Vehicle Dynamics/Stability Control

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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

Tiremarks

Direction of Travel
Accident Dynamics
Accident Dynamics
Direction of Steer
Accident Dynamics

Direction of Steer
Accident Dynamics
Accident Dynamics

Direction of Rotation

Direction of Steer
Direction of Steer
Simulation: No Stability Control
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
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