Case Study 5:

ANDHRA PRADESH

Renigunta-Kadapa Stretch (SH-31)

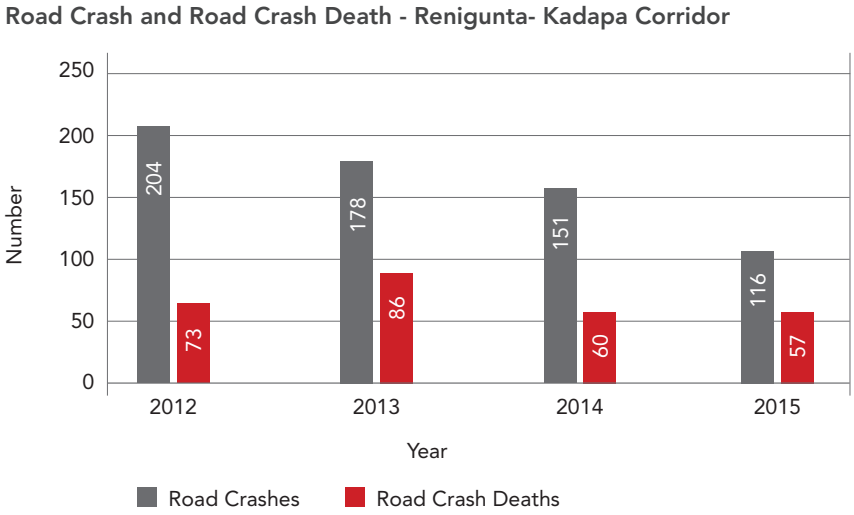
The 138 km Renigunta-Kadapa stretch on the Renigunta-Rayalcheruvu Corridor witnessed a crash severity of 35.7 in 2012, which is higher than the crash severity at the national level i.e. 28.2 in the same year. Interventions across the 4E's were implemented on the stretch, which resulted in a 22% reduction in deaths from 2012-15. The project's implementing agency is the Roads and Buildings Department, Andhra Pradesh.

1 KEY DATES: THE PROJECT WAS APPROVED ON OCTOBER 15, 2009 (WORLD BANK ICR 2019), THE BASELINE SURVEY WAS CONDUCTED ON MARCH 31, 2010, iRAP ASSESSMENT WAS CONDUCTED IN JUNE 2010 (iRAP 2011). THE CORRIDOR WORK BEGAN IN 2014 (WORLD BANK BLOGS 2018). THE PROJECT WAS COMPLETED ON MARCH 31, 2019 (WORLD BANK ICR 2019)

2 AREA COVERED: 138 KM OF THE RENIGUNTA-KADAPA STRETCH ON THE RENIGUNTA-RAYALACHERUVU CORRIDOR

3 IMPACT: REDUCTION IN ROAD CRASH DEATHS: 22% BETWEEN 2012 AND 2015

4 SCOPE OF REPLICATION: THE INTERVENTIONS UNDER THIS PROJECT CAN BE BENEFICIAL FOR HIGH-FATALITY CORRIDORS



Graph 5.1: Road crash deaths on the Renigunta- Kadapa corridor (2012-2015)
(Source: World Bank presentation shared on 26th April 2023 (World Bank PPT 2023).
Civil works of the project were completed in 2013)

1. Documents Reviewed:
a. Andhra Pradesh Demonstration Corridors Preliminary Technical Report - iRAP 2011
b. RTI Response from Andhra Pradesh Roads and Buildings Department dated 1st June 2023.
c. iRAP India Four States Road Safety Report 2011
d. World Bank presentation (2023)
e. World Bank PAD 2009
f. World Bank ICR 2019
g. World Bank Blogs by Nupur Gupta 2018
h. Report of the Comptroller Auditor General (CAG) on the Economic Sector for the year ended March 2016, (Report No. 4 of 2017)

2. For this case study the exchange rate effective is $1=Rs. 69.55 as on March 31, 2019, as mentioned in the World Bank ICR Report 2019

5.1 ABOUT THE PROJECT

The Government of Andhra Pradesh, in partnership with the World Bank Group, developed a Road Safety Demonstration Corridor. The objective of the project was to sustainably provide safe roads to road users by augmenting the capacity of the Andhra Pradesh government's road sector institutions (World Bank ICR 2019). The Roads and Buildings (R&B) Department of Andhra Pradesh had the overall project implementation responsibility. The R&B Department has several units, which have chief engineers as their heads, and one of these units i.e. the Road Development Corporation (RDC) was appointed as the Project Management Unit (PMU) for the project (World Bank PAD 2009).

The government along with the World Bank took up a corridor to test out a new road safety program, a 138 km stretch between Renigunta and Kadapa on the SH-31 was selected, and a multi-sectoral approach across Engineering, Transport, Police, and Emergency Care was deployed (World Bank ICR 2019).

5.2 BACKGROUND

In 2009, the Government of Andhra Pradesh decided that a Road Safety Action Plan needs to be in place for the State. This was because the State witnessed a high number of road crashes, the number being 42,106 resulting in 14,516 deaths in 2009 alone (MoRTH 2009). As part of the plan, it identified a larger 259-km-long Renigunta-Rayalacheruvu Road (SH31) as one of the three demonstration corridors requiring urgent safety improvements, as despite representing less than 1% of the total State Highways in Andhra Pradesh, these roads accounted for approximately 4% of the State's road crash deaths (iRAP 2011). An iRAP assessment was undertaken to analyze the current standards of the road for different road users (car occupants, motorcyclists, bicyclists, and pedestrians). iRAP had inspected and assigned ratings to the corridor with a focus on 50 road attributes relating to the likelihood of a crash and its severity by using software, vehicles

Decision-Making Tools:
iRAP assessment of the quality of the road

Enabler:
The Government Order G.O. Rt. No. 167, Dated 19th February, 2011, Roads and Buildings Department

Validation Mechanism:
Analysis of road crash data

	CAR OCCUPANTS		MOTORCYCLISTS		BICYCLISTS		PEDESTRIANS	
Star Rating	Length (km's)	%	Length (km's)	%	Length (km's)	%	Length (km's)	%
★★★★★	0km	0%	0km	0%	0km	0%	0km	0%
★★★★	14km	5%	5km	2%	0km	0%	0km	0%
★★★	18km	7%	10km	4%	0km	0%	0km	0%
★★	166km	64%	112km	43%	98km	38%	176km	68%
★	62km	24%	132km	51%	0km	0%	0km	0%
	0km	0%	0km	0%	161km	62%	83km	32%
TOTAL	**259km**	**100%**	**259km**	**100%**	**259km**	**100%**	**259km**	**100%**

Figure 5.1. Baseline iRAP star ratings for various categories of road users on the corridor (Source: iRAP "AP" 2011)

that were specially equipped for the inspection, and trained analysts. Some of these attributes were intersection design, road cross-section and markings, roadside hazards, footpaths, and bicycle lanes (iRAP 2011). The results of the assessment have been given above.

The iRAP assessment indicated that the stretch required urgent interventions to augment its safety (iRAP 2011). In addition to iRAP, the Andhra Pradesh Transport Department also took a closer look at the available data to get an understanding of the major risk factors contributing to road crashes on the stretch. The following observations were made:

- Numerous collisions involving trucks occurred because of fatigued drivers.
- Drivers were caught speeding to reach Tirupati, a holy town in Andhra Pradesh, to attend the early morning ceremonies (World Bank Blogs 2018).

Post these assessments, a 138 km stretch from Renigunta to Kadapa was selected as the project stretch for the Road Safety Demonstration Corridor.

5.3 INTERVENTIONS

Based on the data from the World Bank Group and the Andhra Pradesh State Government, the following interventions were implemented across the 4 E's of road safety (i.e. Engineering, Enforcement, Education, and Emergency Care):

5.3.1 Engineering

Some of the Civil Work conducted by the Andhra Pradesh Road Development Corporation on the most vulnerable parts of the stretch involved interventions such as:

1. Improvements of intersections and curves (World Bank Blogs 2018) - out of the 13 proposed locations, 8 locations were improved. 5 locations could not be taken up due to objections from the State Railway Department, and due to the non-availability of "Right of Way." (APRDC 2023).
2. The widening of the road carriageways and curves, installation of retro-reflective signages, addition of lane markings, and safe pedestrian crossings (World Bank Blogs 2018).
3. Installation of crash barriers, and road studs (World Bank Blogs 2018).
4. Blackspot improvements on core road networks (World Bank ICR 2019).

There was a 53% reduction in crashes and a 42% reduction in deaths due to civil work on dangerous curves and intersections (World Bank Blogs 2018).

5.3.2 Enforcement Measures

1. Two Highway Patrolling Outposts were created at Rajampet and Renigunta (World Bank Blogs 2018). They were equipped with tow-away cranes, patrolling vehicles, speed laser guns, and breath analyzers, among other such safety equipment.
2. The focus of enforcement was on checking for over-speeding and driving under the influence of alcohol. Thus, there was a resultant reduction in road crashes involving cars, auto-rickshaws, and Light Commercial Vehicles (LMVs) (World Bank Blogs 2018).

Figure 5.2. Interceptor vehicle procured to patrol the corridor (Source: World Bank)

5.3.3 Education/Engagement

1. All stakeholders received refresher training in road safety measures through workshops for the smooth implementation of the project (The Hindu 2016).
2. Driver Refresher training was conducted for 250 school bus drivers and 300 truck drivers at Kadapa (APRDC 2018).

5.3.4 Emergency Medical Care

A trauma care center was established at Rajampet along with required medical equipment including CT scan equipment, and ambulances (CAG 2017).

5.4 TEAM STRUCTURE AND STAKEHOLDERS

The stakeholders involved in this project are the Roads and Buildings, Police, Transport, and Medical and Health Departments of Andhra Pradesh (World Bank ICR 2019).

5.5 PROJECT FUNDING

Government of Andhra Pradesh reported funding:

The Govt. of Andhra Pradesh reportedly allocated approximately INR 349 million (USD 5 million) (RTI Response, R&B Department 2023).

World Bank Reported Funding:

The road safety component project cost around INR 834.6 million (USD 12 million) (World Bank ICR 2019). Additionally, the institutional strengthening cost around approx. INR 668 million (USD 9.6 million). The institutional strengthening component provided technical assistance, advice, and training to improve the operations of the Andhra Pradesh Road Development Corporation (APRDC), and management of public-private partnership projects as well as management of the core road network project. The Institutional Strengthening Action Plan Governance and Accountability Action Plan were also introduced under this payment head (World Bank ICR 2019).

5.6 REPLICABLE PRACTICES

1. **Highway Patrolling Outposts and Patrolling Vehicles:** The Highway Patrolling Outposts set up in Rajampet and Renigunta and the interceptor vehicles pacing the corridor were key in checkong for speeding, overloading, and drunk driving violations. The vehicles were equipped with roof-light sirens and GPS, and enforcement personnel were at the ready with tow-away cranes, breathalyzers, searchlights, and speed laser guns. States can provide highway patrol teams on crash-prone stretches with equipment suitable to detect the most frequent violations on the stretch. The standards for such equipment, whether electronic or otherwise, can be notified by the Supreme Court Committee on Road Safety for the States' reference.

2. **Monthly Reviews on Road Safety:** The road safety situation on project roads can be monitored and improved by ensuring tight accountability such as via periodic reporting to top members of the State administration. The Transport minister of Andhra Pradesh had directed the district administration involving the District Collector, Superintendent of Police, and Transport Department officials to conduct regular monthly reviews. The case studies developed on the crashes were shared directly with the State Chief Minister every month. Reporting to important government offices in key road safety projects can improve the accountability, efficiency, and transparency of departments implementing the project at the ground level. Such methods of monitoring the implementation at the grassroots by senior government officials have also been adopted in States such as Tamil Nadu, where senior officials are members of road safety agencies.