



U.S. Department of Transportation  
**National Highway Traffic Safety Administration**

# ODI RESUME

**Investigation:** PE22014  
**Prompted By:** SGO Report Review  
**Date Opened:** 12/12/2022      **Date:** 08/20/2024  
**Closed:**  
**Investigator:** Thomas Haugh      **Reviewer:** Sharon Yukevich  
**Approver:** Tanya Topka  
**Subject:** Automated Driving System (ADS)

## MANUFACTURER & PRODUCT INFORMATION

**Manufacturer:** Cruise LLC  
**Products:** Cruise ADS Software  
**Population:** 1,194

**Problem Description:** Automated Driving System (ADS) equipped vehicles may engage in inappropriately hard braking or become immobilized while operating in the specified Operational Design Domain (ODD).

## FAILURE REPORT SUMMARY

	ODI	Manufacturer	EWR D&I	Other	Total	EWR Field Reports
<b>All Incidents:</b>	0	7,626	0	10	7,632 *	0
<b>Crashes/Fires:</b>	0	10	0	10	10*	0
<b>Injury Incidents:</b>	0	4	0	4	4*	0
<b>Number of Injuries:</b>	0	4	0	4	4*	0
<b>Fatality Incidents:</b>	0	0	0	0	0	0
<b>Number of Fatalities:</b>	0	0	0	0	0	0

**Description of Other:**  
 Reports of crashes involving hard braking submitted under Standing General Order 2021-01 (SGO). Table does not include reports of immobilization incidents.

\*Total eliminates duplicates received by the manufacturer

## ACTION/SUMMARY INFORMATION

**Action:** This (PE) Preliminary Evaluation is closed with 24E067.

**Summary:**

On December 12, 2022, the Office of Defects Investigation (ODI) opened a Preliminary Evaluation (PE22-014) to assess reports of inappropriately hard braking as well as immobilizations in vehicles operated by Cruise LLC (Cruise) and equipped with its Automated Driving System (ADS). Both inappropriately hard braking and vehicle immobilizations can increase the risk of a crash. To assess these risks, ODI collected information from Cruise, as well as from five peer ADS-equipped vehicle operators.

Based on ODI's analysis of immobilization data, the potential safety risk is heavily dependent on the context of the immobilized vehicle's location, detectability of the vehicle due to hazard lights automatically engaging, and none of the immobilization incidents reviewed resulted in a crash or injuries.

ODI also analyzed hard braking data which included 7,632 hard braking events commanded by the Cruise ADS. These events were determined by certain thresholds, including rate of deceleration, without regard to the appropriateness of the braking. ODI determined that Cruise vehicles contributed to 10 crashes that were reported under the Standing General Order 2021-01 (SGO), 4 of which involved a vulnerable road user and resulted in injury.

On August 9, 2024, Cruise filed a safety recall (NHTSA Recall No. 24E-067) for "unexpected braking maneuvers [that] could occur if the ADS inaccurately predicts the immediate future path of the close-following actors, experiences diminished sensor precision from the close proximity of the close-following actors, or erroneously responds to a perceived risk ahead of the AV unrelated to the rear actor." The recalled software versions affected all Cruise ADS-equipped vehicles within the US fleet. The Cruise ADS has been remedied through software updates that are intended to reduce the risk of unexpected braking maneuvers, including by improvements to perception, prediction, and planning.

In view of the recall action taken by Cruise and ODI's analysis of the available data, including data presented by Cruise demonstrating a reduced occurrence of hard braking incidents after the software updates, ODI is closing this Preliminary Evaluation. NHTSA reserves the right to take additional action if warranted by new circumstances.

To review the SGO reports cited above, go to [NHTSA.gov/laws-regulations/standing-general-order-crash-reporting](https://www.nhtsa.gov/laws-regulations/standing-general-order-crash-reporting). The SGO report ID numbers are provided below:

30412-2216 30412-2588 30412-2885 30412-3801 30412-3748 30412-5430 30412-6020 30412-6271 30412-6281 30412-6242