Problem Statement: Software-Based Traffic Congestion Reduction for Kachi Dham

Kachi Dham faces severe traffic congestion, especially during weekends, festivals, and peak hours. The area suffers from narrow roads, limited entry/exit points, and uncoordinated vehicle flow. There is no centralized system to guide or control vehicle movement efficiently. The result is long delays, blocked access routes, and chaotic traffic management.

Objective:

Develop a software-only, algorithm-driven system to manage and reduce traffic congestion in the Kachi Dham area. The system should optimize traffic flow by simulating vehicle movement, analyzing patterns, and suggesting dynamic routing or entry schedules—without requiring any additional hardware or sensors.

**If the team will present a novel solution you can independently go over to the Uttarakhand Govt with this proposal.

Reference: https://www.youtube.com/watch?v=iHzzSao6ypE

Key Requirements:

1. **Traffic Flow Simulation**: Simulate real-world traffic conditions for Kachi Dham using a fake map and fake historical inputs (e.g., time of day, events).

2. **Dynamic Route Scheduling**: Suggest optimal entry times and paths for different vehicle groups to avoid congestion peaks.

3. **Queue & Load Balancing**: Distribute incoming vehicles to different time slots or alternate routes to prevent overload.

4. **Event-Aware Algorithms**: Consider public holidays, local events, and crowd surges while generating traffic control strategies.

5. **Offline & Low-Resource Friendly**: Should work in low-infrastructure areas, possibly as a mobile or web app.

6. **Visualization Tools**: Show traffic predictions and plans via simple visual interfaces for authorities and the public.

7. **Authority Control Panel**: Allow traffic managers to simulate scenarios, tweak routing strategies, and monitor execution.

Constraints:

• No use of external sensors, cameras, or IoT devices.

• Must rely only on software, existing maps, and optionally historical traffic or event data.

• Should run on standard computing devices (PCs, tablets).

Deliverables:

• A working simulation or live-routing prototype.

• Admin dashboard for traffic authorities.

• Report explaining the core algorithms and decision logic.

Impact:

The solution will help manage traffic more intelligently without infrastructure upgrades, leading to faster vehicle flow, reduced congestion, and better visitor experience at Kachi Dham.