



सड़क परिवहन
एवं राजमार्ग मंत्रालय
MINISTRY OF
ROAD TRANSPORT
AND HIGHWAYS

सत्यमेव जयते



International Workshop on the Global Navigation Satellite System (GNSS) based Electronic Toll Collection in India

OBU/AIS-140, CMVR &
NH FEE RULE Panel

Panelists for OBU/AIS-140, CMVR, NH FEE RULE Session



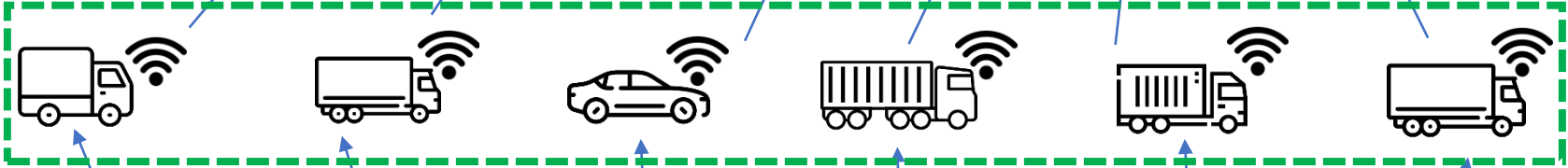
1. Mr SP Singh, Joint Secretary, MoRTH, Apex Committee Member on GNSS Tolling
2. Mr Joydeep Shome, DDG, NIC, Apex Committee Member on GNSS Tolling
3. Mr KC Sharma, Chief Engineer, MoRTH
4. Ms Praveena Rai, COO, NPCI
5. Mr Alok Sethi, AGM, DIMTS
6. Mr Bruno Coudoin, Tolling Solution Architect, Continental Automotive, Germany
7. Mr Christian Perschl, Head Tolling Solution, Yunex Traffic, Austria
8. Mr PK Banerjee, Chief Executive Director, SIAM
9. Mr Vadiraj Katti, CEO & CO-Founder, I-Triangle Infotech
10. Mr Anshuman Roy, Director Business Development, Rosmerta

Toll Charger Engine

1. Map Matching by pings from OBU
2. Distance Calculation
3. Toll Calculation against Virtual ID, Toll Parameter and Vehicle Class

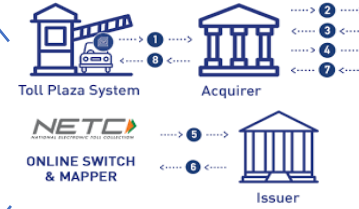
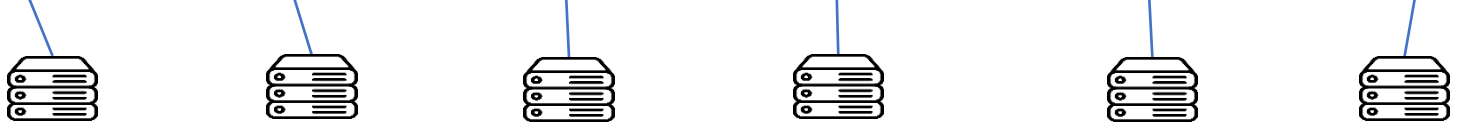
Toll Charge

Payment System similar to existing FASTag



Time & Location stamp with Encrypted Virtual ID

OBU Registration at Issuer Entity through consent & after due checking of OBU/ Retrofitted OBU



The system **will** follow 01 Vehicle - 01 OBU Policy. For any change in OBU Issuer, the Vehicle Owner has to first decouple with existing Issuer Entity.

- Definition of closed user fee collection system to be modified to incorporate Global Navigation Satellite System On Board Unit (GNSS -OBU) or Automatic Number Plate Recognition (ANPR) Device
- Definition of Electronic Toll Collection Infrastructure to include Electronic Infrastructure for Validation & Enforcement
- Definition of GNSS Section and GNSS On-Board Unit (GNSS OBU) will be inserted
- Provision to authorize NHAI to collect additional fee in case of Non-GNSS vehicle using GNSS stretch to be inserted
- Scheme of discount will be modified relevant to GNSS

- Amendment to make fitment of GNSS OBU mandatory for M & N category of vehicles in order to facilitate enforcement of GNSS ETC System for-
 - (i) Vehicle to be sold after [Date 1]
 - (ii) Existing vehicles [Date 2][Rule 138C & 90]
- Meanwhile, GNSS based tolling to commence for vehicle fitted with VLT's as per existing AIS-140. [Rule 138C & Rule 90]
- Provision for requirement of fitment of GNSS OBU at the time of vehicle registration. [Rule 47]
- No Objection certificate is issued by the registering authority for registration of transfer of ownership of a vehicle. [Rule 58]

Proposed changes in AIS 140 Specification



- GPS to GNSS & Definition
- Operating Voltage - compliant to vehicle voltage specification.
- Acquisition Channels – 40
- Data sharing with 3 different IPs
- Increasing in-built memory for storage of data logs of time-location stamp data in no network/power setting and audio notification
- Hot Start, Cold Start timings and Test criteria.

Thin OBU

- Existing AIS-140 VLT devices will be used/retrofitted for the purpose of GNSS based tolling
- Thin Architecture: Map-matching will not happen at OBU device level at present. OBU will share data on as-is basis with encryption etc.
- Suitably programmed as per the protocols set by Toll Charger like FIFO (first in first out)
- Frequency of Data Collection will be 1-5 seconds.

Proposed modification in AIS 140 Spec

- Increase an IP port for TCP/IP communication with Toll Charger
- Increasing the inbuilt memory for storage of data logs of time-location stamp in no network/power
- Creation of Virtual-ID and other necessary information
- GSM network preference and fallback – 5G/4G backed with 2G.

Onboarding to Toll Charger/Gateway

- Issuer Entity shall onboard the Vehicle fitted with OBU to the Toll Charger after doing Quality Check, KYC, mapping its FASTag and generating Virtual-ID and other relevant digital certificates and etc.
- Toll Charger will do secure key/certificate generation and management during OBU onboarding.
- OBUs will be programmed to send data to intermediate gateway layer.

OBU fraud (software level / hardware level)

- Existing AIS 140- devices have provision of data transmission over Secure Channel on TCP/IP but contain no provision for encryption.
- Proposed to include Firmware level Security
- End to end encryption of data.
- Secure Storage – encryption of data stored in device.
- Access Control – Multi Factor Authentication to access device.
- Public Key Infrastructure and Hardware Security Module – Hardware key to be maintained and data sent from OBU should be cryptographically signed.

Proposed OBU testing protocols

- Approval Certificate by CMVR , Security Testing with help of STQC
- Conformity of Production (COP) –More stringent steps to conduct in every 3/6 months
- Stringent OBU on-boarding guidelines for Issuer Entity
- Periodically OBU Audit (physical)
- Continuous remote checks on quality of OBU using streamed OBU data, uptime etc.

Identification of GNSS Vehicle at Toll Plaza/GNSS Stretch

- GNSS Vehicle shall be identified through the Virtual ID linked with the OBU device and ANPR Cameras, AVCC etc that will be installed at GNSS Lanes.

		OBU Status	
		Green	Red
FASTag Status	White Listed	Free-flow	Free-flow with 2x User Fee
	Black Listed	Barrier will close	Barrier will close



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Thank You

