



Safe School Zone Initiatives through SR4S in Nepal (through ADB Funded Project RCIP-AF)

Hemant Tiwari
Senior Transport Officer
Asian Development Bank



NATIONAL STATISTICS

POPULATION: 29.6 MILLION

AREA: 147,516 SQ.KM.

VEHICLE POPULATION = 5 MILLION

Road traffic injury fact sheet for the last ten years (2072/73 - 2081/82)

At a glance



180474
Crashes



287402
Vehicles involved



24648
Fatalities

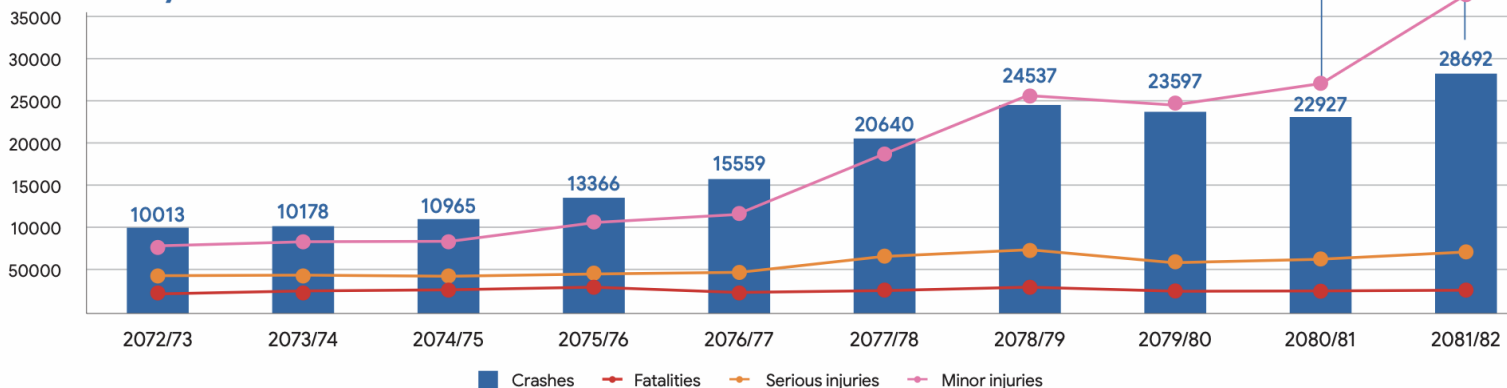


54180
Serious injuries



178798
Minor injuries

Trend analysis



NATIONAL STATISTICS

CHILDREN INVOLVED IN ROAD CRASH

— IN LAST FISCAL YEAR —



TOTAL CHILDREN AFFECTED

5,324

in road crashes



200

DEATH



805

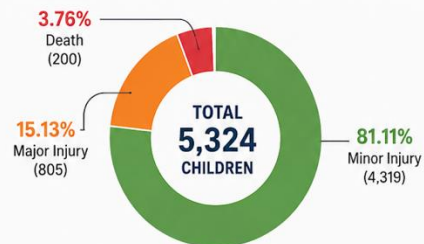
MAJOR INJURY



4,319

MINOR INJURY

BREAKDOWN OF INJURIES



Every number
represents a child.

Let's work together for
safer roads and a
safer future.





- Developed by iRAP – rates pedestrian road safety from 0 to 5.9 stars (recent update)
- Vision: **world where children travel safely to and from school**
- Evaluates based on: Road geometry, Pedestrian infrastructure, Traffic volume & speed Safety features
- 3+ stars considered acceptable safety level.



Impacts of SR4S

**515,305**

students made safer by upgrades

**2,475**

schools

**84**

countries

**8,955**

partners trained

**USD\$11.7 million**

invested

**420**

upgrades Star Rated

**as of December 2025*

METHODOLOGY

SR4S Checklists

- Location
- Road Environment
- Road Type
- Road features
- School Zone
- Sidewalks
- Pedestrian Crossing Type
- Traffic Flow
- Intersection details
- Speed



iRAP Star Rating Methodology



0.9-1-Star Road: Highest Risk — Immediate action required



2-Star Road: High Risk — Significant improvements needed



3-Star Road: Medium Risk — Moderate improvements needed



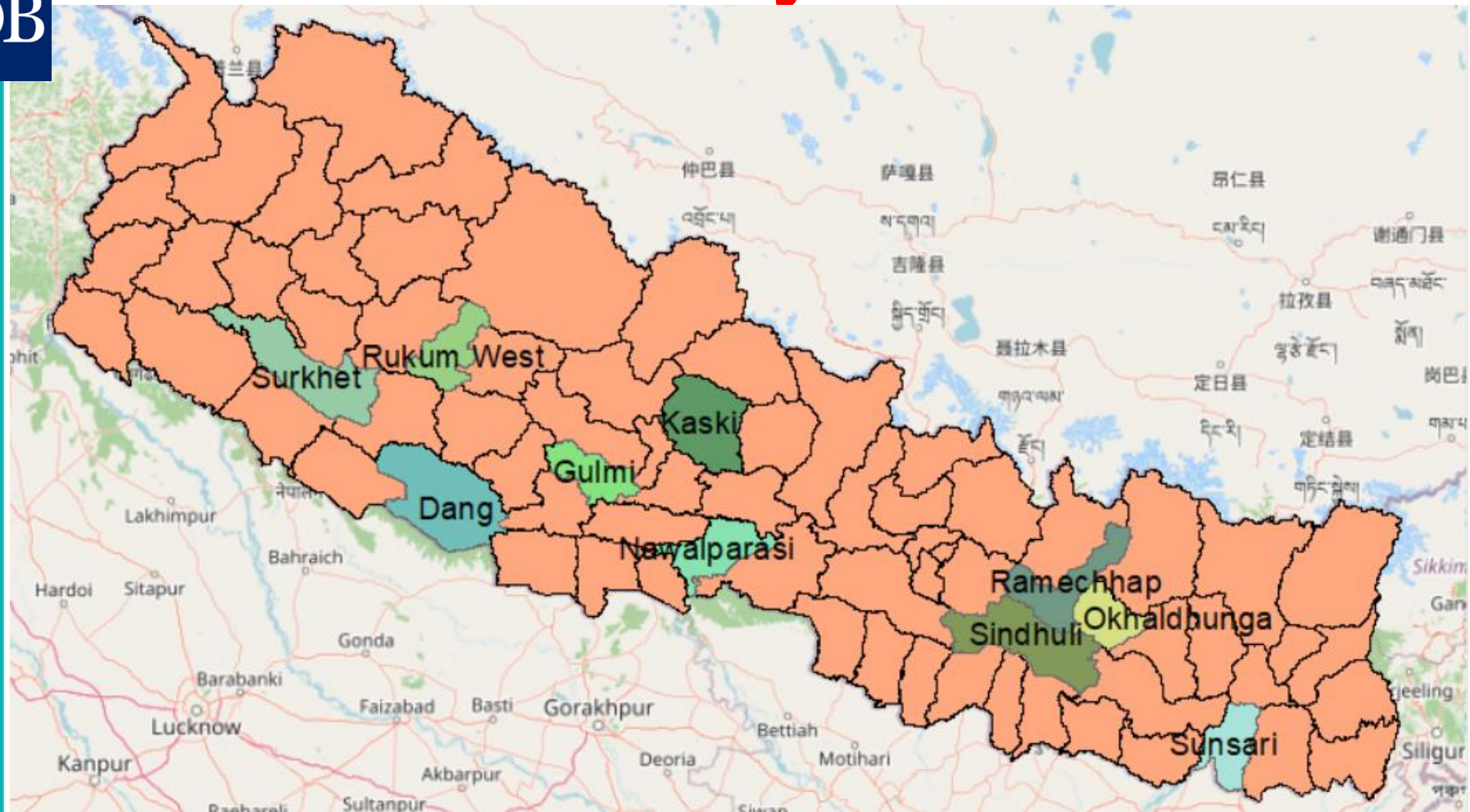
4-Star Road: Lower Risk — Minor improvements beneficial



5-5.9-Star Road: Lowest Risk — Best practice road

A higher star rating = safer road infrastructure for all road users, especially vulnerable school children.

Study Area





Key Statistics at a Glance



14

Schools Assessed



10

Districts Covered



5,507

Students Benifited



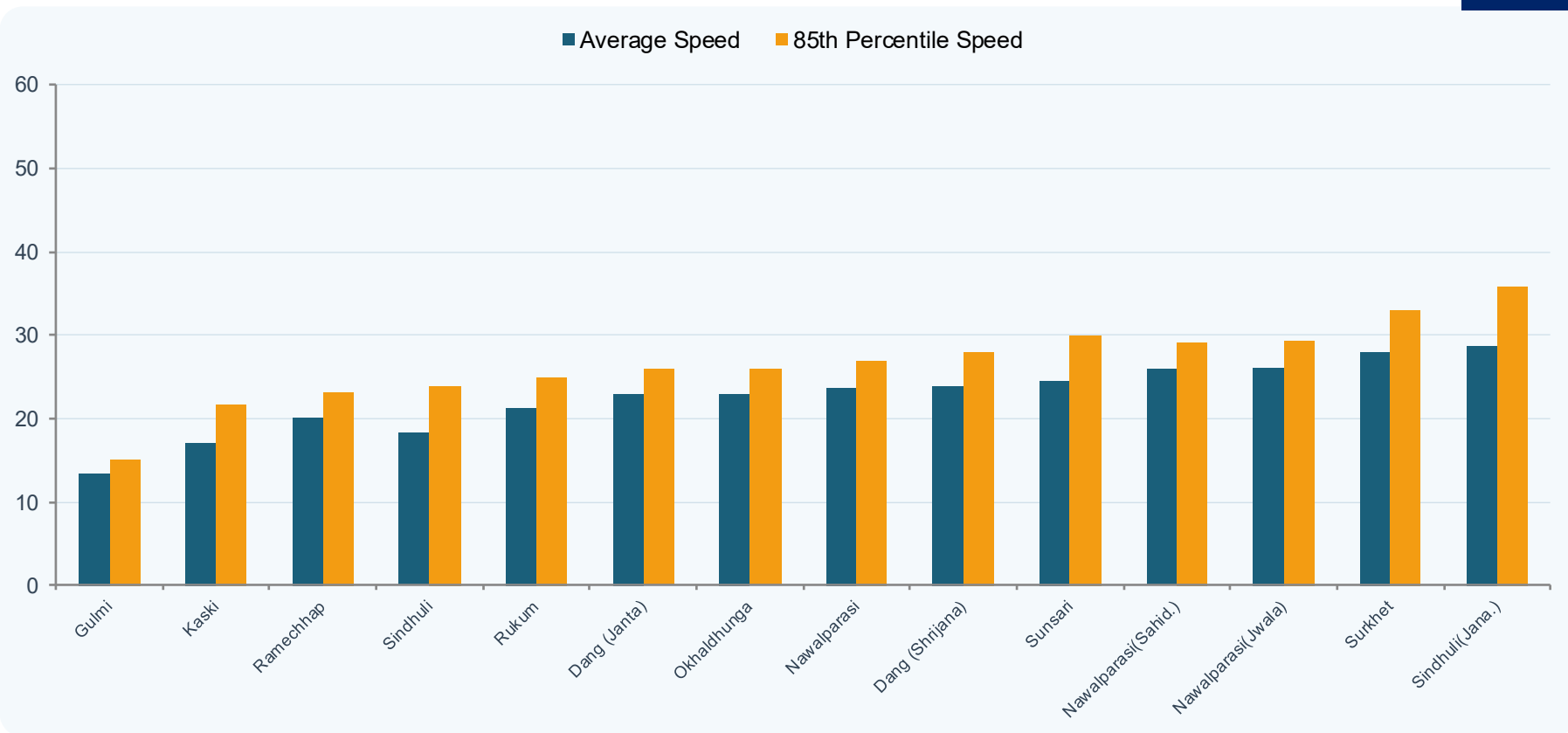
21.8

km/h Avg Speed (Overall)

756

Speed Survey

Average & 85th Percentile Speed by Location (km/h)



* 85th percentile speed is the speed at or below which 85% of vehicles travel — the international standard for road design.

Main Road vs. Access Road Speed Comparison



MAIN ROAD

Metric	Value
Sample (n)	66
Avg Speed	30.6 km/h
Median	30 km/h
85th Pct.	40.25 km/h
Min / Max	20 / 46 km/h

Jantasaheednagar (Highway)

n=75 · Avg: 46.8 km/h · 85th: 56 km/h · Max: 76 km/h



ACCESS ROADS

School zone access roads showed significantly lower speeds than highway sections, indicating better natural speed management in local areas.

Lowest Avg

Gulmi

13.4 km/h (Earthen Roads)

Median Avg

Across sites

~22 km/h

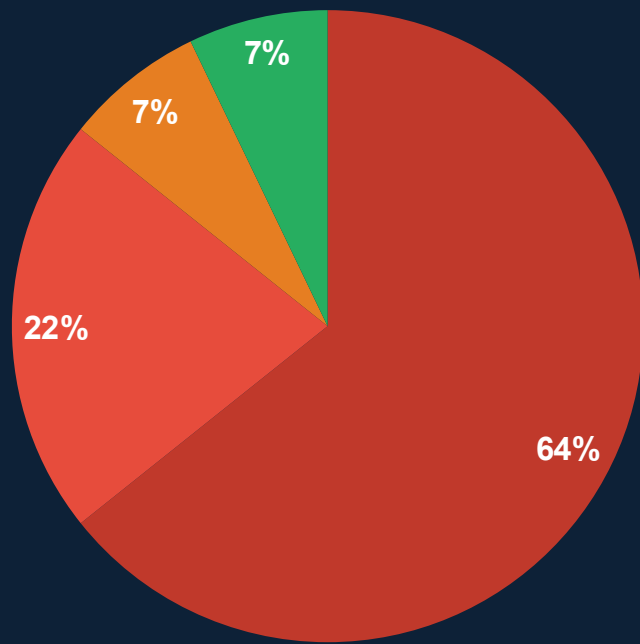
Highest Avg

Sindhuli

28.7 km/h (Gravel Roads)

Highway speeds 2–3× higher than access road schools

Baseline Risk Analysis



■ Critical (<2★) ■ High Risk (2-3★)
■ Medium (3-4★) ■ Lower Risk (4+★)

- ✓ 9 school(s) had CRITICAL rating below 2★
- ✓ 3 schools in high-risk zone (2-3★)
- ✓ 1 school(s) already at medium risk
- ✓ Only 1 school rated 4★+ initially
- ✓ 86% of schools needed urgent intervention
- ✓ Lowest initial rating: 0.7★ (Himalayan Janata)
- ✓ Highest initial rating: 5.3★ (Srijana Balbatika)

DPR Implemented



Road Signs

Some Basics Warning signs (Access road Ahead Warning sign)



Improved Pavement Condition

After the Upgradation of road, Skid resistance and pavement Condition to be improved



Shoulder

Road Shoulder at either side or both sides; Informal Pedestrian Walking.



Road Edge Delineation

Road Markings



No Action Required

2 Dang schools already met safety standards — no other interventions needed (B23, B25, A22, B3, Zebra Crossings All included in DPR)

School-by-School Summary (1/2)

School Name	Initial ★	After DPR★
Prithvi Narayan Higher Secondary School	1.1★	3.3★
B. P. Basic School	2.5★	3.8★
Baruneswar HSS	2.2★	4.1★
Deepjyoti Boarding School	3.7★	4.7★
Janata Sanskrit Secondary	2.5★	4★
Srijana Balbatika English School	5.3★	4.7★
Shree Janak Secondary School	1.9★	2.2★

School Name	Initial ★	After DPR★
Himalayan Janata Secondary	0.7★	3.3★
Janata Higher Secondary,	1.3★	2.7★
Jwala Secondary School	1.8★	4.8★
Janata Higher Secondary	1.3★	4.6★
Janajagriti Primary School	1.9★	3.6★
Kamalamai Higher Secondary	1.6★	2.3★
Shree Dahu Higher Secondary	1.8★	3.6★

Further Improvements Recommended



Road Signs

Warning signs, school zone markers, speed limit boards installed at all 12 intervention sites



Zebra Crossings

Pedestrian crossings marked at all 12 schools requiring improvements



Rumble Strips

Speed management devices installed at 5 schools to reduce approach speeds



Convex Mirrors

Installed at 2 high-risk areas in Surkhet and Sindhuli

Safety Interventions — What Was Done



12

Schools
Road Signs



12

Schools
Zebra Crossings



5

Schools
Rumble Strips



2

Schools
Convex Mirrors

2.55★

Avg Improvement

9

Schools 4★+

0

Still Below 3★

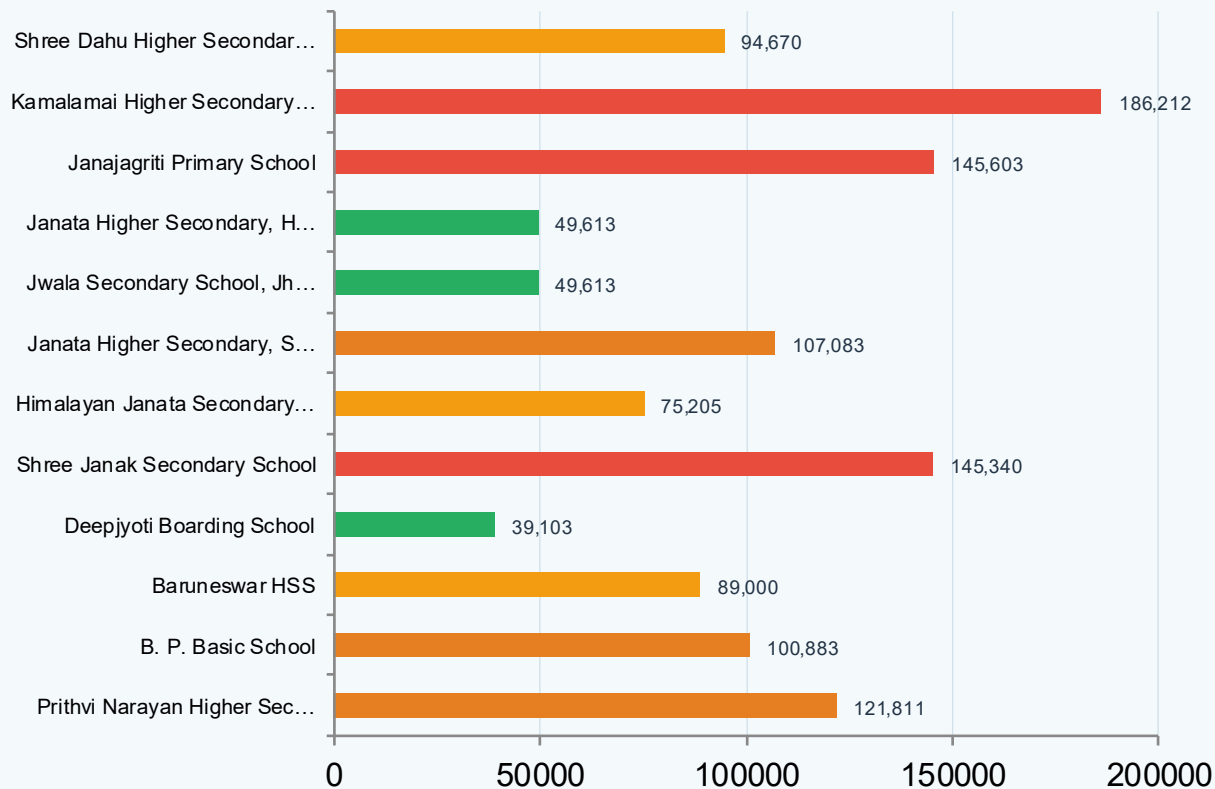
School-by-School Summary (1/2)

District	School Name	Students	Initial ★	After DPR★	Final ★	Cost (NPR)
Kaski	Prithvi Narayan Higher Secon...	161	1.1★	3.3★	4.9★	NPR 121,811
Sunsari	B. P. Basic School	116	2.5★	3.8★	4.5★	NPR 100,883
Okhaldhunga	Baruneswar HSS	698	2.2★	4.1★	4.6★	NPR 89,000
Gulmi	Deepjyoti Boarding School	135	3.7★	4.7★	4.8★	NPR 39,103
Dang	Janata Sanskrit Secondary Sc...	517	2.5★	4★	—	N/A
Dang	Srijana Balbatika English Se...	597	5.3★	4.7★	—	N/A
Surkhet	Shree Janak Secondary School	400	1.9★	2.2★	3.1★	NPR 145,340

School-by-School Summary (2/2)

District	School Name	Students	Initial ★	After DPR★	Final ★	Cost (NPR)
Rukum West	Himalayan Janata Secondary S...	551	0.7★	3.3★	3.9★	NPR 75,205
Nawalparasi	Janata Higher Secondary, Sah...	498	1.3★	2.7★	4.4★	NPR 107,083
Nawalparasi	Jwala Secondary School, Jhya...	250	1.8★	4.8★	5.1★	NPR 49,613
Nawalparasi	Janata Higher Secondary, Hup...	510	1.3★	4.6★	4.8★	NPR 49,613
Sindhuli	Janajagriti Primary School	209	1.9★	3.6★	4★	NPR 145,603
Sindhuli	Kamalamai Higher Secondary S...	345	1.6★	2.3★	3.5★	NPR 186,212
Ramechhap	Shree Dahu Higher	520	1.8★	3.6★	4.8★	NPR 94,670

Cost of Safety Interventions



2 schools (Dang) required no cost intervention — already met safety standards.

NPR 1,204,136

Total Investment

NPR 100,345

Avg per School

NPR 186,212

Highest Cost

NPR 39,103

Lowest Cost

Specific Case Studies

BP Basic school, Sunsari

Student Population: 110

Classes from : Nursery- class 8

Class Hours: 10:00-4:00

Peak Hour: 9:30-10:30





No School Warning: **Both Side**



Vehicles parked on road edge



Right: **Residential**

Street Lighting: **Present**

Left: **School**

No Sidewalk



There is no pedestrian crossing

BP Basic School Safety Upgrade Snapshot

Visualizing the projected safety improvement through road interventions and the iRAP Star Rating for Schools (SR4S) framework.

From 1.1 to 4.9 Star Rating

Modelled SR4S Improvement

Initial Condition

1.1 Stars



DPR Scenario

3.3 Stars



Recommended Scenario

4.9 Stars



■ Extreme risk to a high-safety environment.

213 Vehicles Per Day

Road safety risks are assessed against this daily traffic volume interacting with students.



Recommended Intervention Package



Speed & Traffic Control

Proposed 20 km/h speed limit signs and bituminous premix rumble strips.



Infrastructure & Signage

Marked zebra crossing, stop lines, edge markings, and dedicated school-zone warning signs.

NPR 121,810.77 Total Cost

Estimated investment including contingencies and VAT for the proposed safety package.



Validation required after implementation: Post-upgrade operating speeds and final ratings must be confirmed through field validation.

Improving School Zone Safety through iRAP SR4S Assessment

Dasharathapur-Dandagau-Jitejuwa-Dhadkhet-Matela-Dharampokhara Road Corridor (RCIP-AF) | Shree Janak Secondary School, Surkhet



ADB AF
TA-10113



iRAP SR4S
Verified

1 School Context & Environment



Lekhbesi, Surkhet Corridor

~400
Students

Modal Split:
Active transport

Rural Hilly
Terrain

2 Identified Infrastructure Deficits



No Marked
Crossing



No Pedestrian
Facilities



Speed Management
Deficit



Visibility
Constraints

3 Operating Speed Metrics

27.93
KM/H
Mean Speed

33.00
KM/H
85th Percentile



20 km/h
Mandated Limit

33.00
KM/H
85th Percentile

35.00
KM/H
Maximum
Recorded

5 Engineering Countermeasures Design (Proposed Treatments)



Proposed Treatment Simulation Overlay

countermeasures-list

- Standard Zebra Crossing Implementation
- Standard Crossing Implementation
- Standard Crossing Implementation
- Standard Crossing Implementation
- Converrmeasureslist
- Convex mesoting Pont

4 SR4S Safety Profile Progression



Baseline Rating (1.9 Stars)

The rural hilly road with shar curves road iard sharp cuves near the school.



DPR Design Scenario (2.2 Stars)

The Design deign scenario s sceair, precon planning arenas in the school.



Recommended Plan (3.1 Stars)

Recommended Plan hor aloye recommended from the school.



Future Operating Space (3.9 Stars)

Future operating space comition of our future operating space in ire school.



Baseline Rating (1.9 Stars)

Buun-linn rating exonrris to madnote rating connections in the school.

6 Capital Cost Analysis



NPR 145,339.68

7 Social Capacity Integration

90
Students
Trained

13
Teachers
Engaged

- Educational Engineering
- Teachers on Invonment Topics
- Educational Eduoatting
- Techo/ng Educational Topics

Strategic Engineering Conclusion

Targeted Low-Cost Engineering Measures Combined with Education Can Significantly Improve Child Road Safety

Initial Risk Profile:
HIGH RISK



Target Output:
SECURE ENVIRONMENT



Road Safety Awareness and Perception Survey

Students and Teacher Survey Analysis

Key respondent groups: School teachers, and students



13

Schools Surveyed



674

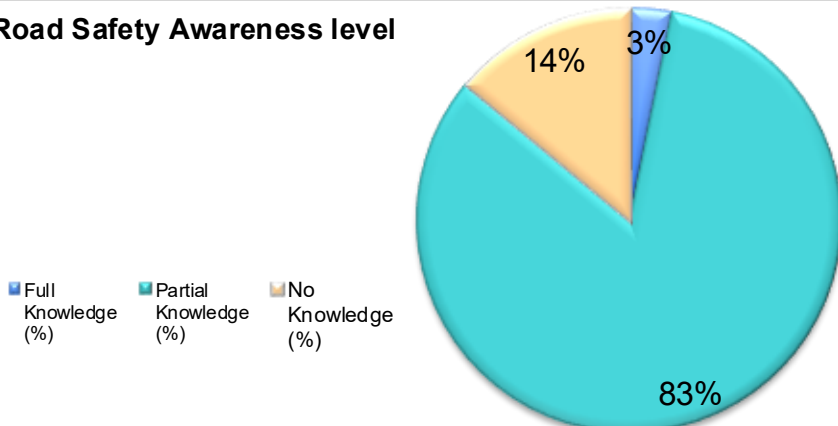
Participants in Awareness class



293 students and
95 teachers
surveyed

Perception Survey: Result

Road Safety Awareness level



83%

Respondents reported to have partial knowledge of road safety

52%

Students reported unsafe road

No Pedestrian Priority

37.4%

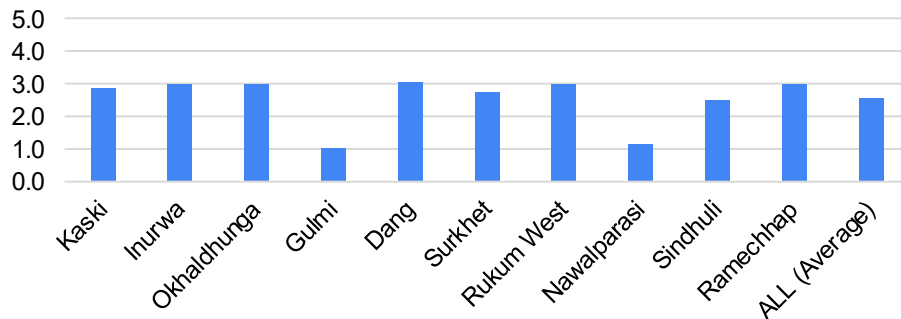
13%

children reported difficult to cross the road

2.4

Average Teachers rating of school area safety: 2.4 out of 5

Avg Road Safety Rating (1–5) by Teachers



Notable Achievements



Biggest Improvement

+3.8★

Rukum West: Himalayan Janata School
(0.7★ → 3.9★ Final) — the most dramatic
safety turnaround



Highest Final Rating

5.1★

Jwala Secondary School, Jhyalbaas —
achieved the programme's highest final
star rating



Most Students Covered

698

Baruneswar HSS, Okhaldhunga — largest
school in the programme, rating improved
to 4.6★



Most Cost-Efficient

NPR 39K

Deepjyoti Boarding School, Gulmi —
highest rating gain per rupee invested



Zero-Cost Success

2 Schools

Dang schools already met safety standards
with no additional investment required



DPR-Only Uplift

+1.8★ avg

DPR alone (without additional
interventions) raised average rating by 1.8
stars across all schools

Key Conclusions

- 01 All 14 school zones showed measurable safety improvement. Average initial rating of 2.11★ rose to 4.37★ final — a programme success.
- 02 DPR implementation alone contributed an average +1.8★ improvement, validating the detailed project report methodology.
- 03 Low-cost interventions (signs, zebra crossings, rumble strips) proved highly effective. Total NPR 1,204,136 protected 5,507 students.
- 04 Highway-adjacent schools face greater speed challenges. Jantasahidnagar highway recorded avg 46.8 km/h vs. 13.4 km/h in Gulmi school zones.

Acknowledgement

Special Thanks to Asmita Pokharel for field data collection and SR4S Initial Coding



Thank You

Making School Zones Safer Across Nepal

