



**NTSB** National Transportation Safety Board

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*Office of Highway Safety*

# Vehicle Dynamics

# Numerical Simulations (TruckSim)

- Used by industry and academia
- Fully capable of modeling 3-dimensional motion
- Can model both linear and nonlinear vehicle and tire properties

# Purpose of Accident Simulations

- Driver's actions
- Vehicle speed
- Vehicle dynamics
- Test accident scenarios

# Data Used in Accident Simulations

- Vehicle parameters
- Survey data
  - Roadway
  - Tiremarks and scrapemarks
- Driver and witness statements

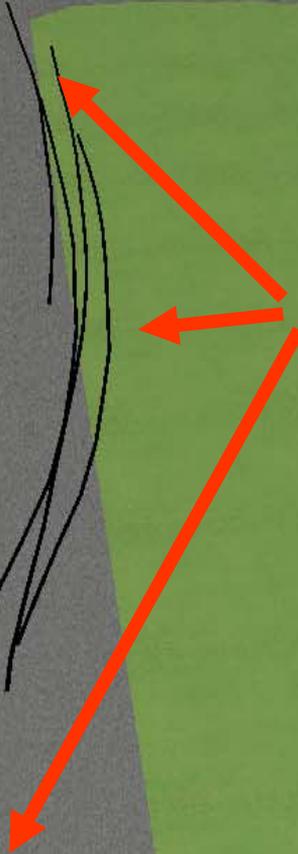
Direction  
of travel



Direction  
of travel



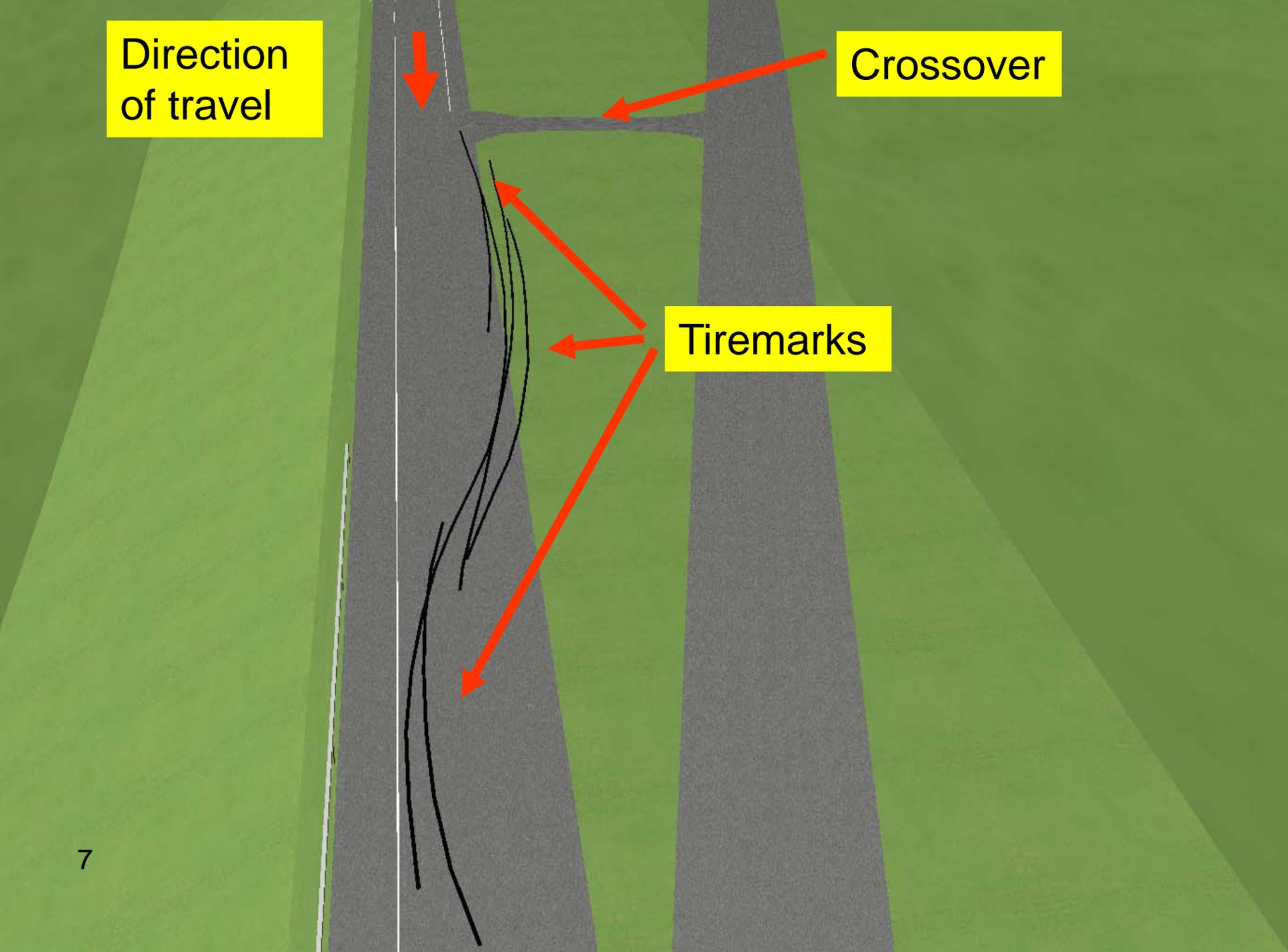
Tiremarks



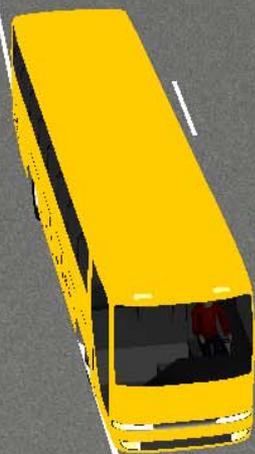
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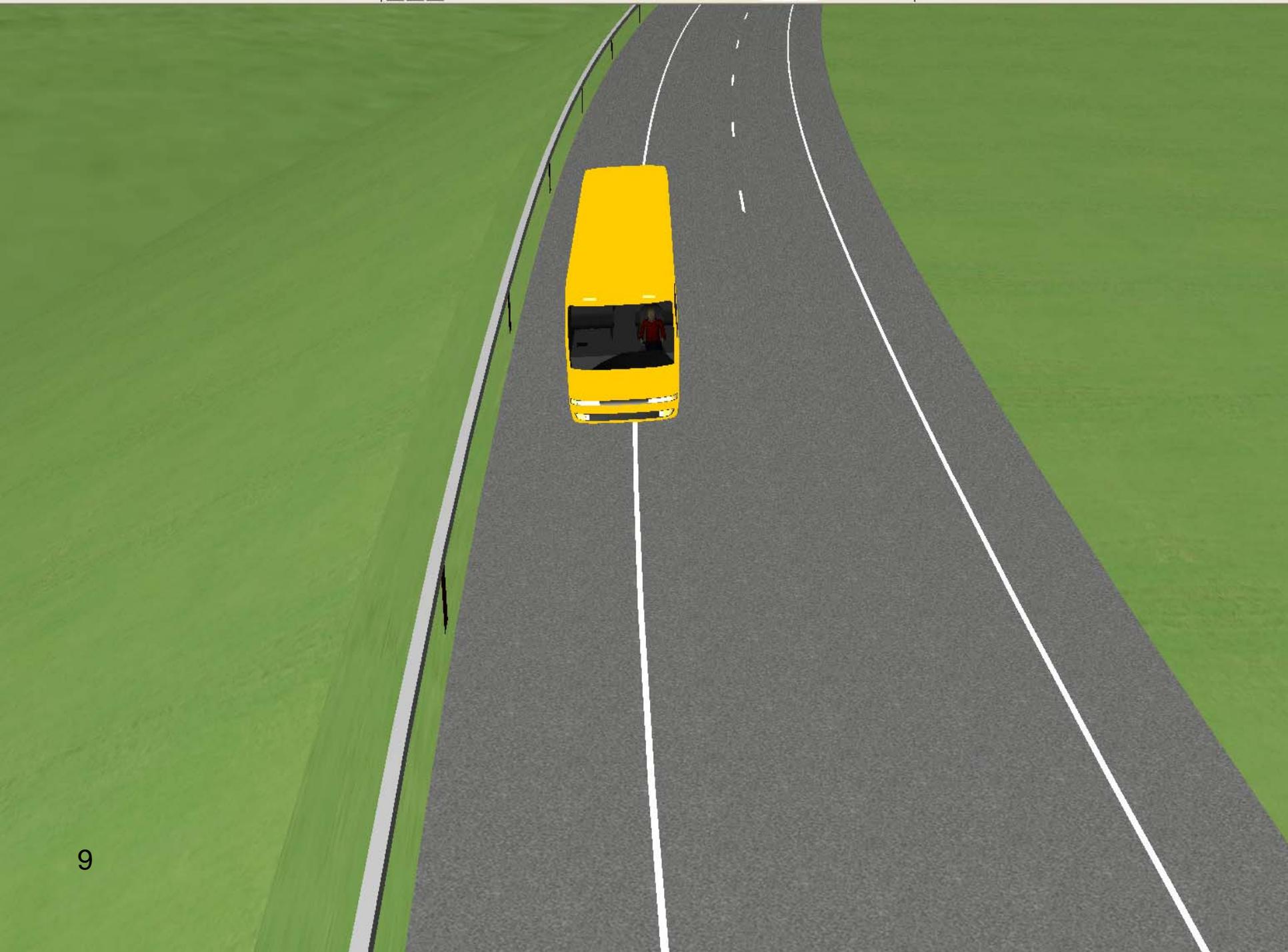
Crossover

Tiremarks



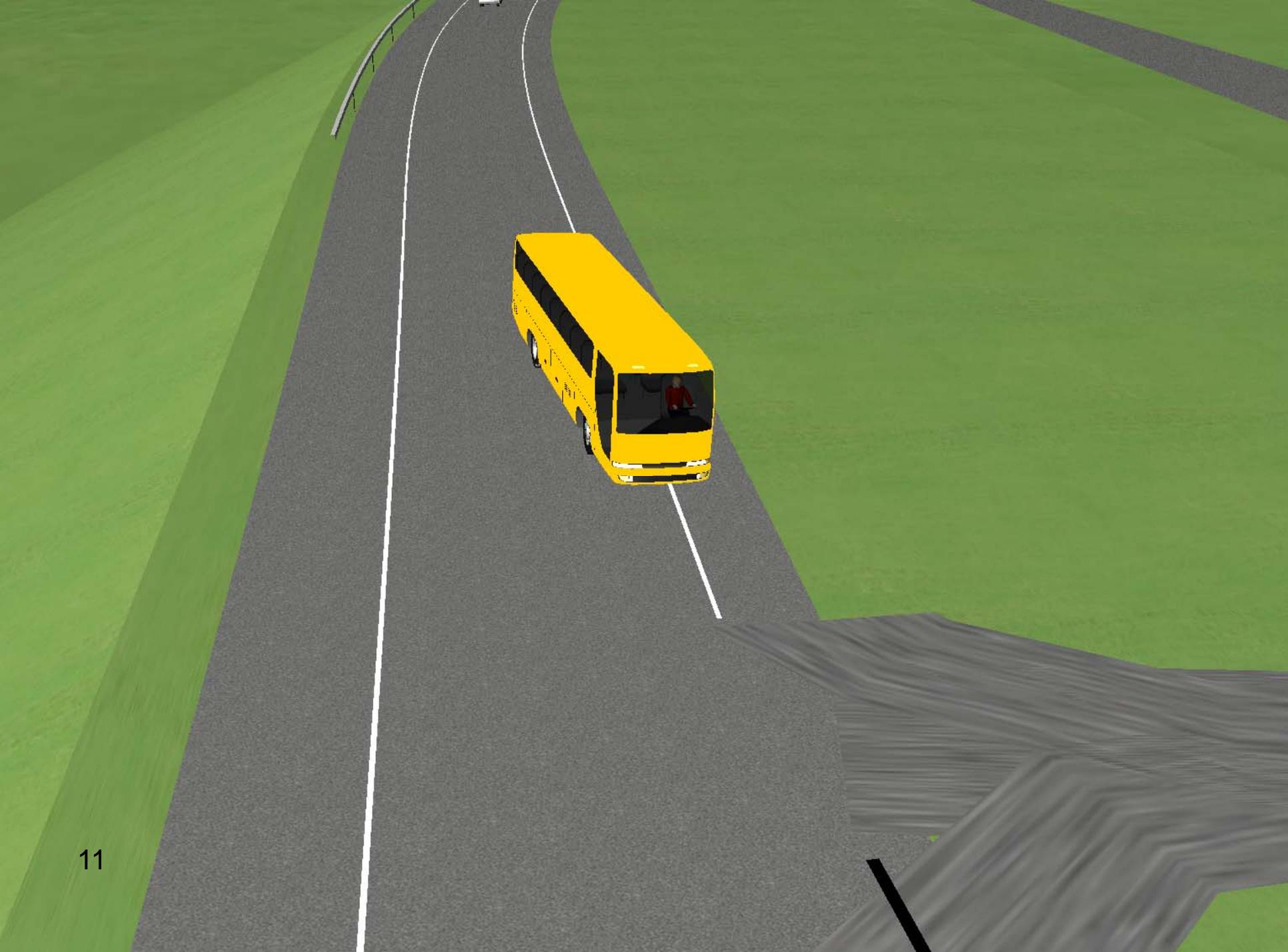
Speed: 65  
to 75 mph





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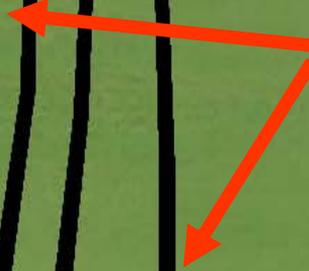




Crossover

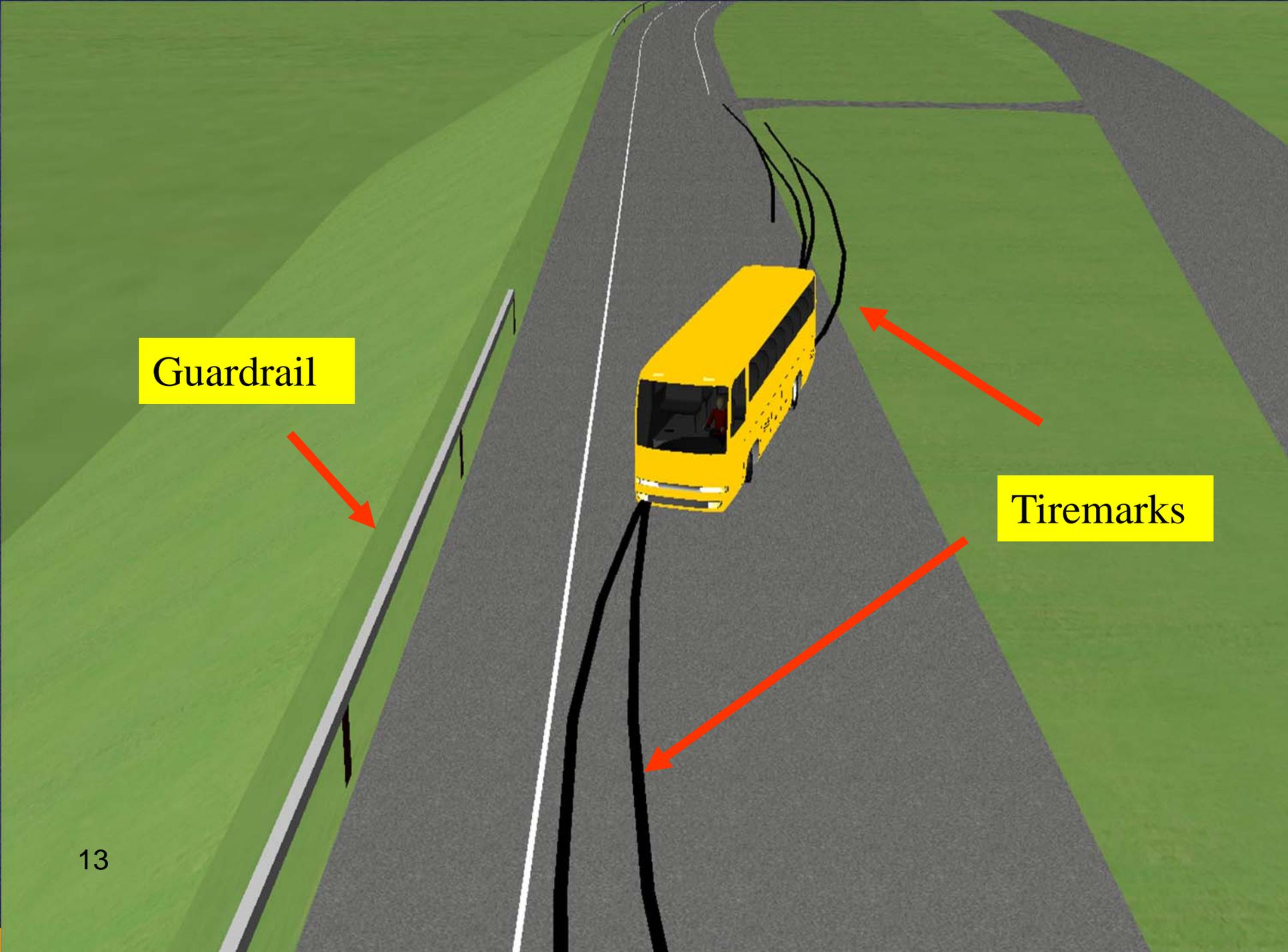


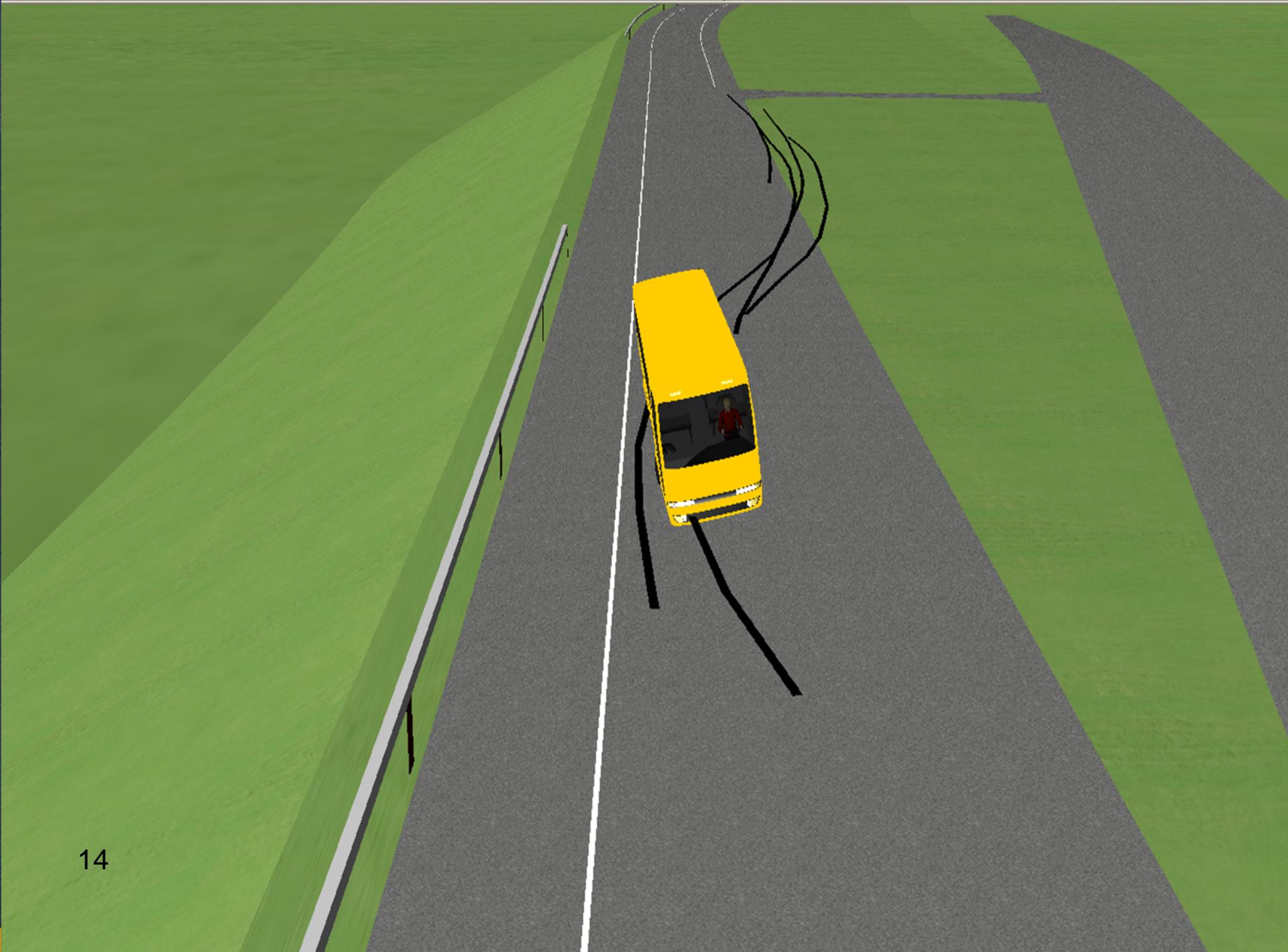
Tiremarks

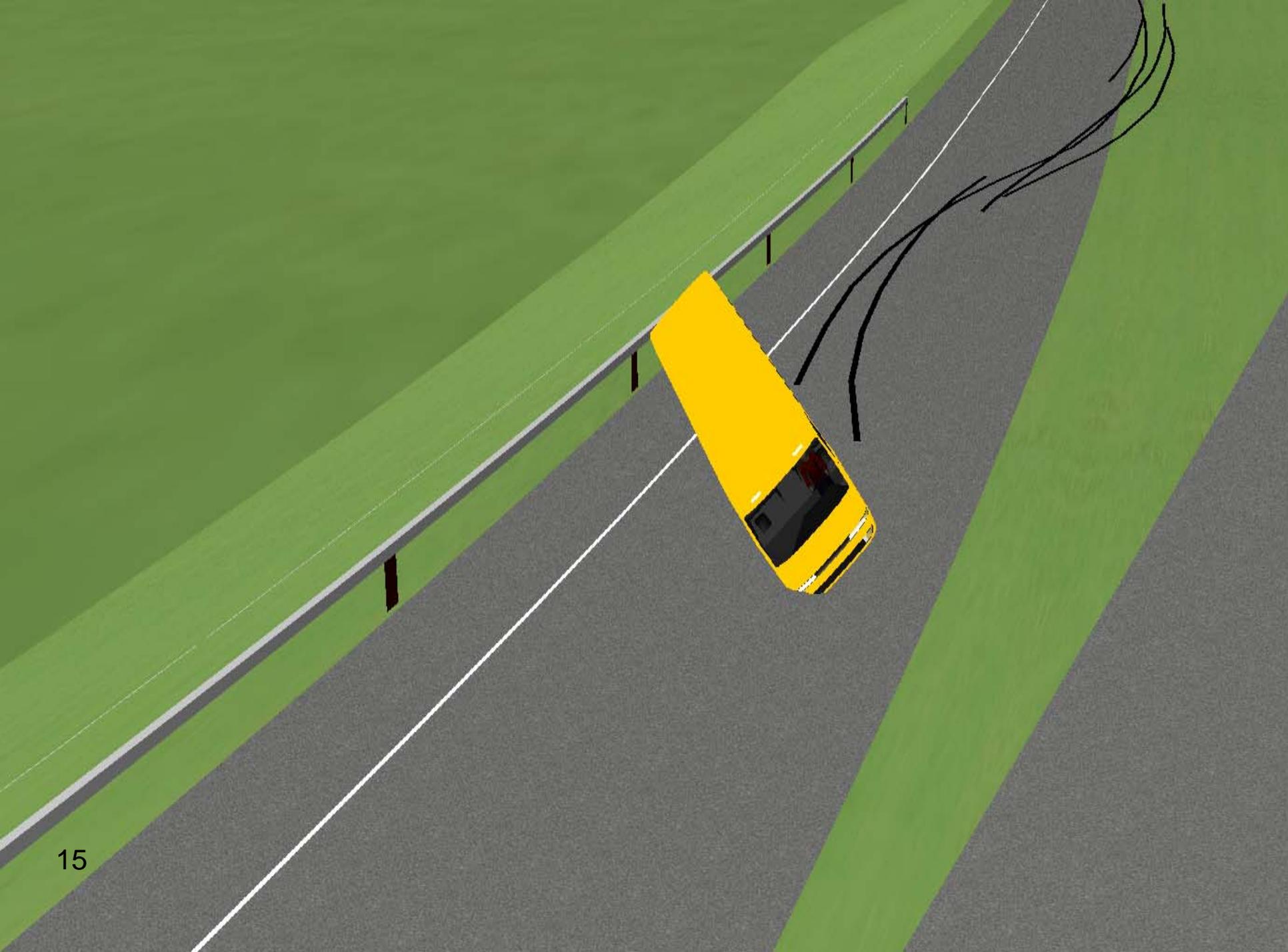


Guardrail

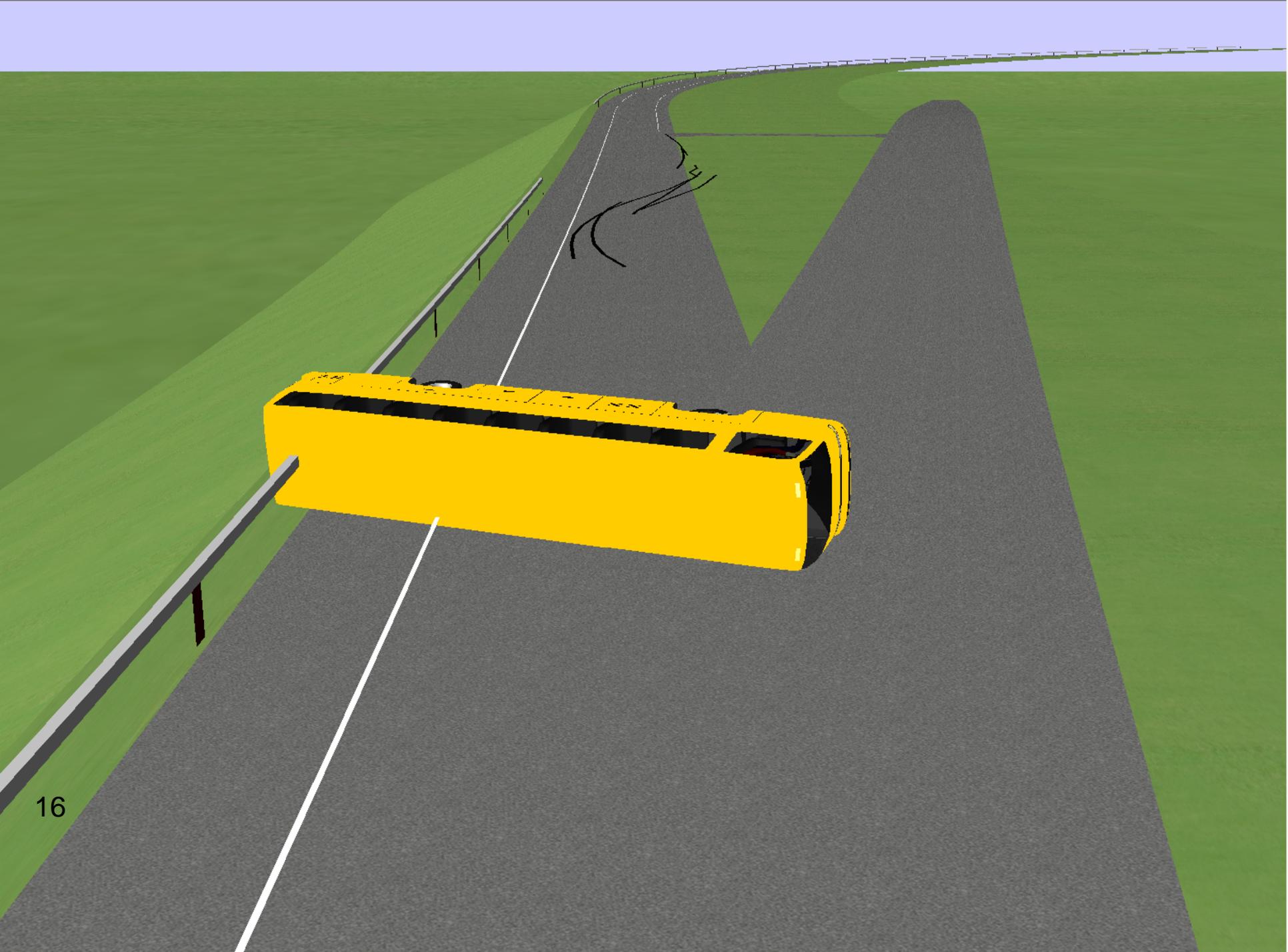
Tiremarks



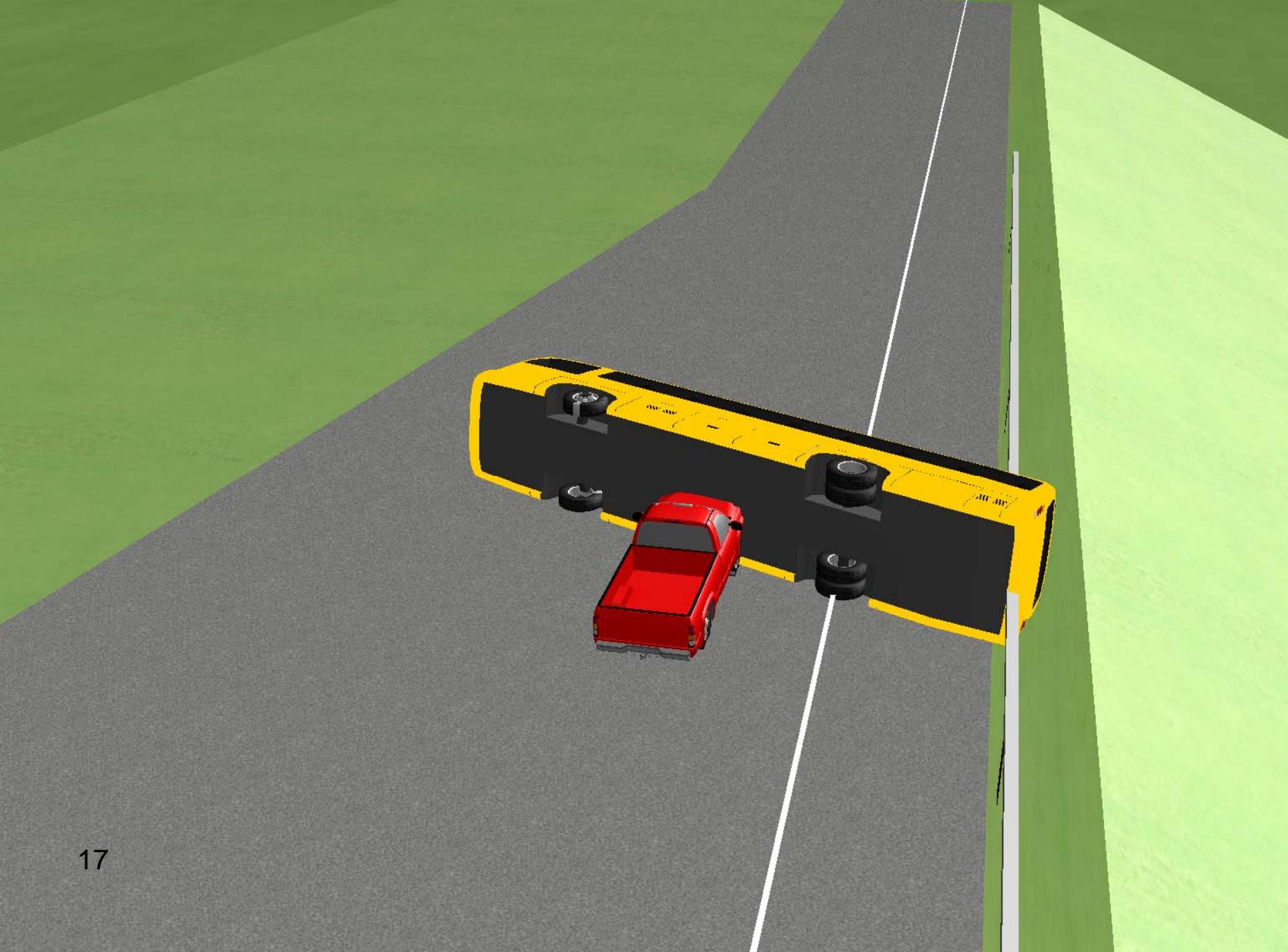




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# Video Animation Motorcoach Overturn Victoria, Texas

# Summary

- Speed 65 to 75 mph
- Physical evidence consistent with motorcoach initially drifting onto right shoulder
- After partially drifting onto the right shoulder, the driver oversteered left as he attempted to steer away from roadway edge
- Driver's overcorrection increased the risk of loss of control



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