

Electronic Stability Control (ESC)



A safety system that reduces traction loss by braking individual wheels, maintaining stability during emergency maneuvers or over/understeering.

Implementation Strategy

How and Where to Apply

- Install ESC on all passenger vehicles and light-duty trucks.
- Particularly effective on rural highways and high-speed roads prone to loss of control, rollovers, and roadway departure crashes due to adverse conditions, sharp turns, or driver inattention.
- ESC can be integrated into new or retrofitted vehicles, using sensors and braking to maintain stability in emergencies.
- NHTSA estimates that ESC can prevent 71% of passenger car rollovers and 84% of SUV rollovers in single-vehicle crashes.

Use in a Safe System Approach

In the SSA, ESC prevents rollovers and roadway departures by automatically braking individual wheels, improving stability and reducing crash severity, especially on high-risk roads with adverse conditions or sharp turns. It enhances overall vehicle safety and minimizes fatalities.

Key Stakeholders

Transportation safety agencies and regulators, fleet operators, policy makers and legislators, roadway infrastructure agencies, vehicle manufacturers.

Proactive Implementation

Proactive approaches include using vehicle telemetry to monitor ESC performance and inform safety programs. Insurance partnerships could offer discounts for ESC-equipped vehicles. Roadway improvements, like optimal friction and warning signs in high-risk areas, should complement ESC. Integrating ESC with ADAS and aligning with Vision Zero and Complete Streets can enhance road safety.

Countermeasure Overview

Objective: Prevent loss of vehicle control by maintaining stability.

Strategy: Monitor vehicle dynamics and automatically apply selective braking or torque adjustments.

Targeted Solution



CONTRIBUTING FACTORS

- Loss of traction
- Sharp steering
- Slippery road conditions
- High-Speed Curves



TARGET CRASH TYPE

- Run-off-road



ROAD FACILITY TYPE

- N/A



AREA TYPE

- All

Safety Linkage



NCHRP 500 Series

High-risk Environments



AASHTO'S TOWARD ZERO DEATHS

Safer Vehicles

SAFE SYSTEM APPROACH

Safe Vehicles

SAFE SYSTEM ROADWAY DESIGN

TIER 1

TIER 2

TIER 3

TIER 4

Tier 3

Selected Related Countermeasures

- CM1 Lane Departure Warning Systems (LDWS)
- CM2 Shoulder rumble strips
- CM3 Improve pavement friction

Cost: \$\$\$ (Moderate to High)

Service Life: 5 years

Electronic Stability Control (ESC) . Source: [NSC](#)



Helps drivers maintain control during skids, reducing crash severity.

Resources

- ¹FMVSS No. 126 Electronic Stability Control Systems
- https://www.nhtsa.gov/sites/nhtsa.gov/files/fmvss/ESC_FR_03_2007_0.pdf

