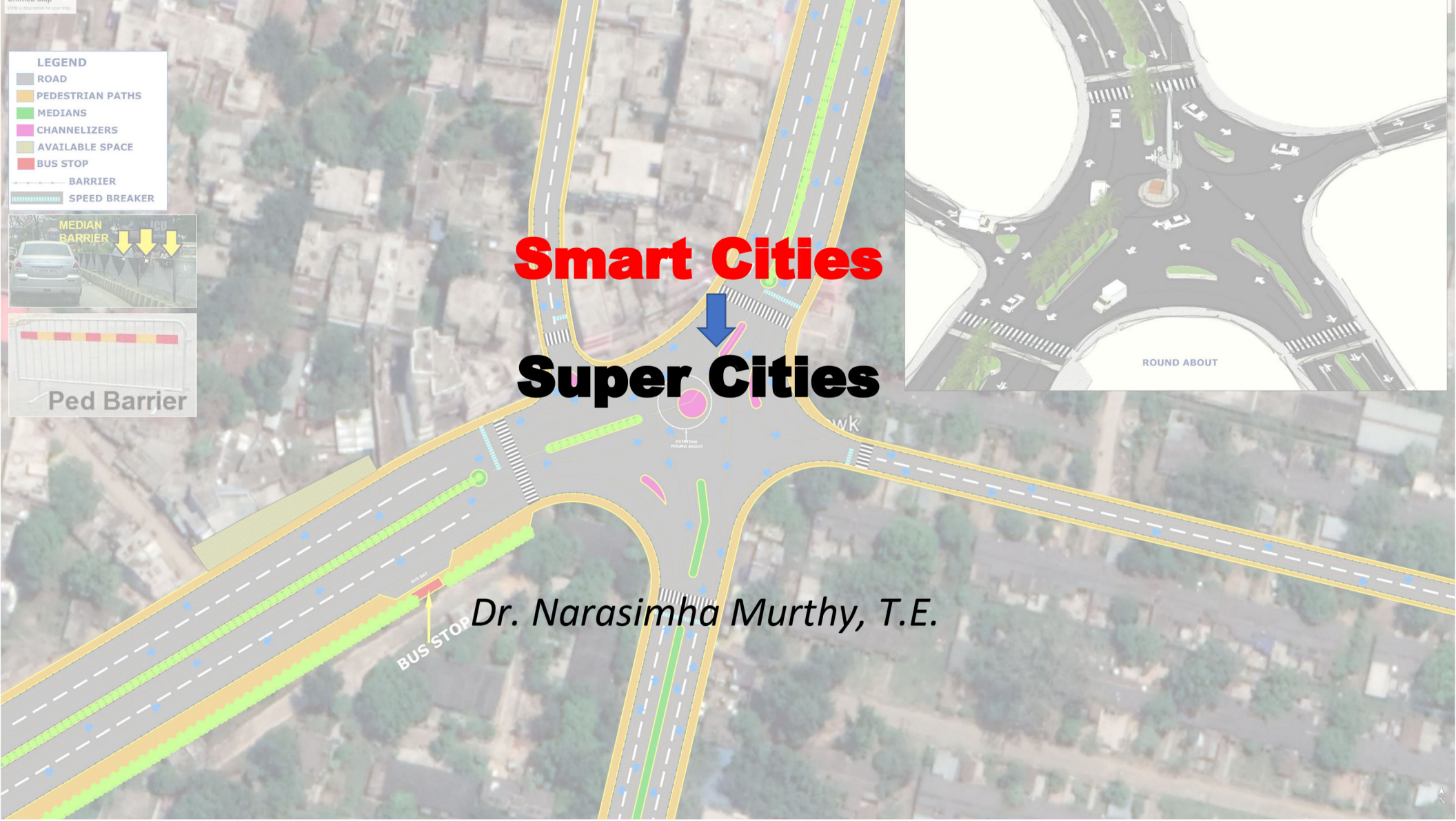


Smart Cities

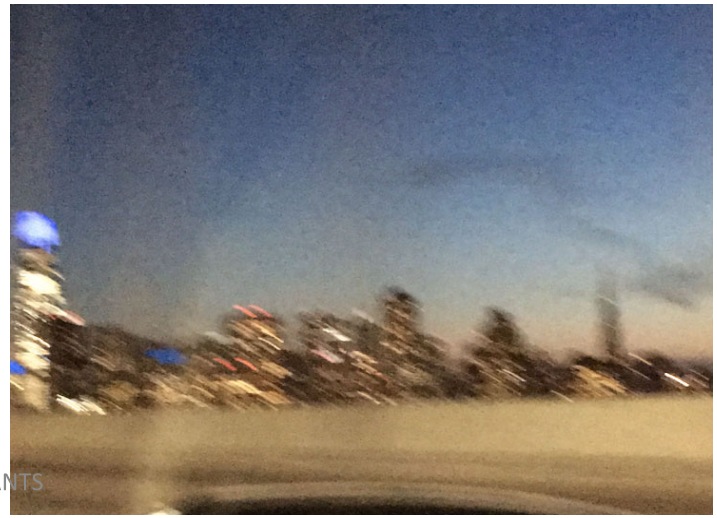
Super Cities

Dr. Narasimha Murthy, T.E.

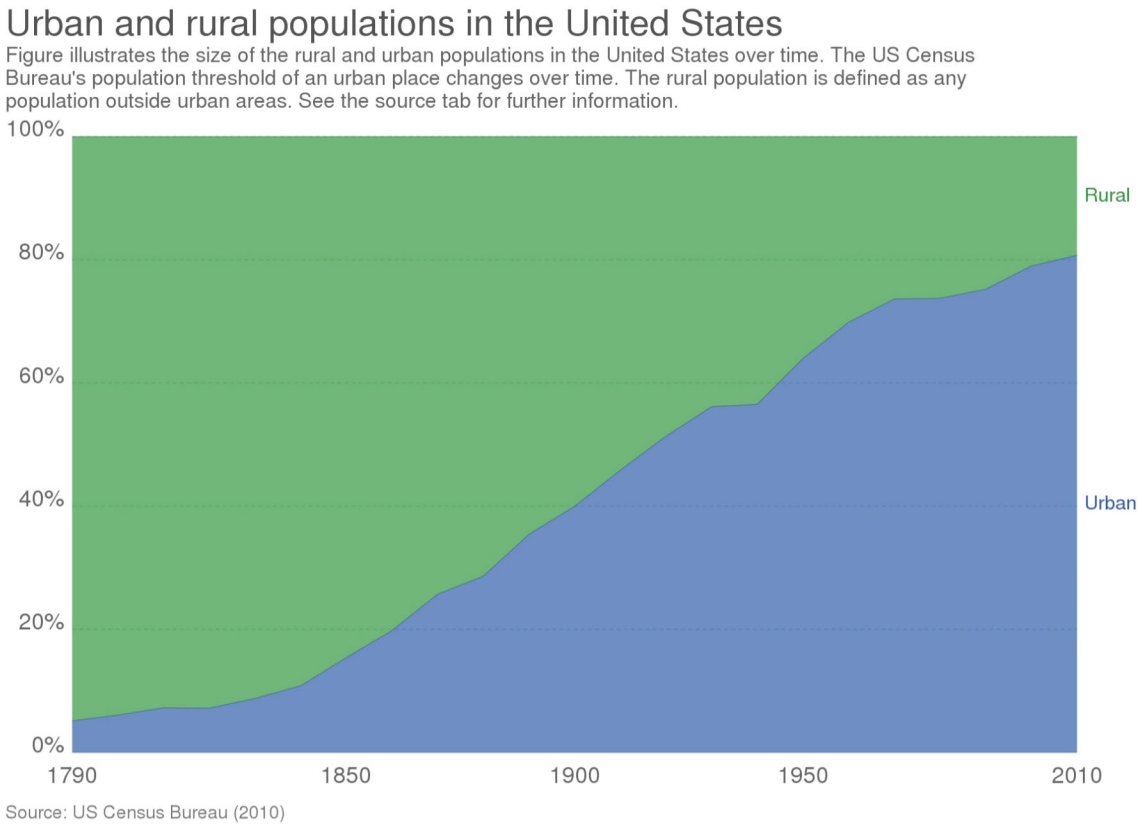
Contents

Cities

Source: Google Earth

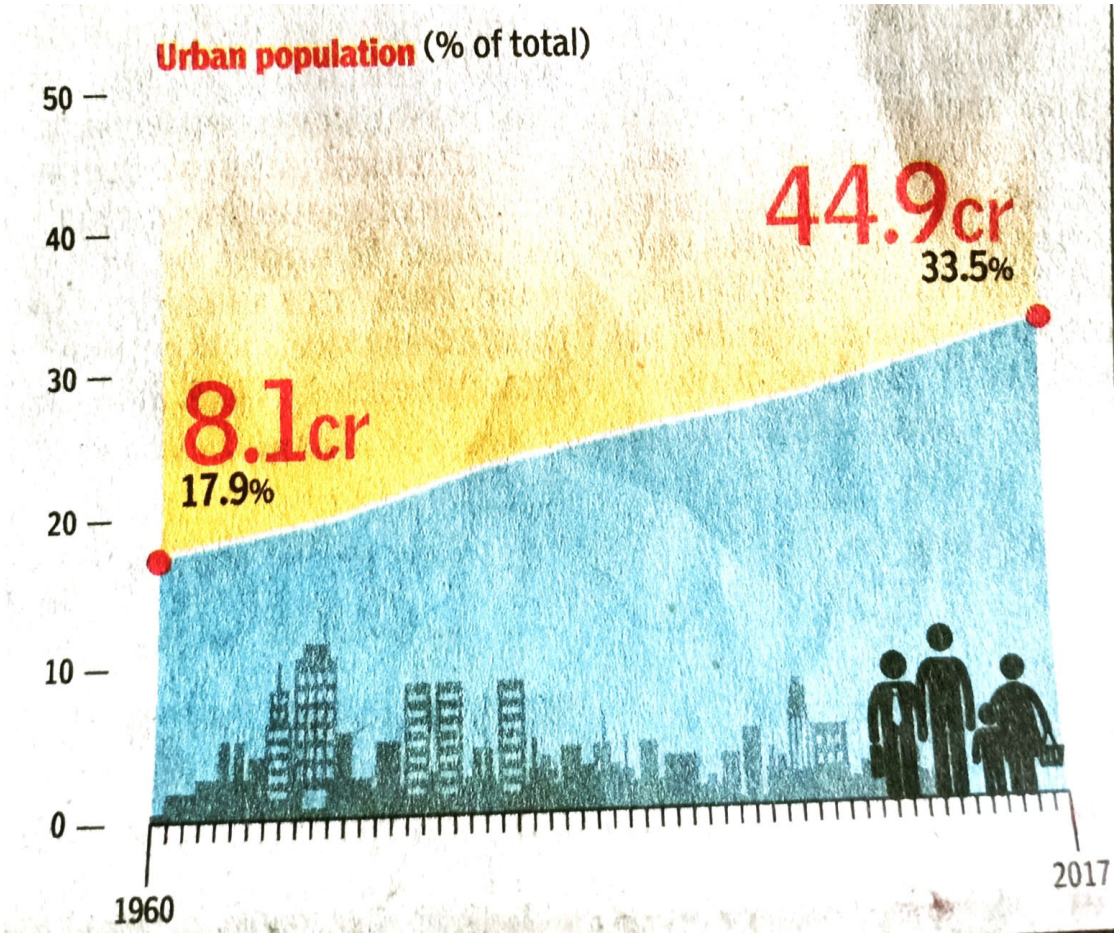


U.S. Urban Population 1790-2010



Urban Population- India

In Six decades the Urban Population rose nearly **6 times**



In 1960;1 in 5 Indian lived in a city now **1 in 3 lives in the City**

Technology

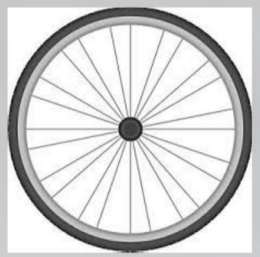
Definition of **Technology**

/tɛkˈnɒlədʒi/

Learn to pronounce

noun	the application of scientific knowledge for practical purposes, especially in industry machinery and equipment developed from the application of scientific knowledge the branch of knowledge dealing with engineering or applied sciences

Technological Inventions - The Wheel!



Mankind's most important invention

How far reaching is technology today?

Cities – Post Industrial Era

Economic transformation – technological advancements – leading to manufacturing – leading to service oriented sectors

New standard of living is established – urban, sub-urban and exclusive areas for living

Changes in production – new technology e.g. car assembly – development of Super Stores for buying goods and distribution methods.

Changes in Communication – allowing easy access to people and goods

e.g. smart phones, computers, telecommunications, etc.

Influence of Technology – leading to Global Integration – creation of national and international capital – decentralization of production and trade – greater political role

Industrial Revolution to Present Day

18th Century - onwards led to massive urbanization and creation of cities – manufacturing moving from farming.

19th Century – the introduction of railroads, public transportation – end of this century introduction of electric urban rail – then the buses and motor vehicles (cars).

Technology such as – street lights, gas lighting, electrification by the 1880's – water supply network – all added to growth of cities during this century.

Industrial Revolution to Present Day

20th Century – rapid urbanization throughout the world – cars – multimodal transportation – sustainable development – modern communication using satellites – internet – computers – smart phones etc.

21st Century – technology and communications making cities center of knowledge and information – suburban sprawl – creation of smart cities –leading to competitiveness, innovation, environment and energy awareness, delivery of efficient services to citizens – leading to greenfield sites.

Role of Technology in Smart Cities

Smart City – Main components are better communication and information sharing with citizens using current technology.

That is the use of Information and Communication Technology (ICT) for various purposes including better transportation network.

Smart solutions are conspicuously based on Internet of Things (IoT), geospatial and ICT, sensors and locations.

Use of Technology – to increase efficiencies of services to the citizens, reduce cost and allow sustainable living conditions and have a steady economic growth.

Objectives: Leading to improved quality of life for the citizens. Also management of resources for a sustainable growth.

Smart Cities

For a “smart city” technology forms the backbone.

Smart City is one that efficiently and ethicallyuses secure technologies, data, & resources to improve quality of life and sustainabilityfor residents, businesses, and visitors.

A smart city is to be evaluated based on the outcome the city delivers in terms of “Quality of Life” to the citizens. The “Smart City Index” uses this criteria for ranking the Cities.

Currently **Singapore** is ranked number 1 among 20 smart cities recognized.

From Cities to Smart Cities

- Gujarat International Finance Tec-City, India
- Lodha Group's Palava City India
- Putrajaya, Malaysia
- Bonifacio Global City, Philippines
- King Abdullah Economic City, Saudi Arabia
- Sejong City, South South Korea
- Songdo International Business District, South Korea
- Dimiadio Smart City Senegal
- Dubai World Central, United Arab Emirates
- US Cities (Mid-Size) Los Angeles?

Lodha Group's Palava City, India

- The first and the fastest growing green field smart city in India.
- It is18 Sq. Km. mixed use integrated city project.
- Houses for about 125,000 residences plus offices and commercial space.
- Objective to provide quality of public spaces, technological solutions, healthcare facilities, safety, connectivity and so on.
- Partnered with IBM & Fluentgrid to build and manage the smart city IT.
- IBM smarter cities technology using advanced, data driven systems to integrate information from all city operations into a single system.
- Smart systems for surveillance, access control, parking, smart cards and integrated with a command and control center.
- The integrated smart city solution offered by Fluentgrid and IBM allows total city management.

LA Smart City Technologies

- The MyLA311 mobile app.
- 5G cellular,
- 911,
- Digital parking meters,
- Electric vehicle charging stations, app
- Body worn cameras for police officers,
- Traffic management system,
- ShakeAlertLA, earthquake early warning app,
- Connected street lamps and GPS-enabled street sweepers.

The objective is to provide a direct and tangible public benefit.

LA 2028 Olympics

Information and Communication Technology (ICT)

ICT builds a bridge between citizen and government where citizens can interact with the government and in return the government builds the city as per the choice of its citizens.

Internet of Things

Internet of Things is like veins of the city spread all across and connecting each dot. All smart solutions in smart cities are based on Internet of Things where they are connected and smart enough to decide their action.

Sensors

Sensors are hidden but ubiquitous components of the urban landscape. Sensors are a crucial component of any intelligent control system. They are like converters that convert parameters of a physical nature to an electronic signal which can be interpreted by humans or can be fed into an autonomous system.

Geospatial Technology

Geospatial technologies provide the underlying foundation and ultimately the fabric upon which solutions for smart cities can be built. It provides location information which allows pinpointing exactly on the need so that better solution can be applied to it.

Artificial Intelligence

Smart city is a digital revolution generating huge amount of data. This massive amount of data generation brings the role of Artificial Intelligence that can make sense out of those data. AI allows machine-to-machine interaction by processing the data and making sense out of that.

Blockchain

Blockchain application is new to smart cities. Its integration into smart cities could better connect all city services while boosting security and transparency. Blockchain is expected to influence cities through smart contracts. It can also be used in smart grids to facilitate energy sharing, a concept which trending these days.

Six major technologies that define the smartness of a city

Source:https://www.geospatialworld.net/article/technology-the-backbone-of-a-smart-city/

Application of Technology and Benefits

Smart Cities have ICT to create two-way communication network and IoT acts as the connector for the network based on the services provided.

Public Services – Water, Electricity, Garbage and Gas

Public Transportation System – Buses to parking management

Land Use Data Sharing – geo-spatial information on land

Application of Technology and Benefits

Health and Education – Schooling to hospital services integration

Government Operation – through e-Governance

Infrastructure – Information on upcoming projects to amenities

Transparency – through open system and on-line e-governance

Cities to Smart Cities to Super Cities

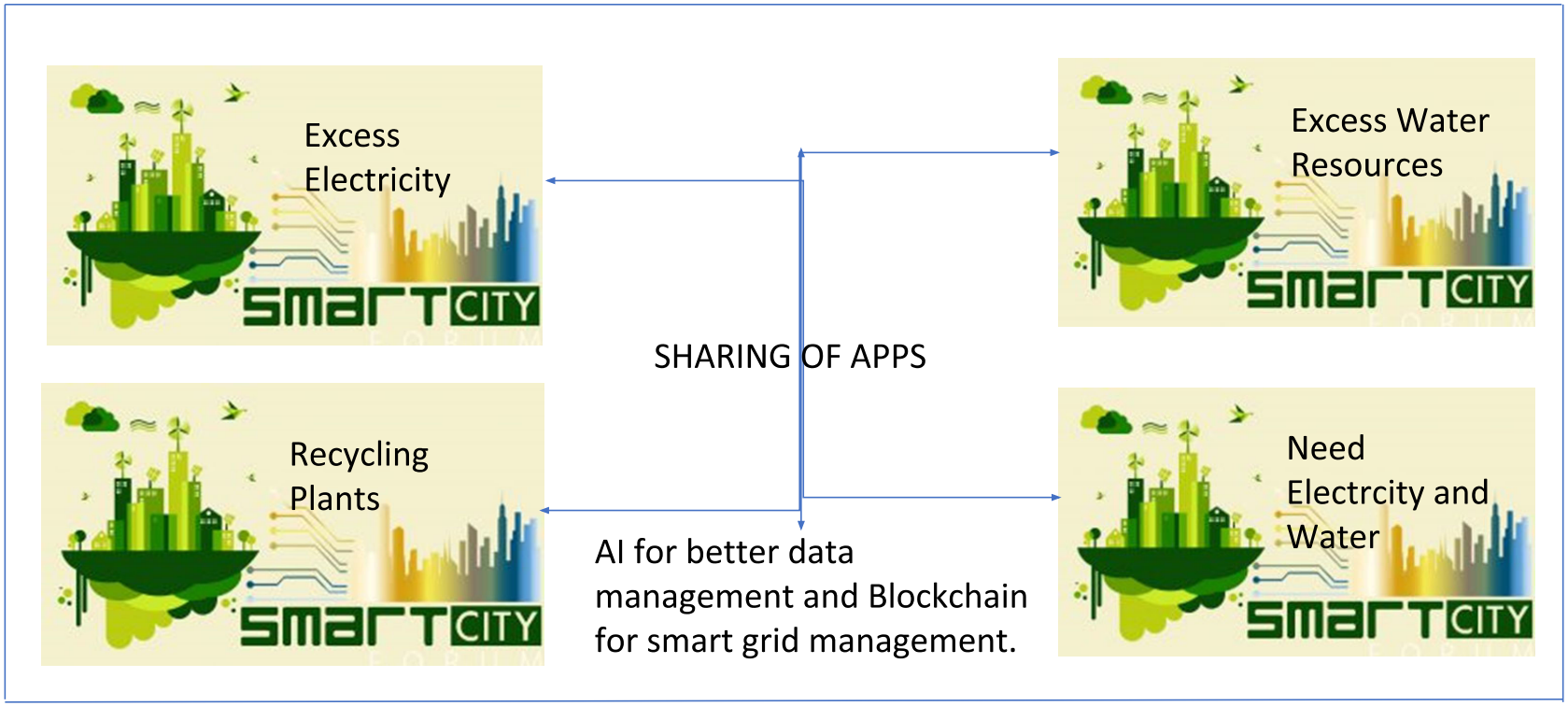
Super Cities – I envision that it will become necessary (say around the year 2050 and beyond) as more and more “smart cities” are developed around the globe and mature. There comes a time from the perspective of “sustainability "the sharing of resources becomes important in all fields.

Super Cities may be formed by “connecting” the “smart cities” and share the data in order to “exchange” excess resources in the future in some kind of “barter” system.

Most of the data exchange and analysis between the smart cities done using Artificial Intelligence (AI) and Blockchain process to be efficient and optimize the solutions over the grid.

As the population keeps increasing and the urban growth percentage increases, there will be a need to exchange resources at a “faster” rate on a regular basis.

Concept of Super Cities (Blockchain)



Smart Communities

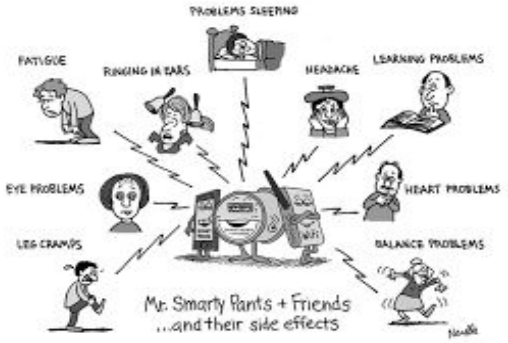
- 2019 Georgia Smart Communities Challenge
- Georgia Smart is a competitive one year program that supports local governments of any size within the State of Georgia by providing grant funding and access to technical assistance, expert advice, and a network of peers.
- Policy development, creation of a technology roadmap, transportation analysis, the development of a prototype or pilot technology or “app” for public engagement.

Some things are Still Undone!

Irrespective of the pace of technology; many things are still undone!

- Minimizing **pedestrian deaths** around the globe.
- In the areas of Educating & Enforcement ; citizens to use the transportation infrastructure with **courtesy and adhere to laws**.
- Raising a new generation of children to be part of **sustainable society**.
- Developing **uniform manuals** for developing countries to use in developing **access, parking and infrastructure**.
- Bringing in **equity** as part of all transportation and technology related projects – to provide basic things for **ALL.**
- A **recheck time to time** is needed in using **TECHNOLOGY** to see the **overall benefits**.

Impacts of Technology – Beaware!

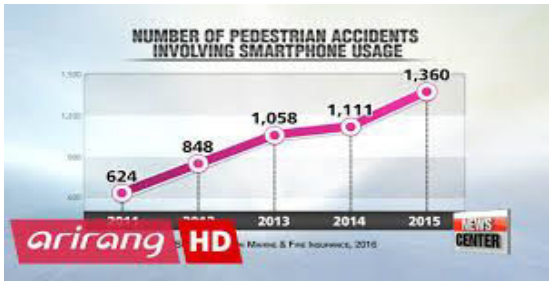


Human Impact

Internet/Cyber Fraud

Excess Travel by all modes (Air); climate change

Vehicle Accidents



Pedestrian Accidents

Where are we heading?

Technologies to follow:

- Hyperloop
- 4G to 5G – 100 times faster than 4G!
- Drones (some practical uses have already been done)
- Autonomous Vehicles (under testing and some in use)
- Artificial Intelligence (some applications; some scary)
- Electric vehicles (all modes)
- Blockchain Applications – Super Cities
- Supersonic Air Travel and E- Planes
- Faster Multimodal Transportation – High Speed Rail (California – yet to build)

Questions & Answers

We have a long way to go before achieving our goals of smart and super cities/communities; it is also important to achieve equity for all.

Thank You

Proven Multi-Modal System still in Use Today

No Union; No Pollution; No Fuel