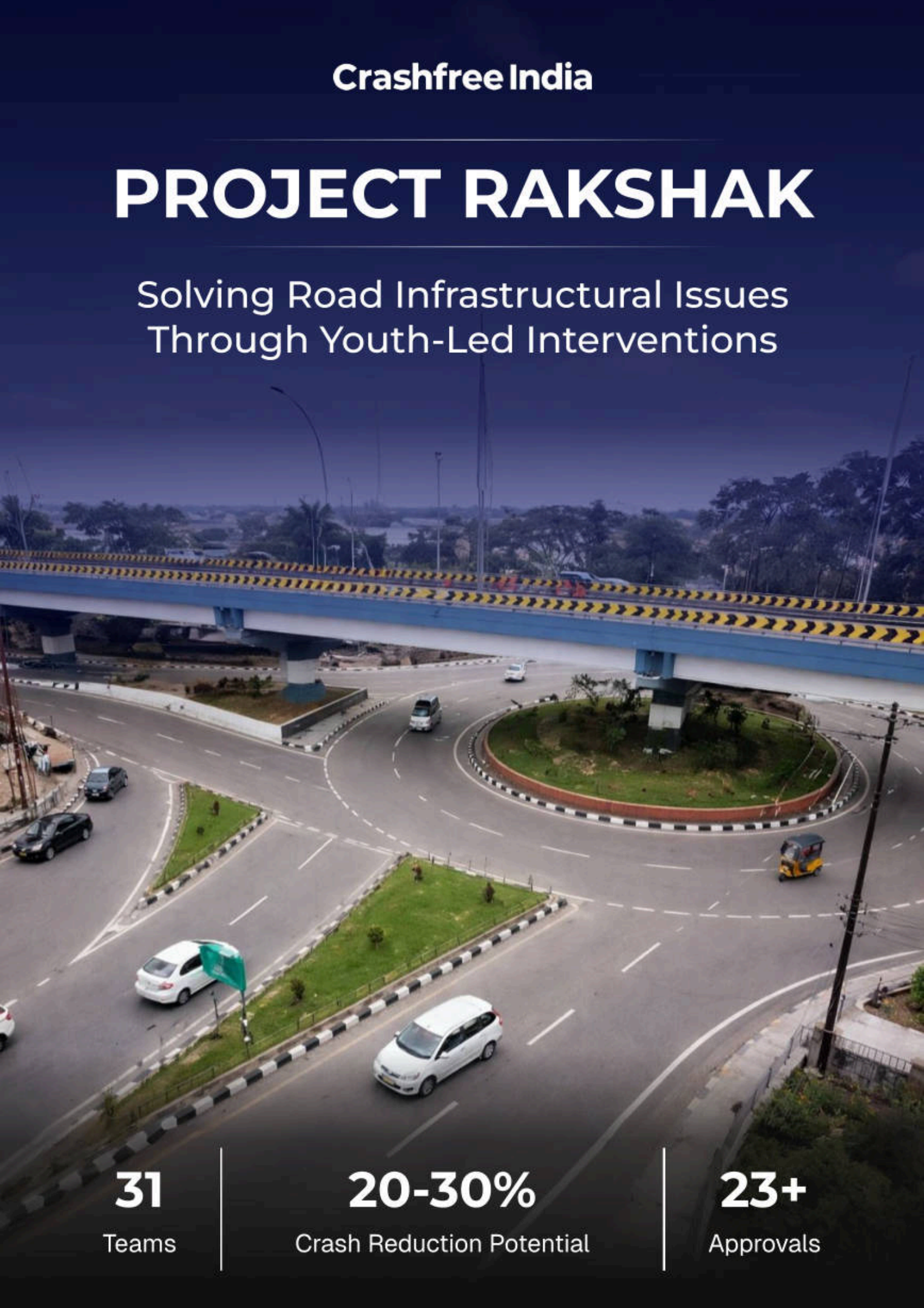
Crashfree India

PROJECT RAKSHAK

Solving Road Infrastructural Issues Through Youth-Led Interventions



31	20-30%	23+
Teams	Crash Reduction Potential	Approvals

Foreword

Dr. Geetam Tiwari

Emeritus Professor, Transportation Research and Injury Prevention Centre (TRIP Centre), IIT Delhi

The idea for Project Rakshak emerged from an urgent concern - how do we translate our collective commitment to road safety into practical action that can help save lives on our roads. When we first conceptualized this initiative, the intention was to encourage young engineers to engage directly with real road environments and examine them with a scientific and critical lens. Over successive iterations, the project has steadily evolved and strengthened in its approach. What began as an exploratory effort has developed into a structured exercise in identifying micro-infrastructure defects that often contribute to unsafe conditions. By focusing on such localized risks and encouraging practical, low-cost and scalable interventions, Rakshak demonstrates that meaningful safety improvements do not always require large investments, but careful observation and thoughtful design. I hope that initiatives such as Rakshak continue to inspire young professionals to approach road safety with both technical rigor and a strong sense of responsibility toward saving lives.

Amar Srivastava

(Managing Trustee, CFI)

We initiated Project Rakshak with the belief that addressing road safety requires the collective effort of many more minds, particularly young professionals who will shape the systems of the future. Across universities, there is immense talent and curiosity, and when this energy is paired with the experience of experts and practitioners, it can lead to thoughtful and grounded solutions.

Rakshak was developed as a platform to enable this collaboration. By engaging students directly with real road environments & guiding them through structured observation and analysis, the initiative has demonstrated how meaningful insights can emerge from such partnerships. As the model continues to evolve, technology offers significant opportunities to scale this approach & expand participation, building a larger community committed to improving road safety.

Foreword

Dr. Richa Ahuja
(Asst. Prof. IIT KGP | Advisor, Project Rakshak)

As the Advisor to Project Rakshak, I witnessed its transformation from concept to impactful practice. Mentored- Student teams approached road safety as a living human challenge, not an abstract policy issue. Through field audits, stakeholder engagement, and data-driven analysis, they collaboratively generated actionable recommendations that were aligned with guidelines yet rooted in real-world contexts. This report is more than a record of diligent effort; it is a testament to how academic engagement can catalyze public-interest outcomes. By bridging research, practice, and policy, Project Rakshak demonstrates the transformative role of youth-led inquiry in advancing evidence-based interventions. Looking ahead, I believe the spirit of this initiative will continue to inspire new collaborations, inform systemic reforms, and contribute to the creation of safer roads for all. The impact of such work lies not only in the solutions proposed but in the momentum it generates towards a culture of responsibility, resilience, and innovation in road safety.

Manas Choudhary
(Mentor, Project Rakshak)

It gives me immense pleasure and pride to see the flagship program which we started a decade back to solve road safety problems in and around our college campus, has matured as project Rakshak today. It has continued to evolve with iterations and has made nationwide impact covering multiple towns and cities. Being a part of this journey, I have learnt that collaborative approach with all stakeholders and youth intent has made it possible! Road safety must remain a living conversation for the youth as they are both today's road users and tomorrow's planners. The initiative proves that their energy, paired with emerging AI and technology, can bring real alleviating change - progress we are already witnessing.

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1. Executive Summary

Launched in July 2025 by Crashfree India (CFI), Project Rakshak is a youth-led road safety and infrastructure initiative developed under the guidance of **Dr. Geetam Tiwari (Transportation Research and Injury Prevention Centre, IIT Delhi) and Dr. Richa Ahuja (Assistant Professor, IIT Kharagpur).** The programme aims to strengthen road safety governance by enabling structured, ground-level identification and analysis of high-risk road locations, followed by evidence-based solution design aligned with national standards.

The programme engaged **31 student teams** across **18 cities to identify high crash-risk locations, conduct field audits and stakeholder surveys, and develop implementable safety interventions** consistent with IRC and MoRTH guidelines. In total, teams assessed over **120 high-risk locations**, subsequently prioritising one site each for detailed analysis, resulting in **31 final locations**, including **11 officially recognised blackspots.**

Across these sites, teams conducted **900+ stakeholder surveys involving pedestrians, cyclists, transport users, shop owners, street vendors, residents, traffic police, and local authorities. Crash information was compiled using First Information Reports (FIRs) and government-recorded data accessed directly or through Right to Information (RTI) requests,** and relevant news and media reports. Several teams also undertook supplemental surveys under expert mentorship and applied data analytics and AI/ML tools to strengthen observational findings and technical rigour.

The audits revealed consistent cross-city risk patterns, including **restricted visibility, inadequate or missing signage and road markings, unsafe pedestrian environments, absence of traffic-calming measures, and complex conflict points at intersections.** Crash information compiled for these high-risk locations indicates a substantially higher burden than what is reflected in official records. While only a subset of incidents could be directly verified through FIRs and police data, national and international studies consistently show that a large proportion of road crashes in India , particularly non-fatal ones, are never formally reported. As a result, FIR-linked data represents only a fraction of the true crash incidence at these sites. Accounting for this documented under-reporting, the selected locations are estimated to have experienced over 1,000 crashes in recent years. Drawing on global best practices and national design standards, the proposed interventions are **expected to reduce crash risk by 20-50 percent**, indicating a significant potential for crash prevention if implemented.

Early administrative engagement indicates encouraging traction. **More than 22 teams have already received approvals** for proposed measures from relevant authorities in **Ropar (Punjab), Guwahati (Assam), Indore (Madhya Pradesh), Vijayawada (Andhra Pradesh), and New Delhi**, signalling readiness for pilot implementation in select sites.

Project Rakshak **aligns closely with India's Vision Zero 2040 and demonstrates how structured, evidence-led, youth-driven assessments can complement formal road safety systems.** By generating locally grounded insights and authority-ready solutions, the initiative illustrates the potential of youth engagement to support scalable, data-informed action in reducing road crashes and saving lives.

This report documents the design, implementation, and early outputs of Project Rakshak. It is intended for government authorities, urban local bodies, enforcement agencies, donors, academic partners, and civil society organisations who engage with road safety planning and implementation at different levels.

Because Project Rakshak is at an early stage of implementation, the report distinguishes clearly between observations, evidence generated, proposed interventions, and early signals of administrative uptake, rather than presenting final impact claims. Readers are encouraged to interpret findings in this context.

- **Sections 1-3** outline the road safety context, the rationale for a youth-led approach, and the structure of Project Rakshak.
- **Section 4** presents consolidated findings from field audits and stakeholder interactions, highlighting recurring risk patterns across cities.
- **Section 5** details proposed interventions and their technical rationale, mapped to identified risks and aligned with national guidelines.
- **Section 6** summarises immediate outputs, early administrative traction, and potential future impacts based on global evidence.
- **Section 7** discusses pathways for scaling and integrating the model into district- and state-level road safety systems.

The report is intended to support decision-making, planning, and pilot implementation, and should be read as a diagnostic and forward-looking document rather than an evaluation of long-term impact.

This pilot demonstrates the feasibility of a **targeted, low-cost, and replicable model for identifying high-risk locations,** generating technically sound interventions, and mobilising local administrative action within a short timeframe. Scaling this approach will require structured support from road-owning agencies and enforcement authorities, particularly to enable implementation, monitoring, and post-intervention evaluation at selected sites.

The next phase of Project Rakshak will focus on supporting pilot implementation at approved locations, strengthening coordination with state and district road safety mechanisms, and refining the model for replication in priority corridors and high-burden districts. In doing so, the programme seeks **to move from diagnosis to demonstrable action,** while continuing to generate evidence that can inform policy, funding, and long-term integration into India's road safety governance framework.

2. Background

India continues to face a deepening road safety crisis, with both crashes and fatalities rising steadily over the past three years. In 2022, the country recorded 4,61,312 road crashes. This figure increased to 4,80,583 in 2023, resulting in 1,72,890 deaths and 4,62,825 injuries. The trend continued into 2024, with Parliament informed by the Minister of Road Transport and Highways (MoRTH) that road accident deaths had risen further to approximately 1.77 lakh.

Taken together, these figures point to a sustained and troubling rise in both the frequency and severity of road crashes. The burden falls disproportionately on people aged 15-49, India's most economically productive population, resulting in long-term social, economic, and public health losses.

Despite the presence of well-established national standards and design guidelines, many location-specific risks persist at the ground level. These include high operating speeds in uncontrolled access environments, unsafe pedestrian pathways and crossings, inadequate provisions for vulnerable road users, inconsistent signage and markings, poor visibility, and sub-optimal intersection design

Such micro-scale infrastructure gaps are not always systematically captured within routine planning and road engineering processes, even though they contribute significantly to serious injuries and fatalities.

Project Rakshak was conceptualised to address this gap by enabling youth to identify, assess, and propose solutions for high-risk locations across Indian cities. The initiative focuses on collecting ground-level evidence and collaborating with local authorities to make localised risks visible, strengthen user-centric accountability, and guide targeted safety action.

2.1 About Project Rakshak

Launched in July 2025 by Crashfree India (CFI), Project Rakshak is a youth-led road safety infrastructure initiative designed to support the identification and improvement of high-risk road locations. The programme empowers young participants to document safety gaps and develop practical redesign proposals aligned with IRC and MoRTH standards.

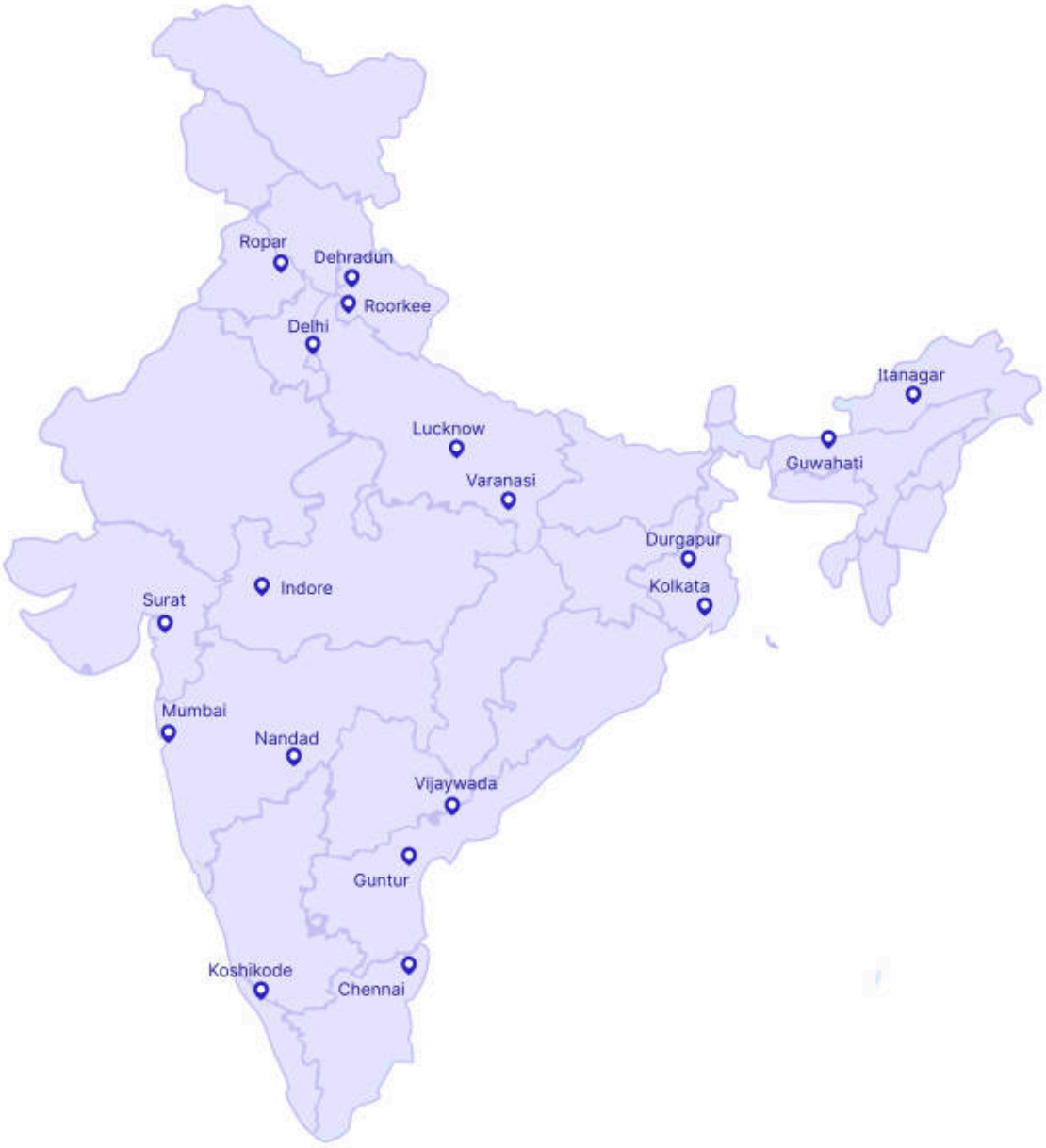
By focusing on locations that continue to experience preventable crashes despite the existence of national guidelines, Rakshak aims to strengthen the link between on-ground evidence and local decision-making. The overarching objective is to contribute to safer road environments through data-driven, evidence-based, and locally grounded interventions.

2.1.1 - Programme Objectives

- Identify and assess high-risk road sections using audits aligned with national standards.
- Develop practical, site-specific safety improvement proposals grounded in evidence and stakeholder insights.
- Engage directly with implementing agencies - including Municipal Corporations, Nagar Nigams, PWD, R&B, NHAI, Traffic Police, and district administrations - to seek review and approvals for proposed interventions.
- Sensitise communities, build local ownership, strengthen administrative accountability, and advance Vision Zero through scalable, citizen-led road safety interventions.

2.1.2 - Geographic and Institutional Spread

Project Rakshak operates across 18 cities in India, with 31 student teams assessing high-risk road locations across diverse urban, peri-urban, and highway contexts. As illustrated in the accompanying map, the initiative spans northern states such as Delhi, Punjab, and Uttar Pradesh; central and western regions including Madhya Pradesh and Maharashtra; and extends to eastern and southern parts of the country, including Tamil Nadu.



This geographic spread reflects the diversity of road environments studied and underscores the broad relevance of location-specific infrastructure improvements across different urban and regional contexts.

3. Methodology, Programme Design and Theory of Change

Project Rakshak's methodology was designed to directly support its core objectives: identifying high-risk road locations, generating site-specific safety insights, and engaging implementing agencies with credible, locally grounded evidence. Rather than treating audits, surveys, and redesign proposals as standalone exercises, the programme integrates them into a single, outcome-oriented workflow that moves systematically from problem identification to authority-facing outputs.

Each phase of the programme contributes incrementally to this pathway - beginning with ground-level evidence generation, progressing through structured audits and stakeholder engagement, and culminating in technically sound recommendations that can inform administrative review and action. This approach ensures that youth-led efforts remain aligned with national standards while producing outputs that are relevant to local governance contexts.

3.1 Theory of Change

Project Rakshak is premised on the idea that youth, when equipped with structured tools, technical guidance, and institutional interfaces, can meaningfully contribute to strengthening road safety governance. Young participants bring proximity to everyday road use, the ability to observe micro-level risks, and the capacity to conduct sustained field engagement that is often difficult to prioritise within routine administrative workflows.

By combining youth-led data collection with expert oversight, structured mentoring, and multi-level quality assurance, the programme seeks to bridge a persistent gap between on-ground risk conditions and planning or enforcement processes. The underlying theory of change assumes that credible, well-documented, and locally generated evidence - when presented in formats aligned with administrative decision cycles - can increase visibility of safety gaps and support more responsive governance over time.

Problem Context	Rationale	Inputs	Activities	Outputs	Immediate Outcomes	Potential Long-Term Impacts
Gaps in routine risk identification	Why Youth-led Evidence Matters	Capacity, tools, and linkages	Evidence-driven fieldwork	Reports and actionable designs	Stronger dialogue and visibility	Safer infrastructure, empowered youth, aligned with SDGs
• Persistent **micro level risks:** unsafe crossings, junction conflicts, visibility, etc., remain undocumented • **Adults and crash data miss everyday** risks in school zones, markets, hospitals, mixed-use corridors • **Vulnerable road users** face high exposure due to discontinuous or absent infrastructure • Authority intent exists, but priorities, **bandwidth, and field capacity limit follow-through**	• **Youth proximity to daily road use enables** granular, sustained field engagement • **Structured tools and mentorship** make youth-generated evidence credible and decision-ready • **Local, documented risk evidence** strengthens visibility of safety gaps & Governance response	• **Trained youth teams** using standardized audit tools and reporting tools • **Expert mentorship** in road safety, traffic engineering, and planning • **Multi-level quality assurance and review** • Institutional linkages with municipal, district, and state authorities	• **Structured field assessments** of design, operational, and maintenance risks • **Stakeholder consultations** capturing lived experience and constraints • **Risk classification and prioritization** including cross-site patterns • Site-specific interventions aligned with **IRC and MoRTH guidelines** • Authority-ready reports and proposals	• **Phase-wise site audit** and risk reports • Implementable designs for high-risk locations • **Cross-city risk analysis;** • Documentation of systemic **Vulnerable Road User (VRUs) gaps**	• **Greater visibility of micro-level risks** beyond routine audits • Improved quality and usability of evidence for authorities • **Early administrative engagement,** including in-principle approvals • **Stronger community-youth-authority dialogue**	• **Reduced fatal and serious injuries** by addressing speed, conflict points, and unsafe geometrics • Safer networks aligned with **Safe System principles** (management, user separation) • **20–50% crash-severity** reduction at prioritized sites, consistent with global evidence • Alignment with **SDG 3.6 and SDG 11,** improving VRU safety and urban public spaces • **Stronger governance** through institutionalized evidence use and a trained youth pipeline

3.2 Programme Structure

Project Rakshak followed a phased, outcome-oriented structure designed to progressively move teams from risk identification to implementable, authority-facing solutions. The programme was supported by continuous mentorship, expert guidance, and multiple quality-control checkpoints to ensure consistency, technical depth, and feasibility across all participating teams.

3.2.1 - Phase 1 (July–August): Research & Problem Identification

Objective:
Establish a clear, evidence-backed understanding of local risk conditions.

Teams identified high-risk locations through structured on-ground research, supported by a review of available crash data including FIRs, RTIs, police records, and media reports where accessible.

Site mapping, photographs, and preliminary risk observations were documented to build an initial evidence base. Weekly one-on-one mentor sessions were used to refine problem definitions, validate data sources, and address early gaps. End-of-phase reviews ensured that teams progressed with clearly articulated risk profiles.

3.2.2 - Phase 2 (August–September): Stakeholder Engagement and Road Safety Audits

Objective:
Validate observed risks through structured audits and community perspectives.

Each team conducted over 30 stakeholder surveys covering pedestrians, commuters, residents, shopkeepers, and other local road users. On-ground road safety audits were carried out using checklists aligned with IRC and MoRTH standards, documenting pedestrian risks, visibility issues, signage gaps, speed conflicts, and infrastructure deficiencies. An expert session by Dr. Geetam Tiwari introduced Safe System principles, speed–injury relationships, and the prioritisation of vulnerable road users. Mentor and advisor-led reviews ensured audit quality and methodological consistency across cities.

3.2.3 - Phase 3 (October–November): Case Study Analysis and Solution Development

Objective:
Translate evidence into feasible, prioritised safety interventions.

Teams analysed comparable case studies to identify context-appropriate interventions and prioritised solutions based on safety impact, cost-effectiveness, and ease of implementation. An expert session by Dr. S. Velmurugan focused on the 5Es framework, traffic composition analysis, pedestrian-first design, IRC-131 blackspot analysis, and engineering beyond signage. Solution development was supported by close mentor handholding, with cross-mentor reviews introducing independent technical perspectives to strengthen robustness and feasibility.

3.2.4 - Phase 4 (November–Present): Final Reporting and Authority Engagement

Objective:
Package findings into formats usable by implementing agencies.

Findings were consolidated into structured technical reports designed for review by municipal bodies, PWDs, NHAI, Traffic Police, and district administrations. Teams prepared presentations aligned with administrative formats and review expectations. Final reports are being evaluated by external domain experts across planning, traffic engineering, and policy, with structured feedback shared with teams ahead of the finale.

3.3 Programme-Wide Quality Assurance Mechanisms

To ensure methodological rigour and consistency across teams, multiple quality assurance mechanisms were embedded throughout the programme lifecycle. Teams engaged in regular one-on-one mentoring across all phases, allowing for continuous refinement of problem definition, audits, data sources, and solution design. Phase-wise review checkpoints enabled early identification and correction of methodological gaps.

Mentors participated in structured guidance sessions led by the programme advisor at the end of each phase to align expectations and maintain technical depth across cities. Draft solutions underwent cross-mentor reviews to introduce independent perspectives beyond assigned mentors. Final outputs were subjected to expert evaluation to ensure that recommendations were technically sound, realistic, and authority-facing.

Across the programme lifecycle, teams and mentors collectively invested an estimated 50–60 hours per team, including field audits, mentoring discussions, documentation reviews, and iterative refinement.

3.4 Study Locations and Coverage

Across the programme, teams initially assessed over 120 high-risk locations. Following preliminary analysis and mentor review, each team selected one priority stretch, resulting in 31 final study locations, including 11 officially recognised blackspots. In total, teams conducted over 900 stakeholder surveys with pedestrians, transport users, shop owners, street vendors, police personnel, and local authorities.

Crash information was collected using FIRs or government-logged data accessed directly or through RTIs. Several teams conducted supplemental surveys, applied data analytics, and used AI/ML tools, under expert guidance, to strengthen observational findings and technical grounding.

Category	Locations (n)	What It Represents
Urban Junctions / Intersections	8	Dense city intersections with mixed traffic and high pedestrian activity
High-Speed Highway Corridors	7	Multi-lane highways and bypasses with recurring crashes
Urban Arterial / Mixed-Use Corridors	6	Busy corridors with markets, institutions, and continuous pedestrian interaction
Roundabouts / Y / T Intersections	8	Complex geometries with merging and turning conflicts
Institutional / Hospital Zones	1	High pedestrian exposure near major institutions
Institutional / Hospital Zones	1	High pedestrian exposure near major institutions
Flyover / Underpass Influence Zones	1	Areas affected by weaving and merging risks

Meet the Mentors

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Senior Transport Planner

Dr. Richa Ahuja
Assistant Prof., IIT Kharagpur
ADVISOR

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Road Safety Expert

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Ph.D. Scholar, IIT Delhi

Participating Institutions

IIT Delhi

IIT Bombay

IIT Varanasi

IIT Roorkee

IIT Madras

NIT Calicut

DTU

SPA Delhi

IIT Guwahati

NIT Delhi

NIT Durgapur

SPA Vijayawada

IIT Indore

Xavier's College, University of Mumbai

NIT Arunachal Pradesh

IIT Ropar

Vignan's Foundation for Science, Technology & Research, Guntur

Babasaheb Bhimrao Ambedkar University, Lucknow

Sardar Vallabhbhai National Institute of Technology ,Surat

IIT Kharagpur

3.5 Risk Index and Visualisation

Each study location was evaluated using a composite Risk Index based on four criteria: traffic exposure, surrounding land use, infrastructure condition, and recent crash severity. These inputs generated a 0–100 score for each site.

Sites scoring 90 and above exhibit a combination of heavy traffic, mixed land-use pressures, and persistent infrastructure gaps. Mid-range sites typically show recurring pedestrian–vehicle conflicts or peak-hour institutional pressures, while lower-risk sites tend to have more consistent geometry and comparatively safer operating speeds.

High Risk Score Identified:

≥ 90

Risk Assessment Criteria:

Heavy traffic, Mixed land-use pressures, and Persistent infrastructure gaps.

4. Recurring Road Safety Risks Across Cities

Project Rakshak enables cities to identify high-risk locations using structured field assessments from 31 teams across 18 cities, covering 120+ sites, including 11 officially recognized black spots. The assessments surface risks in school zones, commercial stretches, and mixed-use corridors that typically fall outside formal road safety audits.

Across diverse urban contexts, the findings reveal that these challenges are not isolated incidents, but part of wider patterns seen across multiple Indian cities, arising from gaps in infrastructure, design and planning, routine maintenance, enforcement, and public awareness. The consolidated analysis provides authorities with ready-to-implement designs, including raised crossings, refuge islands, compact roundabouts, and traffic-calming measures, aligned with IRC and MoRTH guidelines. Global evidence shows such interventions reduce fatal and serious crashes by 20–50% (World Bank, 2023; iRAP, 2022)

4.1 Immediate Impacts Observed Across Cities

The structured field assessments consolidate community feedback, audit evidence, and technical recommendations into a single decision-making input for authorities. In doing so, Project Rakshak highlights several immediate, cross-cutting risk patterns:

- Pedestrian/Cyclists infrastructure is largely missing or non-functional, forcing Vulnerable Road Users (VRUs) onto live traffic lanes.
- Vehicles do not slow naturally at pedestrian crossing points, especially in the absence of raised tables or speed calming.
- Encroachments, on-street parking, and informal activity reduce visibility and effective road width.
- Non-functional traffic signals, faded markings, and missing signage create confusion and unsafe driver behaviour.
- Potholes, waterlogging, and poor drainage escalate minor defects into major safety hazards, particularly during monsoon and at night.

The structured field assessments consolidate community feedback, audit evidence, and technical recommendations into a single decision-making input for authorities. In doing so, Project Rakshak highlights several immediate, cross-cutting risk patterns:

"Pedestrians are not choosing unsafe behaviour - they are being forced into it."

4.2 Problem Overview

Across the 31 locations assessed under Project Rakshak, several recurring, systemic road safety issues were identified. These patterns reflect design, operational, and maintenance gaps commonly found across high-risk urban and peri-urban corridors in India.

1. **Speed & Conflict Risks Overspeeding** near intersections, curves, hospital zones, schools, and commercial corridors. High-speed merging and weaving conflicts with vulnerable road users on highways, flyovers, and Y-junctions. Sudden lane drops, short merge lengths, and unregulated heavy-vehicle movement.

2. **Lack of Traffic Control & Regulation Non-functional or entirely absent traffic signals** at major intersections. No speed calming measures (speed breakers, rumble strips, gateway treatments). Missing or inconsistent signage for warnings, speed limits, and pedestrian priority. Uncontrolled junctions leading to confusion, erratic driver behaviour, and conflict points.

3. **Vulnerable Road Users (Pedestrians & Cyclists) Infrastructure, lack of safe pedestrian and cyclist crossings.** Poor, discontinuous, or encroached footpaths and cycling space. High risk for students, patients, elderly, and cyclists near activity areas. Unsafe movement due to inconsistent infrastructure and no designated routes.

4. **Road Infrastructure Deficiencies Potholes, uneven surfaces, water-logging, and deteriorated pavements.** Narrow carriageways, blind turns, and poor geometric design (especially at Y - bifurcations). Poor visibility due to inadequate street lighting, particularly at night or during rains. Construction-induced hazards (e.g., metro works, flyover ramps, lane narrowing).

5. **Encroachment & Parking-Related Obstructions, illegal parking reducing effective carriageway width**. Bus stops at undesignated points, causing bottlenecks and forcing unsafe manoeuvres. Commercial and vendor encroachments creating continuous conflicts between pedestrians and vehicles.

6. **Inadequate Traffic Management & Operational Issues, no lane discipline due to lack of markings and channelisation**. Faulty or poorly maintained signals, barricades, and delineators. Unauthorised bus stops, chaotic feeder-road entries, and unregulated side-road movements. High congestion zones acting as recurring blackspots (e.g., industrial hubs, markets, transport nodes).

4.3 Stakeholder Survey Insights

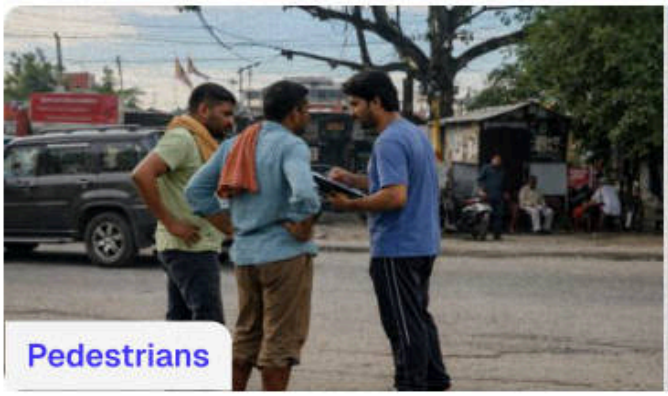
Total number of respondents:

900+

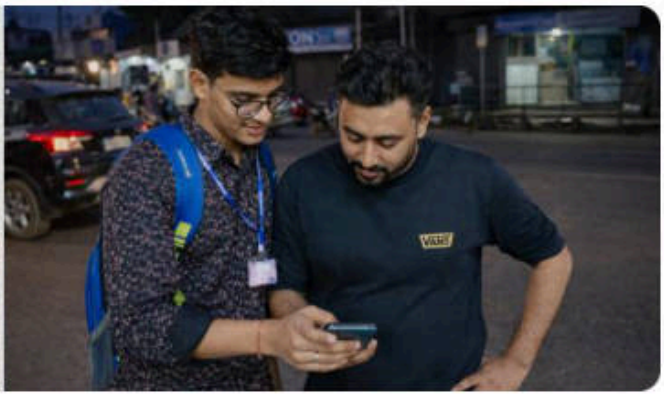
Total category of respondents:

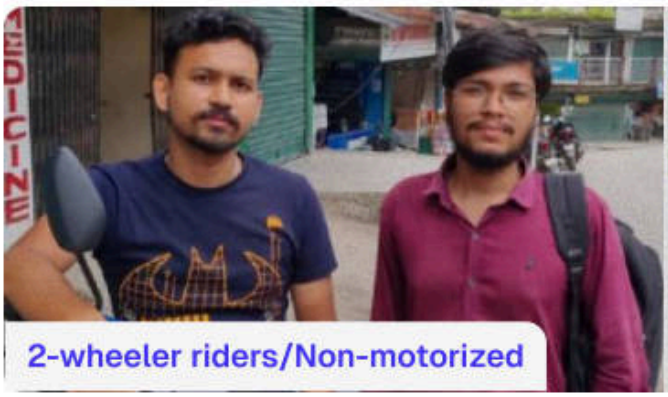
07

Categories of Respondents



Pedestrians



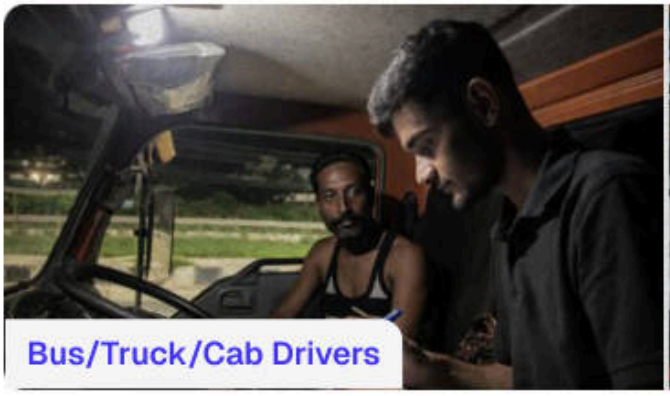


2-wheeler riders/Non-motorized

Police/Government staff

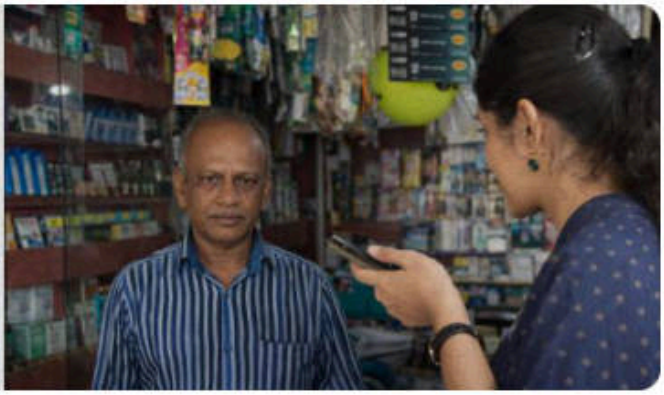
Categories of Respondents

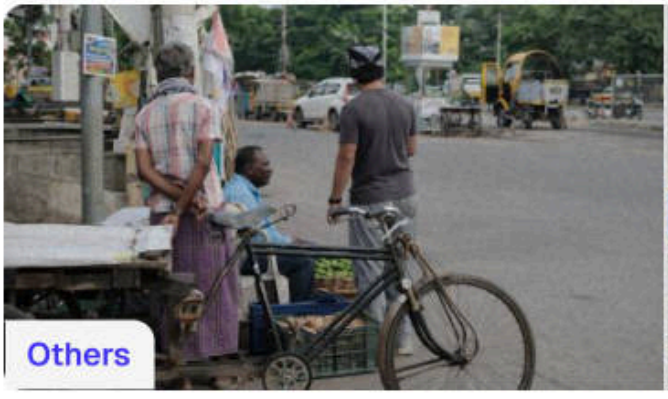
Auto/E-Rickshaw



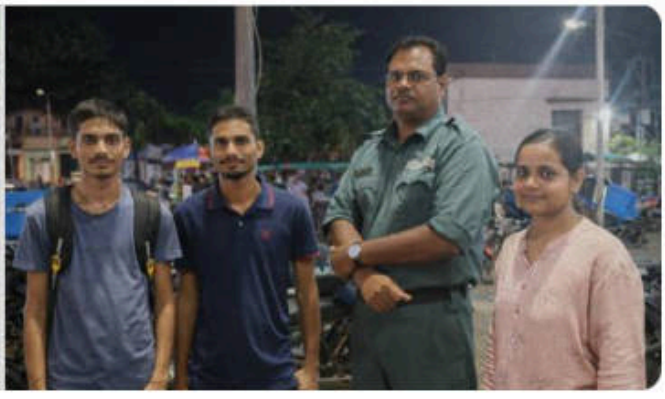
Bus/Truck/Cab Drivers

Shopkeepers





Others



4.4 Lived Experience of Road Users

Stakeholder interactions across cities reinforce the technical findings, illustrating how systemic failures translate into daily risk:

> The team took time to understand our vision and delivered a sleek, professional site that not only looks great but also improved our conversion rates. Their design process was smooth, communication was clear, and they met all deadlines. We've received numerous compliments on the new site, and it's easier for customers to navigate.

> "Visibility is zero. You have to go in front and pray a bike doesn't hit you."

> "Cars are fast and bikes come on the footpath when there's a jam — there's no safe space to walk."

> "The road is very narrow and filled with potholes. If the road were widened and the potholes repaired, it would be much better. During the rainy season at night, it becomes impossible to move ahead without slipping. The traffic signal has also not been functioning for a long time."

> "Lots of obstacles in roads like poles and trees; increasing the width of the road is necessary."

> "Vehicles don't stop even if people are waiting at zebra lines; cameras are needed for discipline."

These testimonies consistently point to design and maintenance failures, rather than individual recklessness, as the root cause of unsafe behaviour.

4.5 City-wise Risk Patterns

A structured city-wise review reveals recurring patterns across high-risk locations despite differences in scale and geography.

Indore (Madhya Pradesh)

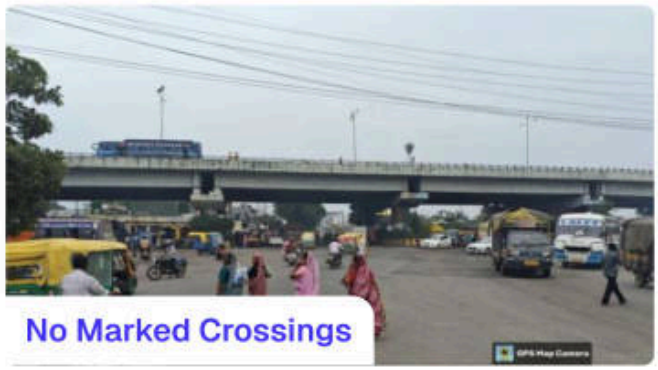
Site Location:
Teen Imli Square, Indore

Geo-coordinates:
22°41'24.4"N 75°53'00.4"E

Site Map


Potholes


Traffic Mismanagement And Congestion


No Marked Crossings

Key Findings & Hazards:

1. No marked pedestrian crossings or refuge points, leading to unsafe crossing
2. Poor road surface with potholes and uneven patches
3. Inadequate street lighting and lack of warning signage
4. Buses and auto-rickshaws stopping at the junction, obstructing traffic flow
5. Unregulated junction movements due to absence of signals and lane guidance

Indore (Madhya Pradesh)

Site Location:
Rau Gol Square, Indore

Geo-coordinates:
22°38'52.4"N 75°49'20.3"E

Site Map

Uneven Road Surface

Lack Of Zebra Crossing And Traffic Signal

Potholes

Key Findings & Hazards:

1. No zebra crossings or safe pedestrian facilities
2. Damaged and unmarked speed breakers
3. Potholes and poor road surface condition
4. Frequent wrong-side driving and lack of traffic signalization
5. Poor night-time lighting reducing visibility
6. Roadside encroachments narrowing the carriageway and blocking sight lines

Indore (Madhya Pradesh)

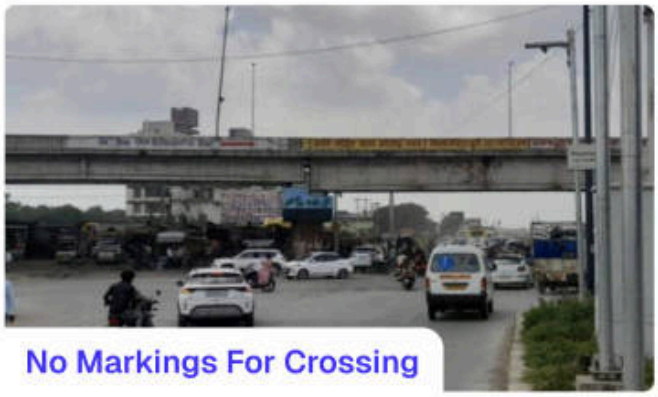
Site Location:
Tejaji Nagar Junction, Indore

Geo-coordinates:
22°42'31.0"N 75°51'48.6"E

No Speed Breakers

No Traffic Signals

Potholes On Road



No Markings For Crossing

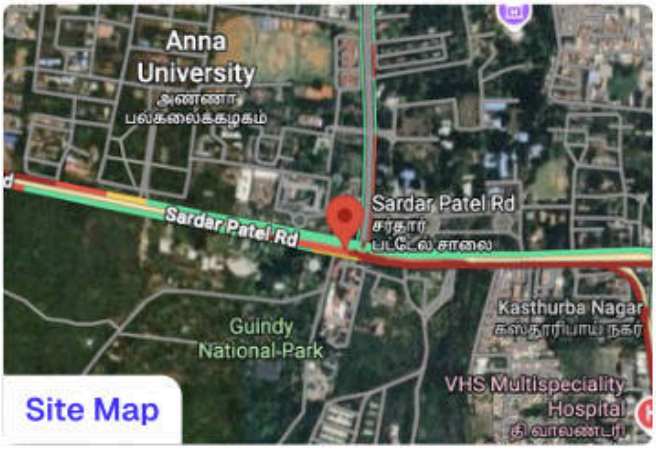
Key Findings & Hazards:

1. No speed breakers or rumble strips, leading to high approach speeds from highway and city roads
2. Poor and uneven road surface with small potholes causing sudden swerving
3. Poor or missing street lighting, especially under the overbridge, reducing night-time visibility
4. Missing footpaths and zebra crossings, forcing pedestrians to walk and cross in fast-moving traffic
5. Regular congestion due to uncontrolled merging and illegal parking on service roads
6. Lack of proper regulatory and warning signage, including speed limit and intersection signs

Chennai (Tamil Nadu)

Site Location:
Sardar Patel Road segment
(Infront IIT Madras Main Gate), Chennai

Geo-coordinates:
13°00'24.1"N 80°14'34.4"E



Site Map


Blocked Footpaths


Absence Of Crossings

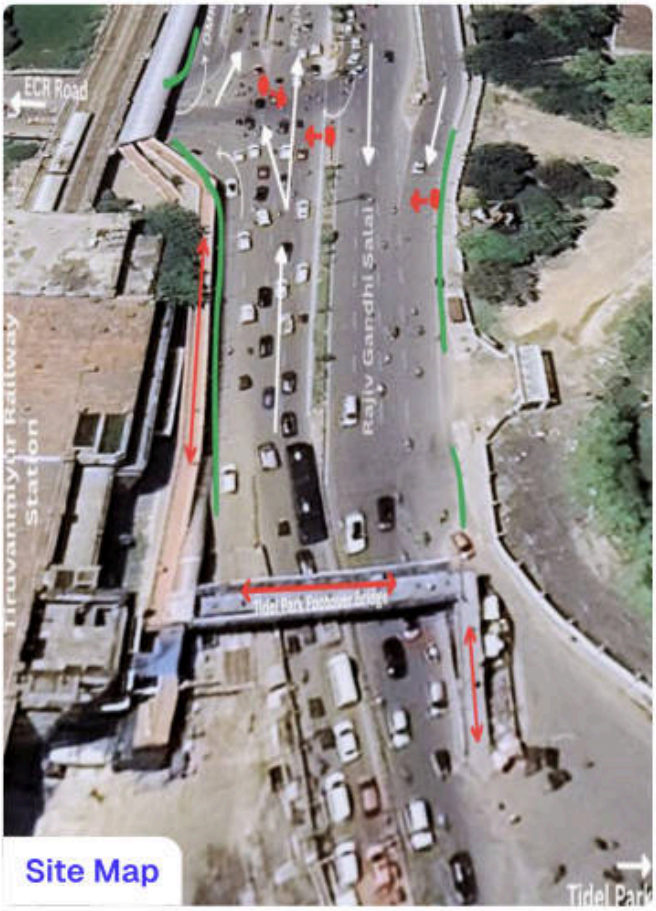
Key Findings & Hazards:

1. No pedestrian crossings despite heavy pedestrian movement
2. Blocked U-turns causing unsafe detours and contraflow
3. Unsafe metro construction zones with poor barricading and lighting
4. Construction materials blocking footpaths and carriageway
5. Narrowed lanes and poor visibility increasing crash risk

Chennai (Tamil Nadu)

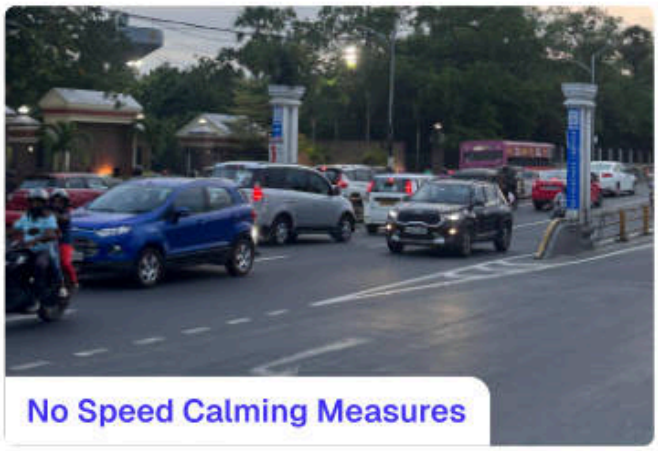
Site Location:
TIDEL Park U-Bridge junction, OMR, Chennai

Geo-coordinates:
12°59'23, 80°14'55



Site Map

Poor Lighting


No Speed Calming Measures

Key Findings & Hazards:

1. Pedestrians continue to cross at-grade despite the presence of a Foot Over Bridge, creating high-risk conflicts.
2. Vehicles frequently overspeed on ramps; no adequate speed calming measures are in place.
3. Bus stop near the ramp blocks traffic and creates unsafe situations for passengers boarding
4. Poor pavement maintenance, including localized sinkholes, poses hazards to all road users.
5. Inadequate lane markings and insufficient night-time illumination reduce visibility and safety.

Chennai (Tamil Nadu)

Site Location:
IITM Taramani Gate junction, Chennai

Geo-coordinates:
12°59'02.8"N 80°14'18.1"E

Site Map


No Lane Markings


Potholes On Road


No Traffic Signals Or Mirrors

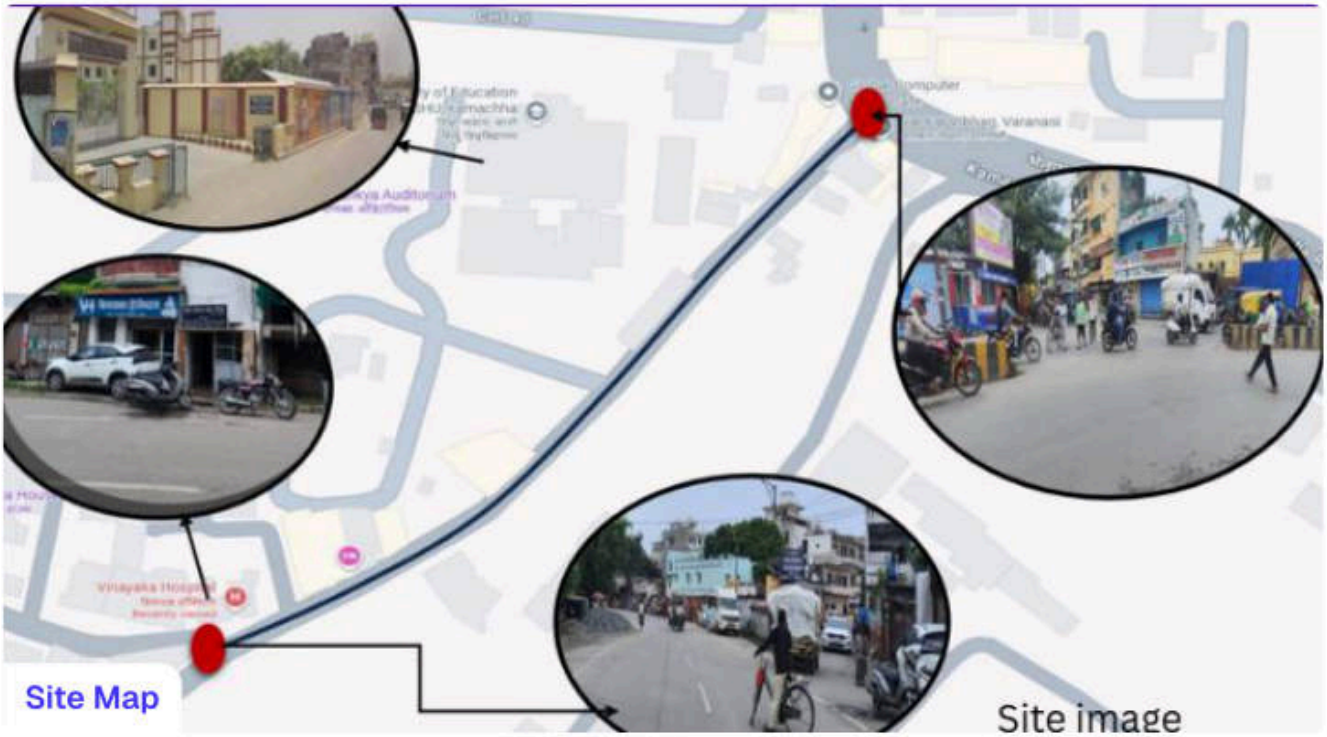
Key Findings & Hazards:

1. Blind left turn near temple with severely restricted visibility
2. No traffic signals or lane markings; irregular and aggressive driving observed
3. Hazardous road surface with potholes and uneven speed breakers
4. Poor street lighting reducing safety during night-time
5. High pedestrian exposure due to temple activity and on-road parking

Varanasi (Uttar Pradesh)

Site Location:
Gurubagh Bhelupur, Varanasi, UP

Geo-coordinates:
25°18'01.7"N 82°59'42.8"E



Site Map

Site image

Inadequate Signage

No Lane Markings

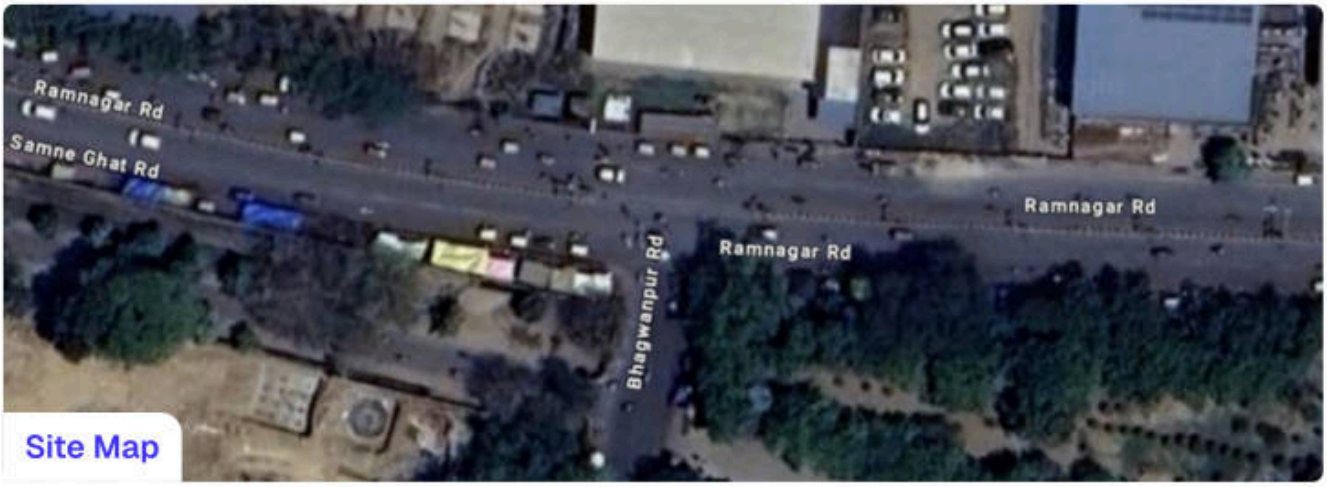
Key Findings & Hazards:

1. Overspeeding on the main road creating vehicle-pedestrian & vehicle-vehicle conflicts
2. Missing and inadequate signage leading to wrong turns and rear-end crashes
3. Blind spot at Y-junction layout increasing risk of head-on and side-impact crashes
4. Lack of footpaths near market areas forcing pedestrians onto the carriageway
5. Heavy congestion during peak hours

Varanasi (Uttar Pradesh)

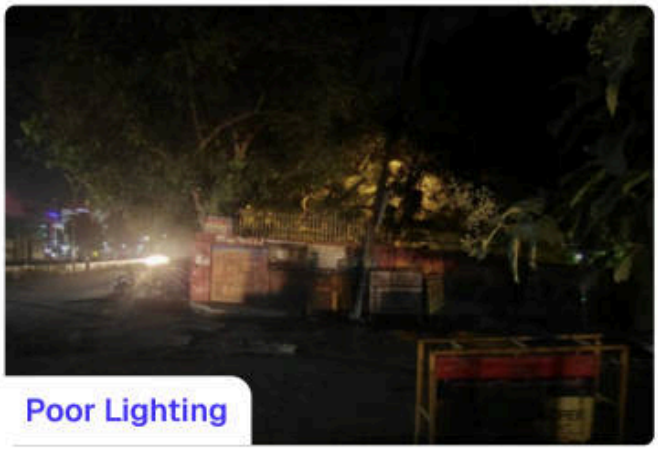
Site Location:
Bhagwanpur Mod near Trauma Centre, Varanasi, UP

Geo-coordinates:
25°16'38.3"N 83°00'16.3"E



Site Map


Encroached Footpath


Poor Lighting

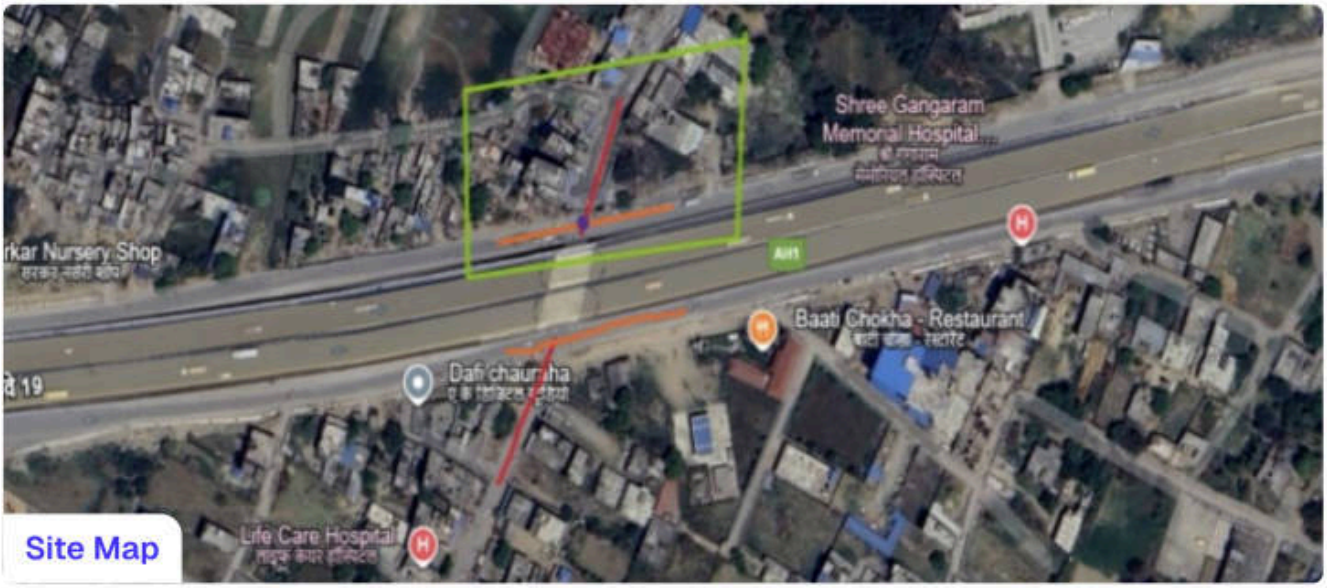
Key Findings & Hazards:

1. Severe traffic congestion due to lack of traffic signals
2. Poor road surface conditions
3. No dedicated provisions for emergency vehicles and ambulances
4. On-street parking and vendor encroachments reducing effective carriageway
5. Poor street lighting and unsafe night-time conditions
6. Frequent violation of traffic rules by autorickshaws and other vehicles
7. Despite being a critical access route to a major trauma centre, ambulances are often delayed due to congestion and lack of priority movement facilities.

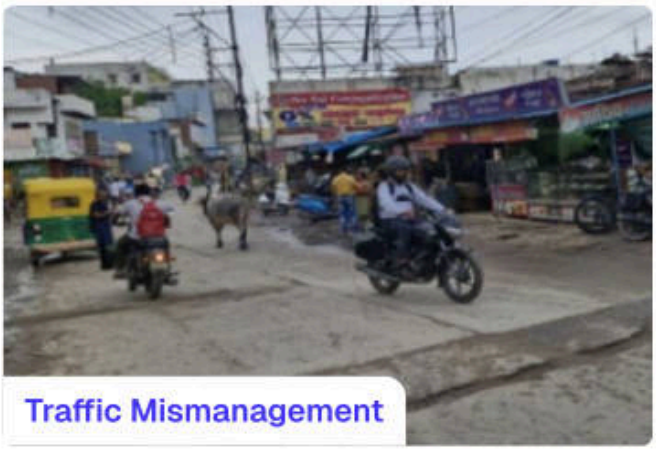
Varanasi (Uttar Pradesh)

Site Location:
Rotary in front of IIT BHU Gate, Varanasi, UP

Geo-coordinates:
25°14'54.0"N 82°59'38.4"E



Site Map


Traffic Mismanagement


Encroachments

Key Findings & Hazards:

1. Poor visibility and lack of road markings/signage.
2. Pedestrians forced to cross without safe zones; heavy vehicle conflicts.
3. Inconsistent traffic police presence and inadequate night-time lighting.
4. Recommended: traffic signals, convex mirrors, marked crossings, enforcement.

Varanasi (Uttar Pradesh)

Site Location:
Zilat Bazar Shivpur, Varanasi, UP

Geo-coordinates:
25°21'33.4"N 82°57'47.9"E

Lack Of Zebra Crossings And Footpaths

Lick Of Signages And Traffic Signals

Key Findings & Hazards:

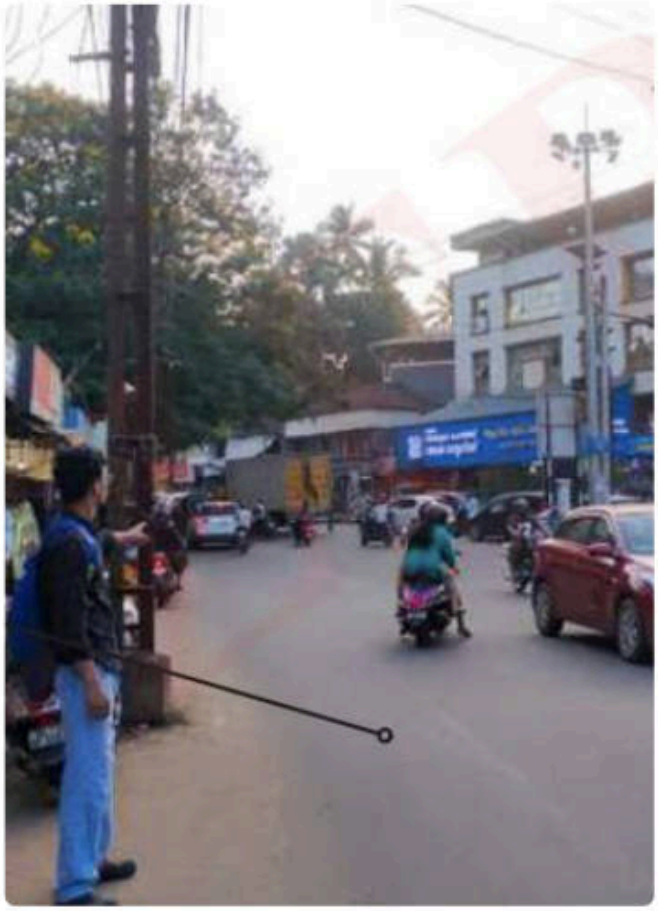
1. Lack of basic safety infrastructure such as footpaths, crossings, and barriers
2. High-speed traffic due to road slope, creating unsafe conditions
3. Poor road surface and road conditions
4. Lack of traffic regulation and enforcement
5. Encroachments and uncontrolled vehicle and pedestrian movement

Calicut (Kerala)

Site Location:
Kunnamangalam Junction, Kozhikode, Kerala

Geo-coordinates:
11°18'24.4"N 75°52'46.3"E

Site Map



Key Findings & Hazards:

1. Faded road markings, lane lines and pedestrian crossings barely visible.
2. No rumble strips or speed calming measures → high-speed merging at Y-intersection.
3. Footpaths limited, pedestrian movement unsafe due to poor crossing infrastructure.
4. Reduced sight distance at merging points → high-risk black-spot behaviour.
5. Lack of traffic signals/roundabout; existing barriers inconsistent and ineffective.
6. Poor night visibility; inadequate/inefficient street lighting.
7. No proper shoulders or median separation leading to conflict between opposing flows

Calicut (Kerala)

Site Location:
Eranjipalam Junction, Calicut, Kerala

Geo-coordinates:
11.24802 N, 75.7804 E

Encroached Footpath

Poor Enforcement

Key Findings & Hazards:

1. Overspeeding and routine traffic rule violations, increasing crash risk.
2. Frequent traffic signal failures, causing confusion for both motorists and pedestrians.
3. Absence of proper footpaths and unsafe or missing pedestrian crossings, exposing vulnerable road users.
4. Potholes, unclear road markings, & poor junction geometry, reducing driver guidance.
5. Lack of clear free-left lane demarcation, leading to vehicle conflicts and congestion.

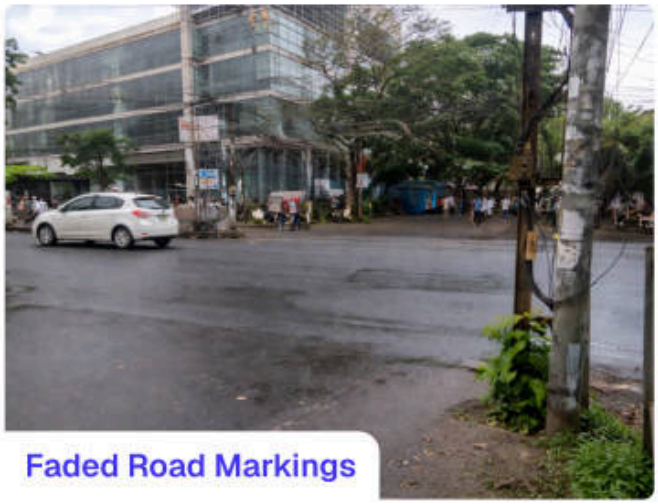
Calicut (Kerala)

Site Location:
Chevayur Junction, Calicut, Kerala

Geo-coordinates:
11°16'10.9"N 75°49'32.0"E

Site Map

Non Functional Signals



Faded Road Markings

Key Findings & Hazards:

1. No traffic control measures; unmanaged vehicle flows cause conflicts
2. High traffic volume and roadside encroachments narrow movement space
3. Poor pedestrian facilities, with unsafe crossings and discontinuous walkways
4. Inadequate street lighting increases nighttime risk
5. Absence of traffic signals and structured pedestrian infrastructure increases vulnerability

Calicut (Kerala)

Site Location:
Medical College Junction, Calicut, Kerala

Geo-coordinates:
11°16'16.2"N 75°50'14.5"E

Site Map

Absence Of Signage And Lane Markings

Key Findings & Hazards:

1. Recurring over-speeding despite proximity to hospitals and schools.
2. High exposure of vulnerable pedestrians (patients, students, caregivers).
3. Gaps in basic infrastructure such as crossings, traffic calming, and signage

Durgapur (West Bengal)

Site Location:
Durgapur, West Bengal — C-49 Commercial Area (Near EDIC Office & Healthworld Hospital)

Geo-coordinates:
23°32'22.6"N 87°17'18.0"E

Site Map

Road Encroachment

Potholes

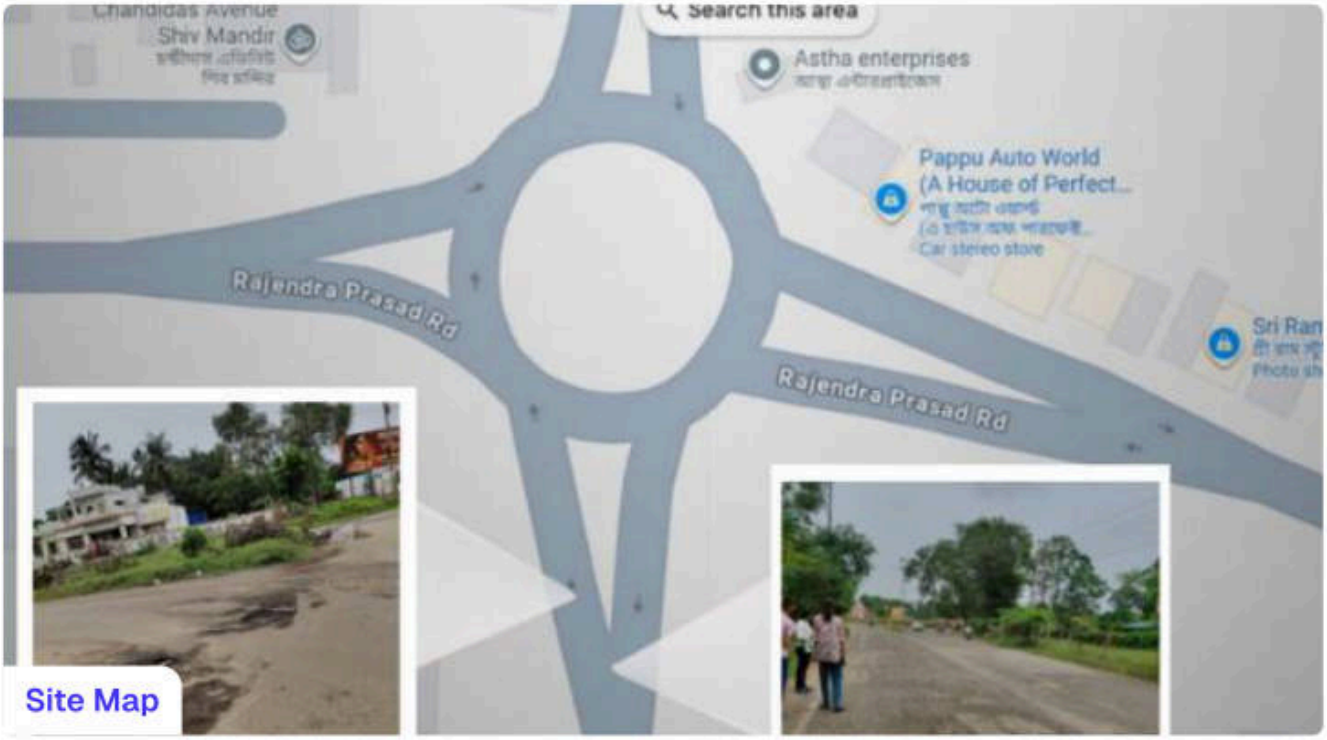
Key Findings & Hazards:

1. Damaged road surface with potholes and waterlogging, especially during rains
2. Unauthorized parking and roadside stalls blocking the carriageway
3. No footpaths, forcing pedestrians to walk on the road
4. Lack of signboards and poor wayfinding for visitors
5. Heavy traffic movement near the hospital area

Durgapur (West Bengal)

Site Location:
Durgapur, West Bengal —
Bhagat Singh Marg, Hatora, C-Zone

Geo-coordinates:
23°33'21.8"N 87°18'46.7"E



Site Map

Potholes On Road

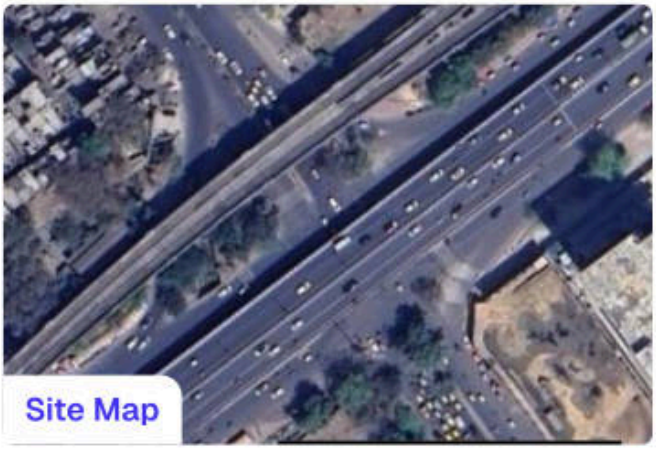
Key Findings & Hazards:

1. Uneven road surface and potholes, increasing skidding risk.
2. Waterlogging on the carriageway, reducing visibility and braking distance.
3. No traffic signals or warning signage, leading to unmanaged movements.
4. Poor road maintenance and encroachments, reducing usable road width.
5. High exposure of two-wheelers and pedestrians to fast-moving traffic.

Delhi

Site Location:
Britannia Chowk, Delhi

Geo-coordinates:
28°40'59.4"N 77°08'46.6"E



Site Map

Encroached Footpath

Faded Crossing

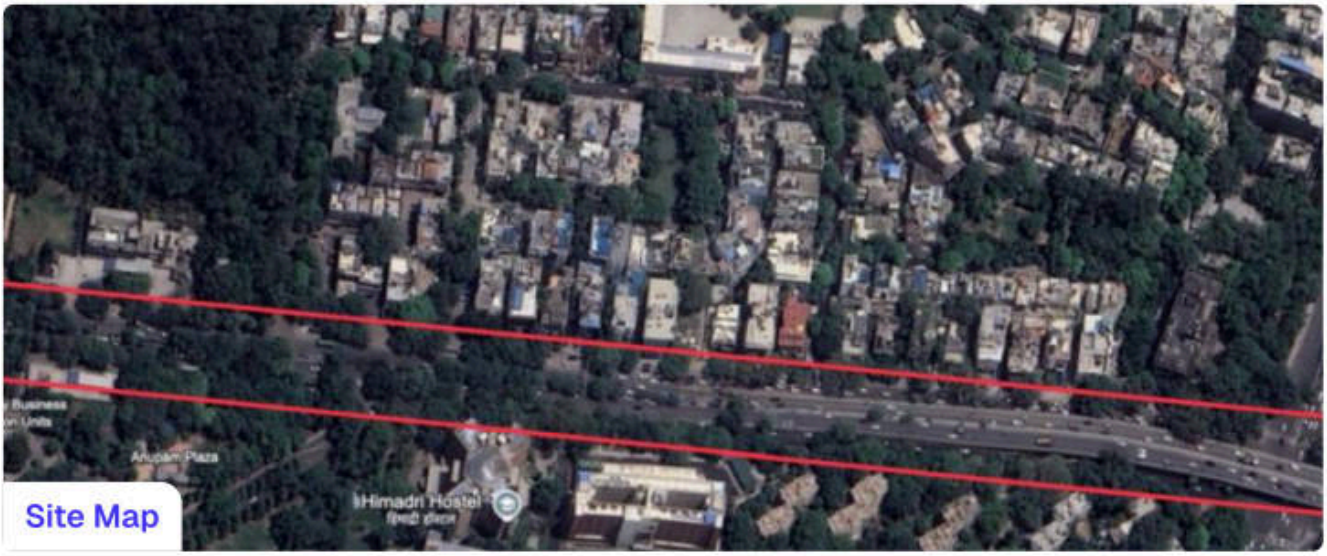
Key Findings & Hazards:

1. Pedestrian subway is underused due to safety and accessibility concerns, leading to unsafe at-grade crossings
2. Zebra crossings are faded or missing, and pedestrian signal phases are not provided
3. Footpaths are discontinuous and obstructed, forcing pedestrians onto the carriageway
4. Lack of pedestrian crossing and speed limit signage
5. Signal layouts without pedestrian phases increasing crossing risk

Delhi

Site Location:
Outer Ring Road, IIT Delhi

Geo-coordinates:
28°32'44"N 77°11'48"E



Site Map

Adverse Condition Of Roads

Non Functional Footpath

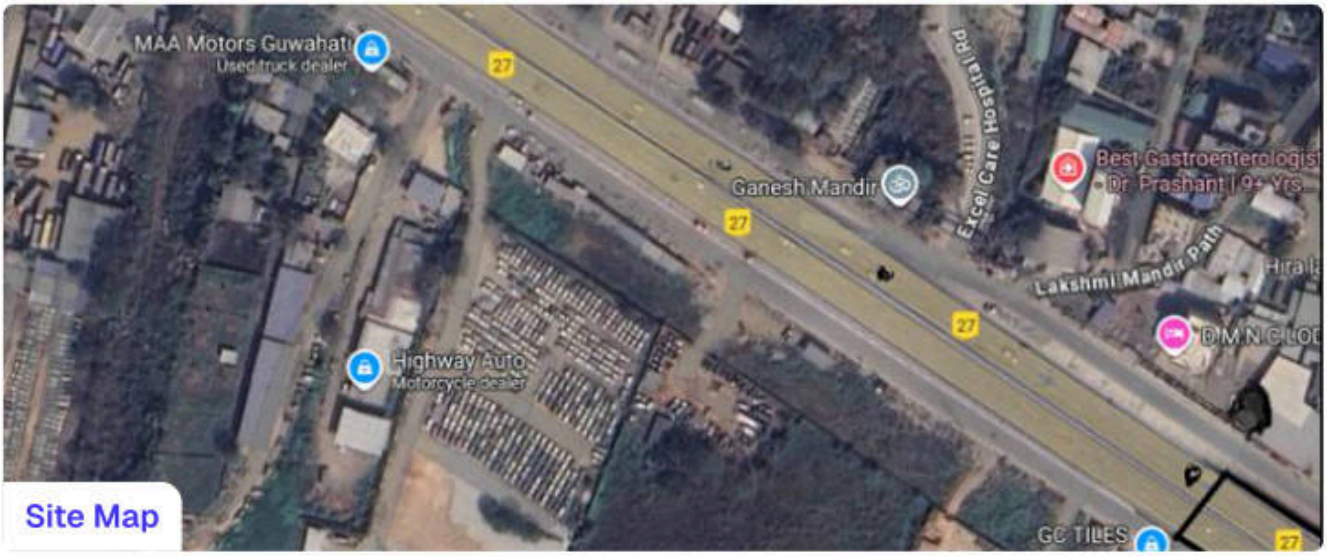
Key Findings & Hazards:

1. Footpaths are broken, uneven, and missing in places, forcing pedestrians to walk on the road
2. Waterlogging occurs near bus stops and kerblines due to inadequate drainage
3. Footpaths are often blocked by parked vehicles and motorcycles
4. Vehicles frequently overspeed on the main carriageway, and there are no speed calming measures
5. Drains are insufficient and clogged, causing repeated ponding after rain

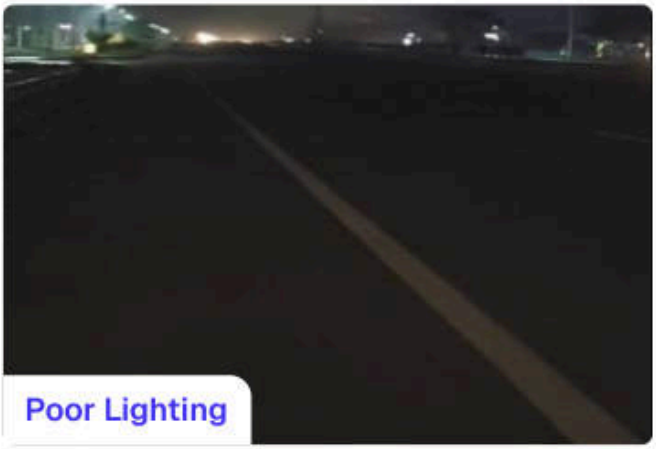
Guwahati (Assam)

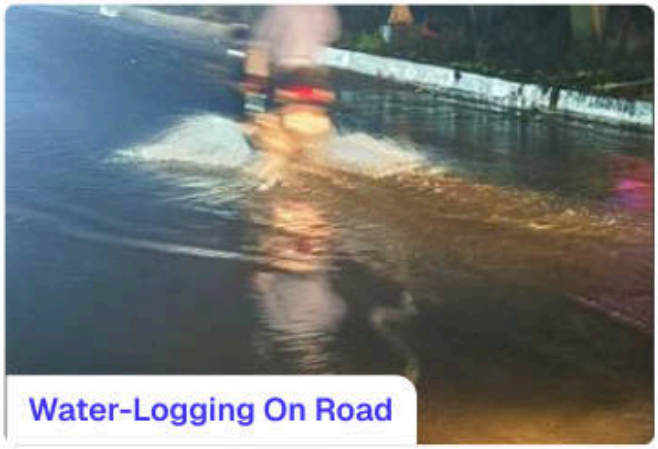
Site Location:
NH-27 (100–200 m stretch after Boragaon Flyover, Guwahati, Assam)

Geo-coordinates:
26.15805° N, 91.67217° E



Site Map


Poor Lighting


Water-Logging On Road

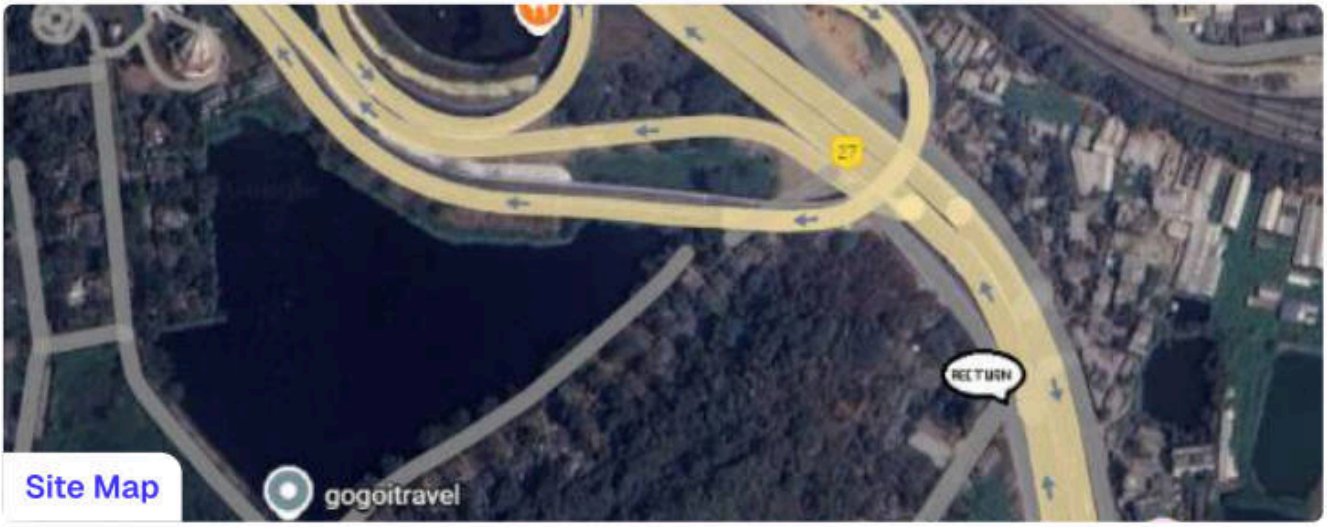
Key Findings & Hazards:

1. No pedestrian crossing → people forced to jaywalk across high-speed traffic.
2. Severe waterlogging → service road becomes unusable, vehicles skid/veer unpredictably.
3. High vehicle speeds (≈50 kmph) at flyover exit → sudden conflict points with mixed traffic.
4. Poor night visibility → faded markings + water glare reduce driver reaction time.
5. Missing median protection → unsafe merging and random crossings.

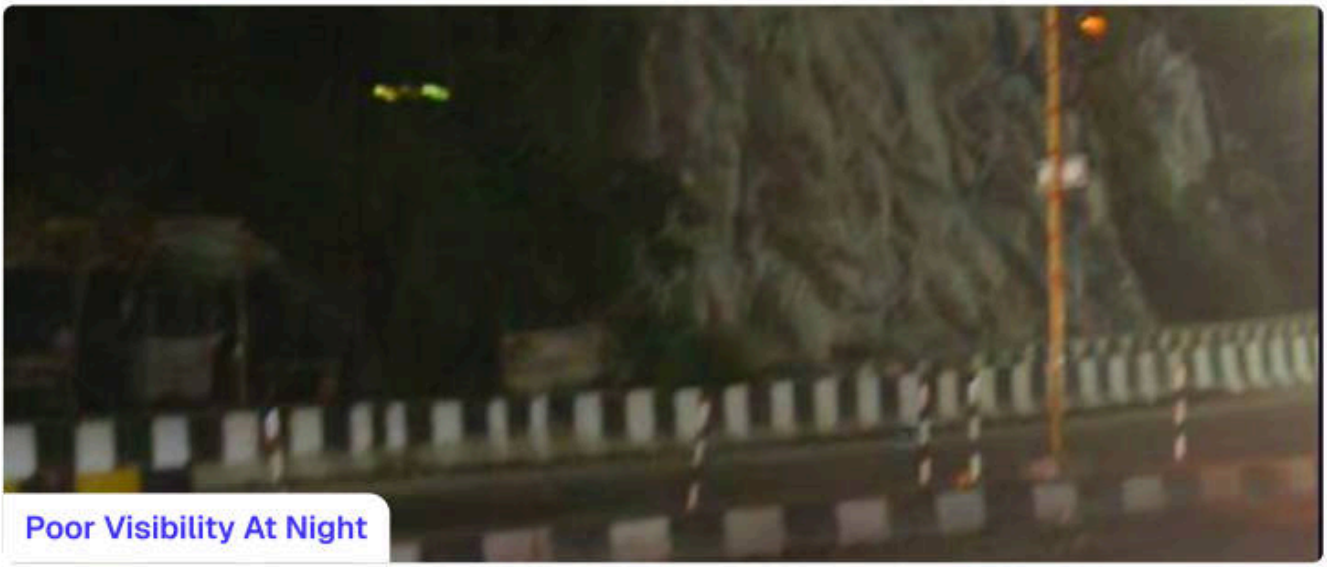
Guwahati (Assam)

Site Location:
AEC Road Turn, Jalukbari, Guwahati, Assam

Geo-coordinates:
26.1577° N, 91.6727° E



Site Map



Poor Visibility At Night

Key Findings & Hazards:

1. No formal pedestrian crossing → unsafe movement in a fast-moving corridor.
2. Excessive speeding due to wide road width + no traffic calming.
3. Inadequate street lighting → sharp drop in nighttime visibility.
4. Blind curves and turning traffic create high conflict zones.
5. Encroachment reduces effective carriageway width and increases chaos.

Roorkee (Uttarakhand)

Site Location:
BT Ganj, Adarsh Nagar, Roorkee, Uttarakhand

Geo-coordinates:
29°48'41.9"N 77°52'44.6"E

Site Map

Street View Of The Road Stretch

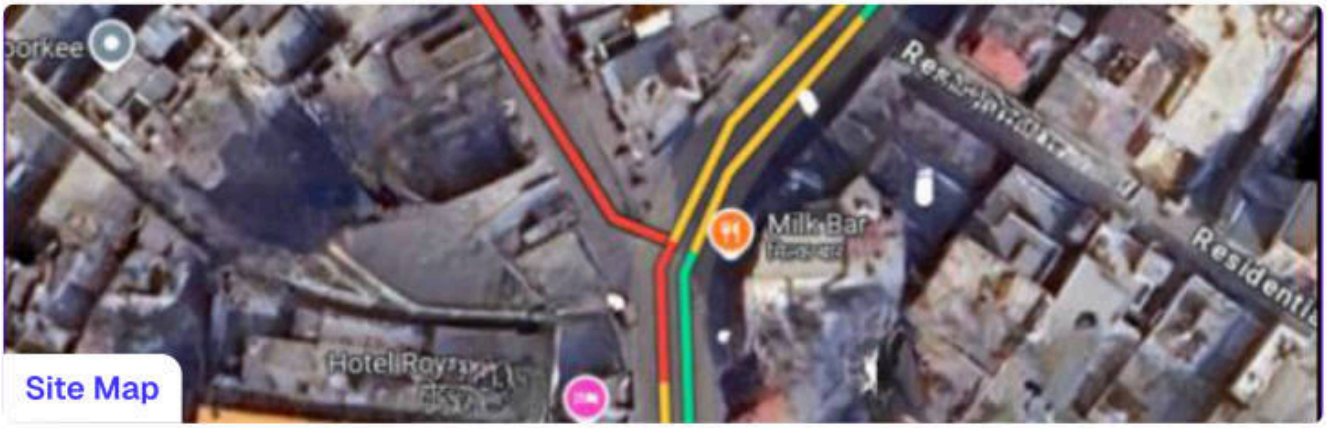
Key Findings & Hazards:

1. No speed breakers or rumble strips at flyover merge points
2. Buses stopping on live lanes for passenger boarding
3. No footpaths, pedestrian refuge, or FOB facilities
4. Pedestrians climbing lane barriers to cross the highway
5. No visible speed-limit signage or traffic calming
6. High pedestrian–vehicle conflict due to unmanaged movement

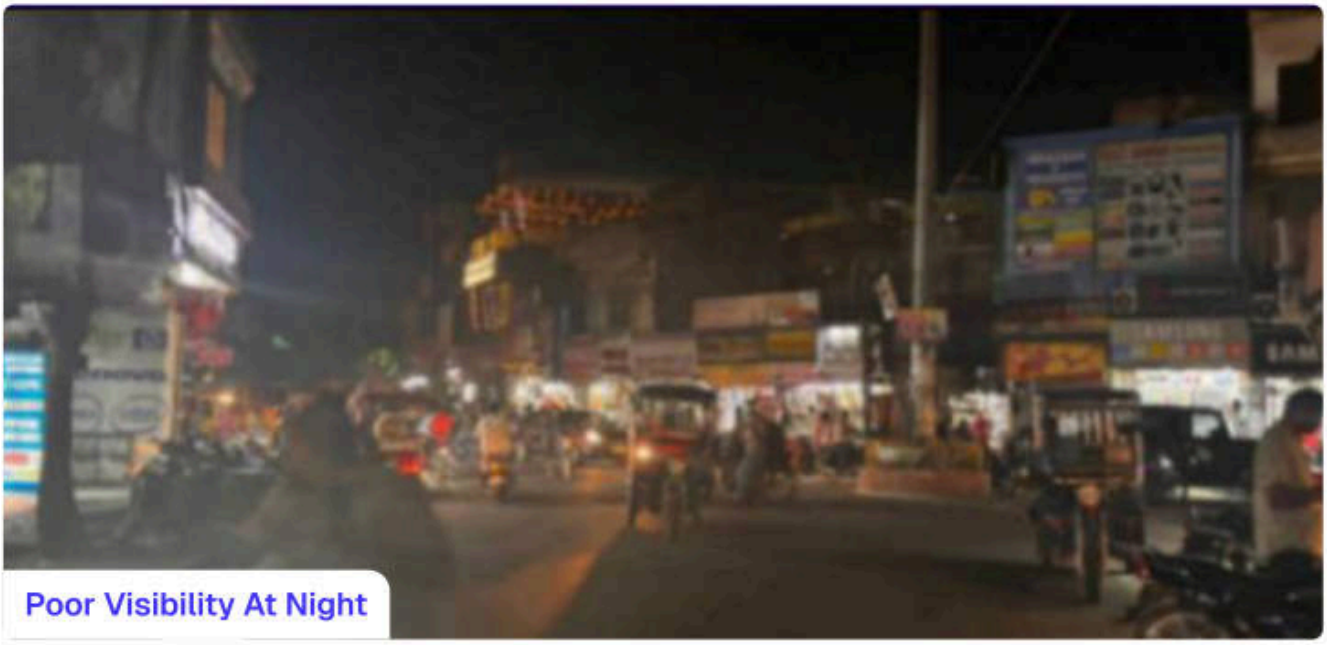
Roorkee (Uttarakhand)

Site Location:
Y-Bifurcation near Milk Bar, Civil Lines, Roorkee, Uttarakhand

Geo-coordinates:
29.8695° N, 77.8900° E



Site Map



Poor Visibility At Night

Key Findings & Hazards:

1. No pedestrian crossing facilities at the Y-junction.
2. No traffic signals/traffic control at bifurcation.
3. Restricted sight distances due to parking and roadside encroachment.
4. Poor geometric design: tight turning radius, unsafe merging.
5. Missing lane markings & directional signage.
6. High-speed entries from both arms → increased crash risk.

Ropar (Punjab)

Site Location:
Intersection near Surjit Hospital, Rupnagar, Punjab

Geo-coordinates:
30°57'18.1"N 76°30'39.1"E

Site Map

Non-Functional Traffic Signal

Key Findings & Hazards:

1. Pedestrian crossings are wrongly located away from the signal, forcing unsafe crossings
2. Vehicles overspeed due to lack of speed calming and enforcement
3. Waterlogging near pedestrian areas due to poor drainage
4. Frequent red-light jumping and traffic rule violations
5. Damaged road surface with potholes and uneven pavement
6. Lack of proper signage and faded road marking

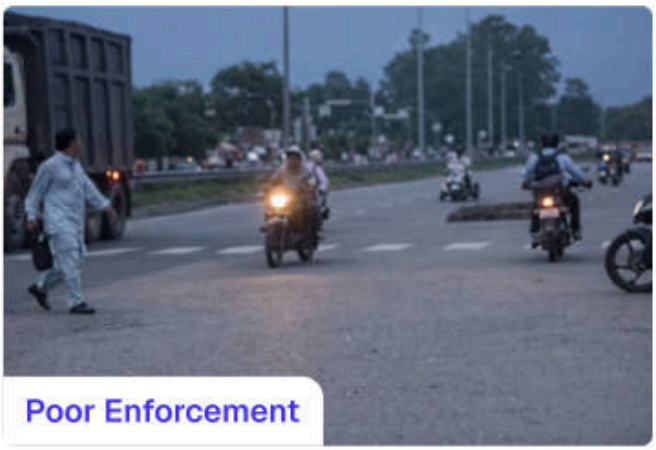
Ropar (Punjab)

Site Location:
Chandigarh–Nangal Road, Ropar, Punjab

Geo-coordinates:
30°57'12.4"N 76°31'48.7"E

Site Map 1


Site Map 2


Poor Enforcement


Poor Lighting

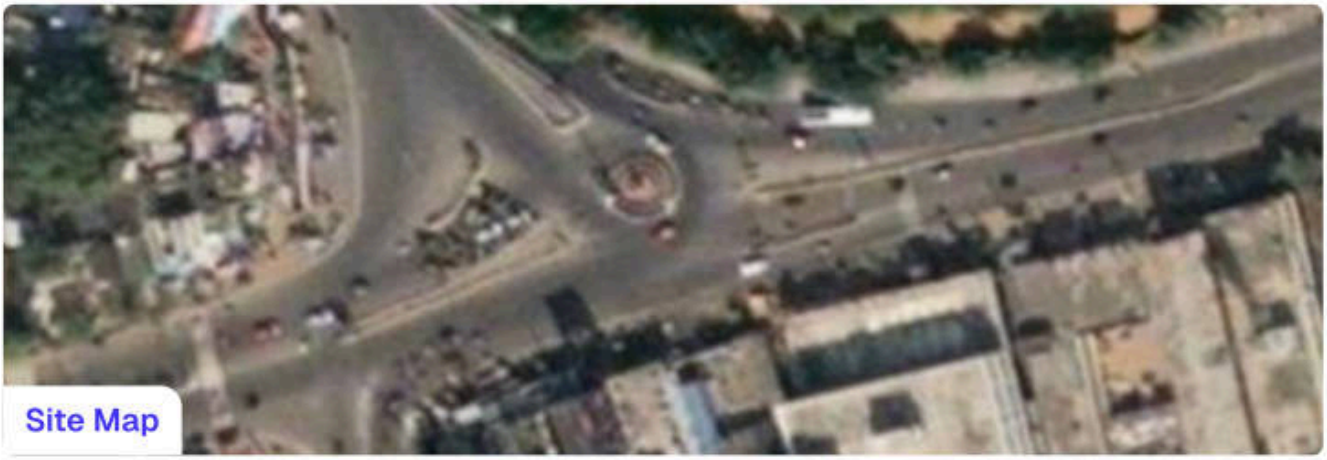
Key Findings & Hazards:

1. Excessive vehicle speeds in a mixed-use area due to lack of physical speed control measures
2. Lack of safe and visible pedestrian crossings, forcing unsafe road crossings
3. Poor and non-functional street lighting, creating dark spots at night
4. Uncontrolled access and blind turns from side roads and driveways
5. Conflicts between heavy vehicles and local traffic and pedestrians

Guntur (Andhra Pradesh)

Site Location:
Chuttugunta Circle Roundabout,
Guntur, Andhra Pradesh

Geo-coordinates:
16°17'27.9"N 80°25'32.0"E



Site Map

Non-Functional Traffic Signal

Uneven Road Surface

Key Findings & Hazards:

1. No traffic lights or zebra crossings, forcing unsafe pedestrian crossings
2. Missing information boards for drivers and out-of-town commuters
3. No designated parking; buses stop inside the carriageway, disrupting flow
4. Road and pedestrian areas covered by debris and unmanaged drainage
5. Inadequate pedestrian space and queuing inside carriageway for buses
6. Electricity poles inside carriageway create additional hazards
7. High pedestrian movement, including school children and elderly, exposed to traffic

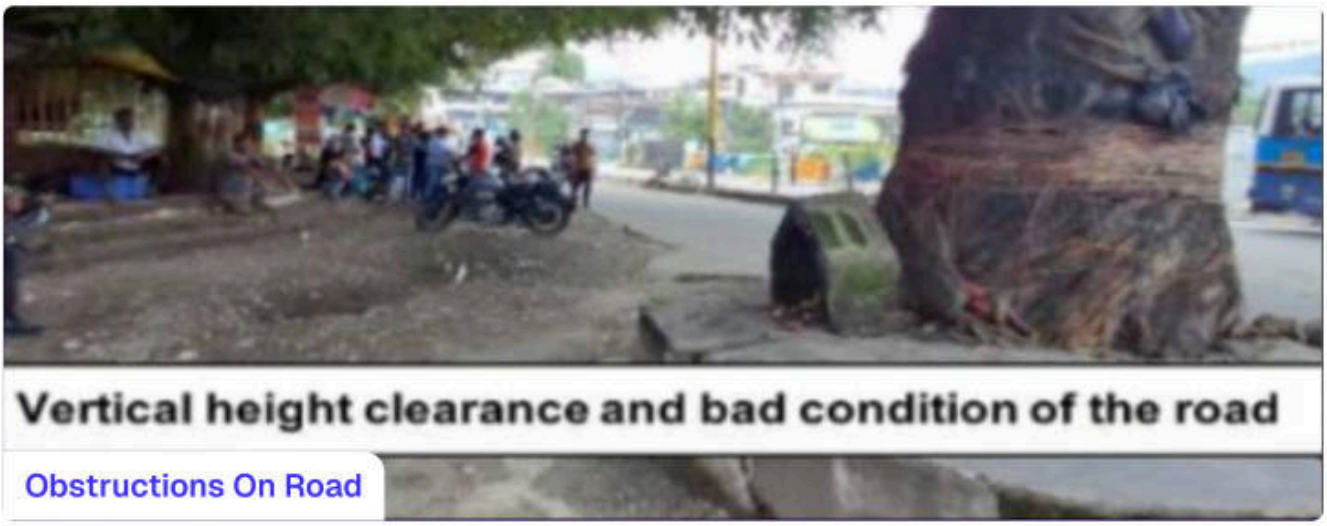
Dehradun (Uttarakhand)

Site Location:
IT Park Chowk, Dehradun, Uttarakhand

Geo-coordinates:
30.355771 N, 78.084448 E

Site Map


Encroached Footpath


Vertical height clearance and bad condition of the road

Obstructions On Road

Key Findings & Hazards:

1. Road markings and signage are missing or faded, reducing driver guidance
2. Carriageway is narrow, causing congestion and vehicle conflicts
3. Visibility is obstructed by overhanging trees
4. No formal pedestrian crossings; pedestrians cross unsafely at informal points
5. Footpaths are encroached by vendors and parked vehicles
6. Informal bus and auto stops disrupt traffic flow and create conflicts

Lucknow (Uttar Pradesh)

Site Location:
Kamta Chauraha, Lucknow

Geo-coordinates:
26°52'25.4"N 81°00'52.9"E

Site Map

Traffic Signal Not Working

Mismangement

Key Findings & Hazards:

1. No formal pedestrian crossings, forcing pedestrians to cross through moving traffic
2. Frequent traffic signal failures and ineffective traffic control
3. Buses and autorickshaws stopping mid-lane, causing traffic obstructions
4. Encroached and narrow footpaths forcing pedestrians onto the carriageway
5. Potholes and waterlogging creating unsafe road conditions
6. Poor junction channelization resulting in lane conflicts
7. Unsafe conditions under the flyover due to lack of crossings, poor lighting, and encroachments

Mumbai (Maharashtra)

Site Location:
Akurli Road Underpass, Kandivali, Mumbai, Maharashtra

Geo-coordinates:
19°12'04.7"N 72°51'40.1"E

Site Map

Illegal Parking

Non-Functional Traffic Signals

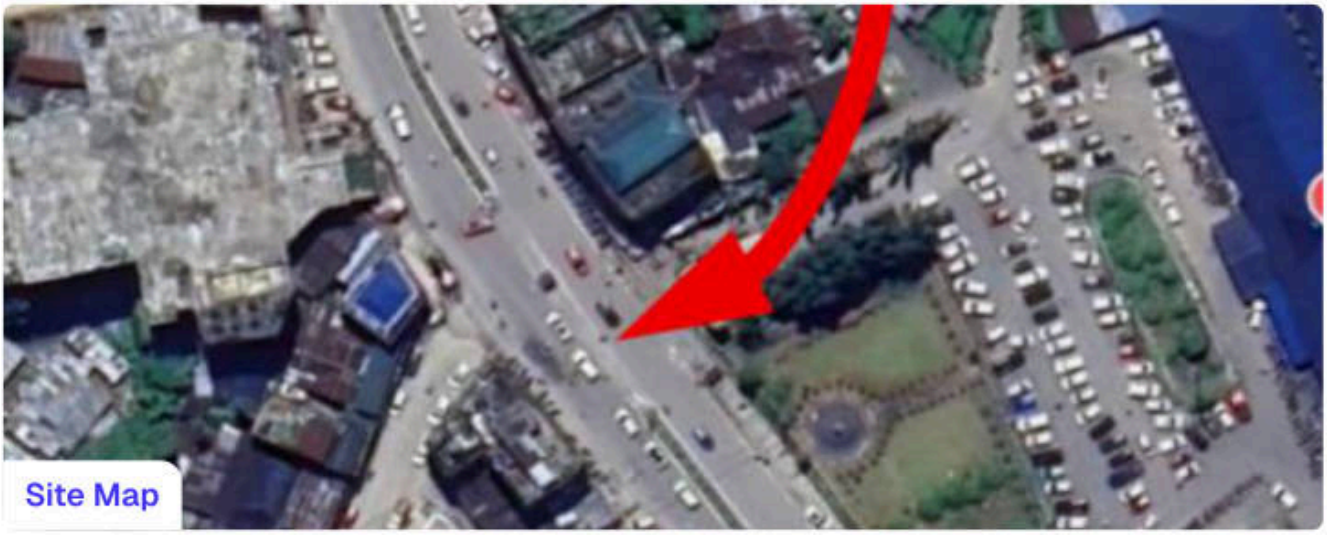
Key Findings & Hazards:

1. Non-functional traffic signals leading to chaotic movement
2. Poor road surface and potholes causing sudden braking and conflicts
3. No pedestrian crossings or pedestrian signals
4. Encroachments reducing carriageway width and sight distance
5. Inefficient traffic management causing congestion and merging conflicts

Itanagar (Arunachal Pradesh)

Site Location:
RK Mission Hospital, Ganga Market,
Itanagar, Arunachal Pradesh

Geo-coordinates:
27°05'13.2"N 93°36'32.3"E



Site Map

Potholes

Faded Footpath

Key Findings & Hazards:

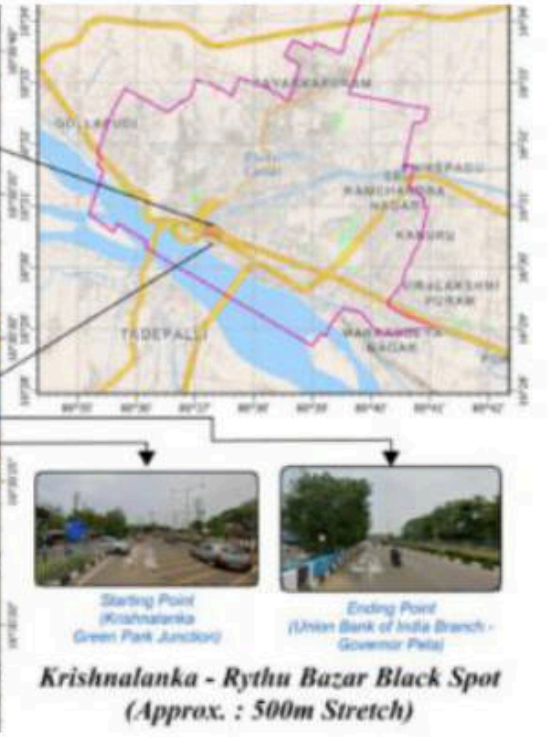
1. Severe congestion during peak hospital hours (10–12 a.m.) creating conflict points.
2. No designated pedestrian crossings; pedestrians navigate unsafe roads.
3. On-street and illegal parking reduce visibility and restrict road width.
4. Poor street lighting worsens night-time safety.
5. Tri-junction layout and lack of signals lead to frequent accidents and near-misses.

Vijayawada (Andhra Pradesh)

Site Location:
Approx. 500m Road Stretch in front of Lakshmi Ganapathi Nursery, Vijayawada, AP

Geo-coordinates:
16°30'30.3"N 80°37'23.0"E

Site Map



Krishnalanka - Rythu Bazar Black Spot (Approx. : 500m Stretch)

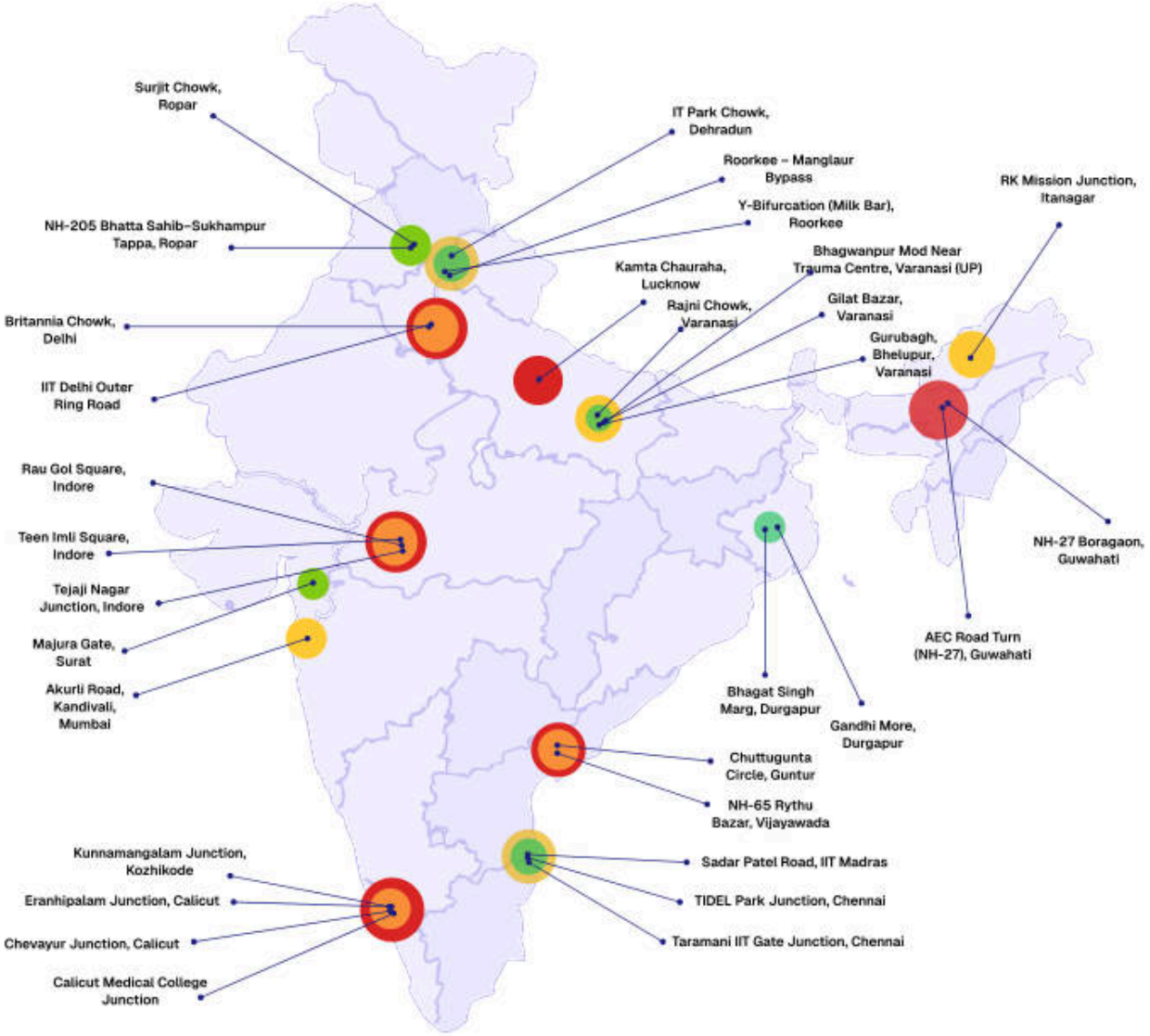
Poor Lighting

Mismangement

Key Findings & Hazards:

1. Footpaths are missing, forcing pedestrians to walk on the carriageway
2. Junction is unsignalized, causing high-speed vehicle conflicts
3. Sightlines are blocked by parked vehicles and overgrown vegetation
4. Buses stop in active lanes due to encroached bus bays
5. Night-time illumination is inadequate, reducing visibility
6. Water accumulates on roads during rain, creating slippery surfaces

4.6 Synthesis



In 2023, India reported 4,64,029 road accidents resulting in 1,73,826 fatalities, reflecting a 1% increase in deaths from 2022, slightly below the national average rise of 2.6%. Million-plus cities continue to account for a significant share of these crashes, with Delhi (5,843), Chennai (3,653), and Indore (3,566) reporting some of the highest numbers. Kozhikode recorded 2,194 accidents, highlighting that even smaller urban centres face substantial road safety challenges. (MoRTH, 2023)

Trends over the past few years show a gradual decline in accident fatalities between 2018–2020, followed by a marginal increase in 2021, and further rises in 2022 and 2023. These figures emphasize that despite improvements in 4 E's of Road Safety encompassing Engineering (roads & vehicles), Enforcement (laws & traffic control), Education (awareness & training), and Environment & Emergency Care of road accident victims, urban and semi-urban areas continue to struggle with unsafe traffic conditions, inadequate infrastructure, and high exposure of vulnerable road users.

The concentration of accidents in high-traffic corridors, school zones, hospital areas, and major junctions indicates systemic deficiencies in traffic management, enforcement, and pedestrian facilities. Cities like Delhi and Chennai, despite robust infrastructure, experience high pedestrian and two-wheeler casualties, underscoring the importance of both regulatory interventions and localized safety improvements.

Smaller and medium-sized cities such as Vijayawada, Guntur, Durgapur, Roorkee, and Itanagar have emerging road safety concerns that require urgent attention. Rapid urbanization, mixed traffic, encroachments, and poorly maintained roads increase the risk of crashes, particularly for pedestrians and cyclists. The comparative data reinforces that interventions must be prioritized not only in large metros but also in these growing urban centres to reduce fatalities and serious injuries.

The patterns identified through Project Rakshak form the basis for a set of practical, context-sensitive interventions. The following section outlines the solutions proposed across sites and explains how each intervention addresses the specific risks identified on the ground.

5. Interventions Proposed & Their Rationale

Across Project Rakshak sites, the proposed interventions respond directly to the dominant risks identified during audits, namely excessive speeds, unmanaged conflict points, poor pedestrian protection, weak visibility, and degraded road conditions. Rather than isolated fixes, the solutions focus on addressing the mechanisms that convert everyday movement into serious injury risk.

Across locations, several intervention categories consistently emerge as high-impact because they reduce either exposure, speed, or conflict severity:

- Speed isolation and separation between vehicles and vulnerable road users
- Junction redesign through channelisation, medians, and controlled turning
- Speed calming using raised tables and humps
- Continuous pedestrian crossings and footpaths
- Drainage repair, resurfacing, and lighting upgrades

Based on established safety benchmarks, multiple teams estimate potential crash reductions in the range of 30-50 percent, with institutional corridors and school zones estimating 60-70 percent reductions in pedestrian–vehicle conflicts. Importantly, more than twenty teams have already received written approvals for proposed improvements in cities including Ropar, Guwahati, Indore, Varanasi, Kozhikode, Roorkee, and Delhi - indicating administrative readiness for pilot implementation.

5.1 Junction-Level Interventions

Addressing conflict concentration and unpredictable movement

Junctions consistently emerge as the highest-risk locations due to turning conflicts, speed differentials, and unclear right-of-way. The proposed interventions focus on simplifying decision-making for drivers and physically separating movement streams. Key measures include multi-modal integration at junctions, geometric realignment, channelising islands for controlled U-turns, and one-way entry restrictions to eliminate crossing conflicts. Dedicated turning lanes, merge control, and chevron delineators improve lane discipline, while convex mirrors and visibility corrections reduce blind spots. In complex geometries such as Y- and skewed intersections, redesign prioritises reduced speeds and predictable movements.

Several sites also recommend grade-separated pedestrian facilities and improvements to junction resurfacing and drainage to prevent skid-related crashes.

5.2 Mid-Block Interventions

Managing speed and visibility along uninterrupted corridors

On long urban arterials and highway segments, risk is driven by excessive speeds, weak visual cues, and deteriorated surfaces. Interventions therefore prioritise speed management and consistent visual guidance.

Proposed measures include rumble strips, raised speed tables, IRC-compliant breakers, high-visibility thermoplastic markings, reflective studs, and chevron boards. Road surface restoration, improved drainage, and LED streetlighting upgrades address hazards that disproportionately affect night-time and monsoon travel. In several locations, average-speed enforcement zones and enhanced warning signage are proposed to reinforce behavioural compliance near curves, hospitals, and schools.

5.3 Pedestrian and Cyclist Infrastructure

Reducing exposure for the most vulnerable road users

Across nearly all sites, pedestrian risk is driven less by individual behaviour and more by the absence of safe, continuous infrastructure. Interventions focus on providing clear, protected, and intuitive pedestrian paths.

Recommendations include marked and raised zebra crossings, signalised pedestrian crossings with countdown timers, refuge islands, and relocation of crossings closer to signalised intersections. Continuous footpaths with tactile paving, bollards, and guardrails reduce spillover into live traffic. In high-conflict zones, anti-skid flooring and improved FOB or subway access - including lighting and safety features are proposed to make grade-separated facilities usable and attractive.

5.4 Parking and Encroachment Management

Restoring visibility and effective road width

Encroachments and informal parking repeatedly reduce sightlines and usable carriageway width, converting minor manoeuvres into serious crash risks. Interventions therefore focus on reclaiming space and organising activity rather than blanket removal.

Measures include removal of unregulated on-street parking, creation of off-carriageway bus bays and auto stands, bollards to protect pedestrian movement, and formalised parking zones supported by enforcement. In market and school areas, vendor relocation and encroachment clearance are paired with safer access planning to reduce resistance and improve compliance.

5.5 Traffic Management and Signals

Improving predictability and enforcement credibility

Several sites report high-risk conditions stemming from non-functional or absent traffic control systems. Proposed interventions focus on restoring predictability and reinforcing compliance.

These include installation of fixed-time or actuated traffic signals, relocation of bus stops away from junction influence zones, flashing amber beacons at high-risk locations, and speed enforcement through cameras and radar-based monitoring. Stop/yield controls, clear speed-limit demarcation (especially 30 km/h zones near schools and hospitals), improved regulatory and cautionary signage, and CCTV-linked smart signal control systems are recommended to strengthen operational safety.

5.6 Long-Term Network-Level Improvements

Sustaining safety gains beyond individual sites

While site-level interventions deliver immediate risk reduction, long-term safety depends on systemic integration. Teams therefore recommend network-level measures that institutionalise learning and evaluation.

These include integrated Engineering–Enforcement–Education-Emergency Care (4E) frameworks, safety communication campaigns, AI/ML-ready sensing systems for monitoring and evaluation, improved work-zone safety during construction, regular safety audits, updated traffic management plans, and comprehensive pavement evaluation and reconstruction. Drainage and water management upgrades are emphasised as foundational, given their role in amplifying crash risk during adverse conditions.

5.7 Effectiveness and System Alignment

Across intervention types, speed isolation, junction redesign, speed calming, and pedestrian infrastructure consistently rank as highly effective, directly addressing core Safe System principles - speed management, forgiving road geometry, and conflict separation.

By targeting the structural contributors to crash severity, prioritised locations can realistically achieve 20-50 percent reductions in fatal and serious injuries, consistent with evidence from WHO, ADB, and iRAP. Project Rakshak demonstrates a scalable, evidence-driven model for continuous improvement, where designs developed at 31 priority sites can be extended to similar corridors and junctions across cities.

Beyond infrastructure, the programme also builds a cohort of technically trained young professionals, strengthening the long-term capacity for road safety planning, governance, and sustainable mobility implementation.

6. Signals of Success: Early Outcomes & Institutional Traction

As Project Rakshak is in an early stage of implementation, its outcomes are best understood in two distinct ways. First, the programme has generated immediate outputs and signals in the form of structured risk identification, authority-ready analyses, and early administrative engagement. Second, based on established global evidence and Safe System principles, the interventions proposed under the programme point to potential longer-term impacts if implemented and sustained.

The sections below therefore distinguish between immediate impacts observed to date and potential future impacts, recognising that the latter are indicative and contingent on adoption, implementation quality, and institutional support.

6.1 Immediate Impacts

Project Rakshak enables cities to identify high-risk locations through structured field assessments conducted by 31 teams across 18 cities, covering 120+ sites, including 11 officially recognised blackspots. These assessments surface risks in school zones, commercial stretches, and mixed-use corridors that often fall outside the scope of routine road safety audits.

The initiative consolidates community feedback, audit evidence, and technical recommendations into a single, authority-ready input, supporting more informed and timely decision-making. Across sites, teams have developed ready-to-implement design proposals, such as raised crossings, refuge islands, compact roundabouts, and traffic-calming measures, aligned with IRC and MoRTH guidelines.

Early administrative engagement provides an important signal of institutional traction. More than 22 teams have received written approvals or in-principle support from relevant authorities in cities including Ropar, Guwahati, Indore, Vijayawada, and Delhi, indicating readiness for pilot implementation at select locations.

6.2 Potential Future Impacts

The proposed interventions address core Safe System principles, notably speed management, forgiving road geometry, and separation of conflict points, strengthening the foundation for safer urban road networks.

By targeting systemic contributors to crash severity rather than isolated symptoms, prioritised locations have the potential to achieve 20–50 percent reductions in fatal and serious injuries, consistent with global evidence from WHO, ADB, and iRAP. The programme also aligns with SDG 3.6 (reducing road traffic deaths and injuries) and SDG 11 (safer, more inclusive urban mobility and public spaces).

Beyond individual sites, Project Rakshak introduces a scalable, evidence-based model that municipal bodies can integrate into routine engineering, enforcement, and review workflows, supporting sustained improvements beyond the project cycle. The design approaches and methodologies developed across 31 priority sites can be adapted to similar junctions and corridors, enabling ward-level and corridor-level safety improvements.

In parallel, the programme contributes to capacity-building by creating a cohort of technically trained young professionals, strengthening the talent pipeline for future work in road safety, planning, and sustainable mobility.

Project Rakshak Impact:

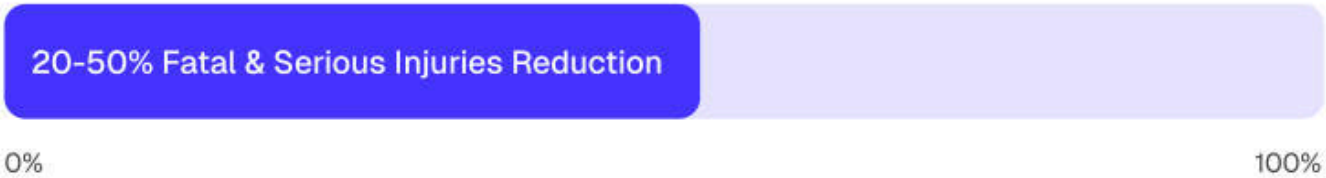
SDG 3.6

Reduce road traffic deaths and injuries

SDG 11

Safer and more inclusive urban mobility

Crash Risk Reduction Potential:



7. Team Profiles

TEAM BLACK WIDOW

Site Location – Akurli Road, Kandivali (E), Mumbai

The site is a key connector between residential areas and commercial/transit nodes, facing heavy congestion, unsafe pedestrian movement, narrow carriageway, informal parking, and vendor spill-over. Peak-hour traffic slows to a single lane due to autos stopping randomly, market crowding, and absent footpaths. Pedestrians often walk on the road, and wrong-side driving is common. As per Mumbai's Road Safety Annual Report, this 250-metre stretch documented 19 crash incidents between 2020-2022, comprising 6 fatalities and 13 serious injuries, marking it as a high-risk junction.

Site Map

Stakeholder Survey

- **Total Respondents:** 42
- **Stakeholder category:** Residents, Daily Commuters, Auto Drivers, Shopkeepers
- **Key Findings:**

1. Traffic & Congestion: Continuous peak-hour buildup; single-lane flow; autos/two-wheelers stopping randomly.
2. Pedestrian Safety: No continuous footpaths; market areas worsen conflicts.
3. Infrastructure: Broken/missing footpaths, potholes, garbage accumulation.

4. Behaviour & Enforcement: Wrong-side driving; poor parking discipline; no enforcement.
5. Network Insight: Improved downstream stretches can support upstream decongestion.

Road Safety Audit (RSA) Findings

- Major bottleneck at primary junction
- Unregulated U-turns near religious site
- Missing/worn signage and markings
- Vendor spill-over narrowing carriageway
- Multiple unprotected mid-block pedestrian crossings
- Service road congested during peak hours

Encroached Footpath

Traffic Congestion

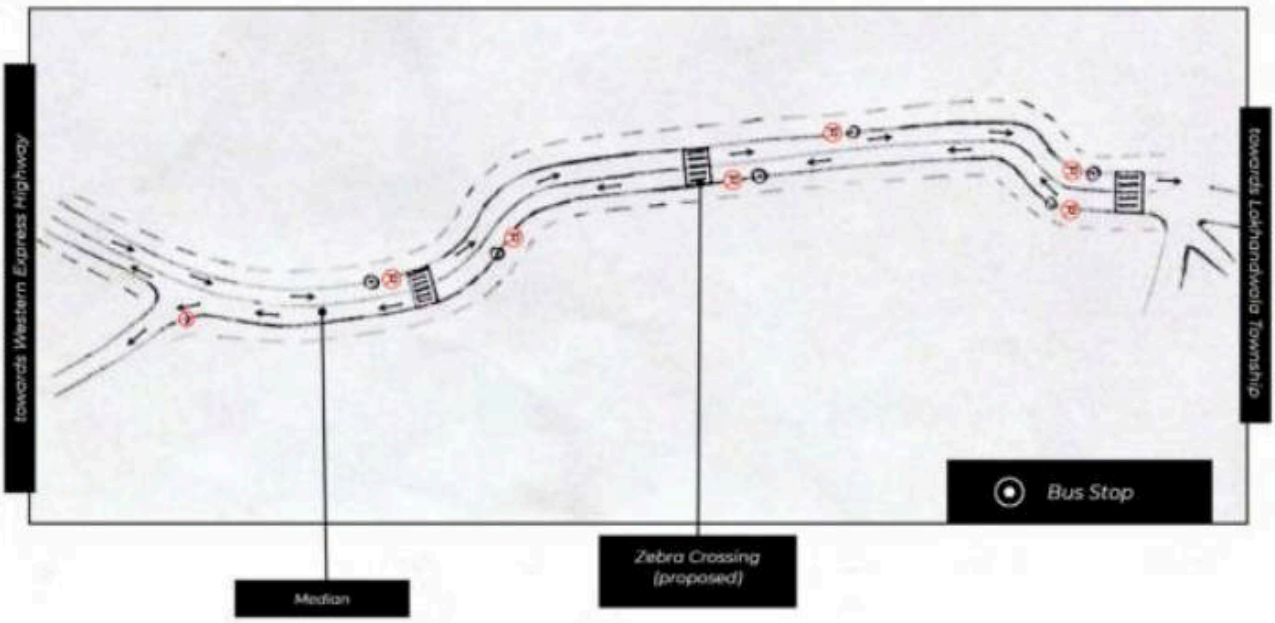
Lack Of Enforcement

Proposed Solutions

A. Junction-Level: Rechannelisation, marked pedestrian crosswalks, bollards/separators.

B. Corridor-Level: Footpath repair with anti-skid surfacing, temporary pedestrian lanes, prevent wrong-side entry, update signage.

C. Parking & Encroachment: Designated auto bays, vendor relocation, strict no-parking enforcement.



Expected Impact & Beneficiaries

Impact: Safer walking, smoother traffic flow, fewer wrong-side incidents, clear pedestrian/vehicle segregation.

Beneficiaries: Local residents, shopkeepers/vendors, auto/taxi drivers, daily commuters, Traffic Police & BMC (R/N Ward)

TEAM PATHRAKSHAK

Site Location: Kamta Chauraha, Lucknow

Kamta Chauraha, a critical junction linking Shaheed Path with Faizabad Road and vital institutions like the Lucknow High Court and Avadh Bus Stand, experiences heavy mixed traffic and constant mid-lane stoppages. Encroachments and the absence of dedicated pedestrian facilities create unsafe conditions, while frequent signal failures and irregular policing amplify congestion and crash risks, making the intersection particularly hazardous for all road users.

RTI data also shows that over the past five years, Kamta Chauraha has witnessed 32 reported accidents, resulting in 15 fatalities and 17 injuries, mostly involving two-wheelers and four-wheelers.

Site Map

Stakeholder Survey

- **Total Respondents:** 42
- **Stakeholder category:** 2 & 4 wheelers, pedestrians, shopkeepers, police officials
- **Key Findings:**

1. Traffic & Congestion: Frequent lane conflicts; mid-lane stoppages; slow-moving vehicles.
2. Pedestrian Safety: No formal crossings; unsafe mid-lane crossing; exposure under flyover.

3. Infrastructure Gaps: Encroachments on footpaths, potholes, poor drainage.

4. Behavior & Enforcement: Signal malfunctions, manual policing, poor parking discipline.

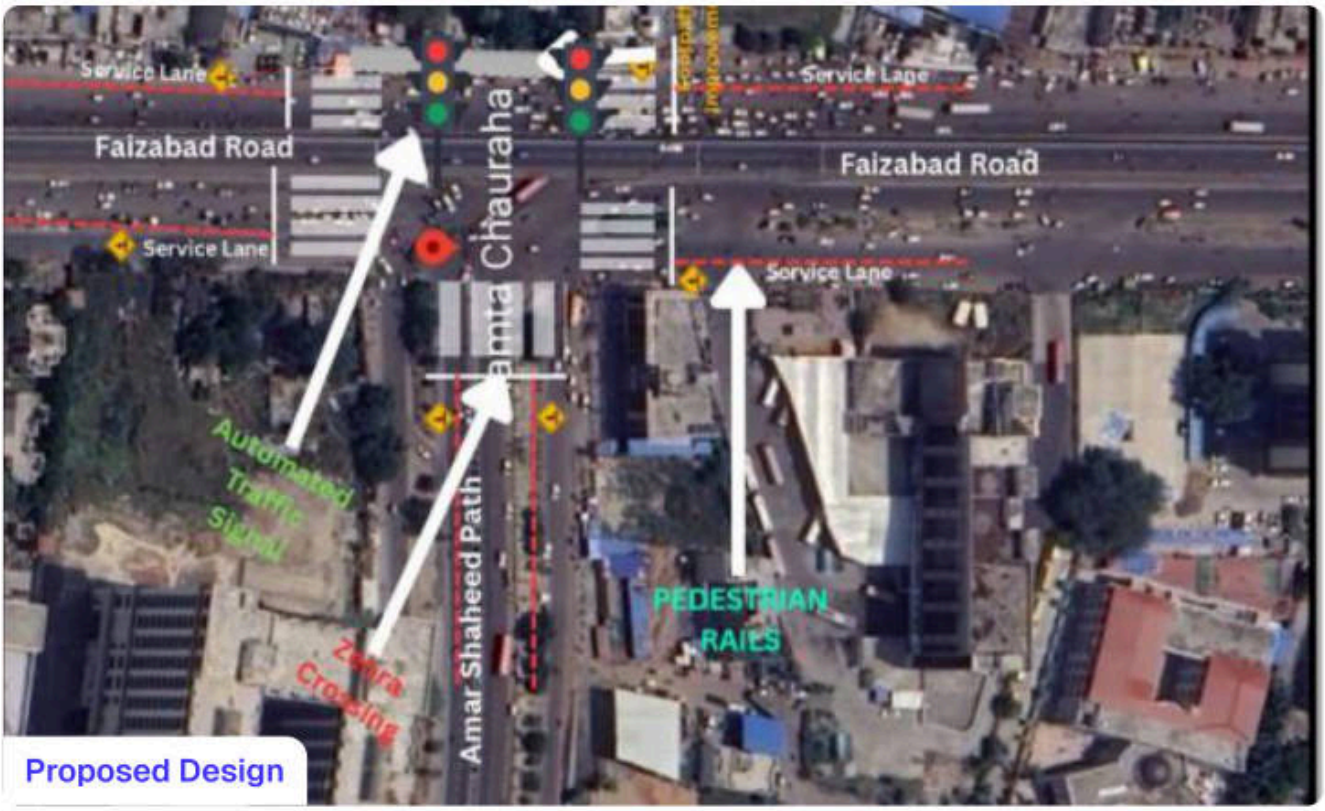
Traffic Mismanagement

Congestion Due To Encroachments

Lack Of Zebra Crossing

Proposed Solutions

- Zebra crossings (3 m wide), reflective studs, pedestrian phases; Short-term (0–6 months)
- Adaptive LED signals, pedestrian countdowns, central monitoring; Short-term (0–6 months)
- 25 m bus/auto lay-bys, signage, kerb markings; Medium-term (6–12 months)
- 1.8 m clear walkway, vendor relocation, bollards; Medium-term (within 1 year)
- Resurfacing, side drains, desilting; Medium-term (6–12 months)
- Traffic islands, improved turning radii, lane markings; Long-term (18–24 months)
- Zebra crossings, synchronized pedestrian signals, railings, tactile paving, vendor relocation; 6–12 months



Proposed Design

Expected Impact & Beneficiaries

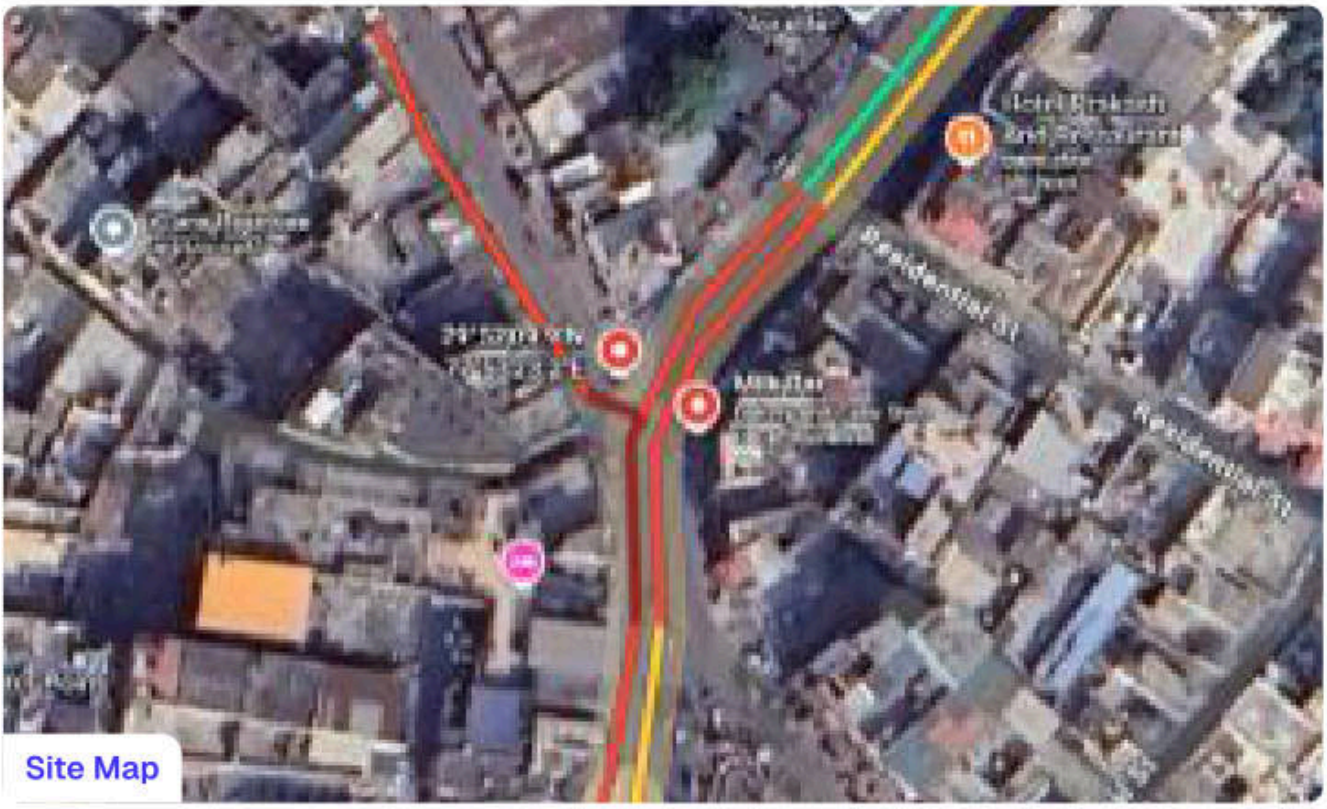
Impact: Reduced crashes, improved pedestrian safety, smoother traffic flow, clear lane discipline, safer under-flyover movement.

Beneficiaries: Pedestrians, commuters, shopkeepers/vendors, public transport users, Traffic Police, local authorities.

TEAM U-TURNERS

Site Location – Y-Bifurcation near Milk Bar, Civil Lines, Roorkee, Uttarakhand

The site is a key connector between residential areas and commercial/transit nodes, facing heavy congestion, unsafe pedestrian movement, narrow carriageway, informal parking, and vendor spill-over. Peak-hour traffic slows to a single lane due to autos stopping randomly, market crowding, and absent footpaths. Pedestrians often walk on the road, and wrong-side driving is common. Recent crash history underscores the urgency of intervention, including a fatal pedestrian crash reported in June 2025 and five fatalities across two crashes near the Civil Lines Kotwali stretch in July 2024.



Site Map

Stakeholder Survey

- **Total Respondents:** 14
- **Stakeholder category:** Students, Retail Owners, Two-Wheeler Commuters, Pedestrians, Auto/Taxi Drivers
- **Key Findings:**

1. High conflict point; no signalisation; right-angle crashes frequent; vehicles encroach opposite lanes at turns.
2. No zebra crossings; no refuge islands; over 60% accept dangerously small gaps; high exposure near commercial strip.

3. Missing markings, narrow turning radii, poor lighting, and random parking compromising visibility.
4. Intelligent signalisation paired with geometric redesign can significantly reduce collision risk and improve flow.

Road Safety Audit (RSA) Findings

- No traffic control at the Y-junction; confusion in right-of-way.
- Substandard turning radius (3.5 m) forcing vehicles into oncoming lanes.
- No designated pedestrian facilities or safe waiting points.
- Absence of signage, lane markings, roadway lighting, and speed guidance.
- Sight distance restricted by unregulated parking.
- High pedestrian volumes due to nearby shops and student activity.

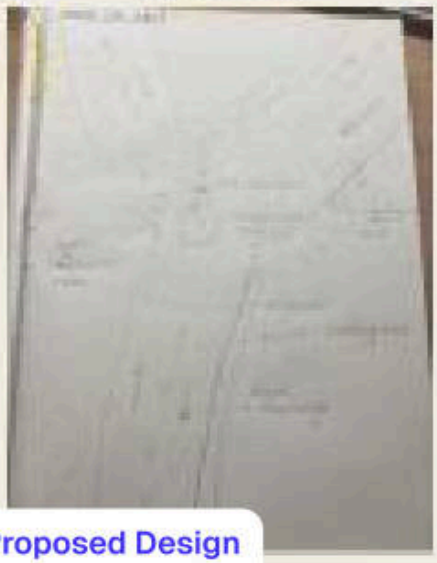
Absence of Traffic Signals

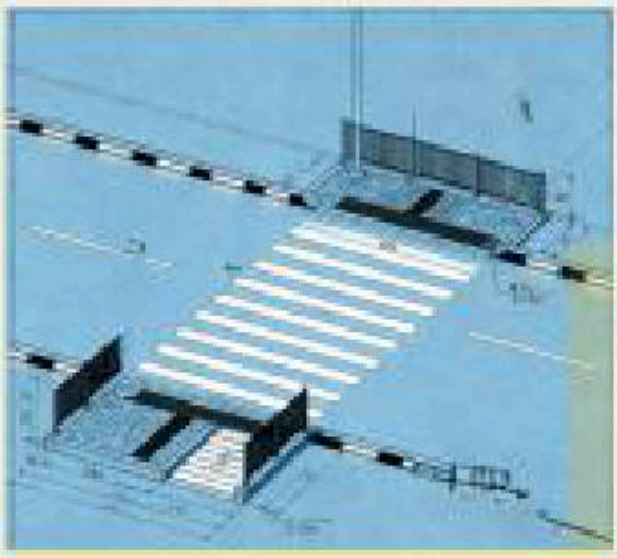
Inadequate Street Lighting

No Accessibility Features

Proposed Solutions

- Adaptive traffic signals with pedestrian phases, countdown timers, audio alerts, loop detectors, and CCTV-based enforcement.
- Enhanced turning radii (6–9.5 m), carriageway widening, raised reflective medians, and high-friction surfacing on curves.
- 4-m zebra crossings, refuge islands, tactile paving, wheelchair ramps, guardrails, and improved night lighting.
- Off-street 50-space parking (100 m away), strict no-parking zones, CCTV enforcement, and designated pick-up/drop-off areas.





Proposed Design

Expected Impact & Beneficiaries

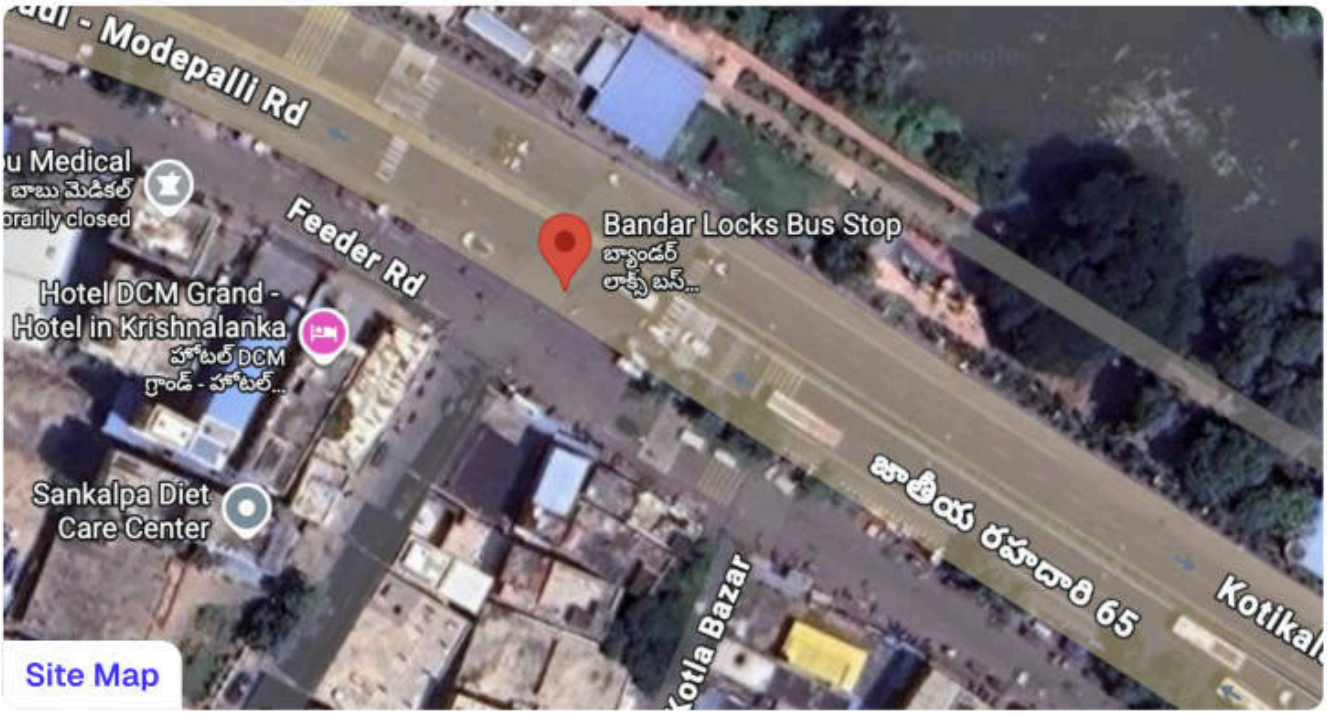
Significant reduction in junction-related crashes, improved pedestrian safety and compliance through guided crossings and clear signals, enhanced night visibility and safer walking zones, smoother traffic flow with fewer conflict points, and lower emissions due to reduced idling.

Local students, pedestrians, daily commuters, shopkeepers/vendors, two-wheeler riders, auto drivers, public transport users, Traffic Police, and the Roorkee Municipal Corporation.

SHAUNAK'S TEAM

Site Location – 500m Stretch of NH-65, Krishnalanka (adjacent to Rythu Bazar, including Bandar Locks Bus Stop Junction) - Vijayawada, Andhra Pradesh.

The site sits on NH-65, where highway speeds meet dense commercial activity around Rythu Bazar and the bus stop, creating constant pedestrian–vehicle conflict. Vijayawada reported 1,041 crashes and 362 fatalities in 2024, with speeding and unsafe crossings as major contributors. This stretch reflects the same risks—an unsignalized Bandar Locks Junction, no usable footpaths, and heavy mixed traffic—resulting in a 2.83/5 safety rating and 82% of users reporting difficulty crossing. NHAI has also flagged multiple blackspots along NH-65 and reduced speed limits (100 → 80 kmph), underscoring the urgency for safety improvements at this location.



Stakeholder Survey

- **Total Respondents:** 35
- **Stakeholder category:** Pedestrians, two-wheeler riders, auto drivers, shopkeepers/ vendors, bus commuters, traffic police.
- **Key Findings:**

1. No signal control; high right-angle crash potential.
2. Faded markings and insufficient signage.

3. No functional footpaths; unsafe pedestrian crossings.
4. Poor nighttime lighting; blocked sightlines due to on-street parking.
5. Confusing junction geometry without channelisers.

Proposed Solutions

Junction Control: Fixed-time signal, stop-lines, pedestrian signal heads; left-in/left-out channelisation with raised islands.

Pedestrian Safety: Continuous marked crossings, refuge islands, tactile surfaces, functional footpaths.

Traffic Regulation: 30 kmph zone at the junction, standard warning/regulatory signage, organised auto bays, encroachment management.

Expected Impact & Beneficiaries

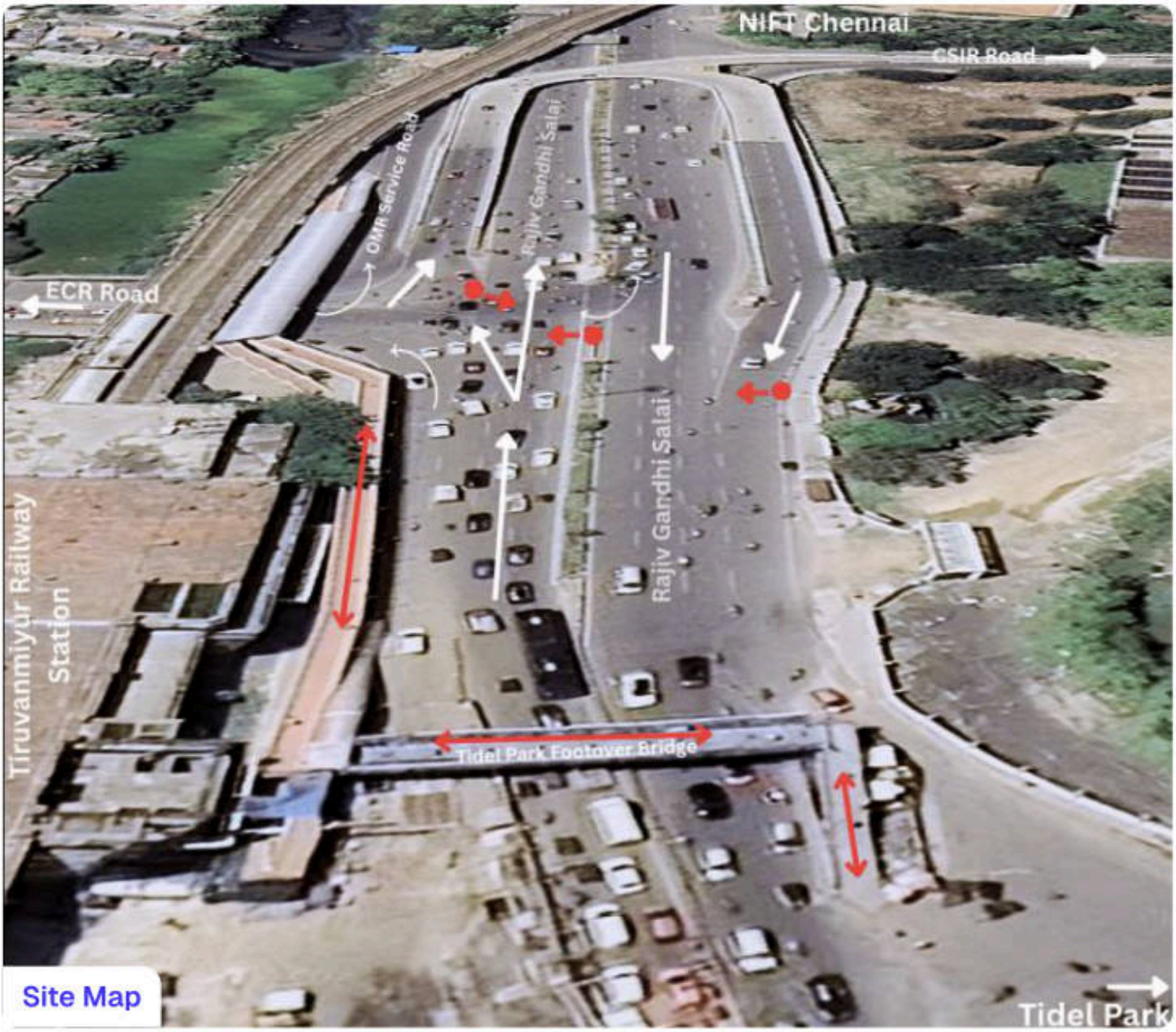
Safer movement for pedestrians and two-wheelers through controlled crossings and structured junction design, along with reduced conflicts, speeding, and crash likelihood on the NH-65 stretch through channelization and improved regulation.

Pedestrians, two-wheeler riders, daily commuters, local residents, enforcement agencies, and roadway authorities.

TEAM SAVIOUR

Site Location: TIDEL Park Junction, Chennai, Tamil Nadu

The U-Bridge junction near TIDEL Park is a high-conflict node where fast-moving traffic from Rajiv Gandhi Salai, ECR, Taramani Road and MRTS merges. Despite flyovers and an FOB, the area continues to face pedestrian risk, overspeeding on ramps, poor lighting, and bus-bay congestion. Recent incidents including a car falling into an 8-ft sinkhole near TIDEL Park and frequent unreported two-wheeler falls on uneven service lanes - highlight persistent safety gaps. These events underscore the need for urgent corrective measures at this junction.



Site Map

Stakeholder Survey

- **Total Respondents:** 42
- **Stakeholder category:** Pedestrians (IT workers, MRTS users, elderly), auto/e-rickshaw drivers, two-wheeler riders, delivery workers, cyclists, bus/truck/cab drivers, shopkeepers/vendors, traffic police & L&O police, and campus students/security staff
- **Key Findings:**

1. Users avoid the FOB due to distance and poor lighting, preferring at-grade crossings.
2. Riders lose control on downhill curves; cyclists face sudden merges.
3. Boarding at ramp exits without bays causes congestion.
4. Under-bridge and FOB areas remain poorly lit.
5. Skidding, waterlogging, and encroached footpaths disrupt movement.

No Lighting

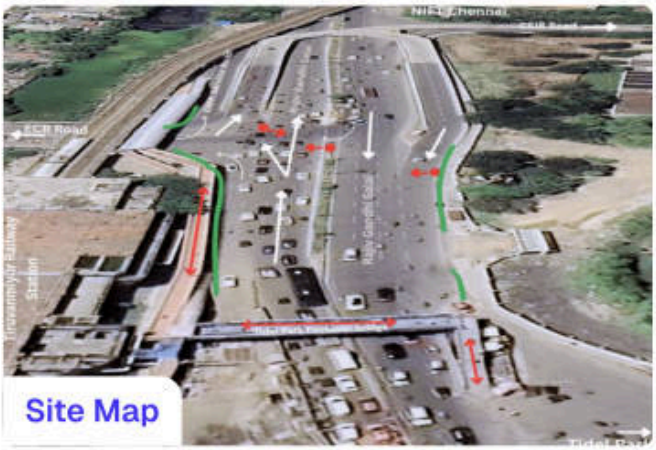
Road Safety Audit (RSA) Findings

- Pedestrian facilities: At-grade desire-line crossings not supported; FOB lacks accessibility and lighting.
- Speed management: No calming measures on ramps; unsafe merge geometry.
- Bus infrastructure: Bus stops located within junction influence zones.
- Lighting: Insufficient lux levels at high-conflict points.
- Surface & drainage: Uneven pavement and waterlogging at multiple points.

(All observations aligned with IRC:SP-88, IRC:103, IRC:65, IRC:99, BIS 1944.)

Proposed Solutions

- Direct pedestrians to the FOB with guard rails, better lighting, CCTV, and escalators; relocate bus stops near the FOB.
- At-grade crossings with zebra markings, refuge islands/medians, and adjusted signals where needed.
- Speed calming on ramps, AI monitoring for violations, improved lighting, and resurfacing to reduce skidding and conflicts.



Site Map

Site Map

Expected Impact & Beneficiaries

Safer pedestrian and two-wheeler movement through controlled crossings, reduced conflicts and speeding, and lower crash risk through better channelisation and regulation.

Beneficiaries: Pedestrians, two-wheeler riders, commuters, bus/auto users, shopkeepers, traffic police, and local authorities.

TEAM WORK WIZARDS

Site Location: Gurubagh, Bhelupur, Varanasi, Uttar Pradesh, 221010

The site is located at a strategic junction near a hospital and college, connecting to a major road network. High pedestrian volumes, sudden lane merges, and a Y-shaped road layout create elevated risks for students, patients, and pedestrians. The area lacks speed control measures, signage, and dedicated footpaths, making it a critical conflict zone. Frequent accidents have also been reported between September 2024–March 2025, including serious injuries to two-wheeler riders and pedestrians. Recurrent crashes and unsafe road conditions underscore the need for immediate interventions.

Site Map

Stakeholder Survey

- **Total Respondents:** 40
- **Stakeholder category:** Pedestrians, Local Residents, Shopkeepers/Vendors, Rickshaw Drivers, Traffic Police
- **Key Findings:**

1. Sudden lane merges and Y-junction layout create conflicts.
2. High pedestrian exposure due to nearby hospital and college.
3. Missing footpaths, crossings, and signage.
4. Traffic congestion during peak hours leads to risky overtaking.
5. Vulnerable users (patients, students, elderly) face heightened risk.

Road Safety Audit (RSA) Findings

- The road exceeds safe speed limits with inadequate crossings and shoulder parking.
- No footpaths, cycle tracks, or provisions for differently-abled users.
- Junctions lack traffic control signs and pedestrian facilities.
- Frequent vehicle-pedestrian conflicts near schools and hospital.

Poor Condition Of Road

Encroached Footpath

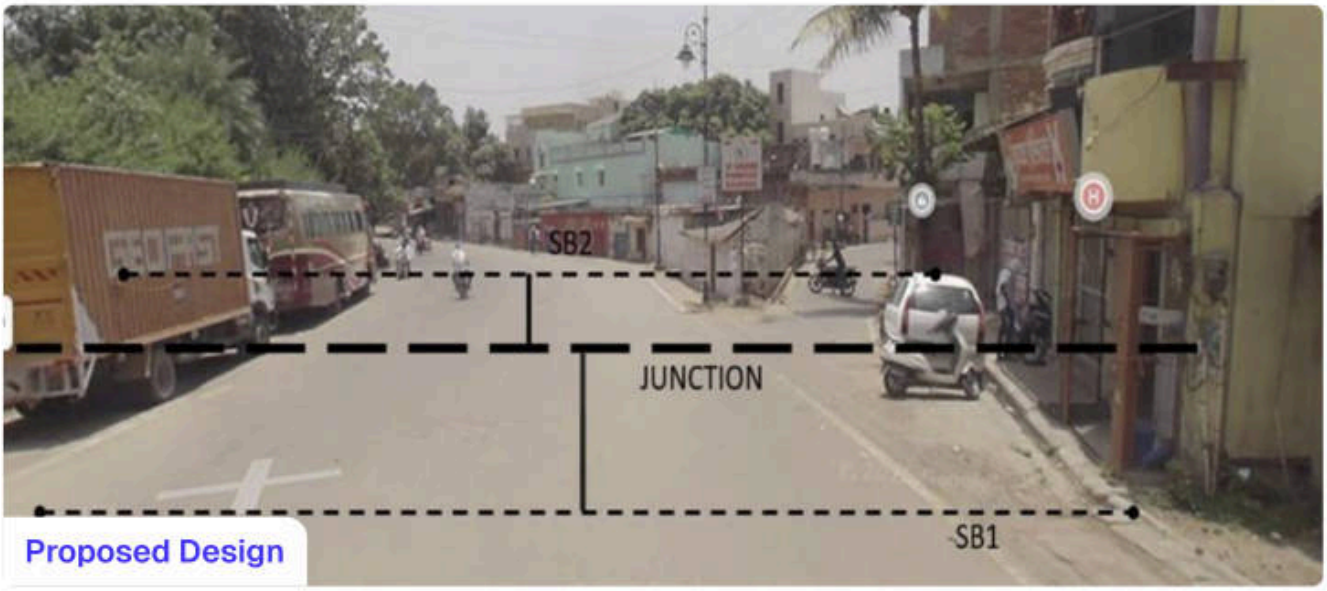
Encroachments On Road

Mismanagement

Proposed Solutions

- Install speed breakers as per IRC:99-2018 guidelines.
- Place convex mirrors at critical blind spots (school gates, hospital driveways, intersections).
- Enhance signage at junctions and pedestrian zones.
- Deploy speed cameras, average speed checks, and red-light violation detection for enforcement

Proposed Design



Proposed Design

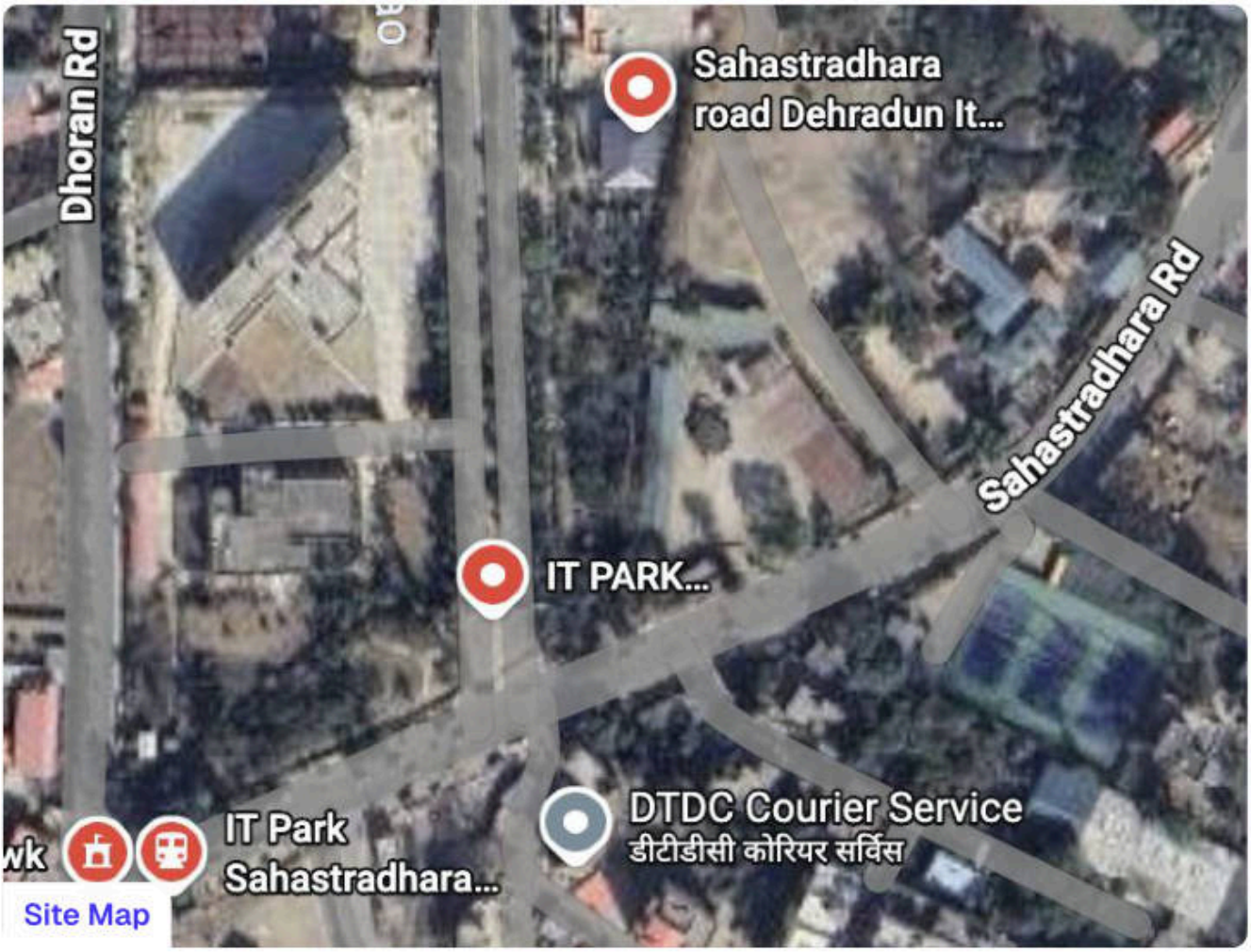
Expected Impact & Beneficiaries

- The measures aim to reduce vehicle speeds and conflicts, improving safety and predictability along the corridor.
- It will benefit pedestrians, commuters, students, local residents, and city authorities managing traffic.

TEAM PLANNER LOKI

Site Location: IT Park Chowk, Dehradun

IT Park Chowk on Sahastradhara Road serves as the main gateway to Dehradun's IT Park and carries mixed residential, commuter, and tourist traffic. The unequal approach widths, faded markings, encroached footpaths, and absence of channelization make the junction functionally weak and operationally unsafe. Its role as a high-volume employment corridor increases the urgency for corrective action. Nearly 47% of surveyed users have witnessed or experienced crashes/near-misses at this junction, reaffirming its past black-spot classification (2016) and indicating persistent safety risks in 2025.



Site Map

Stakeholder Survey

- **Total Respondents:** 33
- **Stakeholder category:** Pedestrians, 2W/4W drivers, IPT, bus and cab users, Lead Agency and Police

- **Key Findings:**

1. Unequal approach widths and substandard 0.5m medians create bottlenecks and unsafe turns.
2. Tree canopies block sightlines, especially at the free left, increasing turning conflicts.
3. Key signs and markings are absent or faded, reducing driver clarity.
4. No marked crossings and encroached footpaths force pedestrians into live traffic.

Road Safety Audit (RSA) Findings

- Narrow carriageway & bottleneck → Rear-end, side-swipe crashes
- Missing signage & markings → Turning collisions, pedestrian hits
- Tree obstruction at free-left → Turning conflicts, sideswipes
- High pedestrian activity without crossings → Pedestrian–vehicle collisions
- Encroached footpaths & IPT stopping → Pedestrian hits, rear-end crashes

Proposed Solutions

- Prune tree canopies, install zebra crossings at key desire lines, and add rumble strips on all approaches.
- Remove encroachments, regulate IPT stopping, and establish formal bus/auto bays at least 50m from the junction.
- Expedite junction widening with proper channelization and build continuous, obstruction-free footpaths.

Expected Impact & Beneficiaries

- The measures will reduce conflicts, improve crossings, organise bus/parking activity, and make the corridor safer, smoother, and more reliable.
- Pedestrians, commuters, two-wheeler users, public-transport operators, local residents, shopkeepers, and city authorities will all benefit from a more orderly and well-managed street.

TEAM CRASHZERO

Site Location: Kunnamangalam Junction, Kozhikode, Kerala

The project site is a high-risk Y-junction black spot serving students (NIT Calicut, IIM Kozhikode), commuters, tourists, buses, and emergency vehicles. It recorded 37 fatal and grievous-injury crashes between 2016–2018, underscoring its critical safety risk. The junction experiences high-speed merging, poor sight lines due to roadside obstacles, absence of working traffic control devices, faded road markings, and lack of pedestrian facilities. These conditions result in frequent side-impact collisions, near-miss incidents, and unsafe pedestrian crossings, especially during peak student commuting hours and tourist inflow periods.

Site Map

Engagement With Stakeholders

Stakeholder Survey

- **Total Respondents:** 71
- **Stakeholder category:** Pedestrians, Two-wheeler riders, Auto/E-rickshaw/ Bus/ Truck/Cab drivers, Shopkeepers, College students, Traffic police & government officials

- **Key Findings:**

1. High-speed merging at Y-intersection creating major conflict points.
2. Rear-end and side-impact crashes are reported frequently.
3. Night-time crash risk increased due to poor visibility.
4. No zebra crossings, footpaths, or refuge islands.
5. Malfunctioning or absent traffic signals.
6. Faded lane.

Road Safety Audit (RSA) Findings

- High-speed merge conflict at Y-junction due to geometry.
- Poor night visibility caused by non-functional lights and obstructed signage.
- Missing/y faded road markings & signage.
- Absence of pedestrian infrastructure.
- No speed-calming measures on approach roads.
- Roadside obstacles restricting approach sight distance.

Potholes

Faded Markings

Mismanagement

Proposed Solutions

- Junction geometry needs to be redesigned using channelization or a mini-roundabout with splitter islands to reduce merging conflicts and slow vehicle speeds.
- Traffic control needs to be strengthened by adding peak-hour signals or flashing beacons, convex mirrors at blind spots, and clearer directional and hazard signage.
- Speed management needs to be improved through the installation of rumble strips and speed breakers on minor approaches.
- Pedestrian safety needs to be enhanced by providing zebra crossings, raised refuge islands, and continuous footpaths.
- Visibility and lighting need to be upgraded using solar-powered LED streetlights, reflective lane markings, studs, and painted curbstones.
- Parking and access management need to be regulated by removing roadside parking near junction arms and creating designated stopping zones away from merge points.
- Enforcement and education need to be strengthened through safety awareness drives, coordination with police for monitoring and speed enforcement, and future ITS integration.

Proposed Design

Proposed Design

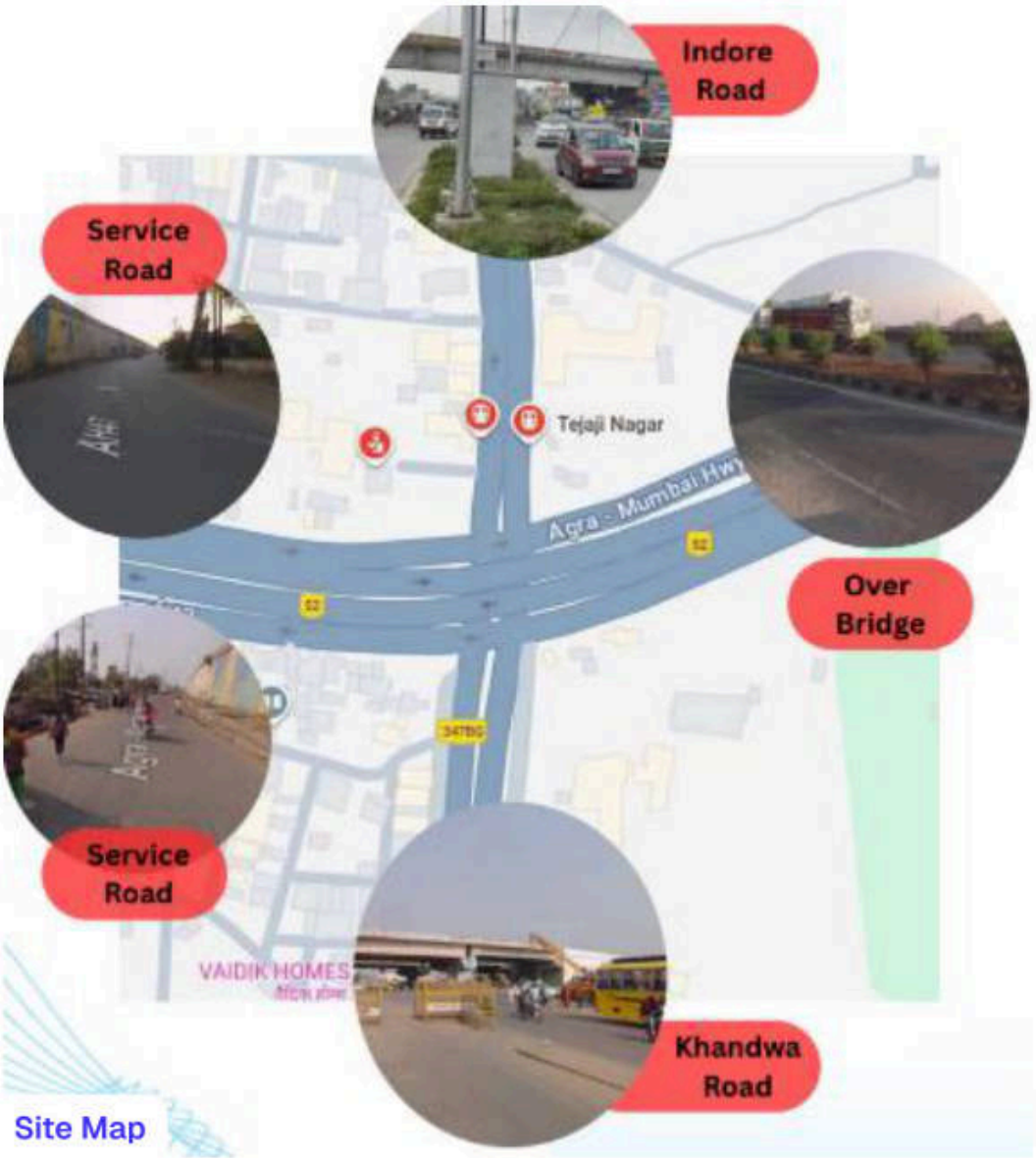
Expected Impact & Beneficiaries

- A reduction in minor accidents and near-miss incidents, improved pedestrian safety for students and residents, smoother traffic flow with less peak-hour congestion, and higher driver compliance due to better signage and awareness.
- Bus operators, freight and private vehicle users, as well as all road users—especially vulnerable groups such as pedestrians and cyclists—along with commuters and IT sector workers, will all benefit from improved flow and reduced delays.

TEAM VISIONEERS

Site Location – Tejaji Nagar Junction, Indore, Madhya Pradesh

The site is a recognized accident black spot with frequent crashes resulting from uncontrolled vehicle entries, absence of traffic signals, high vehicle speeds, and unsafe pedestrian crossings. The junction serves heavy mixed traffic including two-wheelers, autos, cars, buses, and service vehicles. Proximity to schools, commercial establishments, and residential areas increases pedestrian exposure especially for school children. Crash records highlight multiple fatal incidents, including those on 1 July 2025 (2 killed, 3 injured), 22 Jan 2024, 3 Apr 2024 (2 deaths), 2 Oct 2023, Apr 2022 (3 killed, 3 injured), and Aug 2022 (1 killed).



Site Map

Stakeholder Survey

- **Total Respondents:** 35
- **Stakeholder category:** Pedestrians & school children, Two-wheeler users and private vehicle drivers, Auto drivers and bus operators, Shopkeepers and local residents, Traffic police & municipal officials. .

Stakeholder Survey

Survey with Traffic Police

- **Key Findings:**

1. No signal control → simultaneous entry from all arms.
2. High conflict movements leading to side-impact and angle crashes.
3. No formal crosswalks or refuge islands.
4. Missing or faded lane markings & signage.
5. Poor street lighting at night.
6. Uneven road surface and drainage causing vehicle instability.
7. Inconsistent manual traffic regulation.
8. Uncontrolled crossing and merging conflicts dominate crash typology (right-angle collisions, side-impact crashes, pedestrian–vehicle conflicts)

Random Movements of Vehicles

Absence Of Traffic Signal

Road Safety Audit (RSA) Findings

- Absence of junction control (signals)
- Inadequate pedestrian crossing facilities
- High-speed approaches without calming measures
- Missing signage and poor visibility
- Road surface defects and drainage issues

Proposed Solutions

- Traffic control can be improved by installing a full traffic signal system (using a 60-second Webster-designed cycle), marking defined stop lines, and ensuring controlled right-of-way allocation.
- Pedestrian infrastructure can be strengthened by adding zebra crossings on all arms, providing raised median refuge islands on wide roads, integrating formal pedestrian phases into signal timings, and improving continuous footpaths.
- Speed management can be enhanced by installing speed breakers and rumble strips on critical approaches.
- Visibility and lighting can be upgraded by adding LED or solar streetlights at conflict points, applying reflective thermoplastic lane markings and studs, and ensuring permanent regulatory and warning signage.
- Surface conditions can be improved by repairing potholes and correcting drainage issues to prevent skidding and loss of control.

Expected Impact & Beneficiaries

- A major reduction in angle and side-impact crashes, safer pedestrian movement—especially for school children - reduced congestion with smoother traffic flow, enhanced night visibility and lane discipline, and a lower enforcement burden with less need for manual regulation.
- Pedestrians and students, two-wheeler and car users, bus and auto operators, shopkeepers and local residents, and traffic police along with the IMC all benefit through safer crossings, fewer conflicts, smoother flows, reduced delays, improved access, and more efficient junction management.

TEAM VIGNAN

Site Location – Chuttugunta Circle, Guntur, Andhra Pradesh

Chuttugunta Circle is a major urban junction carrying heavy mixed traffic (two-wheelers, autos, cars, buses, trucks) and experiencing frequent crashes according to FIR data. Safety risks arise due to poor signal coordination, lane indiscipline, unmanaged bus stopping on the carriageway, roadside encroachments, drainage issues, missing signage, and lack of pedestrian crossings or footpaths. Peak-hour congestion is severe (4–5 PM), and pedestrians often jaywalk near bus stops and markets.

Site Map

Stakeholder Survey

- **Total Respondents:** 54
- **Stakeholder category:** Pedestrians, commuters, two-wheeler riders, auto & bus drivers, shopkeepers/vendors, traffic police.
- **Key Findings:**

1. Peak-hour flow dominated by two-wheelers (~36%), autos (~23%) and cars (~20%).
2. Delays caused mainly by geometric inefficiencies and unmanaged turning movements.
3. No zebra crossings, refuges, or designated waiting areas.
4. Unsafe crossings near bus stops and roadside markets.
5. Poor or non-functional signals.

6. No signage or lane markings at key points.
7. On-street parking and vending narrowing lanes.
8. Poor drainage causing waterlogging and surface damage.

Road Safety Audit (RSA) Findings

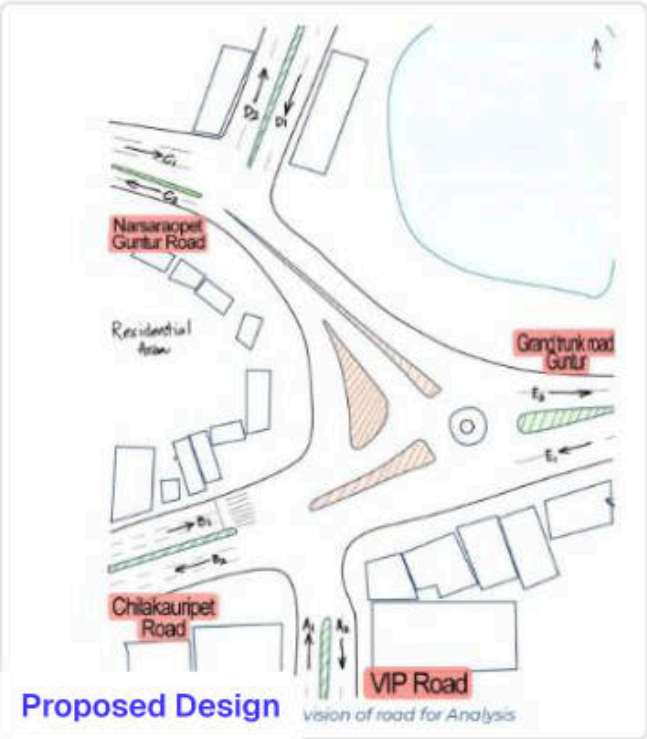
- Non-functioning or poorly coordinated traffic signals.
- Absence of zebra crossings & footpaths.
- Unchannelized turning movements increasing collision risks.
- Encroachments and debris on road edges.
- Unmanaged bus stopping zones.
- Electric poles within roadway clearance.
- Drainage deficiencies impacting safety during rains.

Lack of Zebra Crossing

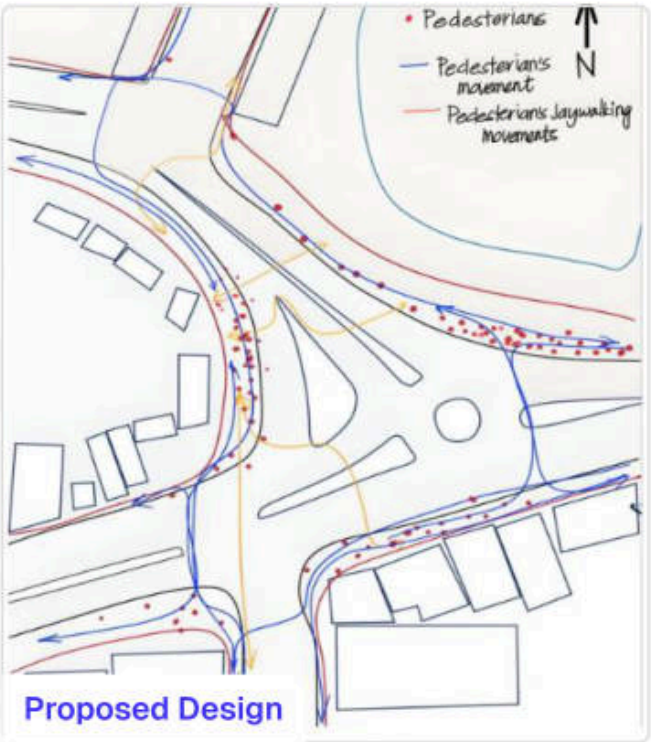
Non-functional Traffic Signals

Proposed Solutions

- Install new traffic signal systems with marked stop lines and lane markings.
- Provide 4 zebra crossings (2.0 m width) with kerb ramps and pedestrian waiting/refuge zones.
- Develop 3 designated bus bays (IRC-standard geometry) to prevent lane blocking.
- Create organized parking areas, remove encroachments and debris, relocate utility poles, and improve drainage.
- Install directional information boards and regulatory signage.



Proposed Design



Proposed Design

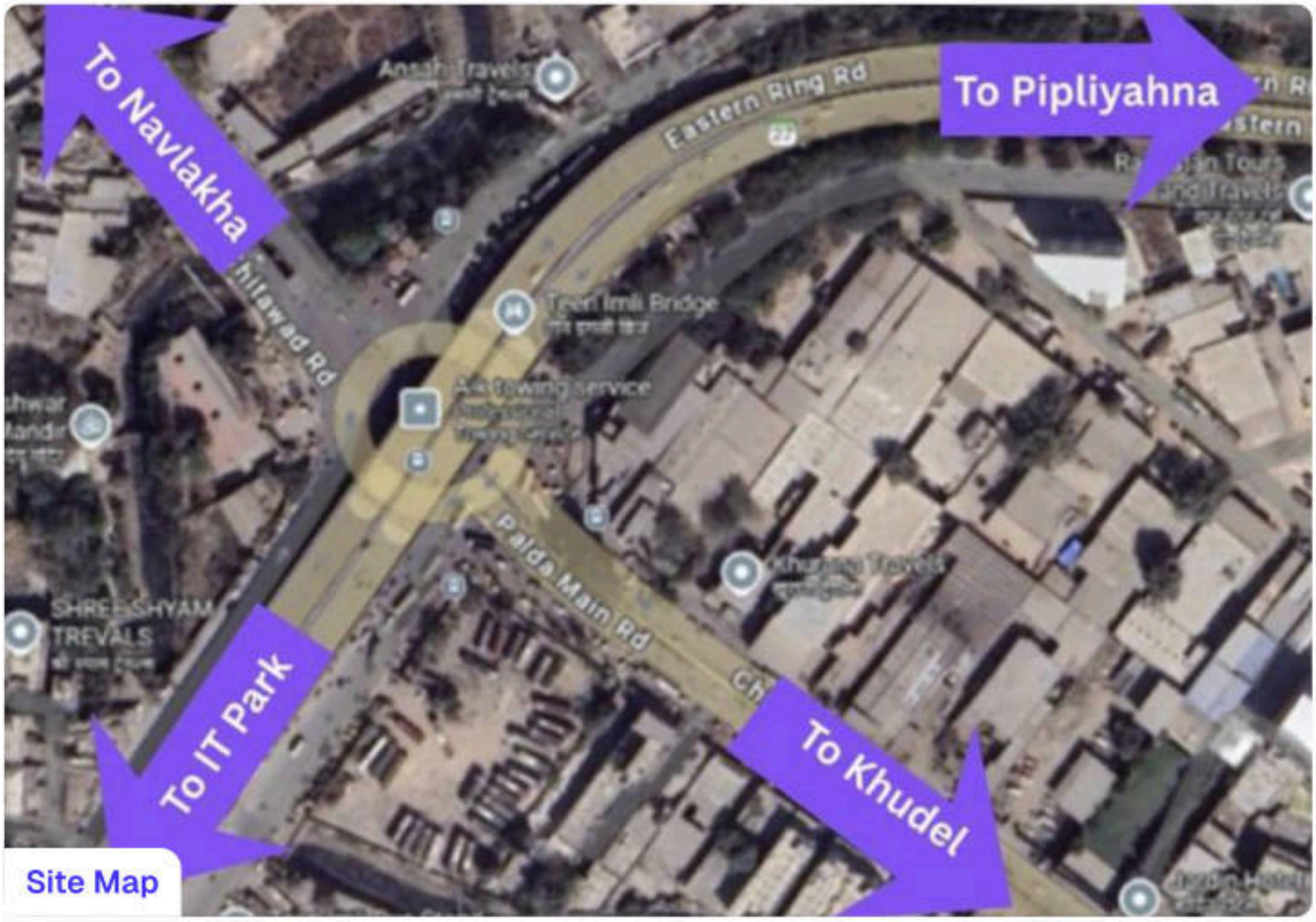
Expected Impact & Beneficiaries

- Reduced pedestrian and side-impact crashes, smoother traffic flow, shorter peak-hour delays, safer bus boarding, improved parking regulation, and long-term congestion relief.
- Pedestrians, local residents, daily commuters, two-wheeler users, bus/auto/goods-vehicle operators, shopkeepers, traffic police, and city authorities.

TEAM NATIONPATH

Site Location – Teen Imli Square, Indore, Madhya Pradesh

Teen Imli Square is a designated high-risk black spot with severe road surface degradation, absence of zebra crossings and lane markings, poor lighting, unmanaged bus and auto stopping, illegal roadside parking, and no signal control. Crash data confirms 9 fatal accidents between 2021–2024, highlighting its critical safety risk. Vulnerable users—school children and elderly pedestrians—face daily exposure due to missing footpaths and unsafe crossings. Recent monsoons have worsened potholes and pavement conditions.



Site Map

Stakeholder Survey

- **Total Respondents:** 50
- **Stakeholder category:** Pedestrians, commuters, two-wheeler riders, auto & bus drivers, shopkeepers, traffic police.

- **Key Findings:**

1. Unsignalized, chaotic mixed traffic movements.
2. Buses halt on the carriageway causing blockage and conflicts.
3. Lane indiscipline and illegal parking near approaches.
4. No zebra crossings or refuge areas.
5. Severe potholes and damaged pavement.
6. Absence of regulatory and warning signage.
7. No functional traffic signals and poor night visibility.

Road Safety Audit (RSA) Findings

- Missing signals and lane markings.
- Road surface failure increases skid risk.
- Bus and auto stopping within traffic lanes.
- Encroachments and informal stalls obstructing flow.

No Markings And Signage

No Crossings And Traffic Signals

Uneven road surface

Proposed Solutions

- High-visibility zebra crossings.
- Speed breakers / rumble strips on approaches.
- Vehicle-actuated (smart) traffic signals.
- Stop lines and thermoplastic lane markings.
- Off-carriageway bus & auto bays to enable organized boarding.
- Comprehensive resurfacing & pothole repair.
- Removal of illegal parking near junction.
- Installation of mandatory and cautionary road signage.

Expected Impact & Beneficiaries

- Significant reduction in pedestrian–vehicle conflicts, improved peak-hour traffic flow, safer bus operations, better lane discipline, and strong economic returns from smart signal upgrades.
- Pedestrians, school children, daily commuters, two-wheeler riders, bus and auto drivers, nearby shops/vendors, traffic police, and the Indore Municipal Corporation.

TEAM VISION ZERO SQUAD

Site Location – Bhatta Sahib & Sukhrampur Tapprian Road Stretches, NH-205 Corridor

The Bhatta Sahib–Sukhrampur Tapprian stretch faces persistent safety risks due to speeding, unsafe pedestrian movement, poor visibility at blind intersections, and inadequate lighting, conditions that frequently lead to near-misses and crashes. These risks are further reflected in multiple documented incidents, including a fatal car crash involving a 25-year-old, injuries to a pedestrian and an elderly person, and another collision near the Gurdwara resulting in several hospitalizations. This corridor remains a high-concern zone requiring immediate safety interventions.

Site Map

Stakeholder Survey

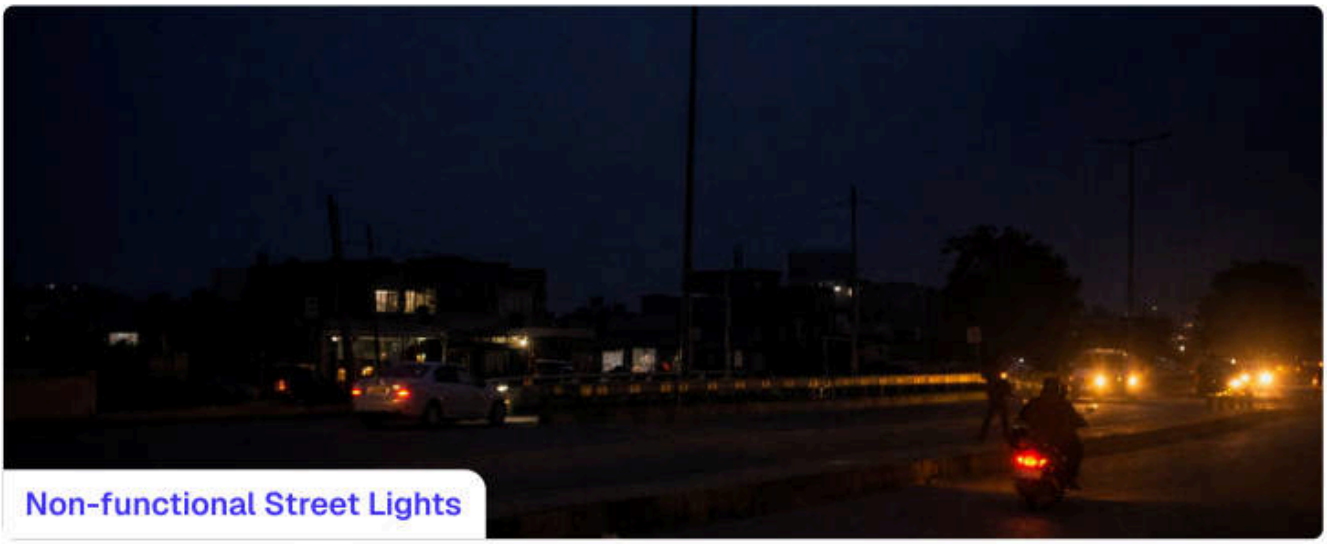
- **Total Respondents:** 32
- **Stakeholder category:** Pedestrians (students & staff), two-wheeler riders, car drivers, bus users, shopkeepers, traffic police.
- **Key Findings:**

1. Very high speeding complaints (96.9% respondents).
2. Frequent sudden turns and blind-spot conflicts (87.5% respondents).

3. No designated safe crossings at key desire lines.
4. High reliance on unsafe jaywalking (96.9% respondents).
5. Poor street lighting at several locations (62.5%).
6. Lack of visibility aids such as mirrors at blind intersections.
7. No road markings or channelization at Sukhrampur Tapprian.

Road Safety Audit (RSA) Findings

- No formal pedestrian crossing facilities along key pedestrian paths.
- Hazardous blind intersections without visibility support.
- Poorly lit road segments, making night travel unsafe.
- Missing or unclear lane markings leading to turning conflicts.

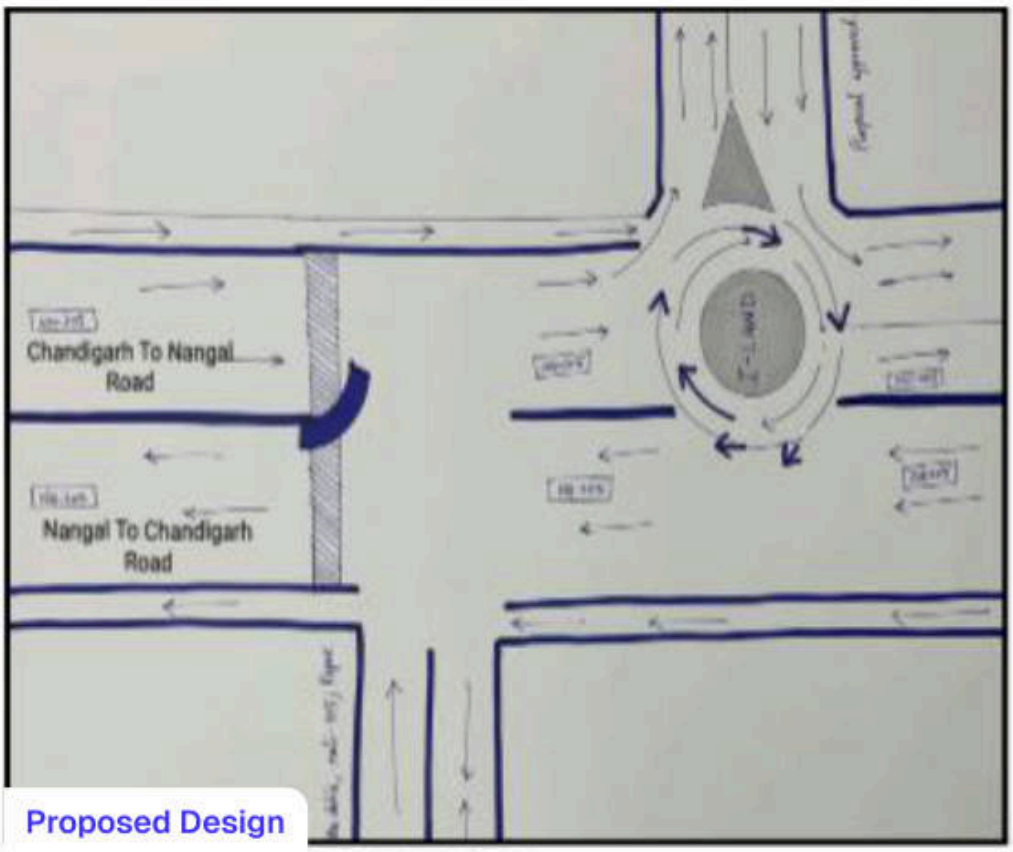


Non-functional Street Lights

Faded Zebra Crossing

Proposed Solutions

- 3D-painted optical crosswalks at two high-risk pedestrian spots to slow vehicles and create safer crossing zones.
- Convex safety mirrors at the blind intersection to improve sight distance.
- Street lighting upgrade with energy-efficient LEDs to eliminate dark patches and enhance night-time safety.
- Thermoplastic lane markings, edge lines, centerlines, stop lines, and zebra crossings.
- Painted traffic island with flexible bollards to guide turning movements and prevent chaotic flow.
- Turn arrows and STOP/GIVE WAY markings for clear driver guidance.



Proposed Design

Expected Impact & Beneficiaries

- The proposed interventions are expected to deliver significant improvements in pedestrian safety, visibility, and traffic discipline, particularly by reducing conflict points, better managing speeds, and improving nighttime travel conditions.
- Enhanced markings, structured turning flows, and improved lighting will create a more predictable, safer environment for all corridor users.

TEAM ZODIAC

Site Location – Sardar Patel Road Corridor (IIT Madras Gate – CLRI Gate), Adyar, Chennai

The corridor has a complete absence of pedestrian infrastructure despite extremely high demand (~7,000 crossings per peak hour). An estimated 3–4 minor crashes occur every day, as stated in the executive summary, underscoring the severity of safety risks. Blocked U-turns at IITM Gate and Madhya Kailash force detours of more than 2.5 km and trigger dangerous two-wheeler contraflow, creating head-on collision hazards. Ongoing metro construction has introduced poor barricading, inadequate lighting, lane narrowing, and footpath blockages, making night-time conditions especially unsafe. Peak-hour congestion is severe (V/C ≈ 1.29), and perceived safety remains very low (2.2/5).

Site Map

Stakeholder Survey

- **Total Respondents:** 35
- **Stakeholder category:** Pedestrians (50%), two-wheeler riders (60%+ traffic share), car drivers, bus users, institutional staff & students.
- **Key Findings:**

1. Contraflow from blocked U-turns is a major crash risk.
2. Severe congestion and long detours increase driver frustration.
3. No zebra crossings or pedestrian signals.
4. 65% report unsafe crossing conditions.
5. Inadequate work-zone barricading.
6. Poor night lighting and blocked footpaths.

Road Safety Audit (RSA) Findings

- No pedestrian crossing facilities.
- Hazardous contraflow operations.
- Poor construction-zone management.
- Low visibility and missing signage.

Lack Of Signage

Encroached Footpath

Encroachments

Poor Condition Of Roads

Proposed Solutions

- 4-m wide zebra crossings at CLRI Gate, Madhya Kailash Bus Stop (both sides) and Anna University.
- Signalized pedestrian crossings with countdown timers.
- Refuge islands and guard rails.
- Restore IITM Gate U-turn with marked bays and advance signage.
- Flexible delineators & CCTV to eliminate contraflow.
- Rumble strips and speed breakers to maintain sub-25 km/h speeds near crossings.
- IRC-compliant barricades and channelizing devices.
- Barrier-separated pedestrian walkway.
- Solar LED lighting and warning beacons.
- Grade-separated skywalks at IITM, CLRI and Anna University with metro integration.

Expected Impact & Beneficiaries

- Significant reduction in pedestrian conflicts and overall crashes, along with safer, more predictable movement through removal of contraflow risks, smoother traffic flow, and improved night-time visibility.
- Pedestrians, daily commuters, nearby institutions, and local authorities—all gaining a safer, more accessible, and reliable corridor.

TEAM CRASH CRACKERS

Site Location – Bhagwanpur – Lanka Trauma Centre T-Junction, Varanasi, Uttar Pradesh

The T-junction experiences frequent safety risks caused by encroached footpaths, non-functional street lighting, uncontrolled merging, poor pavement condition, missing rumble strips, and unsafe pedestrian behaviour. Absence of speed control and organized signal operation leads to congestion and unpredictable vehicle movements, increasing conflicts between vehicles and pedestrians, especially at night and during peak hours.

Site Map

Stakeholder Survey

- **Total Respondents:** 33
- **Stakeholder category:** Pedestrians, two-wheeler riders, auto drivers, car users, local commuters.
- **Key Findings:**

1. Heavy turning movements at T-junction.
2. Merging conflicts drive congestion and delays.
3. Footpaths encroached or unavailable causing high pedestrian exposure.
4. No dedicated crossing points.
5. Poor road condition and potholes.
6. Inadequate or non-working street lights.
7. Lack of rumble strips and speed calming features.

Road Safety Audit (RSA) Findings

- Unsafe merging at the junction.
- Poor lighting reducing night-time visibility.
- Road surface defects.
- No speed management or lane guidance.
- Lack of pedestrian safety facilities.

Poor Management Of Congestion

Mismanagement

Encroached Footpath

Proposed Solutions

- Signal design using Webster Method to regulate three-phase movements and reduce conflicts.
- Continuous rumble strips on approaches.
- Speed limit signage and speed-camera enforcement.
- Reflective road studs (cat's eyes).
- Thermoplastic lane and crossing markings.
- Immediate pothole repair and resurfacing.
- Installation of LED street lighting to remove dark spots.

Expected Impact & Beneficiaries

- Significant reduction in vehicle-merging conflicts and peak-hour delays, improved night-time visibility, lower speeding through better compliance, and a smoother, more predictable traffic environment. Pedestrian safety will also be strengthened across the corridor.
- Pedestrians, local residents, two-wheeler riders, car users, auto drivers, and daily commuters—all experiencing safer, more orderly, and more efficient travel.

8. The Case for Scaling Project Rakshak

Project Rakshak demonstrates the potential of structured, youth-led engagement to strengthen road safety governance by making local risk conditions more visible, evidence-driven, and actionable. While the current phase focuses on identification, analysis, and solution design, the programme offers clear insights into where and how such a model can be scaled effectively within India's road safety ecosystem.

This section outlines the conditions under which Project Rakshak is most effective, the institutional enablers required for scale, and pathways for integration into formal road safety systems at district and state levels.

Where the Model Is Most Effective

Project Rakshak is particularly effective in contexts where road safety challenges are shaped by micro-level design gaps, mixed land use, and complex behavioural interactions that are not always captured through aggregate crash statistics alone. These include:

- Urban intersections and mixed-use corridors with high pedestrian and non-motorised traffic exposure
- High-speed peri-urban and highway stretches where access control and vulnerable road-user safety remain weak
- Institutional zones around schools, colleges, hospitals, and markets with time-bound surges in risk
- Locations with recurring minor crashes, near-misses, or community-reported hazards that may not yet be formally classified as blackspots

In such settings, structured youth-led audits and stakeholder engagement can surface granular risk patterns, contextual constraints, and locally feasible solutions that complement formal engineering and enforcement processes.

8.1 Conditions Required for Scaling

For Project Rakshak to scale sustainably and retain its effectiveness, several enabling conditions are critical:

- Institutional Anchoring: Clear alignment with district or state road safety priorities ensures that youth-generated evidence feeds into existing decision cycles rather than operating as a standalone exercise.

- Standardised Methodology: Use of nationally aligned audit tools, reporting formats, and review checkpoints is essential to maintain quality and comparability across geographies.
- Expert Oversight and Mentorship: Technical guidance from traffic engineering, planning, and enforcement experts remains central to ensuring that outputs are credible and implementable.
- Defined Review Pathways: Clear mechanisms for submission, review, and feedback from authorities help translate findings into actionable inputs rather than one-off reports.
- Capacity and Continuity: Embedding the programme within academic calendars, district initiatives, or youth development platforms supports continuity beyond individual cohorts.

Without these conditions, scale risks diluting quality or creating parallel reporting streams that are difficult for authorities to absorb.

8.2 Role of District and State Authorities

District and state authorities play a pivotal role in enabling scale by positioning Project Rakshak as a complementary evidence-generation and civic engagement mechanism. Their role includes:

- Endorsing priority geographies or themes aligned with district road safety plans
- Integrating Rakshak outputs into Road Safety Committee reviews, blackspot assessments, and vulnerability mapping exercises
- Facilitating access to non-sensitive data, site visits, and stakeholder interfaces where appropriate
- Providing structured feedback that helps refine future cohorts and improve solution feasibility

When embedded within district- or state-led road safety initiatives, Project Rakshak can strengthen community participation while reducing the burden on administrative systems to generate micro-level insights independently.

8.3 Integration into Formal Road Safety Systems

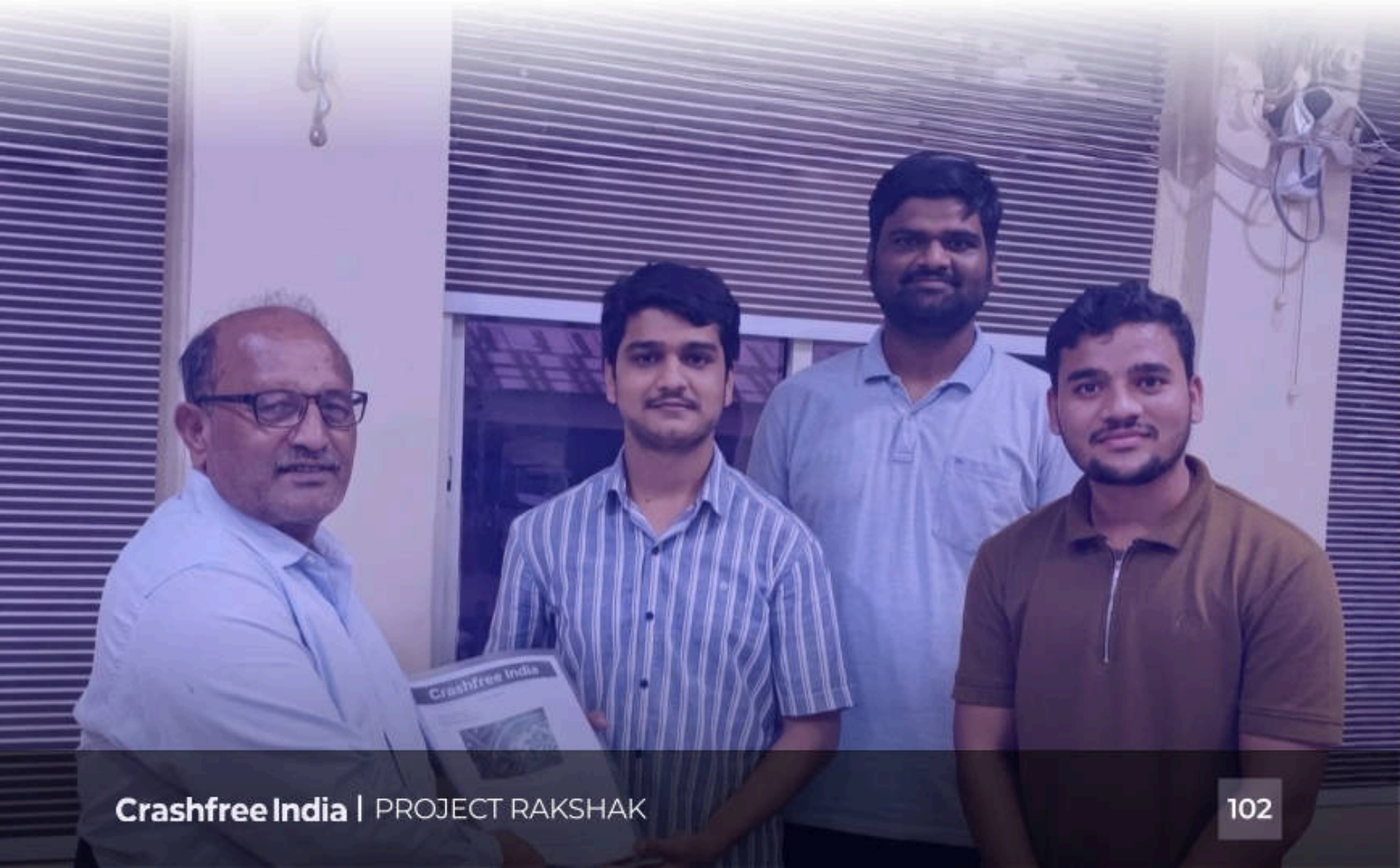
Project Rakshak is best positioned not as a replacement for formal planning, engineering, or enforcement functions, but as a feeder mechanism that strengthens them. Potential integration pathways include:

- Using Rakshak audits as preliminary screening inputs for blackspot identification and safety improvement programmes
- Aligning youth-led assessments with district vulnerability mapping and Safe City initiatives
- Incorporating selected outputs into municipal mobility plans, traffic management reviews, or enforcement planning discussions
- Leveraging the programme as a structured civic engagement module under state road safety policies or youth development schemes

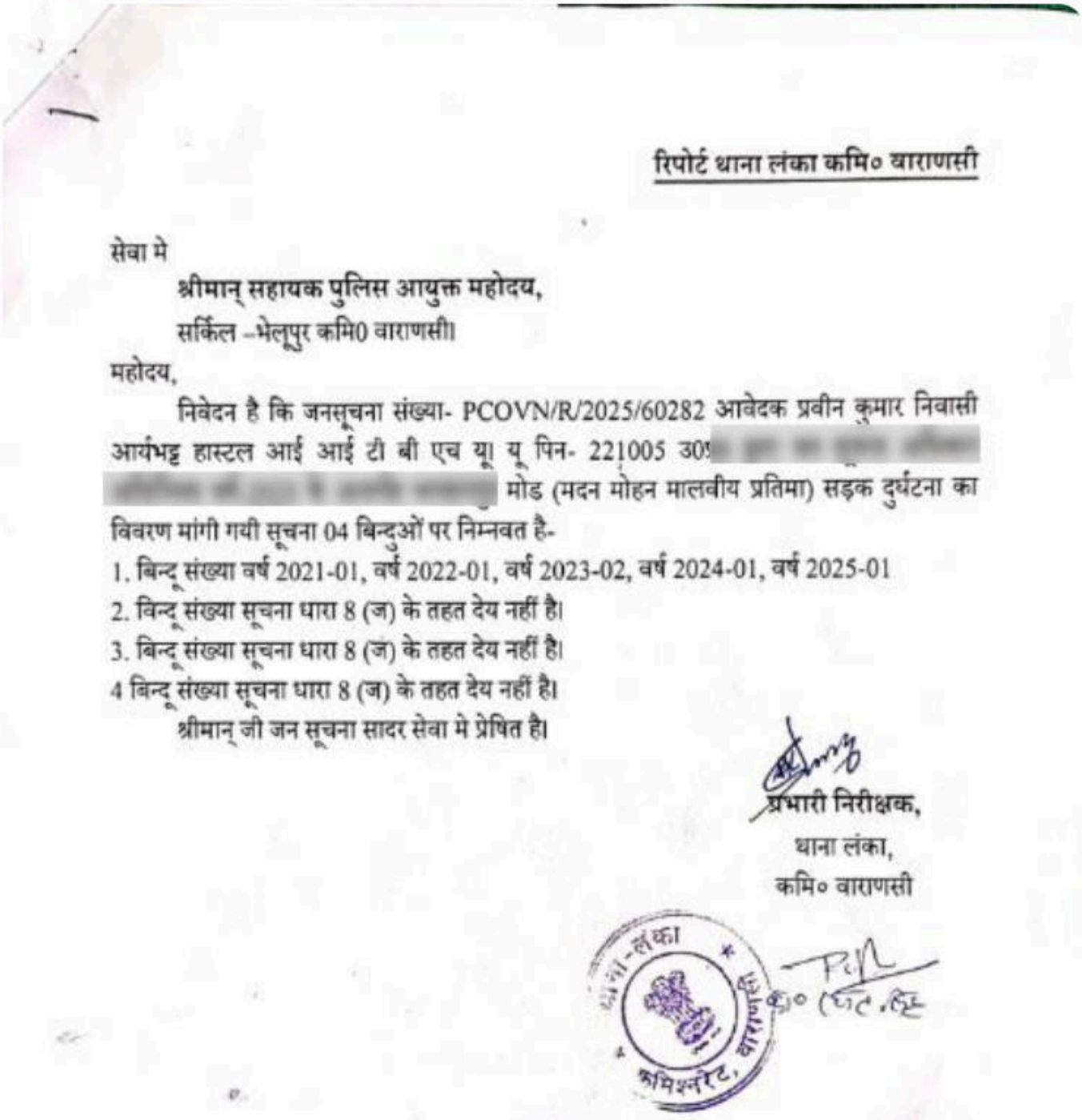
Over time, such integration can help institutionalise community-informed evidence use, improve responsiveness to local risk conditions, and strengthen trust between citizens and road safety authorities.

Looking Ahead

As road safety challenges grow more complex, the ability to detect, interpret, and respond to localised risks becomes increasingly important. Project Rakshak offers a scalable pathway to do this by combining youth engagement, technical rigour, and governance alignment. With appropriate institutional support, the model has the potential to evolve from a cohort-based initiative into a sustained component of India's road safety governance framework.



9. Annexures



रिपोर्ट थाना लंका कमि० वाराणसी

सेवा मे

श्रीमान् सहायक पुलिस आयुक्त महोदय,

सर्किल –भेलूपुर कमि0 वाराणसी।

महोदय,

निवेदन है कि जनसूचना संख्या- PCOVN/R/2025/60282 आवेदक प्रवीन कुमार निवासी आर्यभट्ट हास्टल आई आई टी बी एच यू यू पिन- 221005 30[redacted] मोड (मदन मोहन मालवीय प्रतिमा) सड़क दुर्घटना का विवरण मांगी गयी सूचना 04 बिन्दुओं पर निम्नवत है-

1. बिन्दू संख्या वर्ष 2021-01, वर्ष 2022-01, वर्ष 2023-02, वर्ष 2024-01, वर्ष 2025-01
2. बिन्दू संख्या सूचना धारा 8 (ज) के तहत देय नहीं है।
3. बिन्दू संख्या सूचना धारा 8 (ज) के तहत देय नहीं है।
4 बिन्दू संख्या सूचना धारा 8 (ज) के तहत देय नहीं है।

श्रीमान् जी जन सूचना सादर सेवा मे प्रेषित है।

प्रभारी निरीक्षक,
थाना लंका,
कमि० वाराणसी

ACCIDENT REPORT
NATIONAL HIGHWAYS AUTHORITY OF INDIA
RO-Chandigarh, (01-January-2020 to 31-December-2024)

Sl. No	Name of Project (Full Details)	Date	NH NO.	Time of Accident (AM/PM)	A Accident Location	B Nature of Accident	C Classification of Accident	D Causes	E Road Feature	F Road Condition	G Intersection Type And control	H Weather Responsible	Vehicle Responsible	No of affected Person: Fatal	Grevious	Minor	Non Injured	No of animals killed if any	Help provided by Ambulance/ Patrol Vehicle	Remarks
1	2	3	4		6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	BSC C AND C KURALI TOLL ROAD LTD Toll Plaza Behrampur, Ropar - 140108, Punjab Kurali - Kiratpur, (28+600 to 73+200)	11-Jan-20	New NH-205 (Old NH -21)	09:30AM	40+200 LHS	1	4	2	4	1	0	1	One Unknown no tractor trally suddenly applied break and same time same lane one c.t.d bus no [redacted] coming and hit to tractor trally from rear end.	NIL	NIL	NIL	NIL	NIL	Ambulance & Recovery	
2		15-Aug-20		07:45AM	39+950 RHS	1	4	2	4	1	0	1	One motor cyclist skid on the raod near bhatta sahib Gurudwara	Nil	Nil	1	Nil	Nil	Patrolling Team & Ambulance	
3		17-Oct-20		10:35PM	40+200 LHS	1	0	2	4	1	0	1	An overspeed swift car no [redacted] out of control hit swarj mazda tempo no [redacted] left side center rear tyre	NIL	NIL	NIL	NIL	NIL	Patrolling Team	
4		24-Jan-21		04:30 AM	40+280 LHS	1	4	3	4	1	0	1	An overspeed car no. [redacted] out of control hit the truck rear end and truck runaway.	NIL	NIL	3	NIL	NIL	Ambulance, & Recovery	
5		10-Jun-21		3:45 PM	39+600 LHS	2	3	4	4	1	0	1	One auto three wheeler wrong side coming and same lane one canter no. [redacted] caming and head collision.	NIL	NIL	2	NIL	NIL	Ambulance & Recovery	
6		23-Apr-22		07:30 PM	40+400 RHS	1	1	2	4	1	0	1	An overspeed car nr. [redacted] out of control hit truck nr. [redacted] rear end.	Nil	Nil	1	Nil	Nil	Patrolling, Ambulance & Recovery	
7		10-Jan-23		12:20 AM	40+200 LHS	1	3	1	4	1	1	2	An overspeed cemented tanker nr. [redacted] out of control and turn around there.	NIL	NIL	1	NIL	NIL	Patrolling Team, Ambulance, Recovery Team	
8		27-Oct-23		05:10 AM	40+200 LHS	1	3	2	4	1	1	1	One long cemented tanker no. [redacted] is turnover RHS side To LHS side	NIL	NIL	NIL	NIL	NIL	Patrolling Team	
9		8-Jun-24		10:10 PM	39+030 LHS	1	0	2	4	1	1	1	One fortuner car no. [redacted] on the way to LHS side and same time same lane one unknown no. tipper came and hit fortuner car from rear end and unknown no tipper runaway.	NIL	NIL	NIL	NIL	NIL	Patrolling	
Total:														0	0	8	0	0		

Approval Letters

TO WHOM IT MAY CONCERN

This is to certify that the Report submitted under Project Rakshak, an initiative by Crashfree India, prepared by the student team Visioneers (IIT Indore), has been duly reviewed by this office.

The report presents a comprehensive assessment of Tejaji Nagar Junction, a high-risk location on the Agra–Mumbai Highway (NH-52) and the Indore–Khandwa Road, identified for recurring crashes, pedestrian vulnerability, and unsafe traffic movement. The team has conducted systematic field observations, traffic volume counts, pedestrian studies, stakeholder consultations, and an evidence-based road safety audit.

Based on the review of the findings and recommendations, the proposed interventions are found to be practical, relevant, and aligned with road safety improvement priorities. Accordingly, the following measures are approved in principle for further action, feasibility assessment, and implementation planning:

Approved Interventions for Tejaji Nagar Junction:

- Installation of a traffic signal at the junction
- Marked pedestrian crossings and refuge island
- Speed calming measures, including rumble strips / speed breakers
- Improvement of road surface conditions
- Installation of adequate street lighting, including under the overbridge
- Placement of regulatory, warning, and directional signage
- Footpath construction and pedestrian channelization

This office acknowledges the contribution of the student team and appreciates their efforts toward strengthening road safety. The recommendations will be taken up with the relevant departments for necessary action and coordination as required.

Approved and issued for official use.

Rohit
उपयंत्री
शाखा प्रकोष्ठ
नगर पालिक निगम, [illegible]

कार्यालय मुख्य अभियंता
OFFICE OF CHIEF ENGINEER
उत्तरी अंचल(एम.) लोक निर्माण विभाग
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5th Floor, M.S.O. Building,
इन्द्रप्रस्थ एस्टेट, नईदिल्ली–110002
I.P. Estate, New Delhi -110002
Ph.:011-23325022,23319952
email:cepwddelhimzm3@gmail.com

To whom my concern

विषय:- **Acknowledgement of Presentation and Proposed Road Safety Solutions for pedestrians**

This is to acknowledge that the PWD, GNCTD, has reviewed the presentation and final report submitted by Team Zoro Collision (members: Bhavishya Kuamr Singh & Saubhagya Prakash) regarding the road safety assessment for pedestrians of the IIT Delhi – Outer Ring Road corridor under Project Rakshak.

The department appreciated the team's efforts in identifying key issues on the stretch and proposing practical, implementable solutions based on field observations and stakeholder inputs. The recommendations presented are noted to be relevant and technically sound.

PWD confirms that these suggestions will be taken into consideration during future planning and implementation of improvement works the corridor, subject to technical feasibility and departmental procedures.

We appreciate the contribution of Team Zero Collision and wish the members success in their future endeavours.

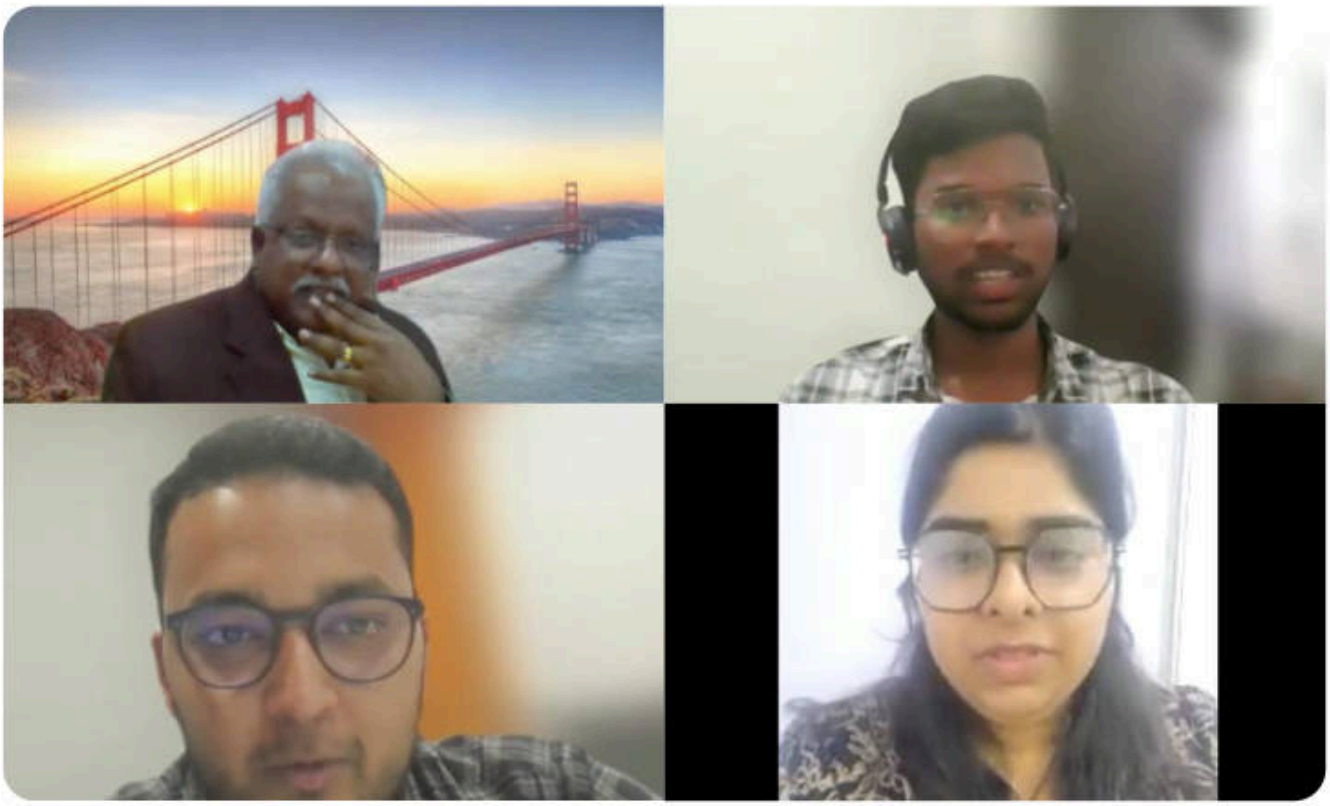
कार्यपालक अभियंता (यो)
उत्तरी अंचल (एम०), लो०नि०वि०

Expert Session With

- **Dr. Geetam Tiwari** (Chair, TRIPC, IIT Delhi)
- **Amar Srivastava** (President, IRSC)
- **Gajendra Jangid** (Managing Trustee, Crashfree India)
- **Dr. Richa Ahuja** (Asst. Prof., IIT KGP)

Expert Session With

- **Dr. S. Velmurugan** (Head, Traffic Engineering & Safety, CSIR–CRRI)
- **V. Sai Vikas** (ex-Intern, Indian Road Safety Council)
- **Dr. Richa Ahuja** (Asst. Prof., IIT KGP)



Teams Engaging With Local Authorities

Team Planner Loki (SPA Delhi)
Working on IT Park Chowk, Dehradun and met with Executive Engineer, PWD

Team Visioneers (IIT Indore)
Working on Tejaji Nagar Junction, Indore and met with the Upper Collector

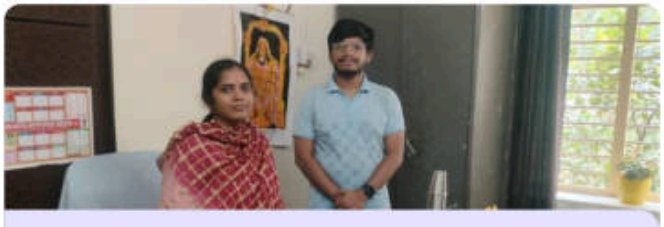
Team Vision Zero Squad & Tangerine (IIT Ropar)
Working on Surjit Chowk & Chandigarh–Nangal Road and met with PWD

Team NationPath
Working on Teen Imli Square, Indore and met with Nagar Nigam Palika

Team Zero Collision
Working on Outer ring road, IIT Delhi, and met with PWD

Team Suraksha
Working on Gandhi More, Durgapur, West Bengal and met with ADDA

Team Tratah
Working on AEC Road Turn at Jalukbari, Guwahati, Assam and met with ADDA



Team Shaunak
Working on Krishnalanka, Vijayawada, Andhra Pradesh and met with R&B National Highways

Crashfree India

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