NTSB National Transportation Safety Board

Office of Highway Safety

Vehicle Dynamics/ Stability Control

Shane Lack

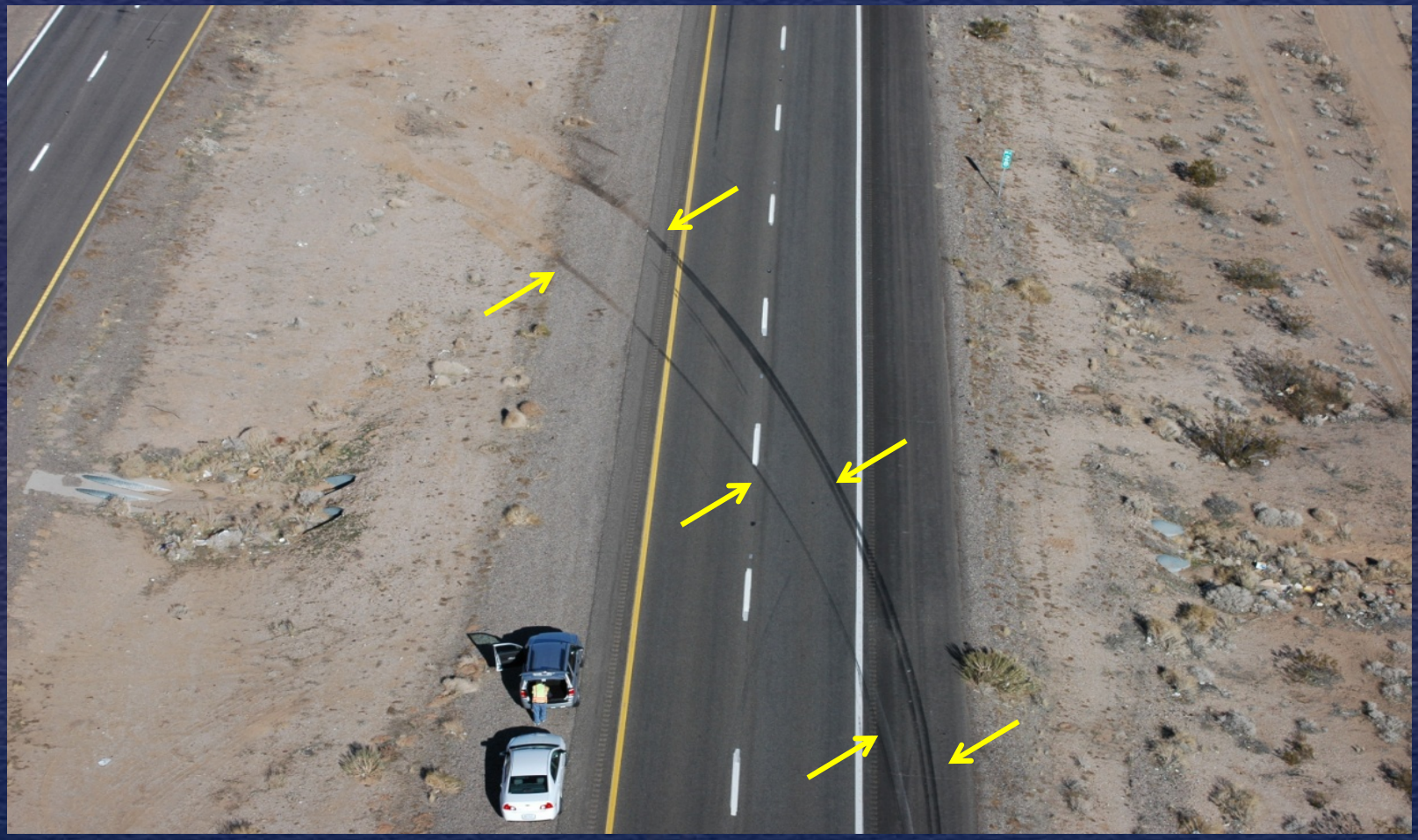
Numerical Simulations

- Part 1- Accident Dynamics
- Part 2 – Stability Control Evaluations

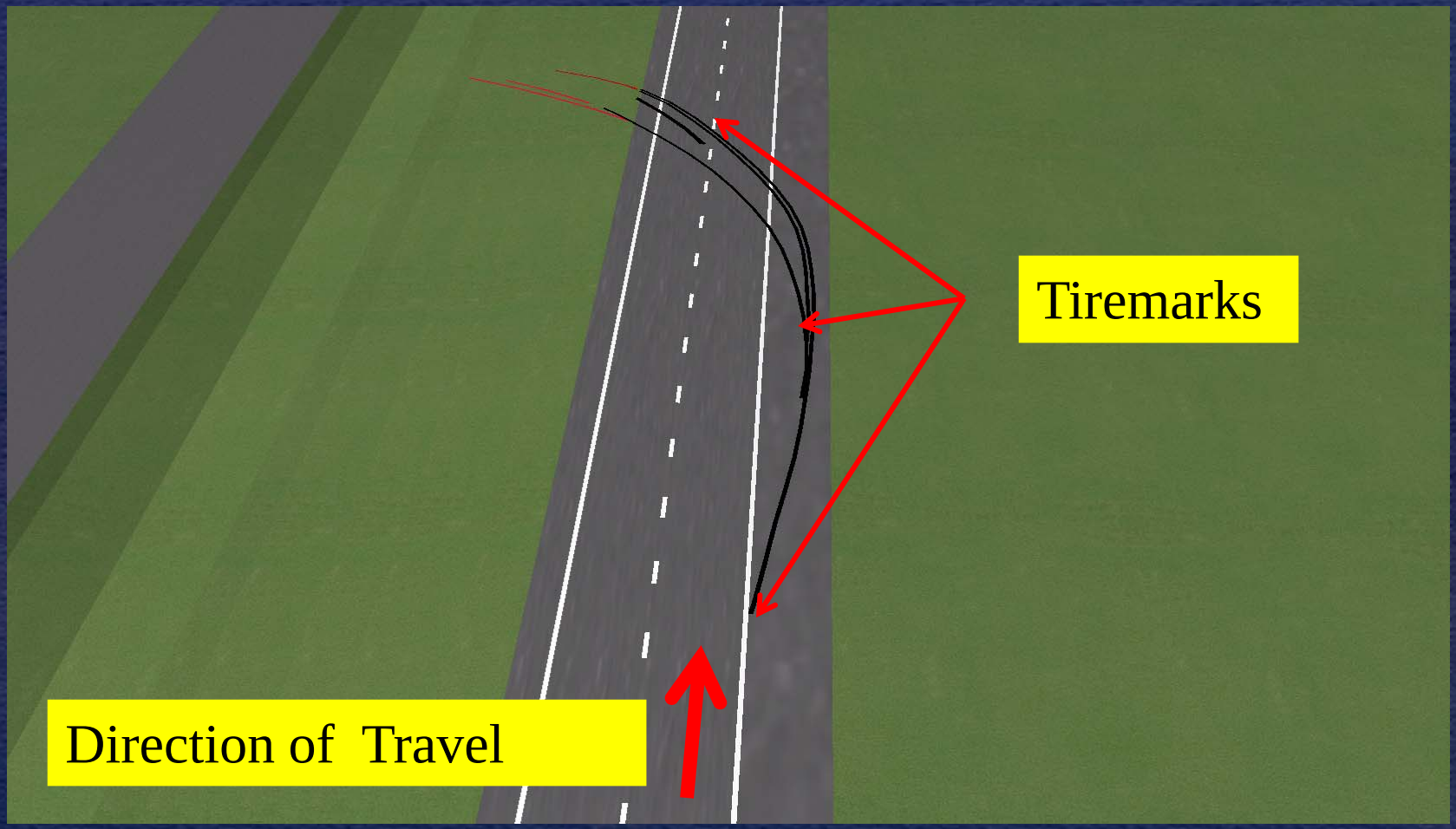
Data Used in Simulations

- Survey data
- Measured vehicle parameters
- Initial speed: 70 mph based on GPS

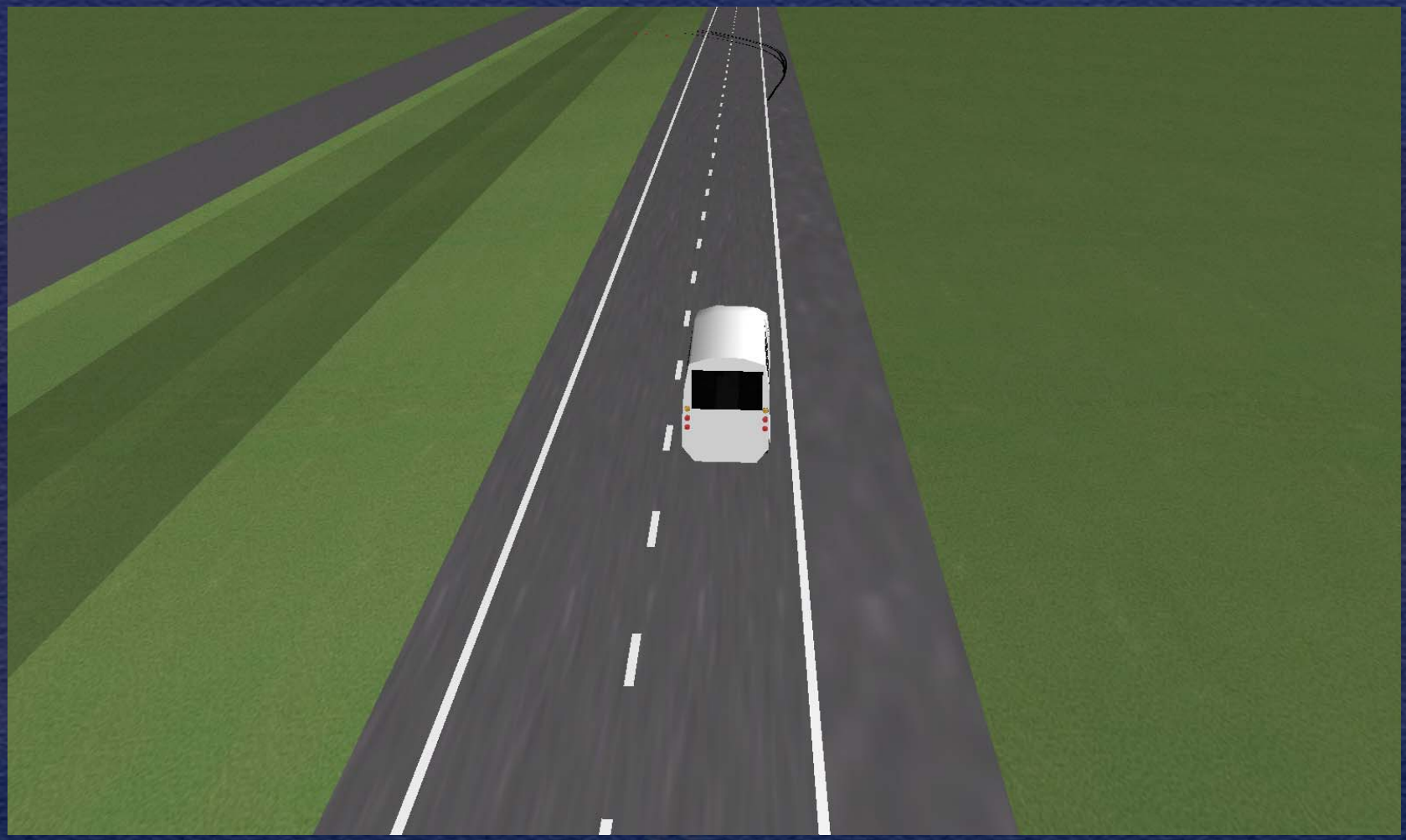
Numerical Simulations



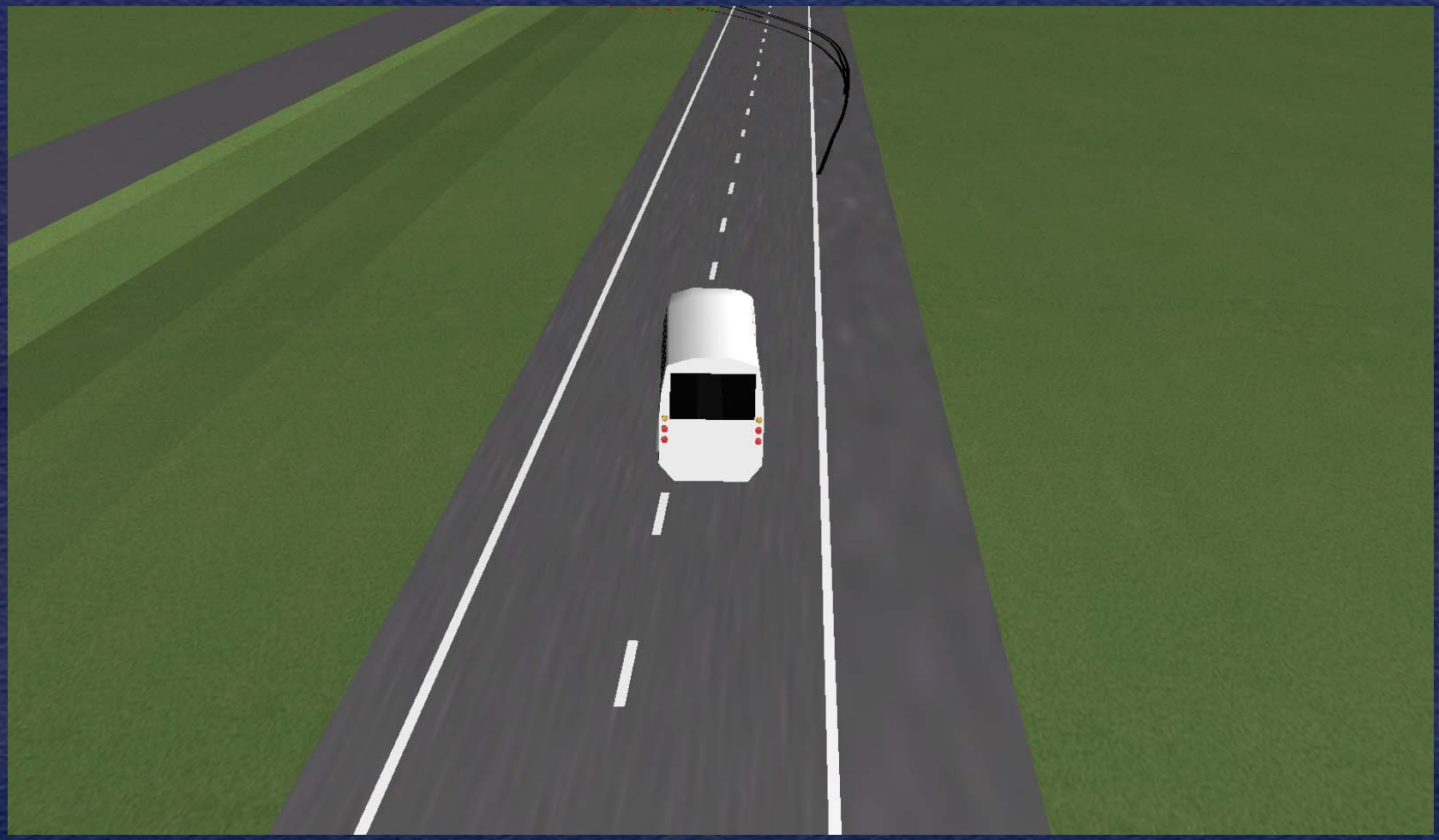
Accident Scene



Accident Dynamics



Accident Dynamics



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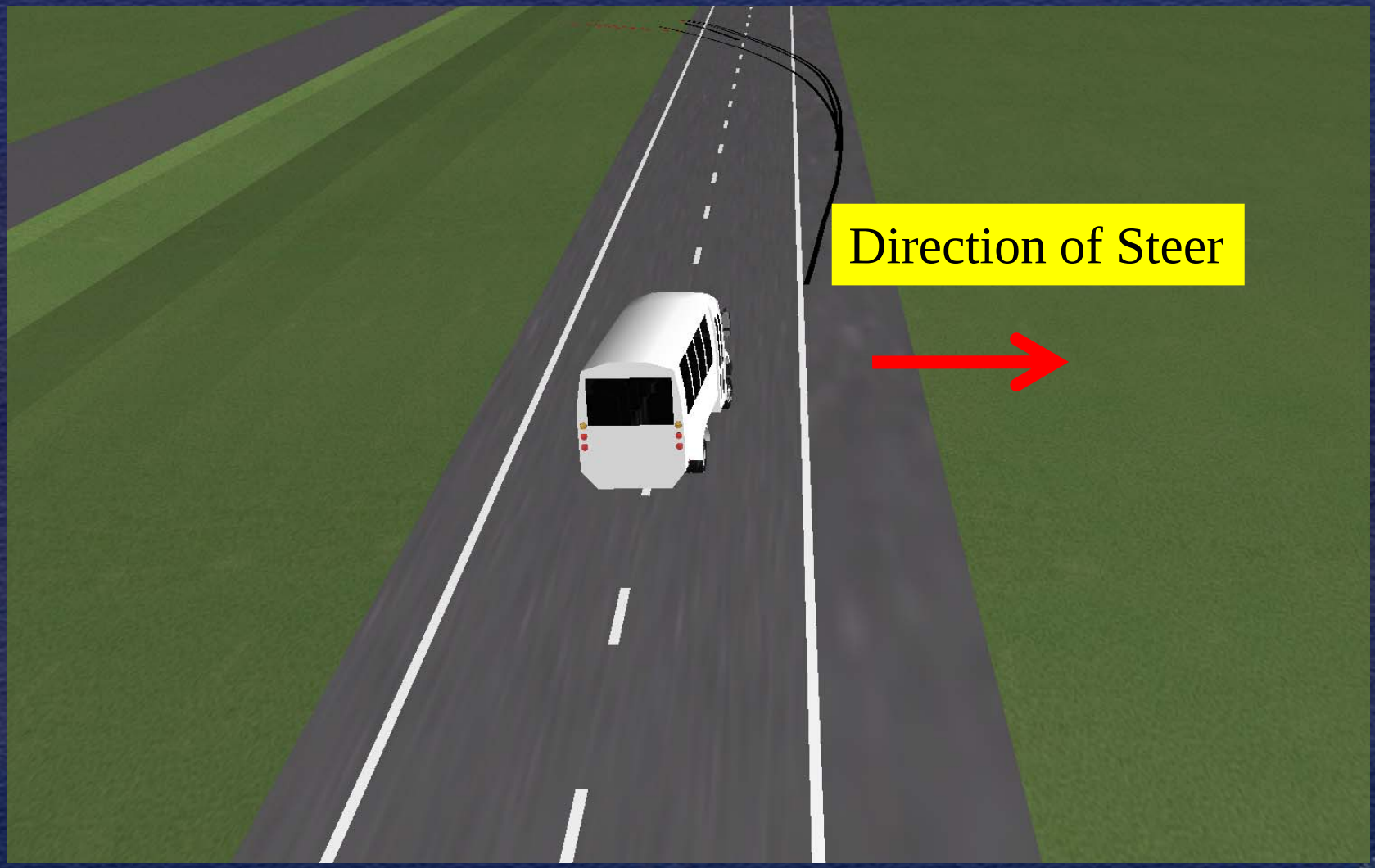

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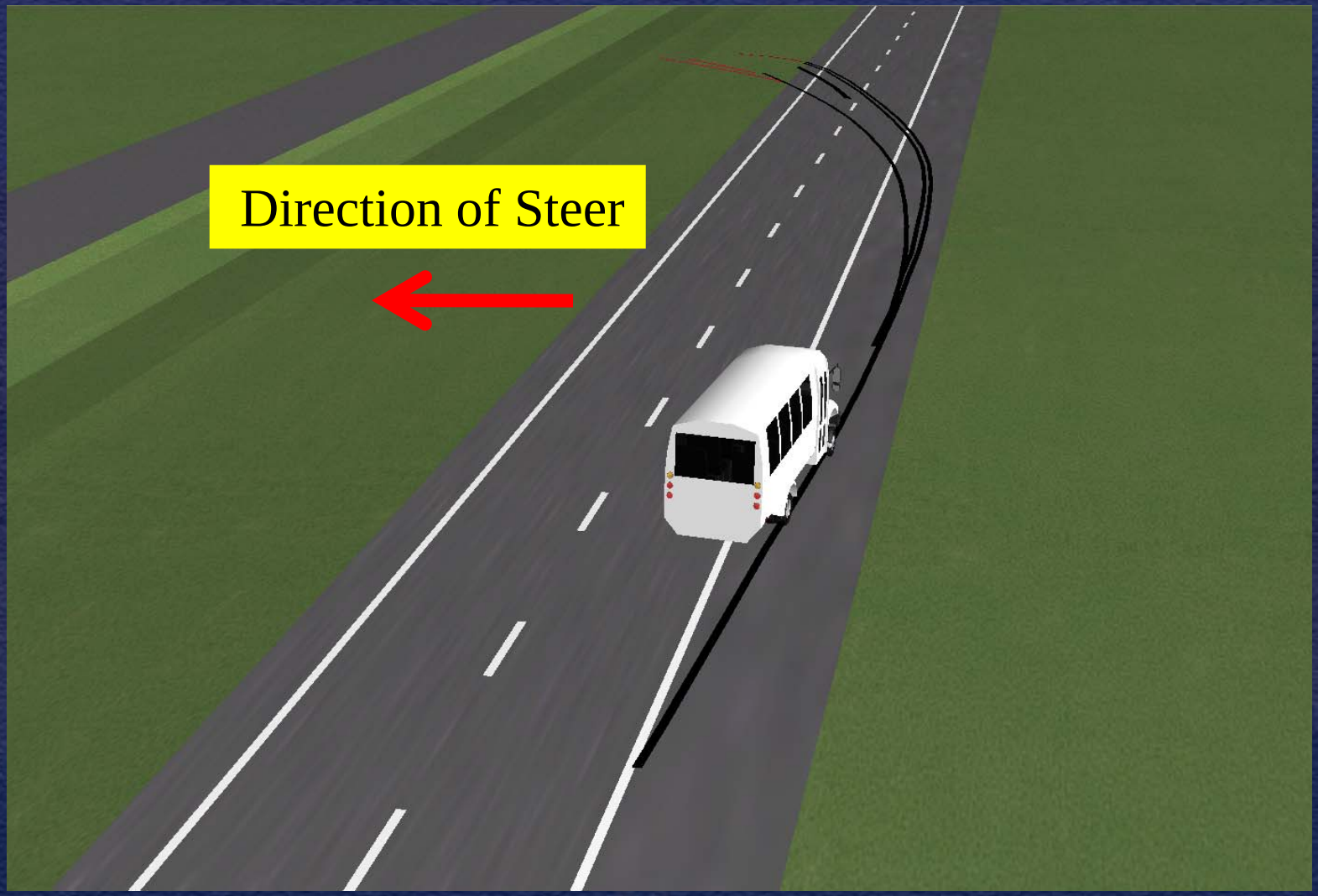

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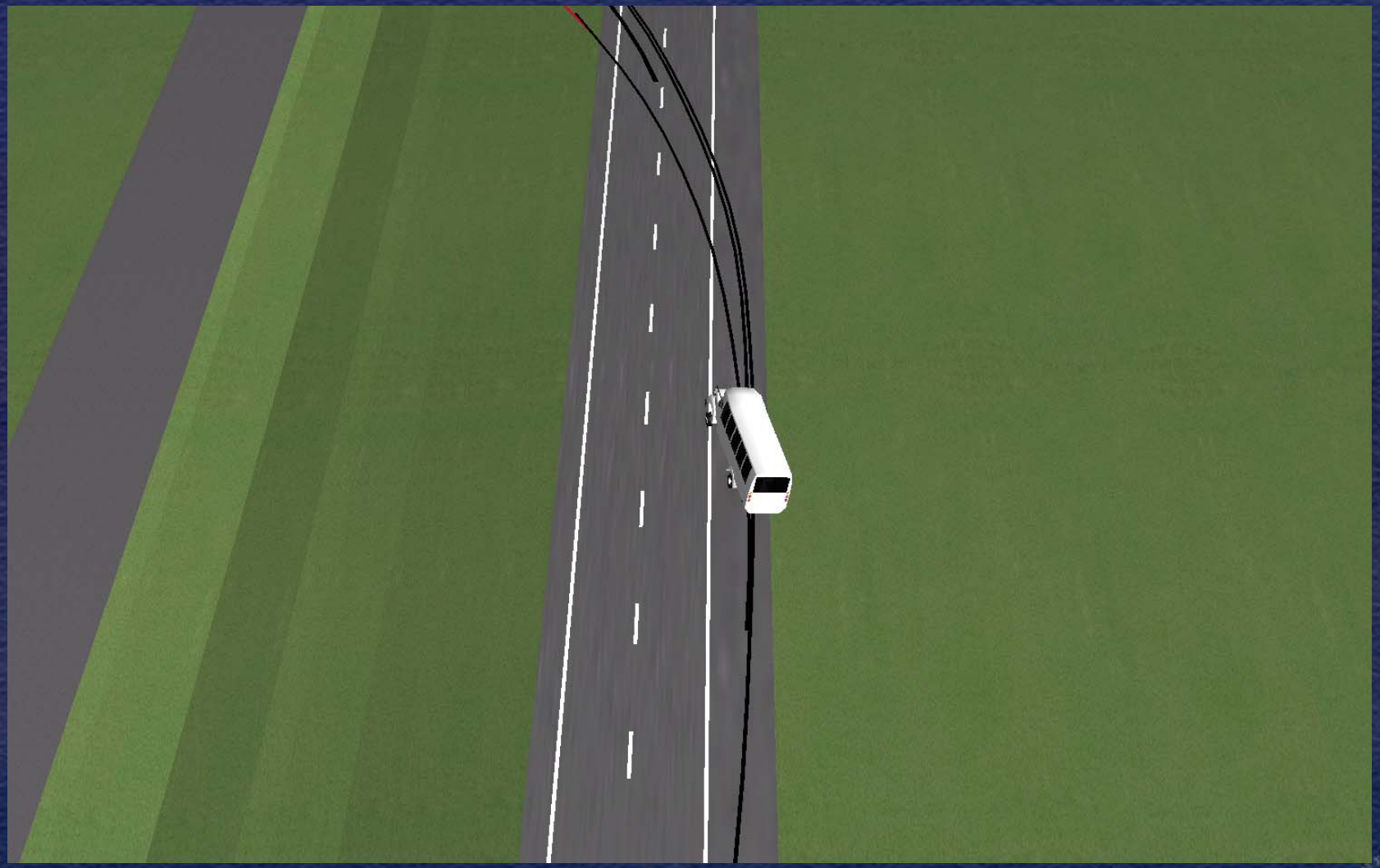
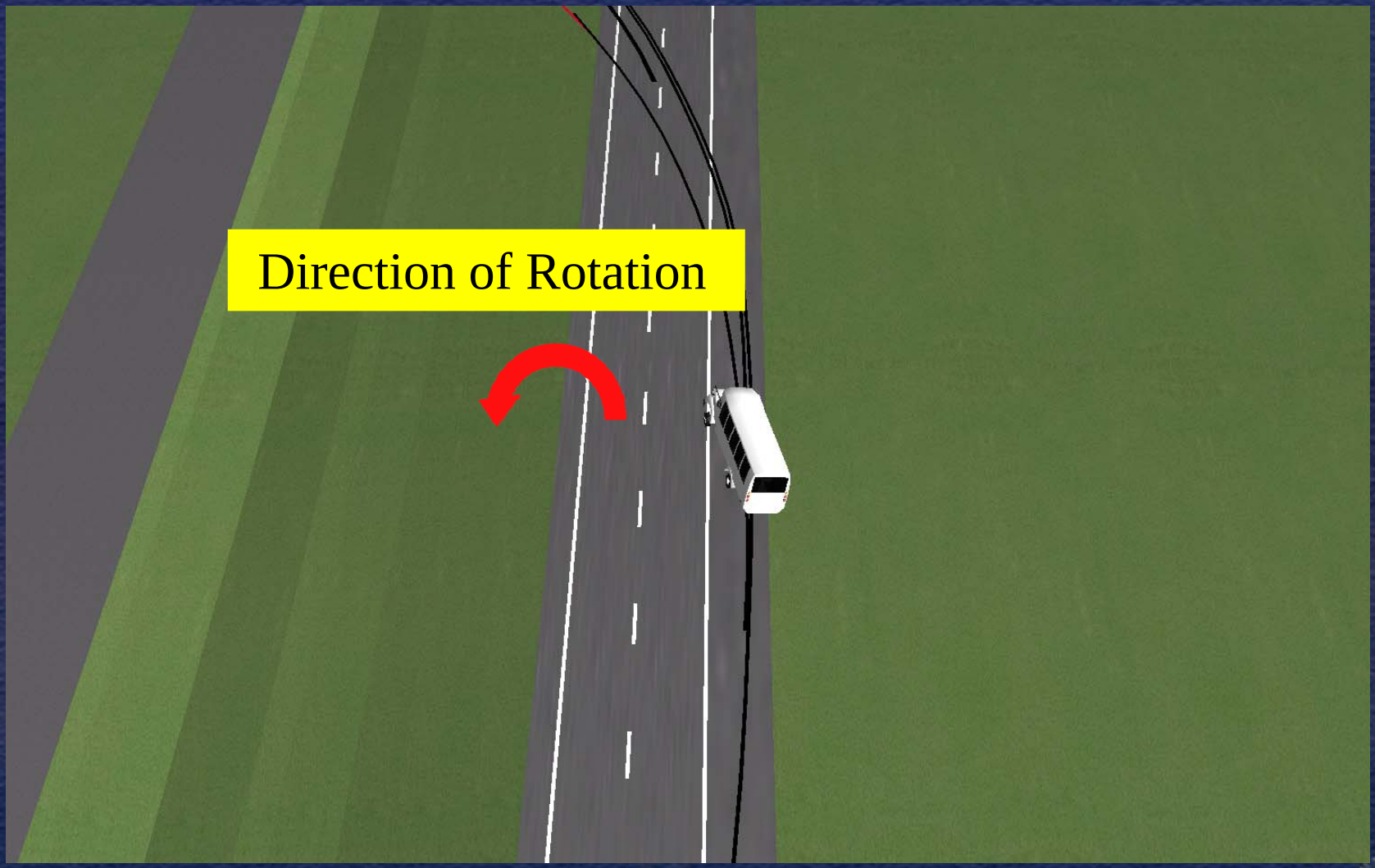
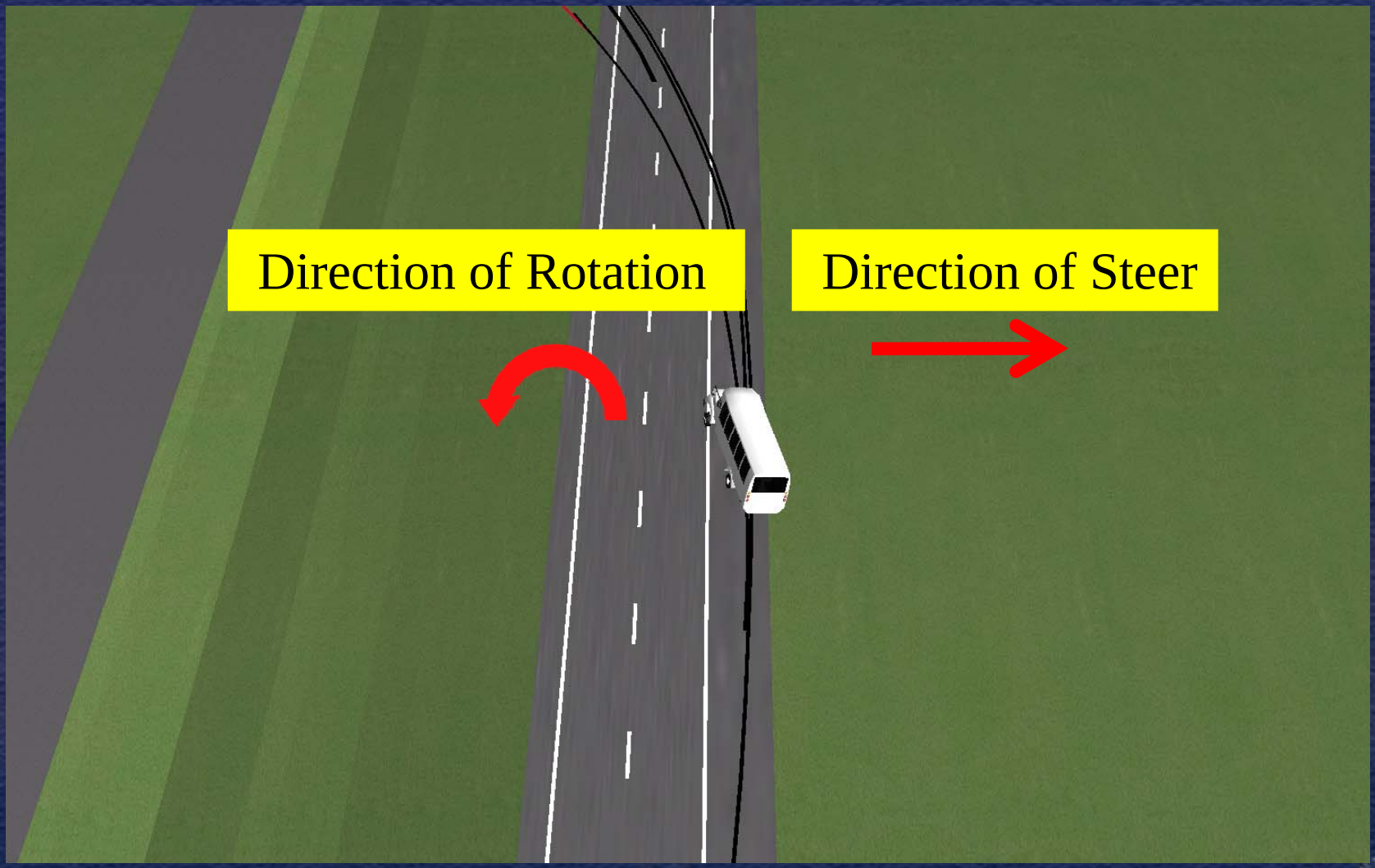


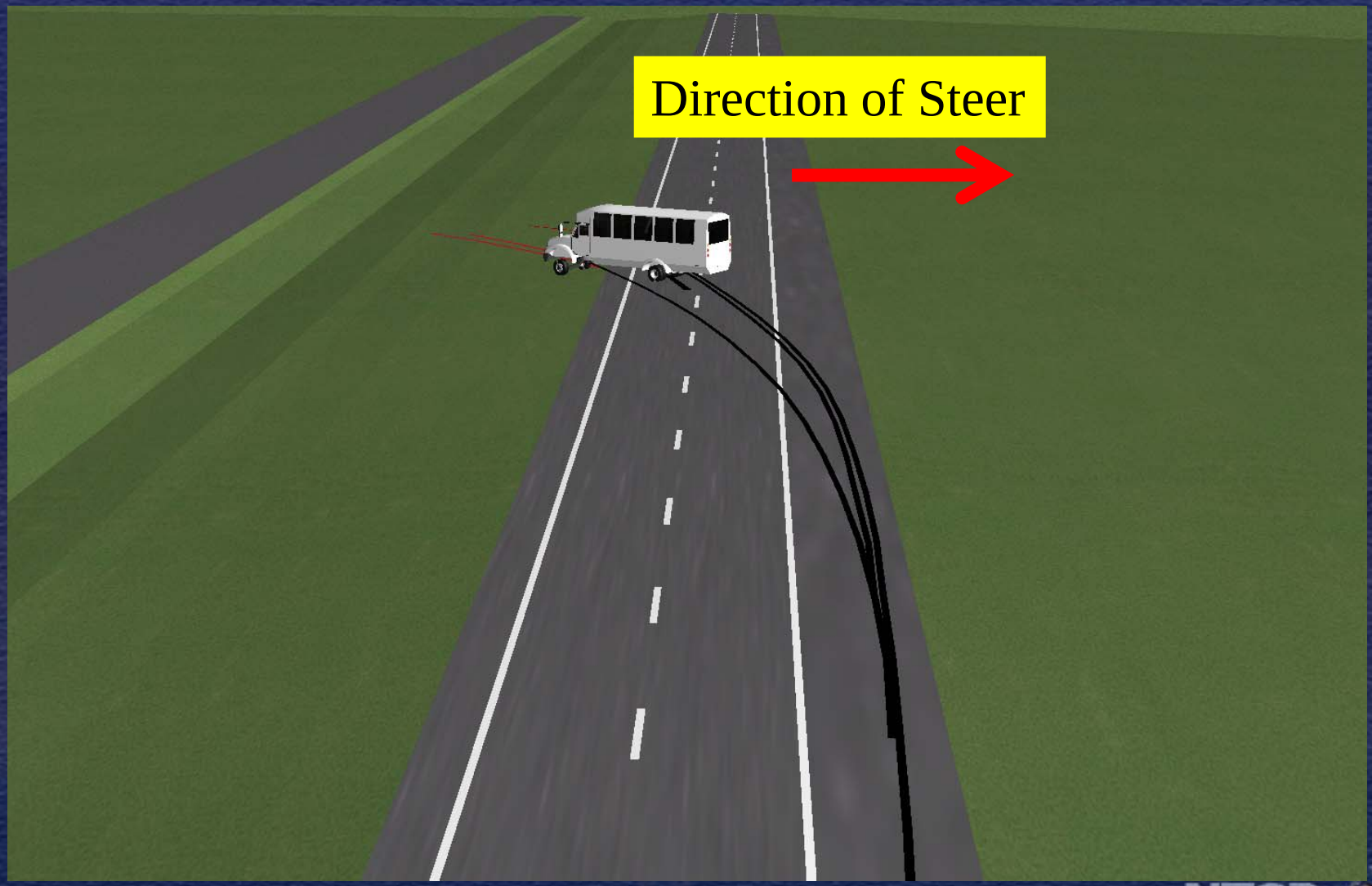
Accident Dynamics



Accident Dynamics

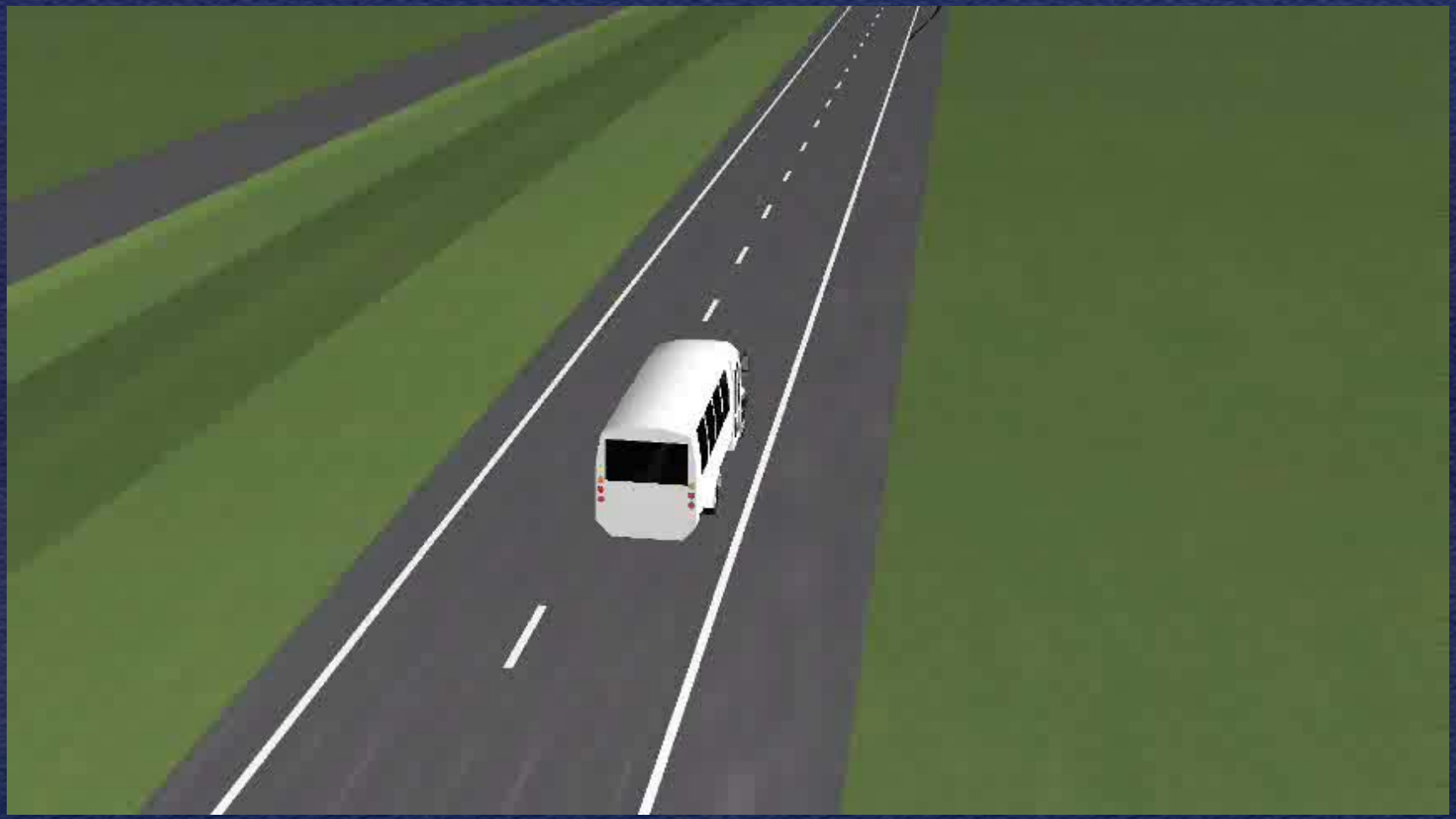


Accident Dynamics



Accident Dynamics

Simulation: No Stability Control



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Part 2: Stability Control Evaluation

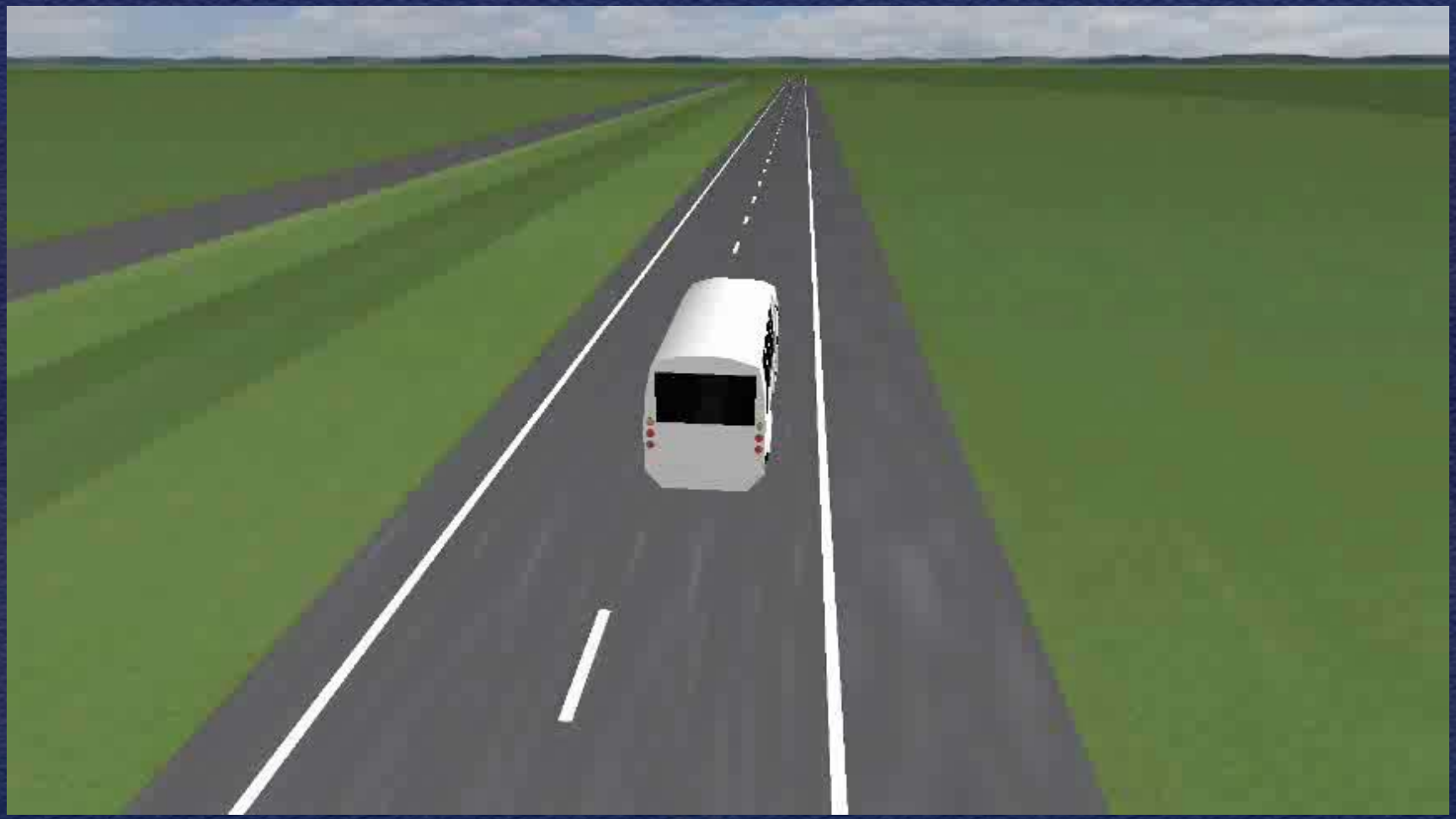
- Same data
- Stability control system incorporated into model
- Simulated driver model
- Conducted with and without a stability control system

Summary

Potential benefits

- Slowing of vehicle
- Reduction in handling changes
- Better responsiveness to counter steers
- Less likelihood of losing control and crashing with stability control system

Stability Control vs No Stability Control



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Stability Control

- Save 5,300 to 9,600 lives per year on light vehicles
- NHTSA bus tests
  - Motorcoaches with GVWR greater than 33,000 lbs

Summary

- Simulation suggests potential benefit of stability control for medium-size buses
- Motorcoach Safety Action Plan
- Stability control standards needed for all buses > 10,000 lbs

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