CEE 4674
Embraer 145 Overrun Event at ROA Airport (September 24, 2025)

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Fall 2025

Pictures of the Overrun

Aircraft used ~180-200 feet of the EMAS bed

Source: Associated Press

Aircraft probably entered the EMAS bed at ~45 knots (my estimate)

Synopsis of the Accident

"A CommuteAir ERJ-145 operating as United Connection Flight 4339 from KIAD-KROA overran the runway upon landing in wet conditions."

"The aircraft touched down on runway 34 at KROA but was unable to come to a stop on the runway surface became stuck in the EMAS off the departure end of 34."

"No injuries were reported out of 53 persons on board."

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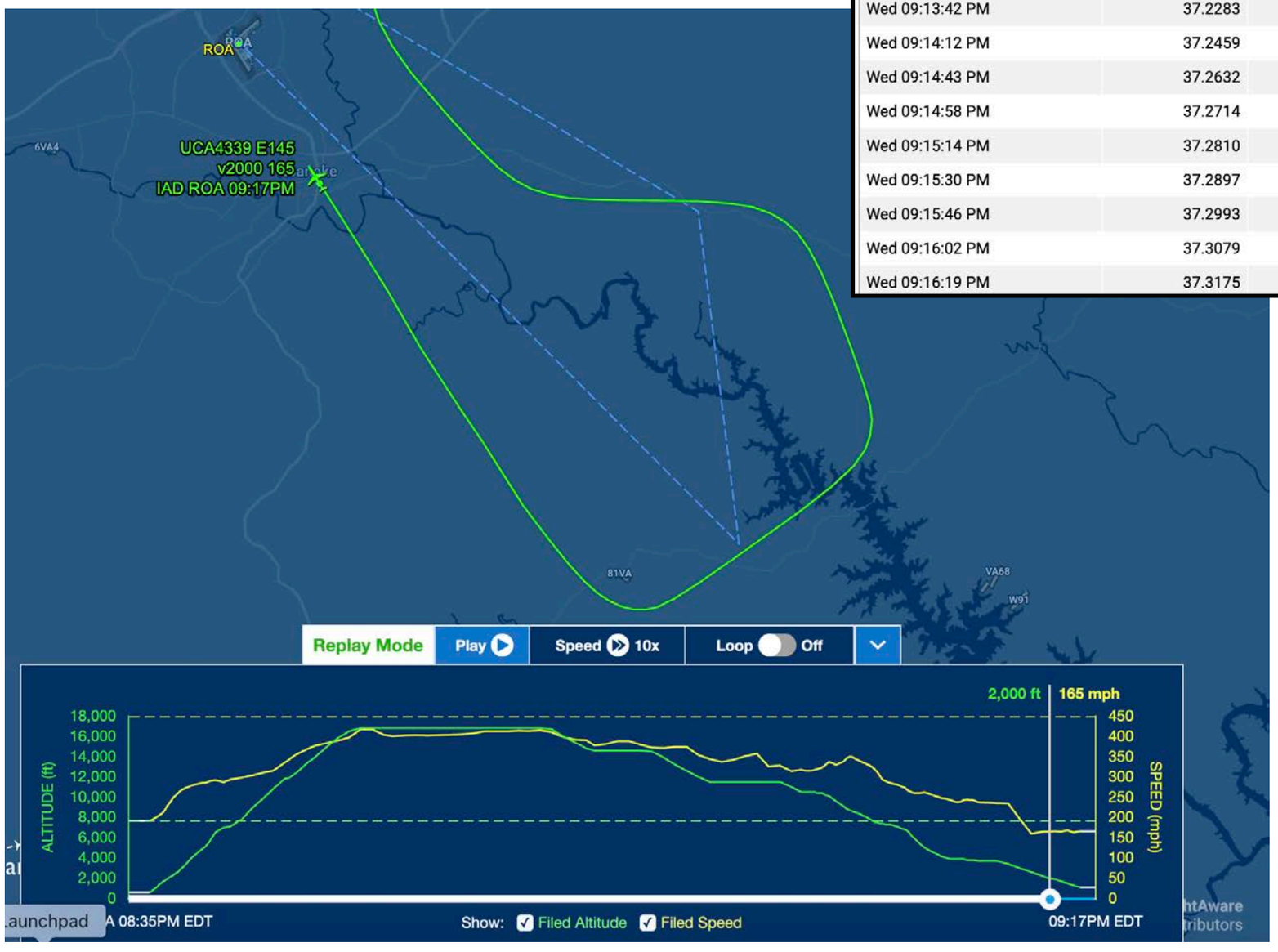
Date:	Wednesday 24 September 2025
Time:	21:16
Type:	Embraer ERJ-145XR
Owner/operator:	United Express, opb CommuteAir
Registration:	N21129
MSN:	145703
Year of manufacture:	2003
Fatalities:	Fatalities: 0 / Occupants: 53
Other fatalities:	0
Aircraft damage:	Unknown
Location:	Roanoke-Blacksburg Regional Airport, VA (ROA/KROA) - United States of America
Phase:	Landing
Nature:	Passenger - Scheduled
Departure airport:	Washington-Dulles International Airport, DC (IAD/KIAD)
Destination airport:	Roanoke-Blacksburg Regional Airport, VA (ROA/KROA)

Source: https://asn.flightsafety.org/wikibase/546744

Evaluation of the Flight Track

Flight parameters prior to touchdown are normal



Time (EDT)	Latitude	Longitude	Course	kts	mph	feet	Rate
Wed 09:13:42 PM	37.2283	-79.9019	↖ 330°	170	196	2,950	-825
Wed 09:14:12 PM	37.2459	-79.9158	↖ 327°	139	160	2,575	-738
Wed 09:14:43 PM	37.2632	-79.9296	↖ 328°	143	165	2,200	-717
Wed 09:14:58 PM	37.2714	-79.9361	↖ 327°	143	165	2,025	-677
Wed 09:15:14 PM	37.2810	-79.9436	↖ 328°	144	166	1,850	-656
Wed 09:15:30 PM	37.2897	-79.9503	↖ 329°	143	165	1,675	-750
Wed 09:15:46 PM	37.2993	-79.9578	↖ 327°	146	168	1,450	-750
Wed 09:16:02 PM	37.3079	-79.9646	↖ 328°	142	163	1,275	-682
Wed 09:16:19 PM	37.3175	-79.9722	↖ 328°	144	166	1,075	-706

Ground speed is stable

Descent rate is stable and within normal parameters

We do not have the landing location (very important)

Source: https://www.flightaware.com/live/flight/map/UCA4339/history/20250924/2140Z/KIAD/KROA

Weather at the Time of the Accident May be a Factor in this Accident

METAR (Meteorological Aerodrome Report):

Incident time: 0117Z:

Wind from the West (260 deg) at 5 knots

- SPECI KROA 250137Z 23005KT 2SM RA BR BKN038 OVC049 22/21 A3006 RMK AO2 SFC VIS 3 RAB07 P0025 T02170211

- SPECI KROA **250112Z** 26005KT **1 3/4SM +RA BR** FEW032 BKN050 OVC085 22/21 A3005 RMK AO2 TWR VIS 2 RAB07 P0000 T02170211

1.75 miles of visibility

Heavy rain

Mist

Source:
https://asn.flightsafety.org/wikibase/546744

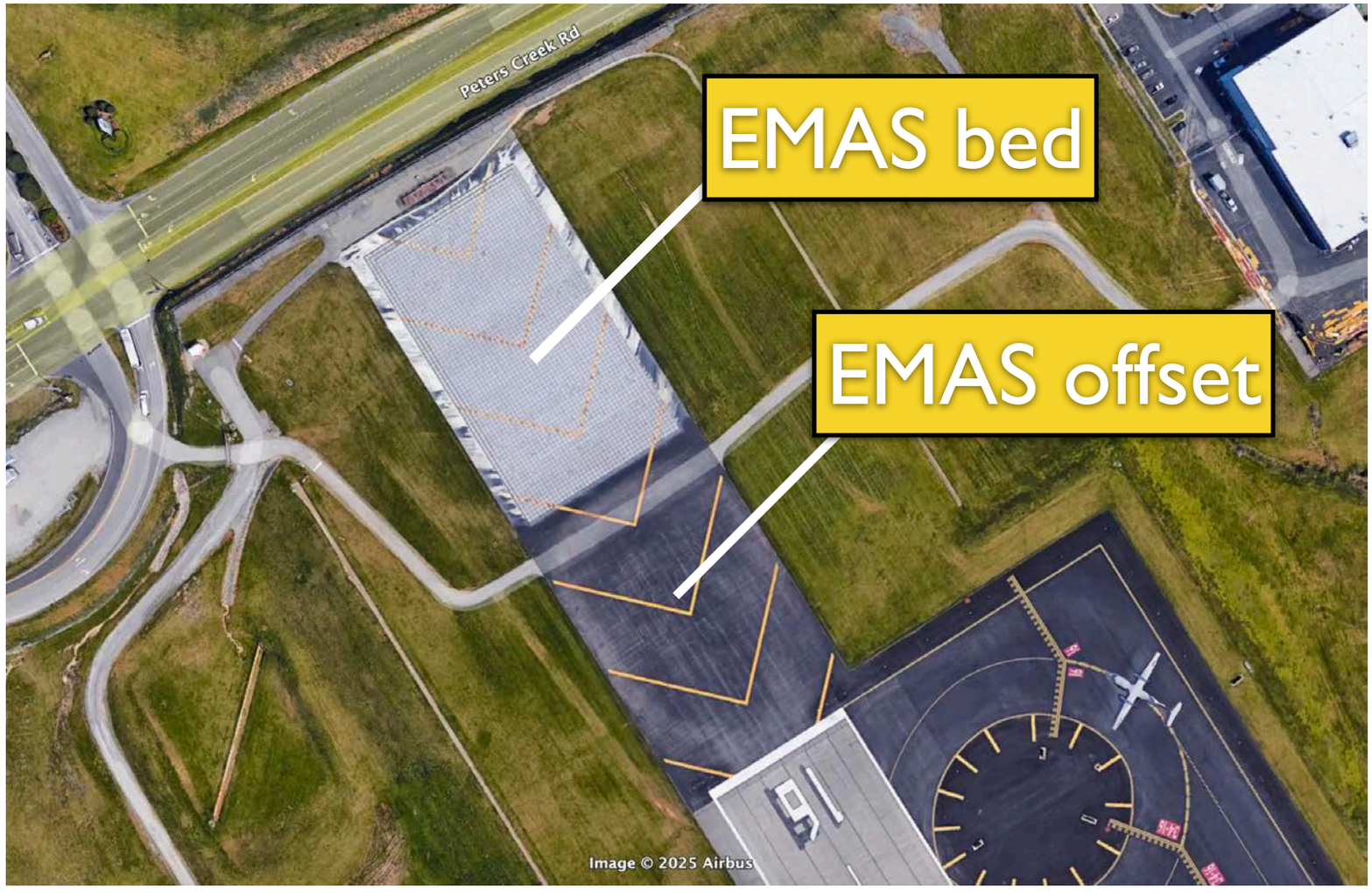
Runway and EMAS Characteristics

Runway 34 is 5,810 feet long (shortest of two runways at ROA)

Landing Distance Available (LDA) = 5,810 feet

Approach lights (MALSR): 1,400 foot medium intensity approach lighting system with runway alignment indicator lights

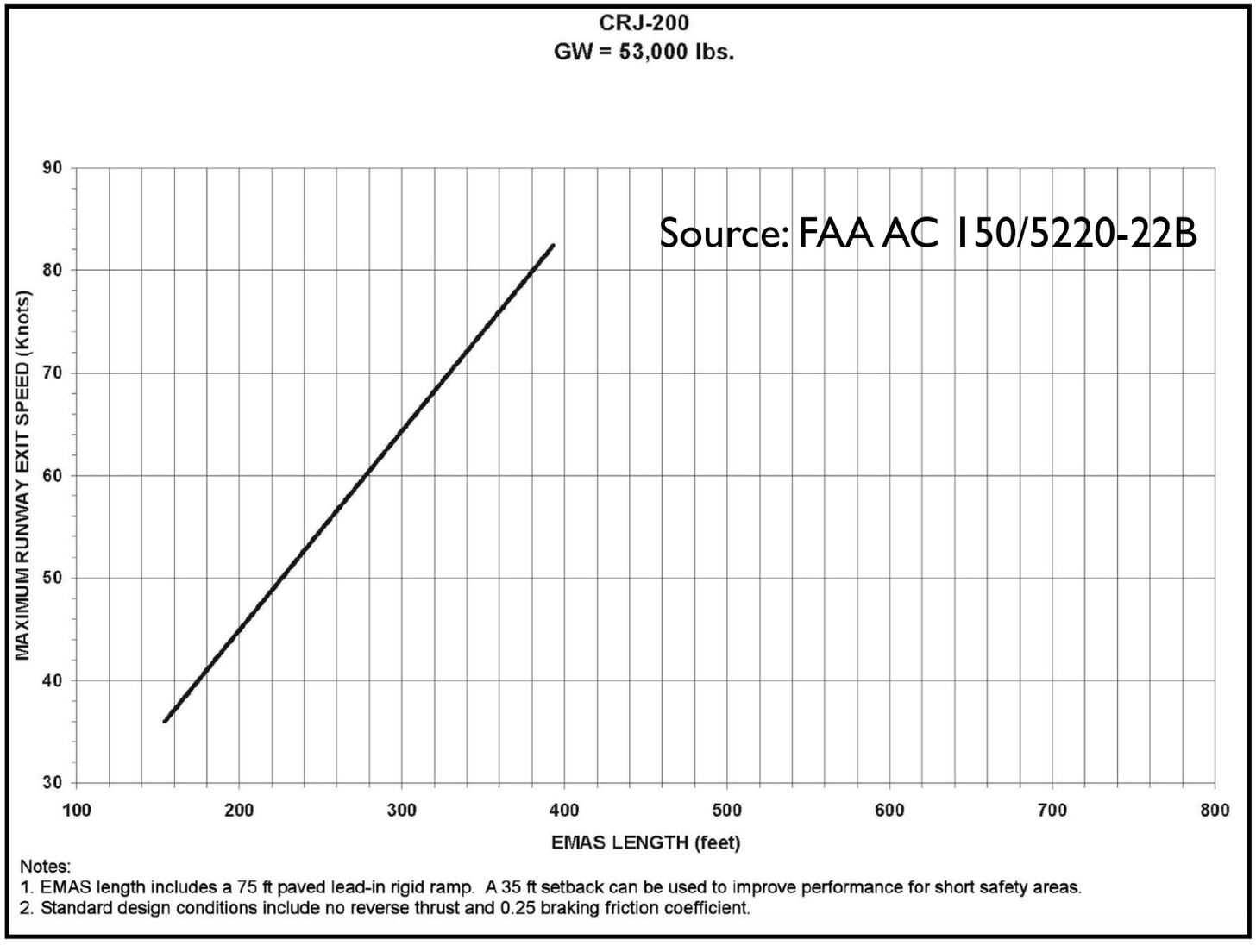
EMAS length = 300 feet
EMAS offset is 300 feet



Sources: Airnav and Google Earth

Embraer 145XR and ROA EMAS

Max. Takeoff Weight = 53,000 lbs.
Typical landing weight = 45,000 lbs.
EMAS chart similar to the Bombardier CRJ-200 (53,000 lbs)



The 300-foot EMAS can stop the regional jet while departing the runway at 64 knots
The 300-foot offset provides another 8-10 knots of deceleration before entering the EMAS bed

Reasons for Overruns

In previous accidents aircraft overrun due to following reasons:

- Long landing on a short runway
- Brake failure or degradation
- Incorrect pilot technique
- Failure of thrust reversers
- **Hydroplaning (possible in heavy rain)**

Horne's formula to estimate the minimum dynamic hydroplaning speed

$$V_{hydro} = \sqrt{9P}$$

where:

V_{hydro} Ground speed (knots)

P Tire pressure (psi)

Embraer 145 Hydroplanning Speeds

E145X uses tire size 30x9.5-14 main, 19.5x6.75-8 nose
Tire pressures vary from125 to 140 lb/sq in)

$$V_{hydro} = \sqrt{9P}$$

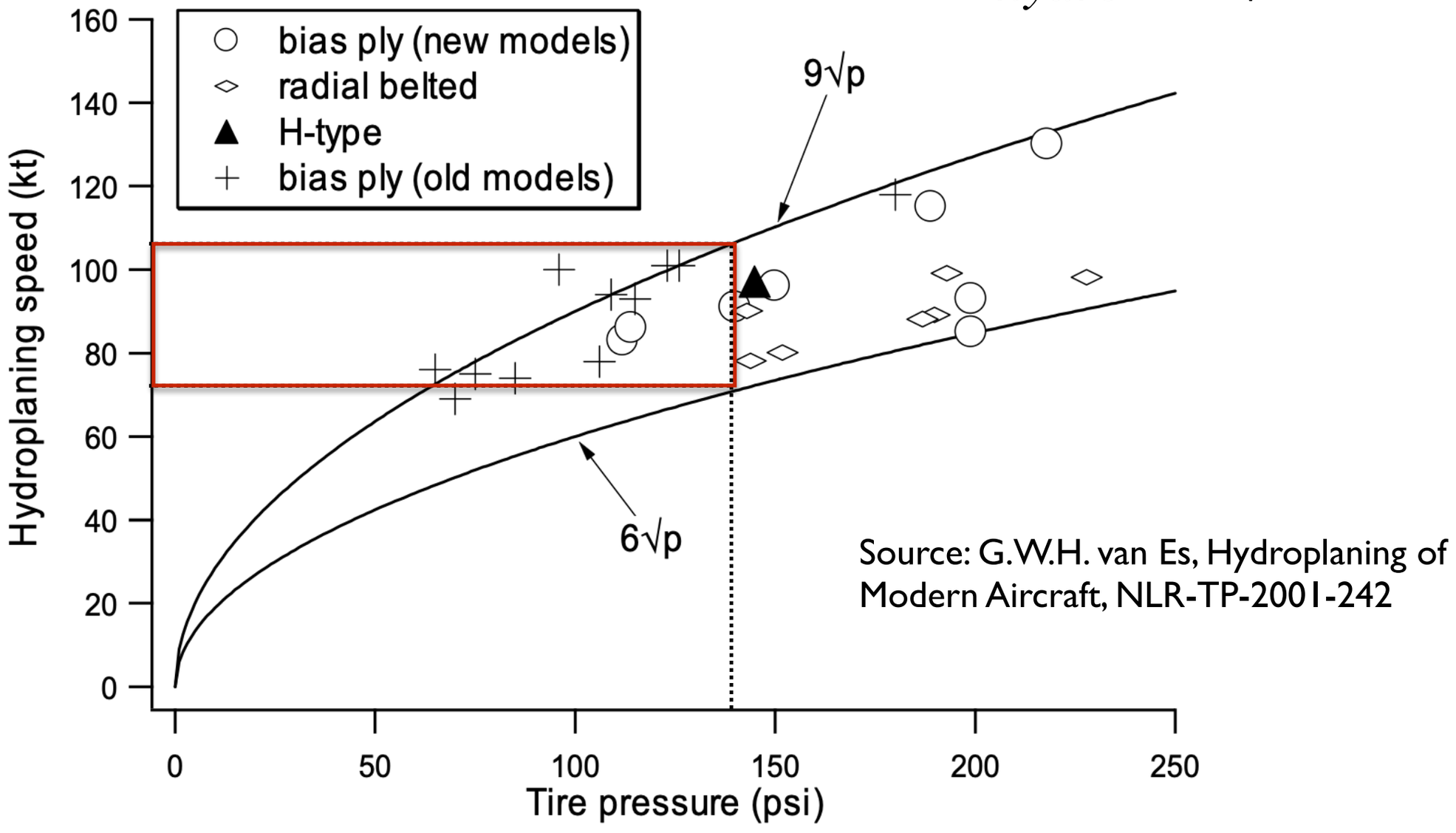
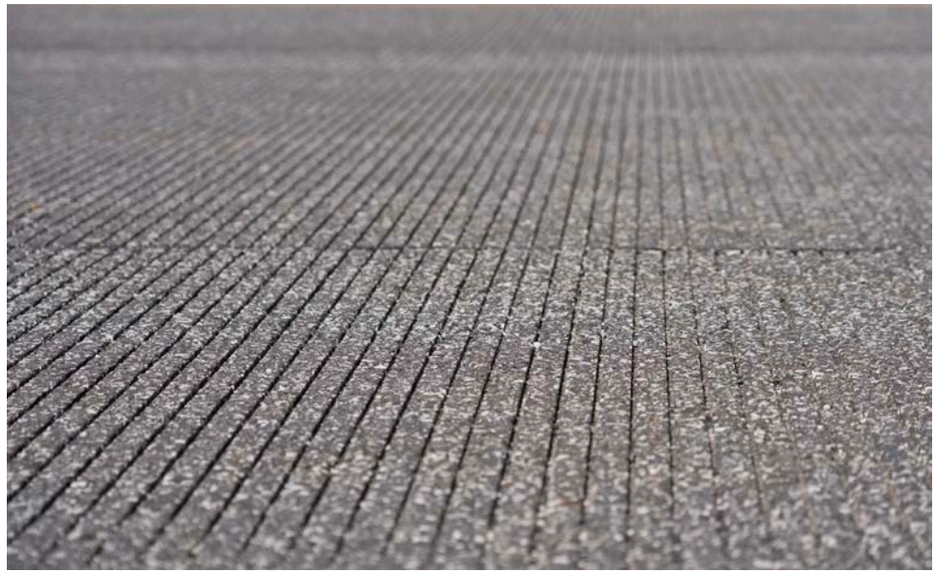


Figure 2: Experimental hydroplaning speeds as function of tire pressure for different tire types.

Runway Grooving

Transversal grooves are used to carry water away from the runway
Transversal slope is usually 1.5% to dissipate water



Possible Factors in this Accident

- Heavy rainfall rate reported six minutes before the landing
  - Possibility of dynamic hydroplaning
- A long touchdown location on a short runway (5,800 feet)
- Selection of runway 34 instead of runway 24
  - Wind was 260 at 5 knots (favors runway 24)
  - Runway 24 is 6,800 feet long (better margin against an overrun)
  - Runway 34 has an instrument landing procedure (ILS) with 700 feet decision altitude and 1.75 mile visibility
  - Runway 34 has approach lights (1,400 MALSR)
  - Runway 24 has no approach lights (just PAPI lights)
  - Runway 24 has an RNAV (RNP) approach with 500 feet decision altitude and down to 1 mile visibility

Looks like the pilot selected runway 34 because of ILS + approach lights