INTELLIGENT TRANSPORTATION SYSTEMS- CASE STUDIES

Challenges and Opportunities

- Mixed Traffic
- Poor lane discipline
- Lack of pedestrian facilities
- Lack of service lanes and on street parking
- Non standards accessories
- Insufficient electric power supply
- Inefficient technical support
- Communication network
- Poor maintenance
- Constraints on site and engineering issues
- No equipment standardisation
- Deficiency in ITS architecture

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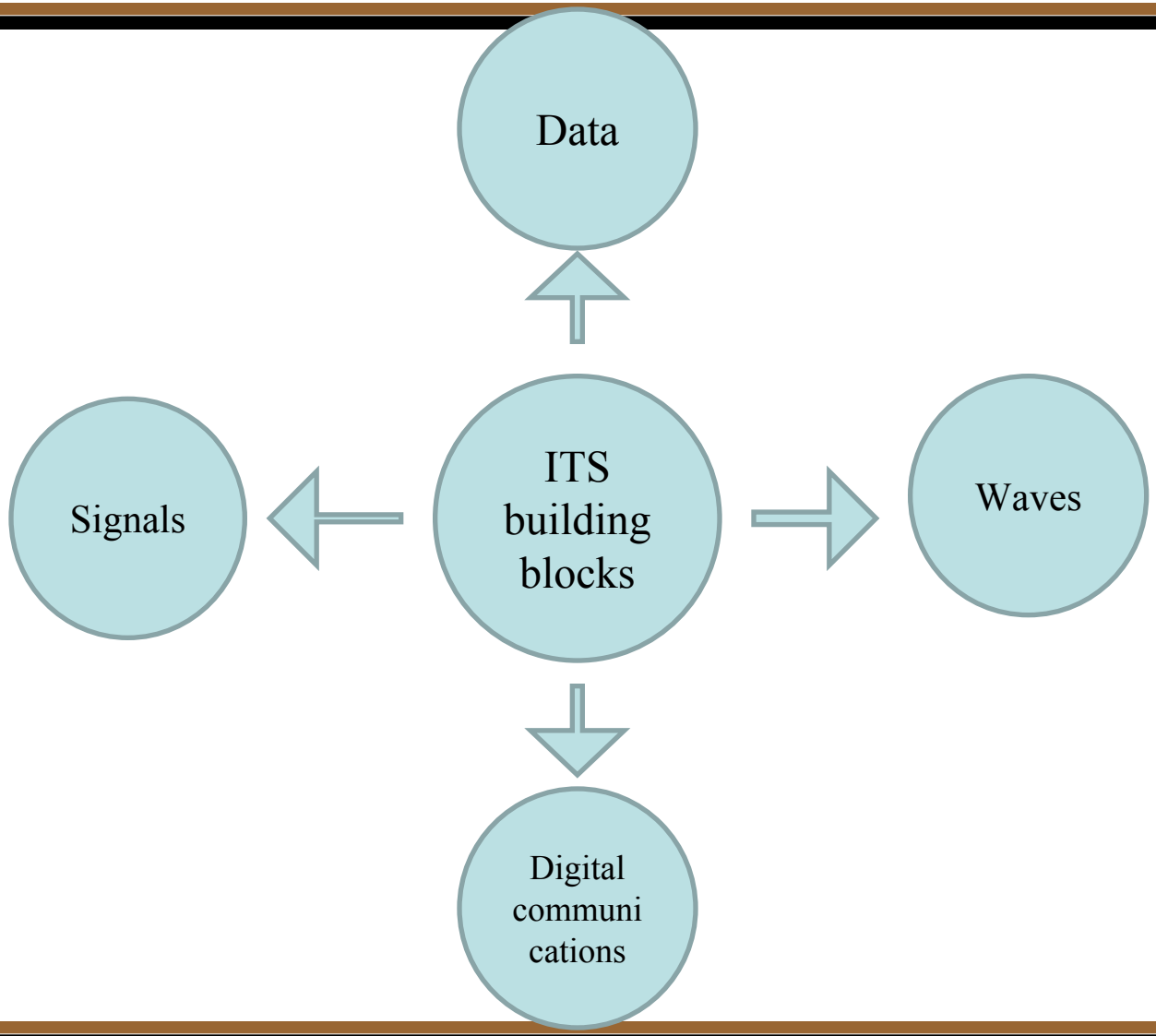
Fundamental building blocks of ITS



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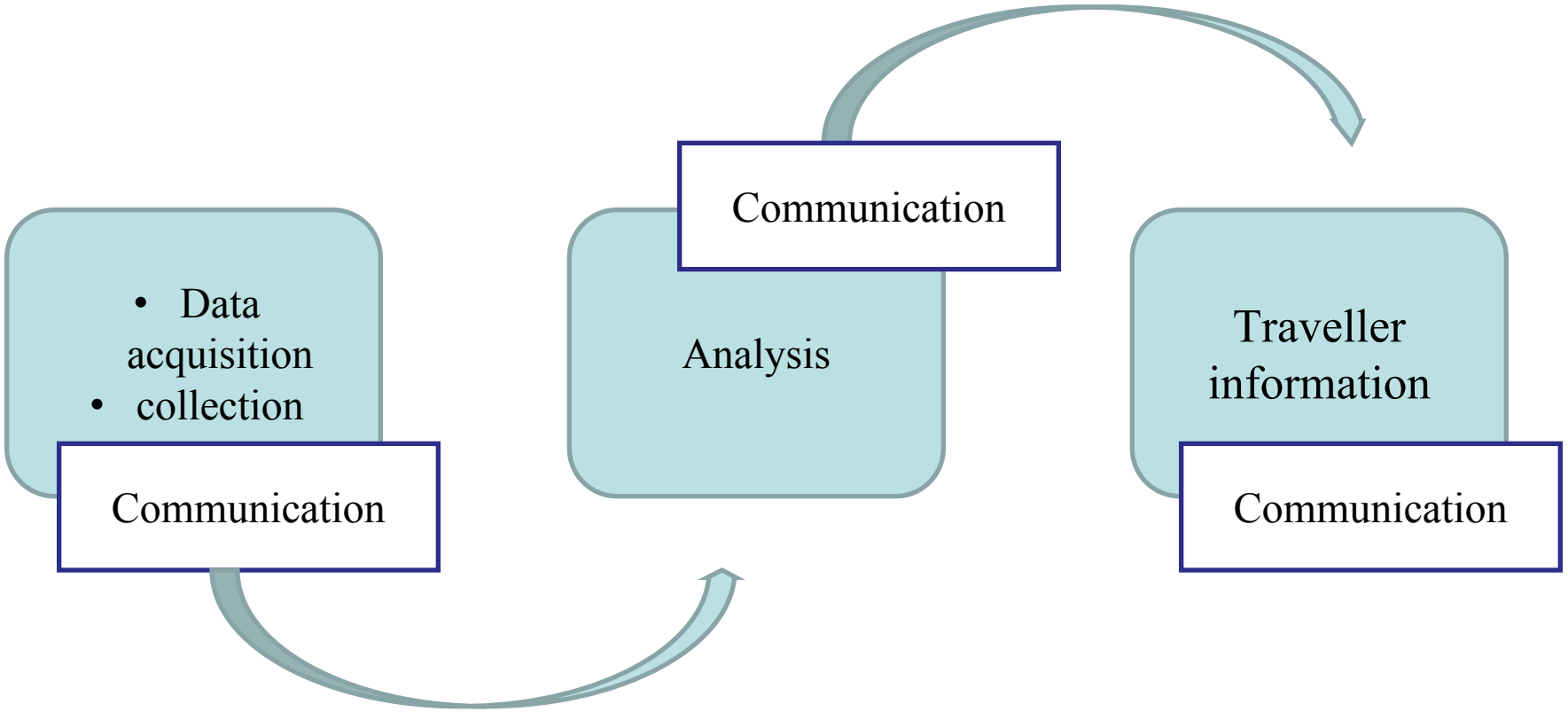
Concept of data flow from generation to the users



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Various sensor and surveillance technologies for data collection

Purpose	Various types technologies	Specific technology
Data acquisition	Sensor and surveillance	Inductive loops, passenger counters. Piezo sensors, radar, CCTV, laser, automatic vehicle location, smart cards, etc.
Communication	Telecommunication	Wireless application protocol, copper wire line, cellular wireless, fibre optics, DSRC, radio and TV
Data analysis	Data mining	Data warehousing, voice processing, speech recognition, internet, customised software tools for processing transport information
Traveller information	Information dissemination and display	VMS, in vechicle information system, emergency, telephone booth, kiosks, display at bus stops, mobile.

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Detection and Sensing Technologies

Detection method or sensors are the techniques to detect the presence of a vehicle or pedestrians moving on the road.

Roadway sensors:

- **Embedded (intrusive) detectors**

✔Inductive loop

✔Magnetometer

- **Non intrusive detectors**

✔Radar, infrared, microwave, ultrasonic, acoustic, video image processing, closed circuit television cameras

- **Environmental Sensors**

✔ Atmospheric sensors

✔ Road surface sensors

✔ Sub surface sensors

- **Probe Based Sensors**
- **Bluetooth**
- **Radio Frequency Identification (RFID)**

✔ LF RFID

✔ HF RFID

✔ UHF RFID

- **Mobile Reports**
- **Cellular network and GPS Probe**
- **SMART Cards**

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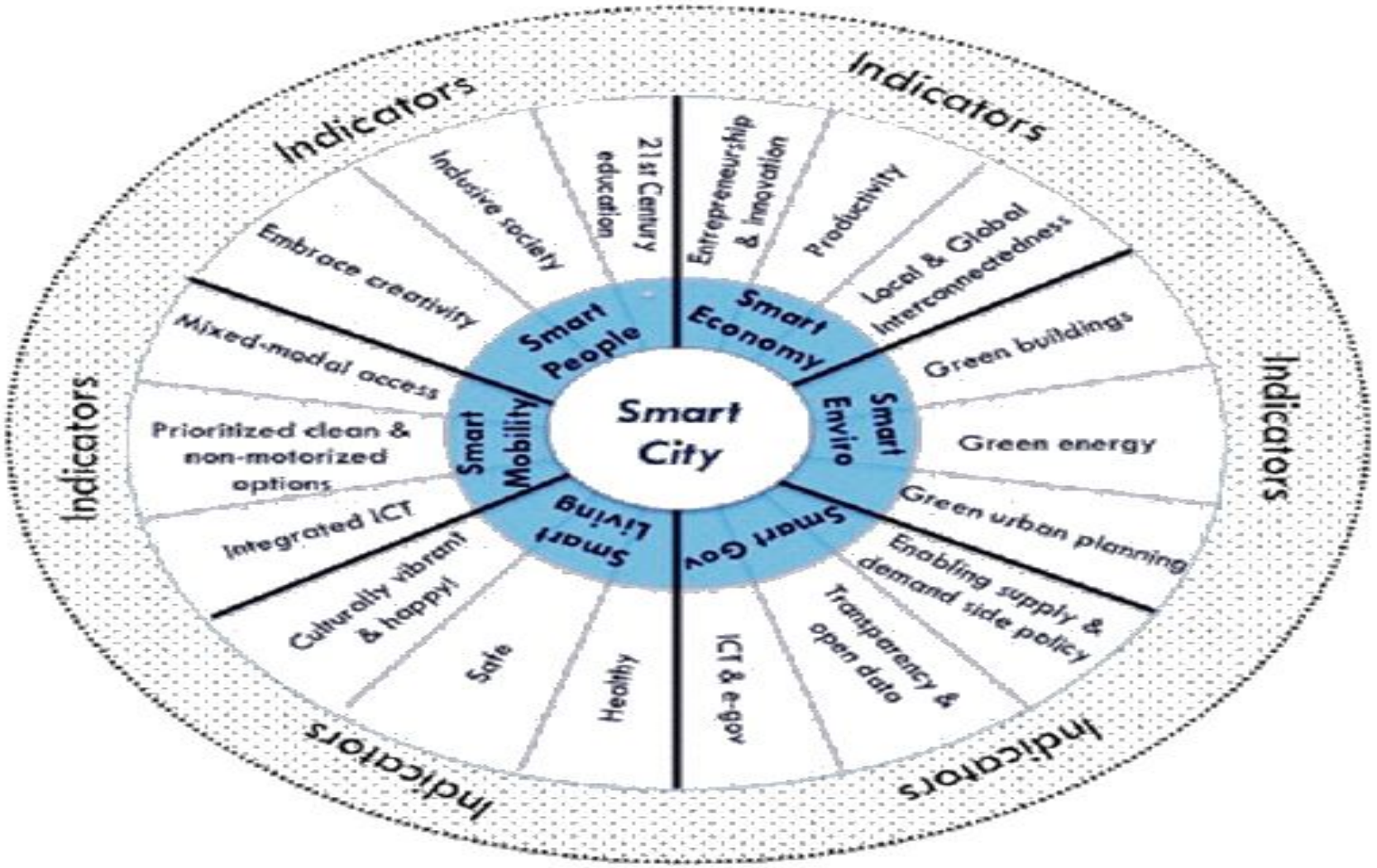
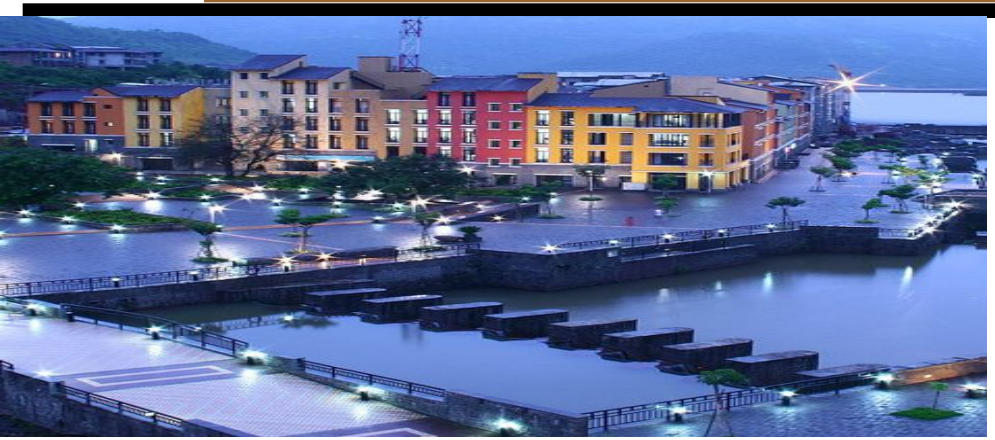
ITS for Smart Cities



ITS Technologies for Smart Cities

a) Multi-model transportation and traveller information systems
b) Smart ticketing and mobile payments
c) Intelligent traffic management systems
d) e-mobility
e) Cooperative ITS or cooperative vehicle infrastructure system (CVIS)
f) Solar power for electric vehicles (EVs) and vehicle-to-grid (V2G)
g) Freight solutions
h) Car and bike rental and sharing
i) on-demand taxis
j) Congestion zones and road user charging
k) Automated highway system (AHS)
l) Driverless public transportation service
m) Artificial intelligence for smart transportation systems

Smart City Initiatives in India



Lavasa, Pune

GIFT, Gujarat

Delhi- Mumbai Integrated Corridor

Smart City Kochi

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Case Study: ZURICH, Switzerland

- ***Zurich Public Transport is responsible for operations of trams, trolley buses and buses in Zurich.***
- ***ITS forms an essential part- operation and organisation, business processes, operating procedures, data and management. ITS operations for almost 40 years and RTPI for almost 20 years.s***
- ***Precision operation with on time running and transfer assurance.***

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Reasons to implement ITS

- To offer priority to PT
- To provide a reliable service
- To provide real time information
- Capacity to deal with disruptions and emergencies
- Integrated and seamless travel
- To gather, analyse and utilise extensive data for future purpose
- To optimise resource and maximise efficiency.

ITS Equipment and Devices

- **In vehicle**

✔ On board computer

✔ Driver console

✔ Display screens for RTPI

✔ GPS

✔ Radio

✔ Wireless LAN

✔ Voice announcer

- **Station equipment's**

✔ Displays for real time passenger information

✔ Self service ticket vending machines

✔ Wireless LAN/Ethernet for data exchange

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Benefits arising from the ITS

The focus now is on:

- Maintaining quality of service
- Integration of the passenger transport services along with neighbouring areas.
- To ensure seamless and reliable travel to passengers.

Thank You