



# State Route 264 Safety Improvements

Navajo County, Arizona

Arizona Department of Transportation



Counterclockwise from top: Construction teams work on SR 264; a completed segment of SR 264 with wider shoulders and rumble strips (©Sunland Asphalt & Construction, Inc.); pre-project insufficient shoulders and steep drop-offs and local school bus service on route (©Arizona Department of Transportation)

A statewide safety review found this rural safety hotspot leading to the best return on investment solution.

## CONTEXT

- Constructed 2015.
- Western.
- Rural.
- \$17 million.
- 25-mile corridor.
- 4,100-6,500 Annual average daily traffic.



## SAFETY+ IMPROVEMENTS

- Safety hotspots identified through a statewide analysis.
- Multimodal facilities helped deliver a better return on investment.

## WHAT WAS THE PROJECT DRIVER?

Through a systemic statewide safety analysis, the Arizona Department of Transportation (DOT) recognized that a sizable part of fatal crashes were roadway departures along rural two-lane highways. As a result, they identified State Route 264 (SR 264) from Burnside Junction to Summit One as a priority corridor for shoulder widening and slope flattening to address the high crash rate.

## HOW DID THIS CONNECT THE COMMUNITY?

Nearby topographical constraints, such as steep slopes and large cross culverts, coupled with ROW constraints, led to the Arizona DOT developing a creative approach.

Using a **Performance-Based Practical Design (PBPD)** approach to maximize the return on investment, Arizona DOT developed two alternatives:

- **Alternative A:** Widen existing roadway to 34 feet; 12-foot lanes, 5-foot shoulders, add centerline and shoulder rumble strips, flatten

side slopes, install guardrail, etc. The 5-foot shoulder incorporates a 4-foot bikeable width outside of the rumble strip.

- **Alternative B:** Widen existing roadway to 40 feet; 12-foot lanes, 8-foot shoulders, add centerline and shoulder rumble strips, flatten side slopes, and install guardrail.

Evaluation criteria included road safety benefits and economic value. The safety analysis used Highway Safety Manual predictive method procedures and the Interactive Highway Safety Design Model. In this case, the local calibration factors were adjusted to reflect conditions on other rural two-lane, two-way state highways on tribal lands. This allowed for the model to reflect **context-sensitive conditions**. The economic value was determined through a benefit-cost ratio analysis, and the monetized benefits included the reduction in crashes and the reduction in the severity of crashes.

Arizona DOT determined that Alternative A had the lower overall cost and higher benefit-cost ratio, and was thus the better option.

In addition, Arizona DOT was able to build new modal facilities to help provide greater access to services and opportunities for the Navajo Nation and the surrounding rural communities.

Roadway Element	Existing SR 264	Alternative A	Alternative B
Lane Width	12 feet	12 feet	12 feet
Shoulder Width	1 foot	5 feet	8 feet
Construction Costs	\$0	\$16.5 mil	\$26.3 mil
2016-2036 Expected Total # of Crashes	636	532	504
% Reduction of Crashes over Existing Conditions	N/A	17%	21%
Benefit-Cost Ratio	N/A	2.3	1.9

Results of PBPD-based alternatives analysis (Source: FHWA)

As a **pilot project**, the savings realized by using the PBPD approach can now be used on other similar highway corridor projects in Arizona.

### WHAT WERE THE BENEFITS?



#### REPAIR

Through PBPD, Arizona DOT quantified the safety and operational deficiencies of the corridor, and developed safety and operational improvements while accommodating bicyclists in the final design. With the lower overall cost and higher benefit-cost ratio, Alternative A had an estimated annual benefits of approximately \$3.8 million over the existing road.

#### For more information:

[https://www.westernite.org/annualmeetings/13\\_Phoenix/Presentations/Session%203D%20-%20Kar.pdf](https://www.westernite.org/annualmeetings/13_Phoenix/Presentations/Session%203D%20-%20Kar.pdf)

<https://www.fhwa.dot.gov/design/pbpd/documents/fhwahif15014.pdf>