

Research Results



Design

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Project Title:

Reducing Accidents Due to Driver Fatigue

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Reducing Accidents Due to Driver Fatigue

Rest areas are a countermeasure for fatigue; what role do they play in fatigue-related freeway collisions? The present study spatially evaluates fatigue collisions.

WHAT WAS THE NEED?

In California, of 2,203,789 highway collisions recorded between 1995 and 2005, fatigue collisions accounted for 1.3% ('strict' definition of fatigue) and 9.7% ('expanded' definition). Fatigue collisions tend to be more serious, so finding ways to reduce them is important. One established way to address fatigue is to provide rest opportunities at Safety Roadside Rest Areas, but California needed to quantify the accident reducing benefit of rest areas.

WHAT DID WE DO?

Collisions in the vicinity of rest areas were investigated using two different approaches:

1. 10-miles up/downstream of rest areas
2. Distance traveled from rest areas

The study also compared ramps at rest areas to other ramps and found that trucks were the primary vehicle type involved in rest area ramp collisions.

Finally, the study explored the growth of informal rest areas: shoulders frequented by truck drivers when other safe stopping opportunities do not exist. The study analyzed collision rates at informal rest area ramps and determined that the rates were higher, on average, than at other ramps.

WHAT WAS THE OUTCOME?

Both fatigue and non-fatigue collisions decreased statistically significantly downstream of rest areas. Collisions due to fatigue tended to decrease immediately downstream of rest areas, then climbed after about 30 miles from rest areas, while non-fatigue collisions remained the same. Binomial tests confirmed that the percentage of fatigue collisions further than 30 miles from rest



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areas was significantly higher.

'Parked, parking' movements caused the highest number of collisions on ramps at rest areas, compared with 'proceeding straight' movements for other ramps. The comparison revealed that some rest areas had too few parking spots.

Analysis of fatigue-related collisions adjacent to informal rest areas provided mixed results regarding the efficacy of informal rest areas in reducing highway collisions. However, higher incidence of fatigue-related collisions at these locations supports the need for additional rest areas.

This study showed the need to increase the number of rest areas and address the shortage of parking spaces at locations where needed.

Caltrans is proceeding with an update to the Safety Roadside Rest Area Master Plan incorporating the findings from this research.



Figure 2 Safety Roadside Rest Area sign in Arizona

IMAGES

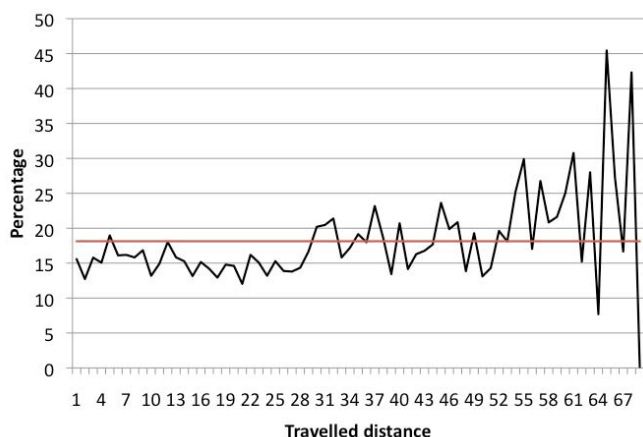


Figure 1 Percentage of accidents due to fatigue downstream of a rest area: Compilation of 11 years of data from 34 rest areas on I-5. An uptick in fatigue related accidents is observed at 30 miles downstream.

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