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# Analysis of Australian National Crash In-Depth Study (ANCIS) Pole Side Impact Cases by Angle of Impact

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4<sup>th</sup> Meeting - GRSP Informal Group on Pole Side Impact

Seoul, South Korea, 27-28 October 2011

# About ANCIS

- The Australian National Crash In-depth Study (ANCIS) commenced in 2000.
- ANCIS is managed by Monash University Accident Research Centre (MUARC).
- Participants identified and recruited by MUARC appointed nurses.
- Participants interviewed.
- Vehicle inspections conducted.
- Crash site inspections conducted.
- Cases finalised and details coded to a database.



# Process Used to Identify ANCIS Pole Side Impact Serious Injury Cases

Filter cases by case participant MAIS  
(MAIS 3+ and MAIS 4+ cases analysed)

Filter cases by object hit code  
(codes 10-12 identify trees and codes 15, 21-25 identify poles)

Filter cases by case participant seating position  
(code 1 is used to identify drivers, code 2 is used to identify front-row outboard passengers)

Identify struck side occupant cases  
(CDC codes used in combination with case participant position codes to identify struck side front row occupants of pole side impact vehicles with damage to passenger compartment)

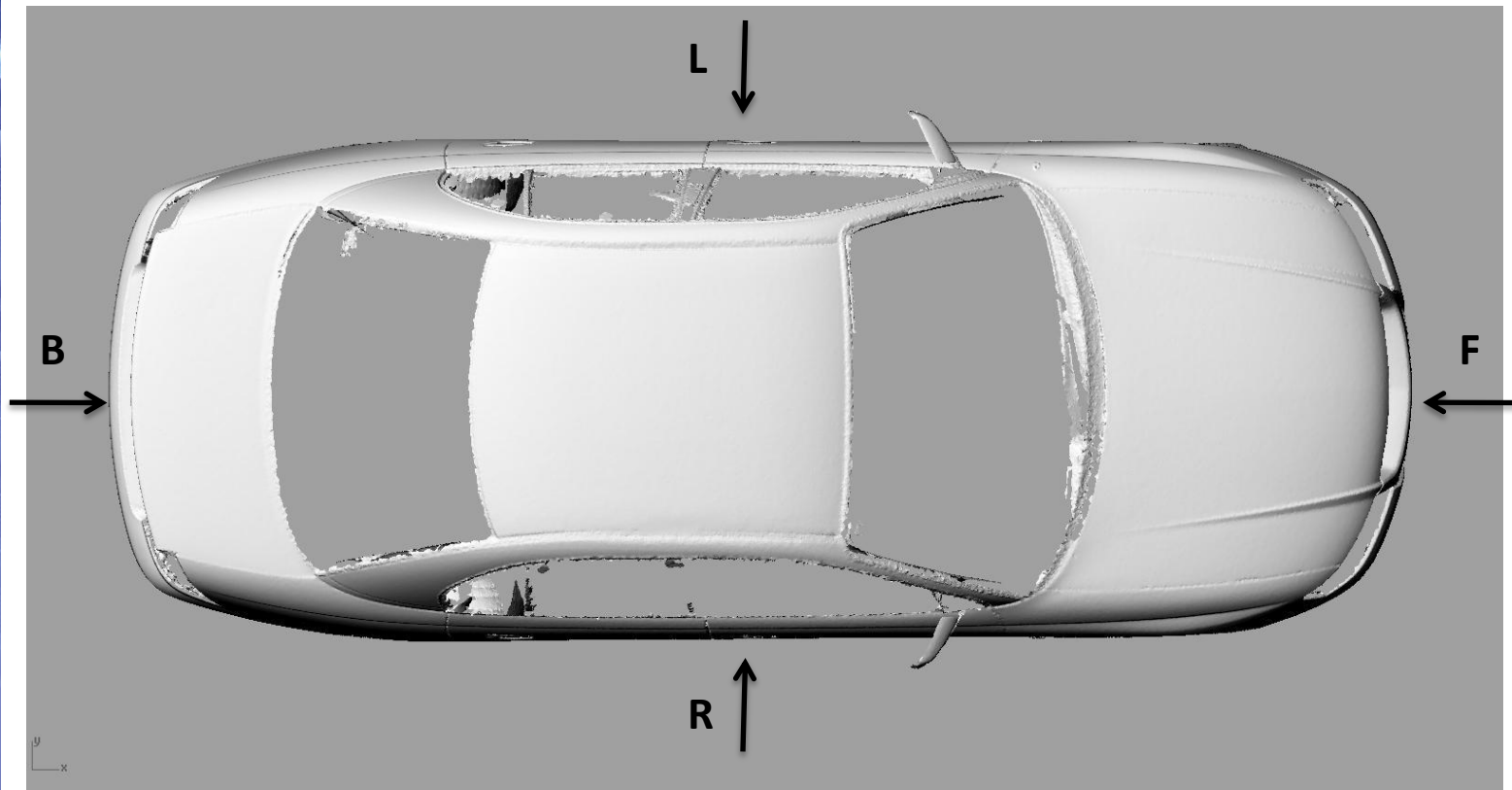


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# Collision Deformation Classification (CDC)

3<sup>rd</sup> Digit:



- Used to select side impacts. Cases were therefore excluded if 3<sup>rd</sup> CDC digit was not R or L.

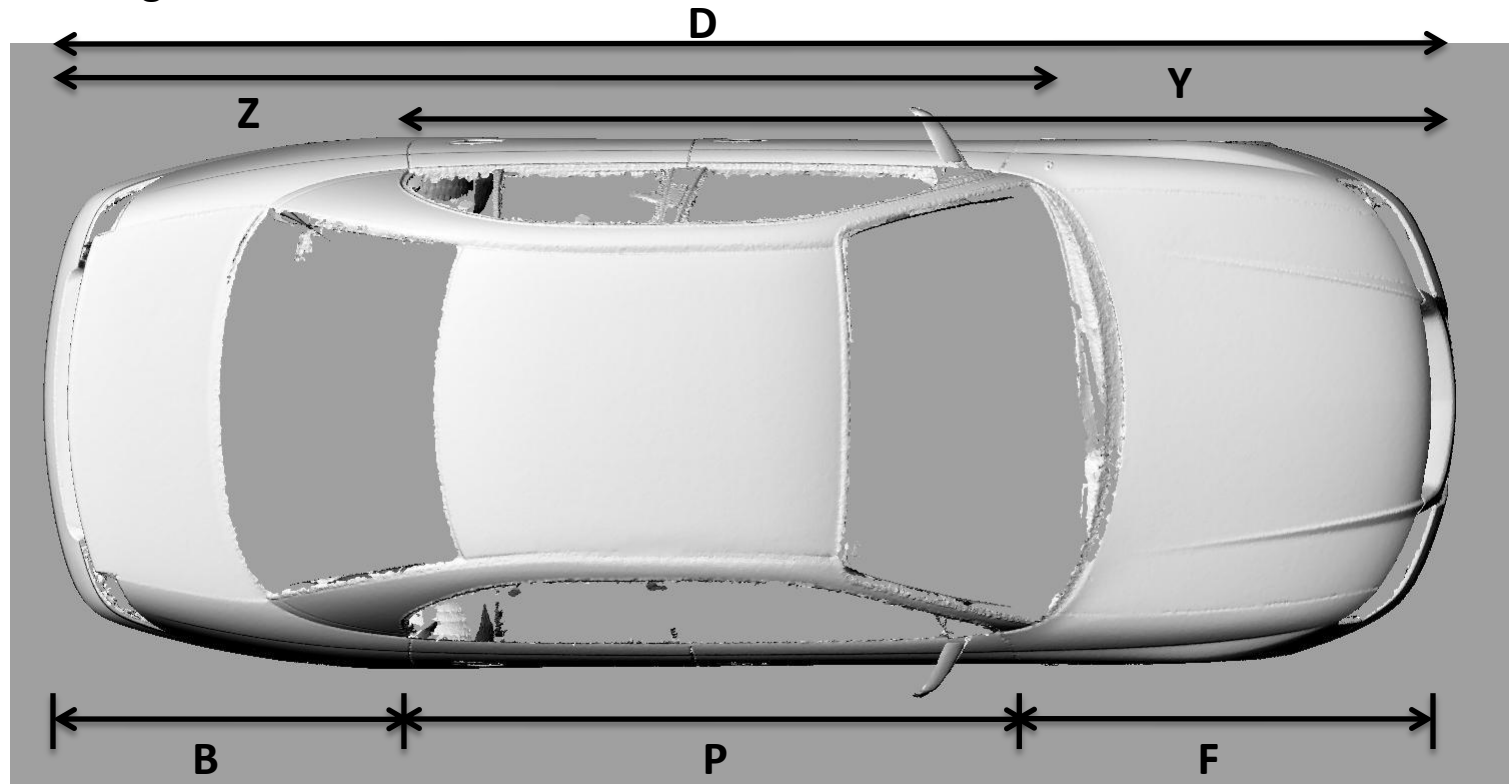


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# Collision Deformation Classification (CDC)

4<sup>th</sup> Digit:



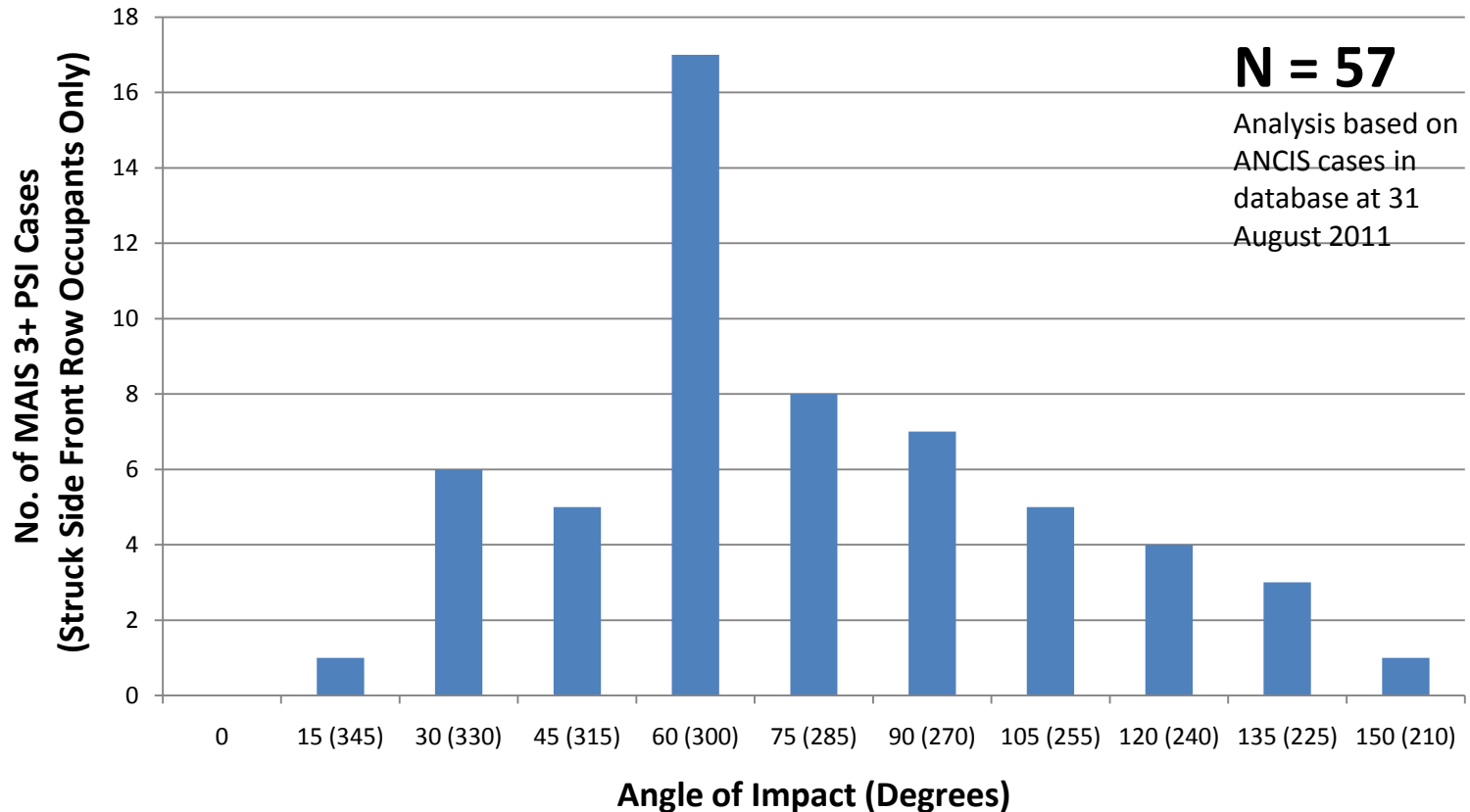
- Used to select cases with damage to passenger compartment. Cases were therefore excluded if 4<sup>th</sup> CDC digit was not D, Z, Y or P.
- For all MAIS 4+ pole side impact cases, 4<sup>th</sup> digit was always D, Z, Y or P anyway.



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# ANCIS MAIS 3+ Pole Side Impact Cases



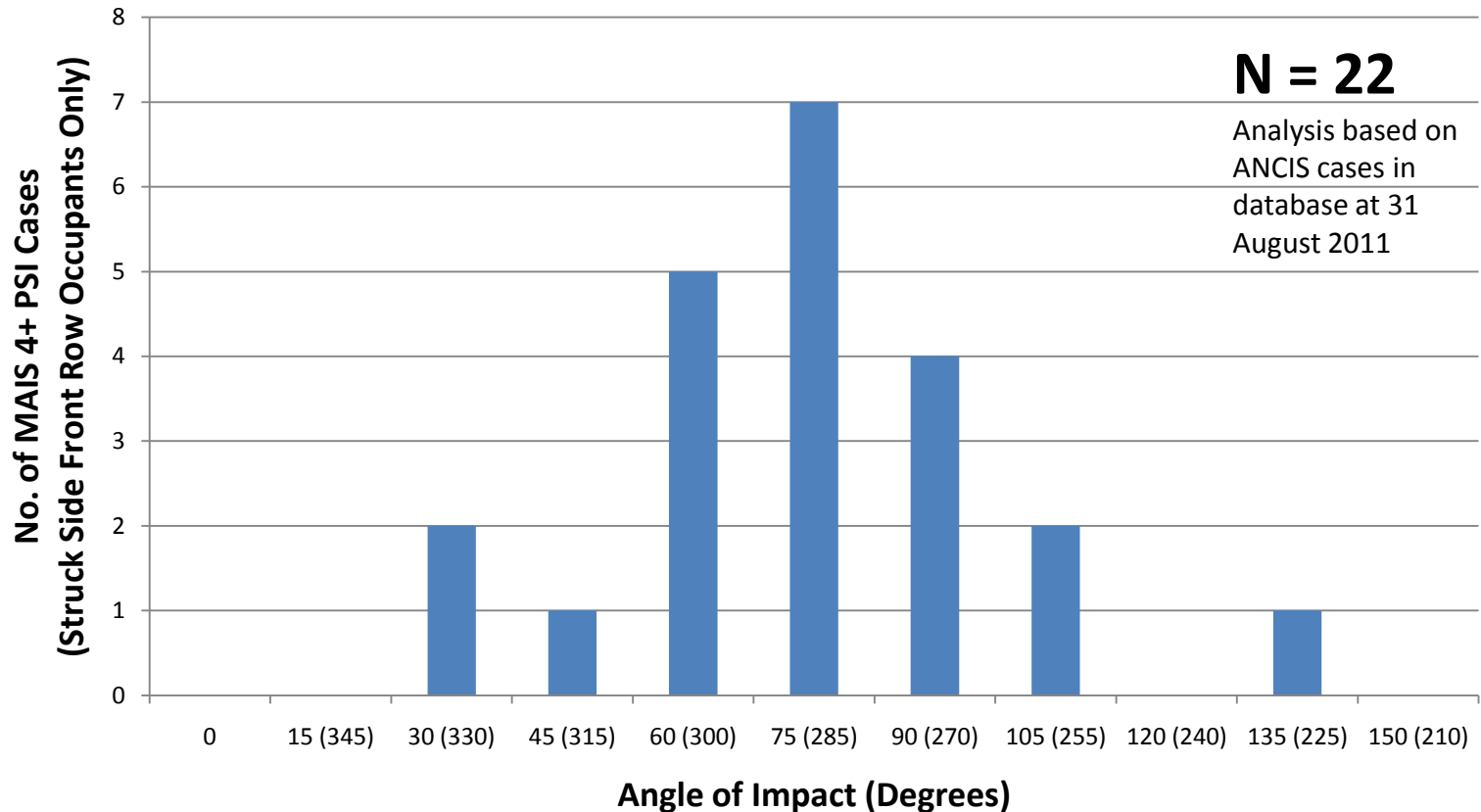
- 60 degree oblique is clearly most common coding for MAIS 3+ injured struck side front row occupants in ANCIS.
- Serious injuries were recorded for angles of impact between 15 degrees and 150 degrees.



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# ANCIS MAIS 4+ Pole Side Impact Cases



- 75 degree oblique is most common coding for MAIS 4+ injured struck side front row occupants in ANCIS.
- Severe injuries more likely to have occurred at angles of impact between 60 and 90 degrees.



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# Conclusions

- Analysis is based on a relatively small number of cases, but nevertheless supports conclusions of similar in-depth data analyses completed by NHTSA and BAST.
- Data does not show any reason why a pole side impact GTR should not specify a 75° oblique impact angle. In fact 75° oblique is likely to be a very reasonable choice given:
  - 75° was most common angle for MAIS 4+ injured occupants and second most common for MAIS 3+ injured occupants.
  - 75° bisects the 60-90° range within which most MAIS 4+ pole side impact injuries occurred.
- Regardless of what field crash data supports, it is also important that the angle of impact suits the biofidelity, design and measurement capabilities of the dummy:
  - Pole side impact crash test research with RibEye suggests WS 50<sup>th</sup> male is actually likely to be better suited to 75° pole side impact than 90° pole side impact.





# Acknowledgement

ANCIS is a collaborative study which has been sponsored by Australian state/federal government departments, vehicle manufacturers, insurers and motoring clubs including:



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Thank you



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