DRUM Web App

Why in News?

Prelims- General Science.

Mains paper 2 - e-governance- applications

Recently, IIT-Kharagpur created the Dynamic Route Planning for Urban Green Mobility (or DRUM) web app.

- **DRUM -** Dynamic Route Planning for Urban Green Mobility web app.
- It's like Google Maps but with the added feature of allowing users pick routes based on air quality and energy efficiency.
- DRUM gives users 5 route options
  - Shortest,
  - Fastest,
  - Least exposure to air pollution (leap),
  - Least energy consumption route (lecr), and
  - A combination of all four factors called the suggested route.
- These options are based on real-time air and traffic data.
- When applied to Delhi, the LEAP route reduced exposure by over 50% in Central Delhi while increasing commute time by 40%.
- LECR meanwhile helped reduce energy consumption by 28% in South Delhi.
- These tradeoffs may not work for everyone, especially given the added fuel costs of longer routes, but DRUM could make a difference for more vulnerable groups.
- DRUM determines routes using GraphHopper, a Java-based routing library that generates multiple options, while fetching real-time traffic updates from Mapbox. This setup allows the system to handle different vehicles and adapt to cities beyond Delhi.
- The team relied on data from the CPCB and the World Air Quality Index.
- **Working** - DRUM is a rank-based elimination method.
- A segment-wise interpolation approach was adopted to assess pollution levels in areas lacking direct sensor coverage.
- Routes were divided into segments to facilitate more accurate estimations.
- Nearby sensor data was utilized to fill in gaps where coverage was insufficient.
- To test the system, the team simulated Delhi's East, South, North, and Central corridors, accounting for different traffic, road quality, and pollution patterns.
- The results showed that shorter or faster routes often passed through polluted zones, offsetting time or distance gains.
- **Challenge** - Integrating real-time air and traffic data.

Reference

[The Hindu | DRUM Web App]

