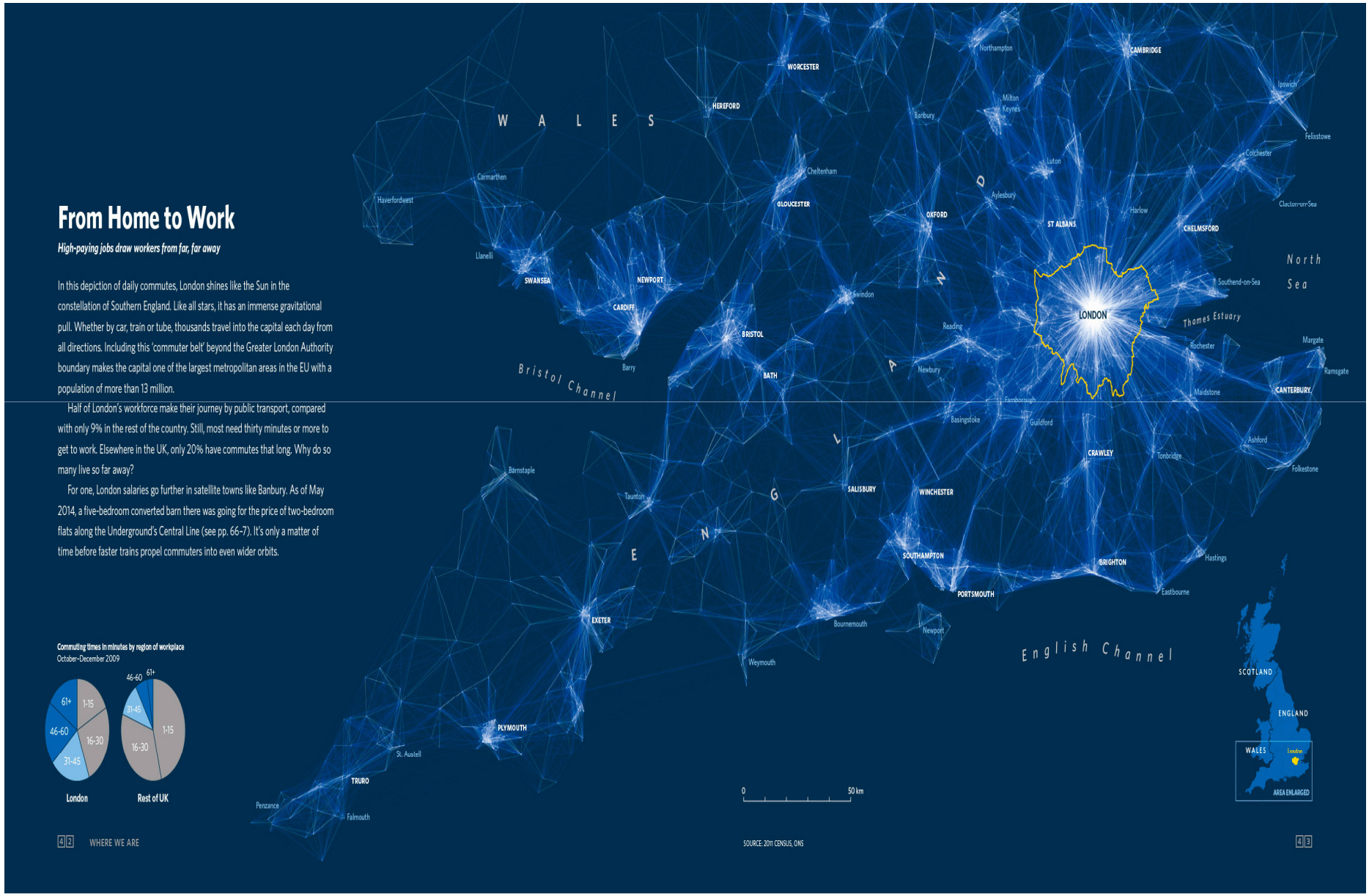
Source : Times of India – Feb 2015

Bangalore – Bus transport network



Source : BMTC

From Home to work - London



Excerpted from *London: The Information Capital* by James Cheshire and Oliver Uberti (Particular Books, 30 October 2014)

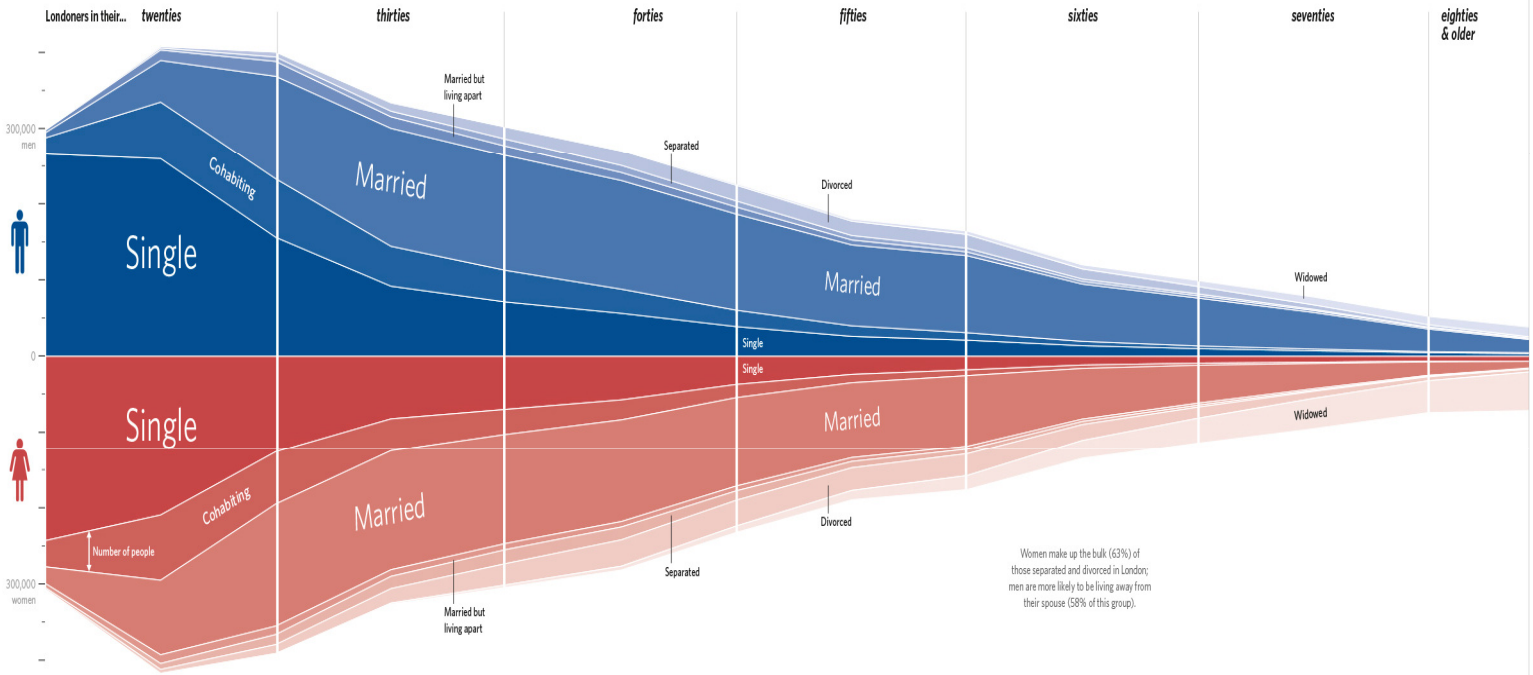
Relationship status - London

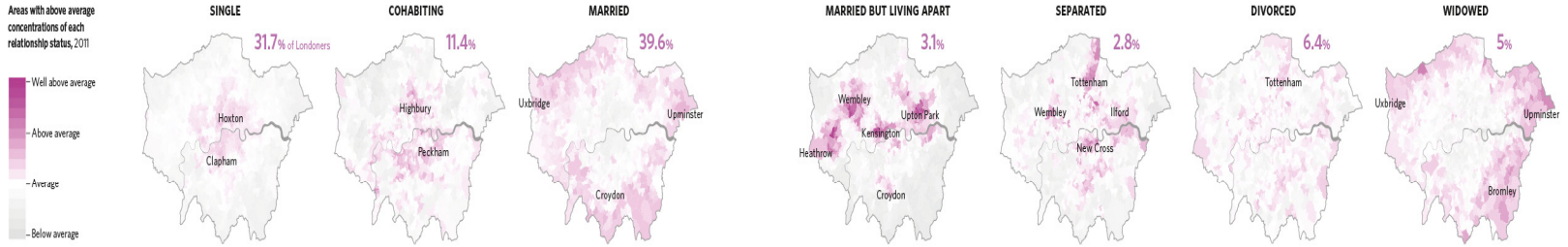
Relationship Status

We age, we marry, we migrate.

Twenty-five and single? In London, you're anything but alone. According to the 2011 Census, more than half of twentysomethings go solo. Then come your thirties and that deep river of available singles your age narrows to a shallow stream. By age fifty, it's little more than a trickle.

Most will have married and settled in the leafier boroughs (see maps). Young singles – and their cohabiting friends – prefer trendier parts of the city such as Hoxton, Clapham and Peckham. Those living away from their spouse fall into two camps: pricey places in Kensington or more affordable housing near Heathrow, Wembley and Upton Park. Separated couples and divorcees cluster around Tottenham and to the east; widowed spouses stay put.

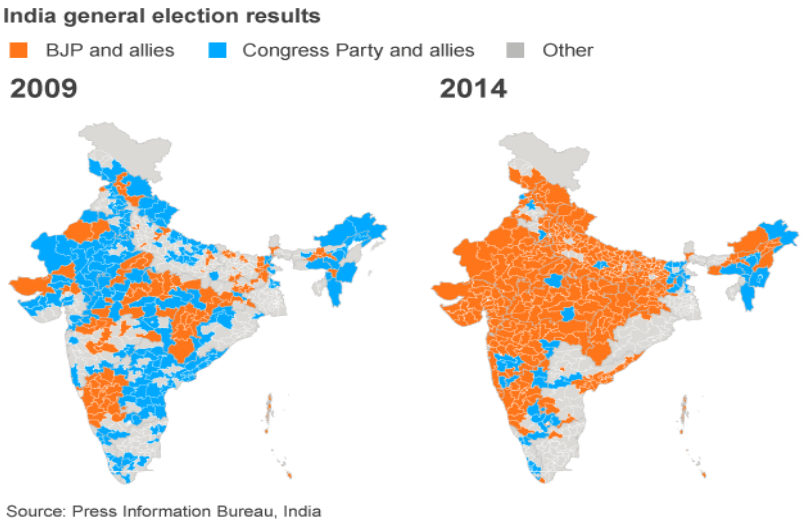




SOURCES: 2011 CENSUS, ONS; OS

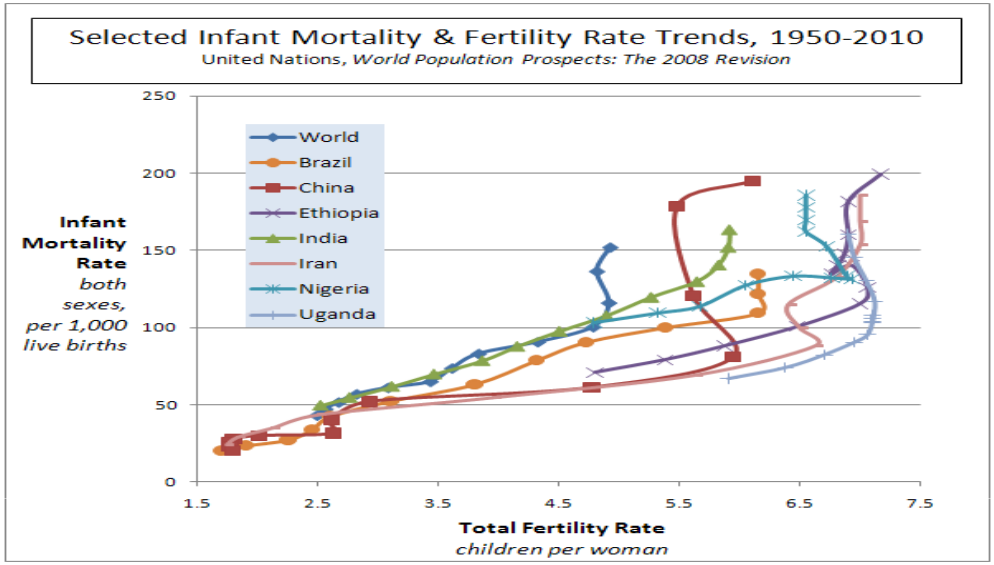
Excerpted from *London: The Information Capital* by James Cheshire and Oliver Uberti (Particular Books, 30 October 2014)

Few other specific indicators

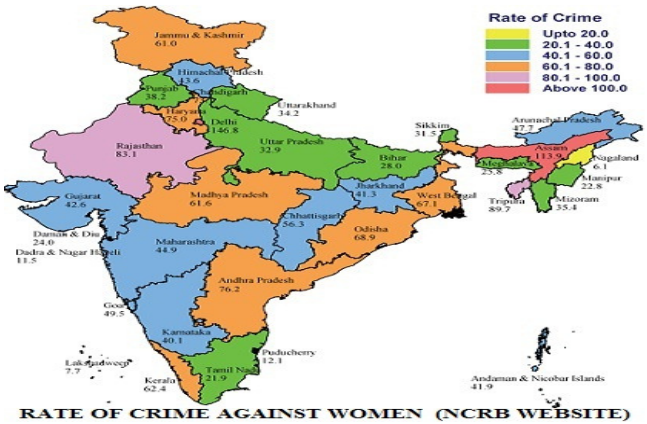


Source: Press Information Bureau, India

Election results



Infant Mortality

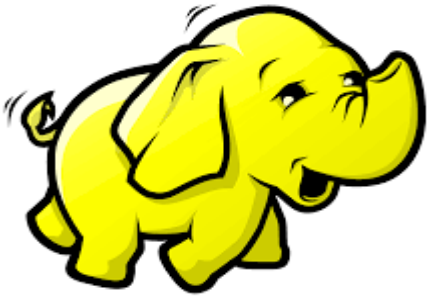


Source : Ministry websites

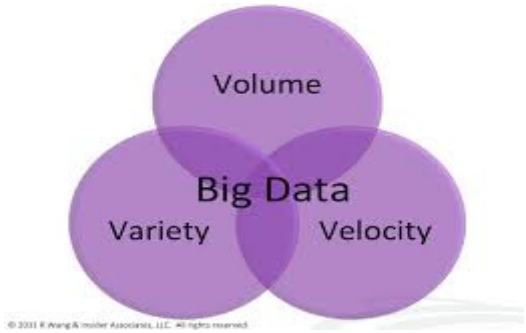
Rate of crime against Women

Big Data Analytics

Market Opportunities- Big Data & Analytics



Big-data-Hadoop



Cloud computing

Social media

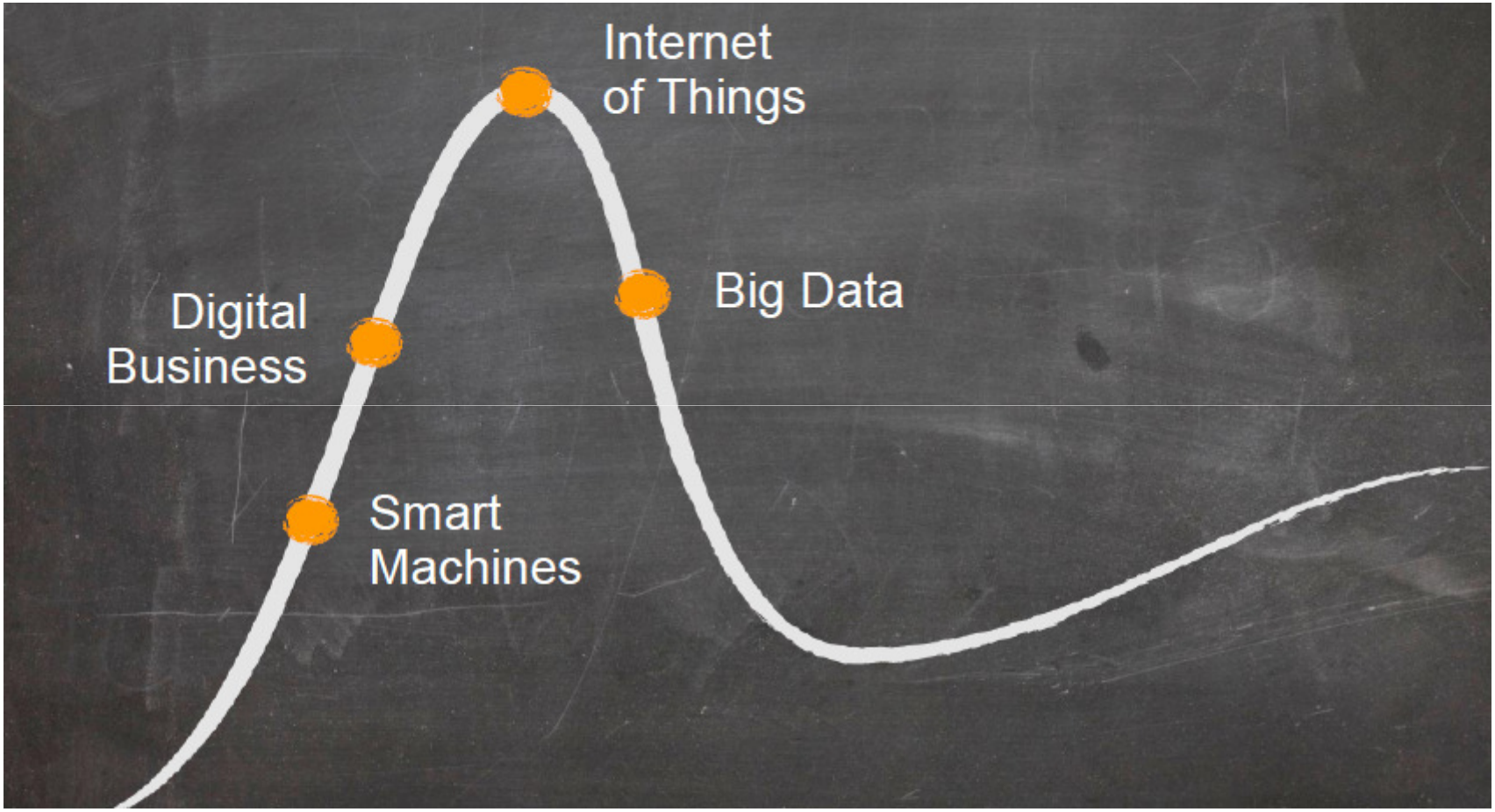
Mobile

Unstructured data

Market Opportunities- Big Data & Analytics

These shifts are converging, with Big Data at the center

Big Data Hype Falling Into the Trough … and That's Not Such a Bad Thing



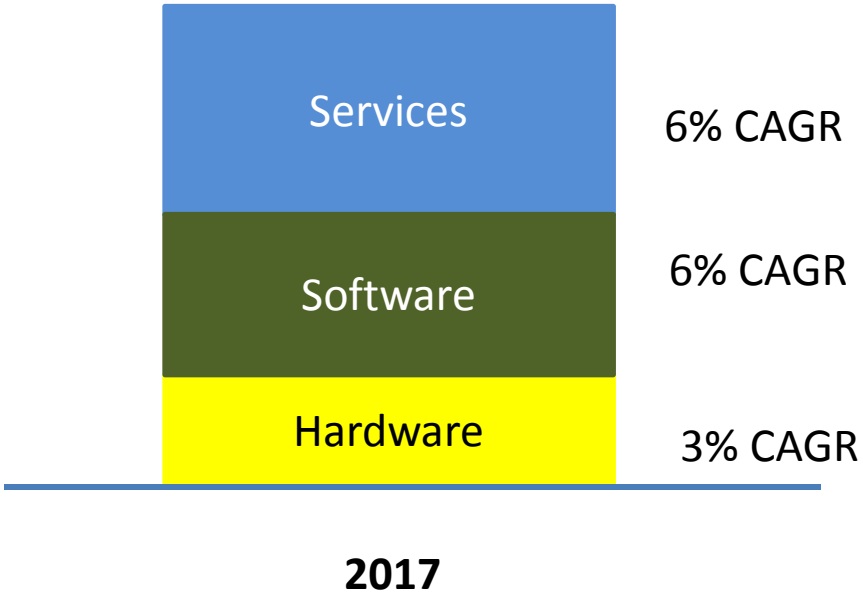
Market Opportunities- Big Data & Analytics

Big data & Analytics Market Opportunity is growing very fast globally.

Market trends

- By 2017 there will be more than 1 trillion connected objects and devices on the planet generating data
- There are 2.5 billion gigabytes of data generated every day of which 80% is unstructured
- By 2017, WW data spend will be $266 B

Big data and Analytics market opportunity 6% CAGR through 2017



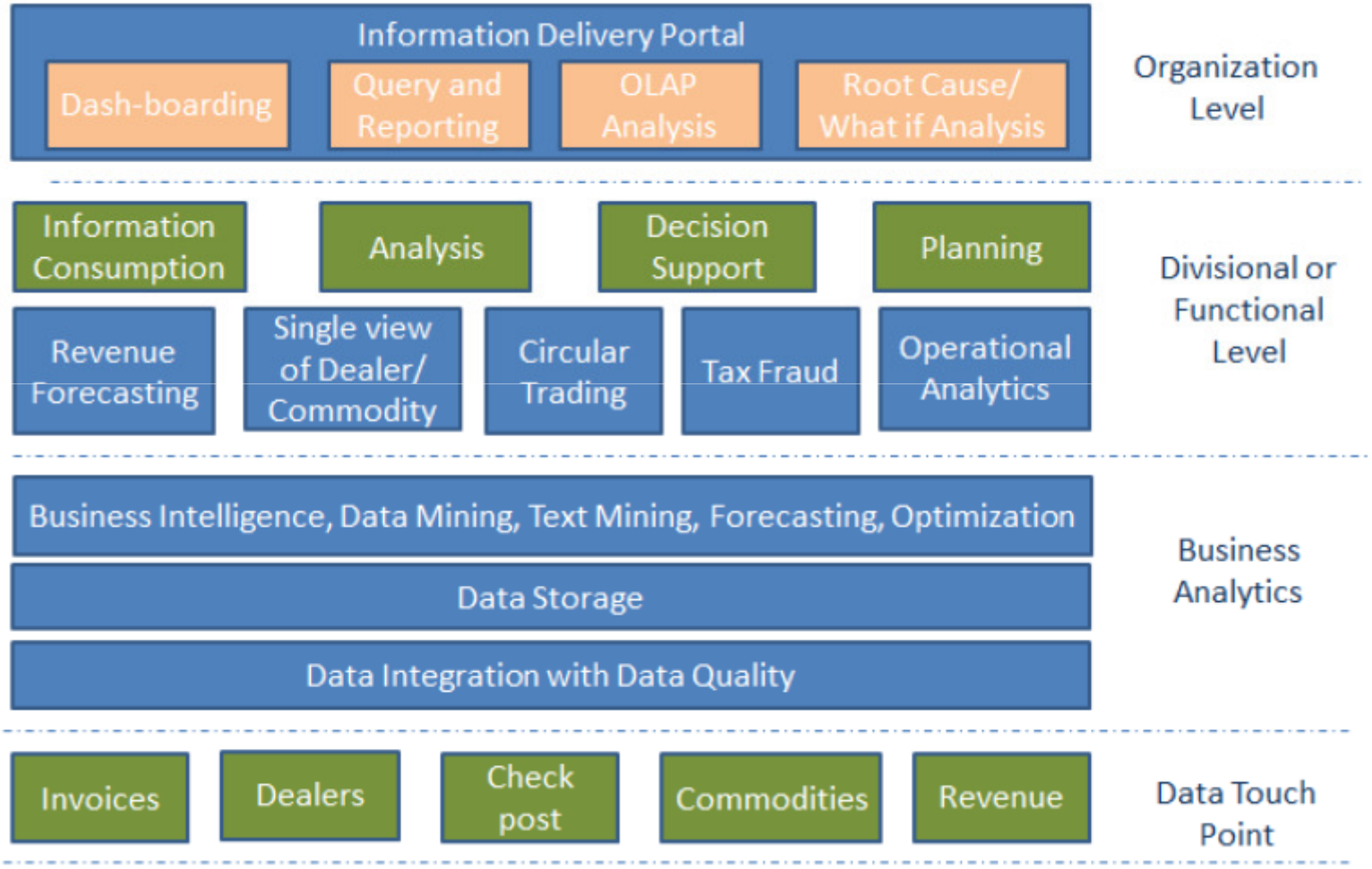
Market Opportunities- Big Data & Analytics

Is Big Data Finally Getting Traction? (One point of view)

- "We're beginning to see trends and similarities as big data goes mainstream.
- "It's not about the peta bytes" . "People want to make decisions fast, predict customer behavior more quickly, and react more quickly to events in the real world."
- Between 2012 and 2014, machine-generated data jumped from 23.7% of projects to 41.2% of projects, while the other two sources dropped (from 45.4% to 30.9% for human-sourced data and from 30.7% to 27.7% for process-mediated data). That ties into IT's mantra – or mandate – to be more automated.

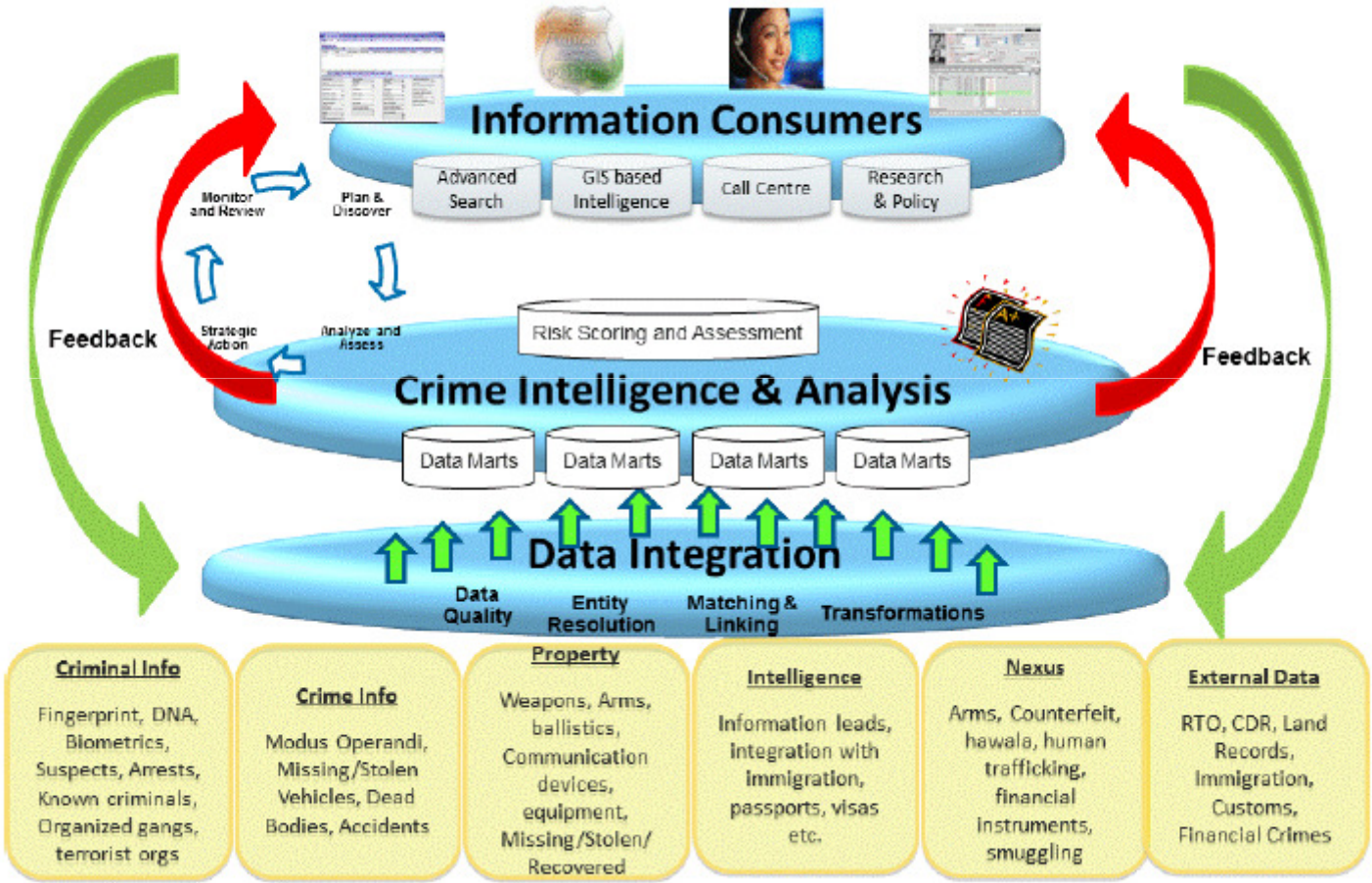
Government – Use Cases

Fraud framework - SAS



Government – Use Cases

Analytics for Law enforcement - SAS



Technology

In this project, we use various latest Big Data Technologies including analytical data processing, led by Hadoop software and operational data management, led by NoSQL databases, Graph databases, Google Map APIs, Open source software such as R, analytics and visualization software.

Where are we

Contours of the city
Airport/railways – Travel to outside world across India and the world
Weather indicators – day time and night time indicators…
Property prices in the city – Median apartment prices – leading localities – last three years
Rent generation Residential – Median monthly rent – leading localities- last three years

Who we are

Life and Death – Mortality details
Relationship status – Single, married, married but living separate, divorced, widowed
Types of occupation
City ethnicity
Election voting in the cities – 2014 – by constituency – Election commission data

Where we go

Tweets from the city(need to work on what we are going to do)
Transportation – Origin destination details…on a map – Home to work
BRTS/Metro/Bus – Map of the city
Bicycle track in a city
City– marathon/half marathon map
History and tourism

How are we doing ?

Life expectancy
Health indicators – obesity, causes of death
Prescribed drugs in Ahmedabad – Need to get it from Pharma friends
108 – calls – emergency call map
Crime in the cities – Where violent crimes flare up
Top crimes in the city
City – Fire map – where are the reported fires
Serious injury by vehicle type

What we like

Popular supermarkets in the city
Popular restaurants in the city
Popular papers in the city
Popular politicians in the city
Popular schools in the city

Thank You