

GPS based toll collection system

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In News: Union Minister of Road Transport & Highways has said that the Government has finalised GPS-based(Global Positioning System) technology toll collection to ensure seamless movement of vehicles across the country.

About GPS based toll collection system

- **Ministry:** Union Minister of Road Transport & Highways
- It will ensure India becomes 'toll booth free' in the next two years.
- Toll amount will be deducted directly from the bank account based on the movement of vehicles.
- While now all commercial vehicles are coming with vehicle tracking systems, the Government will come up with some plan to install GPS technology in old vehicles.
- The Minister expressed hope that the toll collections may reach Rs 34 thousand crore by March 2021.
- By using GPS technology for toll collection, the toll income in next five years will be Rs 1.34 lakh crore.
- Government has been pushing for the mandatory use of FASTag at National Highways, a radio-frequency identification (RFID) based Electronic Toll Collection (ETC) system, to avoid paying highway toll fees in cash.
- Implementation issues with the technology still persist, with truckers and motorists often stuck for hours at toll booths.
- In order to address these issues, the NHAI is working with the Indian Highways Management Company Limited (IHMCL) and officials of 22 banks, to streamline the toll collection process. The implementation of the GPS-

based tolling system is a step further, with the toll charge set to be deducted based on the movement of vehicles.

Technology Behind It

- Based on the movement of vehicles, the GPS-based system will deduct the amount. New commercial vehicles that are being rolled out, already have this tech in place though it is yet to be activated.
- It is likely that the same formula as the Fastag may be applied here. If this formula is implemented, toll booths will be removed and this will facilitate transport movement in a better fashion.
- FASTag already makes toll collection entirely automatic, with the charges deducted directly from the linked bank accounts of users.
- So, the new tolling system will bring about a free flow satellite-based ETC system that uses GPS and GPRS (General Packet Radio Service).
- GPRS is already used to provide cellular-based data services by several telecommunication providers in India, and all commercial vehicles sold after 2019 are equipped with an inbuilt Vehicle Tracking System (VTS).
- As such, the GPS-based system will further help make toll collection more efficient, by allowing vehicle movements across the country to be tracked accurately.

Some Concern

- Locals around a toll booth within a 5km radius are usually exempt. Based on the GPS system, how this will be implemented remains to be seen.
- Fastag a new account is created and one has to deposit money in it. If there is no money in that account, then the person has to pay cash at the toll booth. With the absence of a manned booth, if the GPS-related account doesn't have money in it, how will the toll tax be

collected?

- If there is no separate account and instead the existing savings account of an individual is taken into the picture, it could lead to a possible cybercrime issue.

The Global Positioning System (GPS)

- Satellite-based navigation system that consists of 24 orbiting satellites, each of which makes two circuits around the Earth every 24 hours.
- These satellites transmit three bits of information – the satellite's number, its position in space, and the time the information is sent.
- These signals are picked up by the GPS receiver, which uses this information to calculate the distance between it and the GPS satellites.

Working

- With signals from three or more satellites, a GPS receiver can triangulate its location on the ground (i.e. longitude and latitude) from the known position of the satellites.
- With four or more satellites, a GPS receiver can determine a 3D position (i.e. latitude, longitude, and elevation).
- In addition, a GPS receiver can provide data on your speed and direction of travel.

Applications

- Anyone with a GPS receiver can access the system. Because GPS provides real-time, three-dimensional Positioning, navigation, and timing 24 hours a day, 7 days a week, all over the world, it is used in numerous applications, including GIS data collection, surveying, and mapping.