

# State Apportionment Analysis: Safety Efficiency Rank

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## Abstract

*The Interstate System was created when the Federal Highway Act was signed by President Dwight D. Eisenhower in the spring of 1956. Since that time, there has been a need to allocate tax dollars to the infrastructure that will provide the most positive impact. These allocations or apportionments are determined by state. For much of the time apportionments were calculated by specific factors like Vehicle Miles Traveled (VMT), population, and highway road length. In more recent years, the largest factor of current funding appears to be past funding. This research is the first to evaluate the “Safety Efficiency” or relative measure of how effective apportionments are at creating safer roads. By providing this analysis, we believe the most safety efficient states will be able to provide a model that prevents further loss of tax dollars from safety inefficient states.*

## 1 Introduction

State highway apportionments have never been adjusted by safety. Prior to this research, highway spending has historically been apportioned based on a combination of general need and population. Apportionments for federal highway assistance historically accounted for various metrics such as vehicle miles traveled (VMT), population, and highway road length. In recent years, these formula factors have ceased to play a direct role in determining apportionment; rather, stability of funding as a function of past funding has been predominant, with a caveat to provide for the return of at least 95 cents of every dollar in taxes paid by its residents into the highway account of the Highway Trust Fund[1].

## 2 Current Safety Analysis & Resources

The federal government tracks highway safety. Specifically the NHTSA uses the Fatality Analysis Reporting System (FARS) to track fatalities on state highways[2]. FARS data, in conjunction with accompanying normalization data, allows direct comparison of how each state provides highway safety to its residents.

### 2.1 Safety Efficiency Approaches

Here we devise a new metric based on combining safety efficacy and spend apportionment. We find that state apportionment does not correlate with normalized rates of highway fatalities, indicating that some states may be

more effective at spending to keep their residents safer than others. With the goal of reducing fatalities on federal roadways, we suggest that future federal spending apportionment incorporate rewarding states that reduce fatalities, and encourage low performing states to focus more directly on safety spending efficacy.

## 2.2 Data and Methods

2017 data was gathered from [FARS](#) and Congressional Research Service Report [R45727](#). Data was normalized as follows: first, fatalities were normalized by population, then normalized by VMT to arrive at a normalized count of fatalities corrected for population and mileage. Spend was then corrected by this factor, to arrive at a spend per normalized fatality rate. Ranks are provided at <https://gosafelabs.com/safetyanalysis>. Ranks were ordered 1-51 as follows in ascending order: largest population, most VMT, most fatalities, largest spend, largest fatality rate normalized by population, largest fatality rate normalized by population and mileage, least spend by corrected fatality rate.

## 3 Safety Efficiency Rankings

Safety Efficiency Rank	State
1	Florida
2	Arizona
3	North Carolina

## 4 Conclusion

After adjusting for population and travel patterns, Florida drivers benefit from the safest highway spend. The top 10 states are Florida, Arizona, North Carolina, South Carolina, Colorado, Mississippi, Georgia, Kansas, Tennessee, Kentucky. Full rankings can be found here <https://gosafelabs.com/safetyanalysis>.

## References

[1] [CRS Report R45727](#)

[2] <https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars>