1. **With less than 1% of total vehicles of the world, India accounts for the highest number of fatalities related to road accidents. Why? Examine. What are the smart solutions to address this challenge? Suggest.**

Introduction

Over millions Indian lost their life in road accidents in last decade. From 2008, India is has recorded highest number of death due to road accident in the world. WHO estimates that these accident amounts to economic loss of 3 percent of GDP. 'Road Accidents in India-2018' report, informed that a total of 467044 road accidents were reported in the year 2018.

Body

India accounts for the highest number of fatalities related to road accidents due to following reasons –

- Faulty road design and poor engineering such as sharp curves, single lane etc.
- Improper public transport often leading to neglect of safety such as overloading.
- Poor road conditions with potholes and blind spots. In 2016, government identified 76 black spots in different National Highways and tried to fix them.
- Use of poor building materials and construction.
- Climatic condition such fog in winter in northern India, heavy rainfall and dust storm often reduces visibility causes road accidents
- Weak vehicle safety design even in top selling cars of India, most of which fails to withstand crash test.
- Lobbying by transport unions, car industry to stop government to bring better legislation for improving car safety etc as this comes against their economic interest.
- Negligence on part of driver by over speeding, drunken driving, riding without helmet, driving without seatbelts etc
- Late action of government in adoption Brasilia declaration, bringing amendment in motor vehicles act, has already delayed our efforts.

Smart solutions to address this challenge

In order to reduce road accident by more than 50 percent, staying committed to Brasilia declaration, we must think innovatively and apply smart solutions.

- Use of smart trafficking, better lighting, 3-D speed breakers etc.
- Improvement of public transport, metro and other safer mobility option should be encouraged. India should move towards automated vehicles to reduce manual errors.

- Bettering vehicle design, safety features, use of new sensors, on board analytics that can provide drivers with real time suggestions.
- Enhancing the capability of police to check over speeding and neglect of traffic rules through digital technology such as CCTVs, laser speed gun etc.
- For pedestrian safety and cyclists mobility, such as sidewalks, bike paths, bike lane should be maintained.
- Strict implementation of traffic rules such as Motor Vehicles (Amendment) Act.
- Civil society should work for not only behavioural change of masses but also to demand attention of government on road safety.

Conclusion

India loses 3% of its GDP due to road accidents, most of which are preventable. The Ministry of Road Transport & Highways, Govt. of India has announced the observance of 30th Road Safety Week Campaign from 4th to 10th February 2019. These steps must be implemented with utmost urgency to make road safe for the citizens.

2. Can you suggest few working models to reduce and reuse waste in a city? Are you aware of some of the best practices for waste processing prevalent in few Indian cities? Discuss.

Introduction

Urban waste generation in India is around 62 million tonnes every year.
As per Global resources outlook 2019

- Resource extraction has more than tripled since 1970
- Resource extraction is responsible ~ 50% of greenhouse gas emissions and over 90 per cent of biodiversity loss and water stress.
- Exploding human consumption is the driving force for Anthropocene extinction (The living planet report, WWF)
- This calls for some working models to reduce and reuse waste in a city.

Body

Few working models to reduce and reuse waste in a city

- **Waste to Energy plant**

  According to the Ministry of New and Renewable Energy, there exists a potential of about
  - 1700 MW from urban waste
  - 1300 MW from industrial waste.

Why Waste to Energy?

- Treatment of waste resulting in
  - mitigating the harm to land and water bodies
  - Safe landfills
- Renewable source of energy
- New business opportunity with appropriate technology and government incentive.
- International expansion possibilities for Indian companies, especially expansion into other Asian countries.
- Success in municipal solid waste management will lead to opportunities in sewage waste, industrial waste and hazardous waste by development of new technology.

- **Biogas**

  Compressed biogas can be produced from various bio-mass/waste sources including agriculture residue, sugarcane press, cattle dung, sewage treatment plant waste.

  Importance of Biogas

  - Sanitation – Complement WASH program; Swatch Bharat Abhiyan reduce vector borne disease etc
  - Reduction in emission of greenhouse gasses
  - Reduction in urban air pollution
  - Renewable source of energy
  - Energy access – off grid connectivity
  - Import of oil, gas and coal are expensive
  - Increased income of farmers
  - Local employment and entrepreneurship opportunity
  - Can become rural development strategy.

- 'Waste to Wonder' Theme Park

- Circular economy - circular flows of resources through a combination of extended product life cycles, intelligent product design and standardization and reuse, recycling and remanufacturing. Eg: decentralised smaller units of steel plant.

- Plastic waste recycling - plastic waste generation is around 25000 tonnes per day (CPCB)

Some of the best practices for waste processing prevalent in few Indian cities

- Alappuzha municipality
    - Biogas plants in every locality
    - Piped compost unit within houses.
    - Aerobic compost units in public places
- Bawana WTE plant - A model
    - The garbage is burned in a controlled environment
    - Remaining ash placed in a scientifically created landfill a part of which remains underground.
- Kerala Government has switched over to ink pens and steel cutlery to avoid usage of plastic products.
- In Kerala fishermen are engaged in not just finding fish but also plastic that either gets stuck in the fishing nets or floats in the sea.
- Recycling plastic into wide range of products from construction materials to threads and fabrics for the textile industry.
- Project 'Tsang-da' - It aims at sustainable waste management in rural areas of Leh district.

Conclusion

UNCTAD report on India – $280 billion additional economic value can be created by using circular economy by 2030. Models for reduce and reuse waste in a city can not only lead to sustainable development but also open new avenues to accelerate growth.

3. With increasing instances of city crimes that include rape, murder, theft, robbery etc, there is a need to create a robust, effective and integrated security ecosystem for urban India. Elucidate.

Introduction

In October 2019, India's National Crime Records Bureau (NCRB) released crime statistics for the year 2017. The NCRB has provided crime rates in terms of crime per lakh population where Delhi witnessed the highest crime rate in the country with 1,050 Indian Penal Code (IPC) crime incidents per lakh of the city's population, which clearly showcases the extent of city crimes prevalent in India.

Body

- Social changes affect the concept of crime in many ways, one of which can be through transition from a rural self-contained and relatively sparsely populated to highly urbanized, industrialized pattern.

- The NCRB further reports that in terms of fatal attacks that have resulted in deaths, Patna tops the list, with a crime rate of nine murders per lakh population. It is followed by Nagpur (eight), Indore, Jaipur and Bengaluru (three each). The lowest crime rates for murder are reported from Kozhikode, Kochi, Kolkata, Mumbai and Hyderabad – all clocking below one murder per lakh population.
- It is generally acknowledged that cities have a greater propensity to crime and that megacities have a higher crime rate than smaller cities.The reasons assigned to this phenomenon of more crime in cities are:

a. Greater access to wealth.
b. Greater anonymity on account of large-size-cum-high-density and hence lower probability of arrest and
c. The larger urban ability to attract crime-prone individuals.

- Crime is primarily the outcome of multiple adverse social, economic, cultural and family conditions. To prevent crime, it is important to have an understanding of its roots. Social root causes of crime are:

a. Inequality and not sharing power.
b. Lack of support to families and neighborhoods.
c. Real or perceived inaccessibility to services.
d. Lack of leadership in communities.
e. Low value placed on children and individual well-being and overexposure to television as a means of recreation.

In light of these factors and reports of crime in Indian cities, there is a need for robust, effective and integrated security ecosystem for urban India which addresses the deficiencies of current system and ensures a secure urban space for citizens. This can be achieved through the following measures:

- The recently announced umbrella scheme on “Modernisation of Police Forces” to strengthen law and order and modernize the police is a welcome stimulus. A part of police reform is intrinsically linked to legal/judicial reform, which would result in efficient criminal justice dispensation.
- Create a law-abiding society - It is necessary to inculcate respect for the rule of law among citizens. The process should start at the school level and can be effected by mandatorily introducing innovative programmes with well thought out content and activities.
- Greater sensitivity on the part of government officials to citizens’ needs can help reduce the number of litigations/disputes. This will require an attitudinal reorientation among government officials through sensitization programmes. Future prospects of employees can be made contingent on their successfully completing such programmes.
- Launch a common nation-wide emergency contact number to attend to emergency security needs of citizens. Legal and judicial reforms to address the massive pendency and capacity issues in Indian courts, which impede

access to justice. Several archaic and defunct laws have already been repealed and many others are in the process of being weeded out.

- Strengthening finances of ULB's and civic agencies - Cities require a financial sustainability roadmap to be financially self-sufficient to support high-quality security infrastructure and the delivery of services.
- There is a strong link between reducing risk and building resilience in children and decreasing crime. As a result, the provision of appropriate care and required resources to all children will have great significance for their long term physical, intellectual, and emotional well-being and their development into independent, healthy adults.
- Citizen participation - Enhanced citizen participation is needed for greater trust between citizens and governments, improved sustainability, better security service delivery and accountability. Ward committees and area sabhas should be activated with a technology enabled 'Open Cities Framework' and the use of digital tools for security feedback and crime reporting.
- Further, following measures will help in addressing the city crimes -

1. Collaboration between government, media and public
2. Increasing the capabilities of security force
3. Institutionalising swift decision-making
4. Building the overall resilience of cities

Conclusion

Establishing the causality of crime in relation to the nature of its settlements is a complex issue. India is still in the midst of urbanization, hence this is a subject worthy of deep and wide investigation. The results may light up the path of India's choices with regard to the pattern of growth for its cities and towns and the security systems in place for it.

4. What are some of the smart and innovative solutions being carried out in India to make city transport better and more efficient? What can be learnt from these solutions? Discuss.

Introduction

Currently, India's nearly 30% population lives in urban areas and it is expected to rise upto 50% by 2050. Being a developing country with a huge population pressure India is facing many challenges and one of them is public transport.

Body

Smart and innovative solutions

China has about six buses for 1,000 people while India has only four buses per 10,000 people.

Some of the smart and innovative solutions given by government are

- Jawaharlal Nehru National Urban Renewal Mission JNNURM, 2005:JNNURM was launched in 2005 and closed in 2014 (now succeeded by Atal AMRUT Mission). It attempted to improve the public transport system in larger cities through funding of public transport buses, development of comprehensive city mobility plans and supporting city transport infrastructure projects.
- National Urban Transport Policy, 2006: The policy envisages safe, affordable, quick, comfortable, reliable and sustainable urban transport through establishment of quality focused multi-modal public transport systems.
- Green Urban Transport Scheme, 2016:. The scheme aims to improve non-motorised transport infrastructure such as dedicated lanes for cycling, pedestrians, increasing access to public transport, use of clean technologies and adoption of intelligent transport systems (ITS).
- Mass Rapid Transit/ Transport Systems (MRTS): The metro rail has come up as a favoured alternative of mass transport in Indian cities. In 2017, the government introduced new Metro Policy which aims to improve collaborations, standardising norms, financing and creating a procurement mechanism so that the projects can be implemented effectively.
- Bus Rapid Transport System (BRTS): BRTS segregates the movement of buses from all other transport modes, and introduces other changes in the road infrastructure that are associated with safety. BRTS is an important component of AMRUT (Atal Mission for Rejuvenation and Urban Transformation)
- National Transit Oriented Development Policy, 2017: The policy framework aims to promote living close to mass urban transit corridors like the Metros, monorail and bus rapid transit (BRT) corridors.
- Sustainable Urban Transport Project (SUTP): The project in partnership with Ministry of Urban Development and UNDP aims to promote environmentally sustainable urban transport in India.
- Personal Rapid Transit System (PRT): It is a transport mode combining small automated vehicles, known as pods, operating on a network of specially built guideways. In 2017, the National Highway Authority of India (NHAI) had called the expression of interest (EOI) for launching India's first driverless pod taxi systems on a 70 km stretch from Dhaula Kuan in Delhi to Manesar in Haryana
- National Public Bicycle Scheme (NPBS): In 2011, NPBS was launched to build capacity for the implementation and operation of cycle sharing systems across the country. The first public bicycle sharing (PBS) initiative — Trin Trin was launched in Mysuru.
- Promotion of Electric Vehicles: Indian Government plans to have an all-electric fleet of vehicles by 2030. For promotion of electric vehicles FAME (Faster Adoption and Manufacturing of (hybrid &) Electric vehicles. Under FAME, the Centre subsidizes the cost of electric buses and has sanctioned 390 buses in 11 cities (as of April 2018).

- Ahmedabad BRTS Corridor: Features that stand out is- For the first three months, the Ahmedabad Municipal Corporation (AMC) ran BRTS free and then made design changes based on commuter feedback, It provides affordable Smart cards for commuters.
- Integrated Transportation Management System (IMTS) which includes Advanced Vehicle Tracking System (AVLS), Fleet Management System (FMS), Automatic Fare Collection System (AFCS), Passenger Information System (PIS), Passenger announcement (PA), and Vehicle Scheduling and Dispatching (VSD)
- CNG Buses
- Safe and secure BRT bus stops with a standard attractive form for presenting passengers information such as signages, route details and graphics

Learnings and way forward:

- Taking an integrated view of comprehensive mobility for the city/metropolitan areas and/or national/regional geographies.
- Viewing the entire eco-system (and not only the transit system) as a 'black-box' to ascertain overall viability and act as a financial intermediary between different commercial models.
- Providing interoperability between transport modes in terms of quality, schedule alignment and integrated ticketing.
- Making the public transport system amenable to technological innovations that can enhance user experience and make transport safe and efficient.
- Facilitate the inter-connect between different service providers and modes.
- Specifying standards and deliverables on each parameter related to customer experience for any/all service providers and monitoring the same.
- Providing a mechanism for grievance redressal for both customers and service providers with options for modifying, in light of the changing business conditions.
- Promoting research, development and innovation.

Conclusion

NITI Aayog Recommendations calls for a 3C Framework (Clean, Convenient and Congestion free) for transforming mobility in India. To achieve this, it lays down the following action-agenda: a. Connect Bharat

b. Optimize travel footprint
c. Promote seamless public transport
d. Adopting green modes and technologies.

5. How can IT solutions make urban governance more effective and efficient? Illustrate with the help of suitable examples.

Introduction

Indian urban population has already reached 31% of the total population in 2011 and is expected to reach 50% by 2040. IT and digital technology provide efficient,

effective and sustainable tools for urban governance. 12th five-year plan conceived digital technology to address the urban infrastructure deficit in Indian cities, and to also promote sustainable development.

Body

IT Solutions making urban governance effective and efficient:

- Urban Master planning: One of the major issues in our urban areas is lack of proper planning which is holistic, sustainable. IT tools like GIS, Remote sensing, AI etc., can be used to make it more efficient.
- Citizen participation: IT can provide tools by creating online forums for citizen feedback, e-petitions and so on. E.g. Fund raising for rehabilitation of flood hit citizens in Chennai, citizen vigilance app to report crimes by Delhi police etc.,
- Urban security: E.g. Use of digital tools (CCTV, e-registration of police complaints etc.,) in Rajkot city under smart city mission has reduced crime rate by 18% within 6 months. Suraksha app of Bengaluru police.
- Information dissemination: Digital display boards are efficient tools for communication with the public which can be seen in major metro cities around the world. Projects like video wall, Indian Urban observatory also aim at information dissemination to the public which would help in effective communication, awareness spreading and campaigns.
- Crisis management: IT can be effectively used in all the stages of crisis management - prevention, mitigation, preparedness, response and recovery. E.g. Pune has installed flood sensors in the city triggering timely warning and response mechanism, Satellite communication/ Local area network during the floods used in Kerala etc.,
- Fund utilization: e-management of funds address the issue of leakages and pilferages - corruption in the fund management. E.g. e-tendering of road projects etc.,
- Compliance: Bhopal has seen increase in property tax collection after the Revenue department underwent digitization.
- Smart resource utilization: IT can provide solutions for urban issues like water shortage, electricity shortage and so on by efficient monitoring. E.g. smart electricity grids and smart metering for electricity, water and gas. ICT applications like Intelligent LED Street Lighting and Surveillance, networking of safety and security systems (CCTVs, police, traffic, etc.).
- Sustaining social infrastructure: A GIS based heritage mapping can be done to conserve and promote the historical monuments located in cities.
- Transportation efficiency: can be increased by using IT tools which can manage the traffic congestion using technologies like AI. Intelligent Transport Systems (ITS) are introduced in several cities all over the world.
- Fund Mobilization: IT provides an interface to raise public funds which can be used for urban development. E.g. issue of municipal bonds over the internet platform.

Conclusion

An Integrated Command and Control Centre (ICCC) would help in comprehensive coverage of all aspects and planning of overall Urban governance. IT tools are a part of Good governance ensuring transparency and accountability in governance and thus make the urban governance efficient and effective.