Concept Note

Title:-

Path Pulse – Real-Time Visual Dashboard for NSV Survey Monitoring

1. Background:-

India's national highway network requires constant monitoring to ensure smooth and safe travel. The Network Survey Vehicle (NSV) captures valuable data like road roughness, cracks, and rutting, along with dashboard video and geo-coordinates. However, this data is currently not accessible live, making site inspections slower and reactive instead of proactive.

2. Problem Statement:-

There is no system for real-time visualization of NSV data (distress + video + GPS), which limits engineers during field inspections and remote decision-making.

3. Objective:-

To develop a mobile and web-based system/dashboard that displays:

- Live video feed
- Map with GPS path and damage markers
- Vehicle speed, direction, chainage, survey ID
- Road distress information (e.g., cracks, rutting)
- Accessible both onsite and remotely by engineers and NHAI officials.

4. Proposed Solution:-

- A lightweight, scalable system including:
- A mobile-friendly web dashboard
- Integrated Google/Mapbox Map with markers for distress data
- Live or near realtime camera feed
- Display of NSV parameters: Speed, Direction, GPS etc.
- Layer toggle: engineers can turn ON/OFF video, map, and data overlays

5. Key Features:-

- Real-time damage markers with severity color codes
- Click on map → show video + details at that GPS point
- Summary dashboard: % of cracking, roughness, etc.
- Remote access with simple login
- Support for historical survey data playback

6. Expected Benefits:-

- Faster decision-making during inspections
- Remote monitoring from HQ or regional offices
- Improved transparency and planning
- Data archived for audits and maintenance planning

7. Technology Stack :-

- Frontend: ReactJS / Flutter (mobile)
- Mapping: Google Maps API or Mapbox
- Backend: Firebase / Node.js
- Video: MJPEG / RTSP stream (or stored cloud video playback)
- Data Storage: JSON / Cloud Firestore

8. Future Scope :-

- Add AI based crack detection from camera feed
- Integrate drone visuals for inaccessible areas
- Predictive maintenance using past NSV data

9. Contact Info :-

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