



agilysis



IDENTIFYING COMPARABLE AREAS

A MACHINE LEARNING SOLUTION FOR THE ROAD CASUALTIES INVESTIGATION PROJECT

DR CRAIG SMITH AND BRUCE WALTON

THE TASK



Road Collision Investigation Project



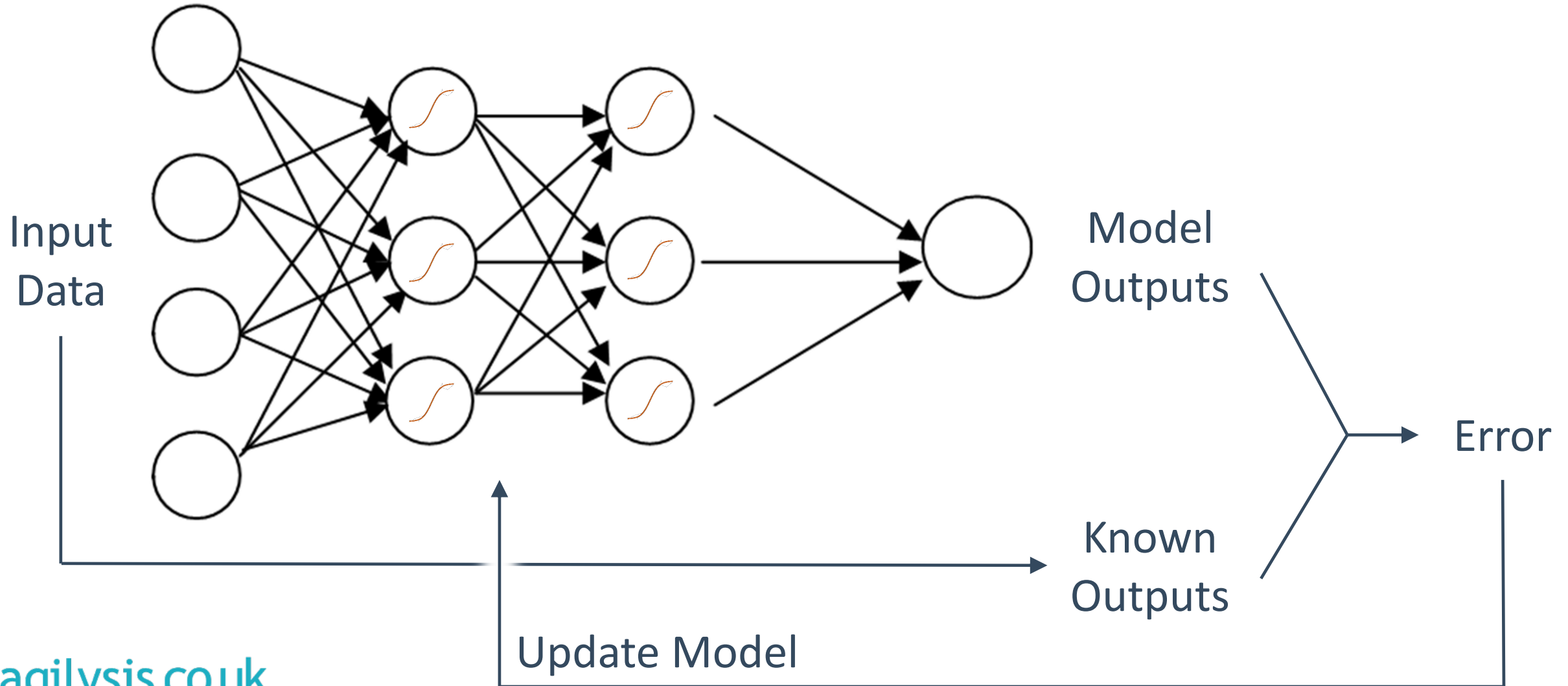
<https://www.racfoundation.org/collaborations/road-collision-investigation-project>



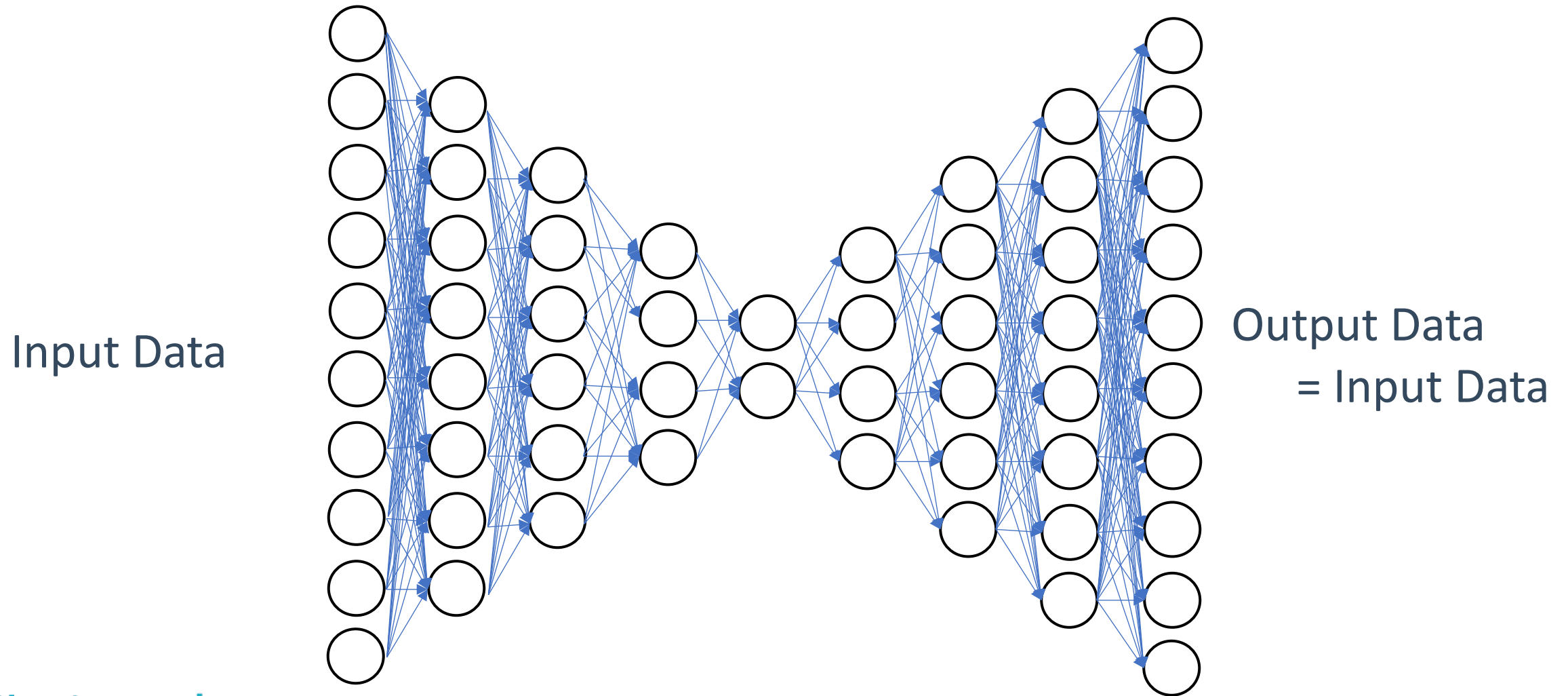
- Humberside
- West Midlands
- Dorset, Devon and Cornwall
 - *Two forces*



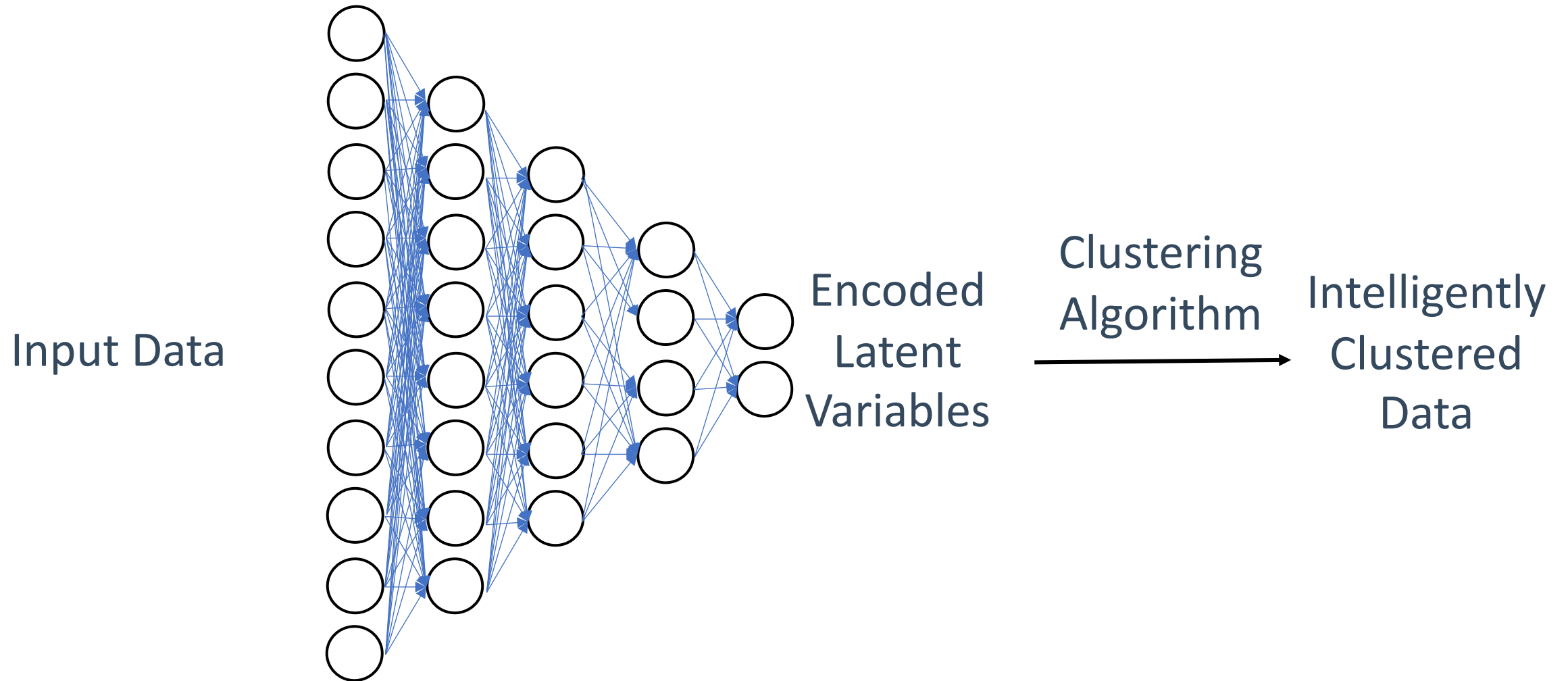
WHAT IS A NEURAL NETWORK?



UNSUPERVISED LEARNING



UNSUPERVISED LEARNING

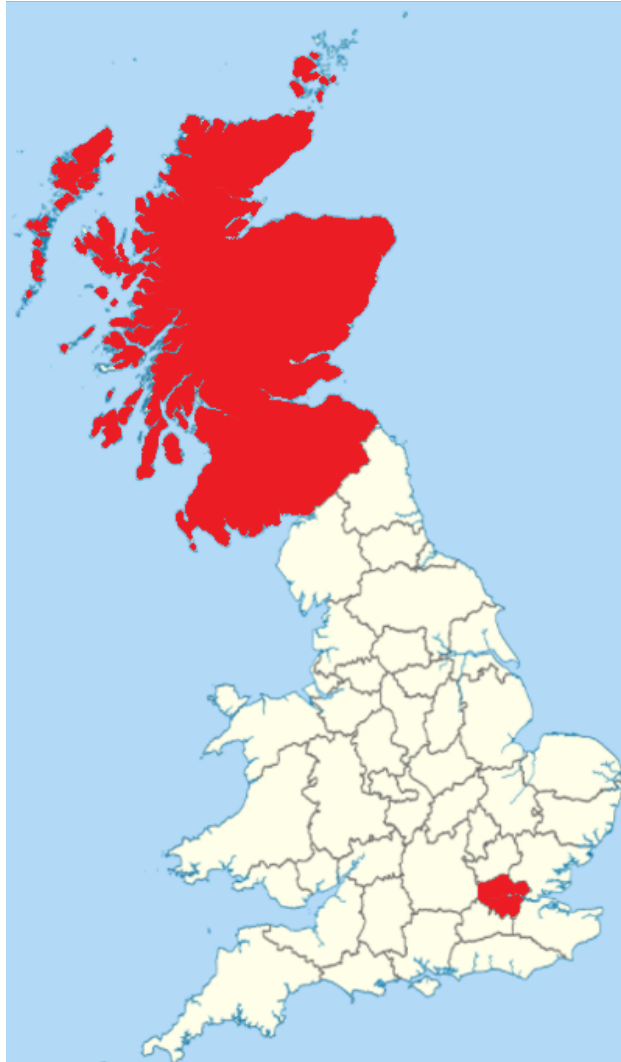


MODEL INPUT VARIABLES

- Network density
- Percentage of road length by class
 - Motorway
 - A Road
 - B Road
 - Unclassified Road
- Percentage of road length by rurality
 - Rural
 - Town
 - Urban
- Percentage of road length by traffic (AADF)
 - Quiet (bottom quartile), Normal (inter-quartile), or Busy (top quartile)
 - Separately for Motorway, A Road, Other
- Population density
- Population deprivation
 - Average score in Index of Multiple Deprivation
 - More Deprived % (*top half of IMD scores*)
 - Less Deprived % (*bottom half of IMD scores*)
- Percentage of breakdowns that are near home

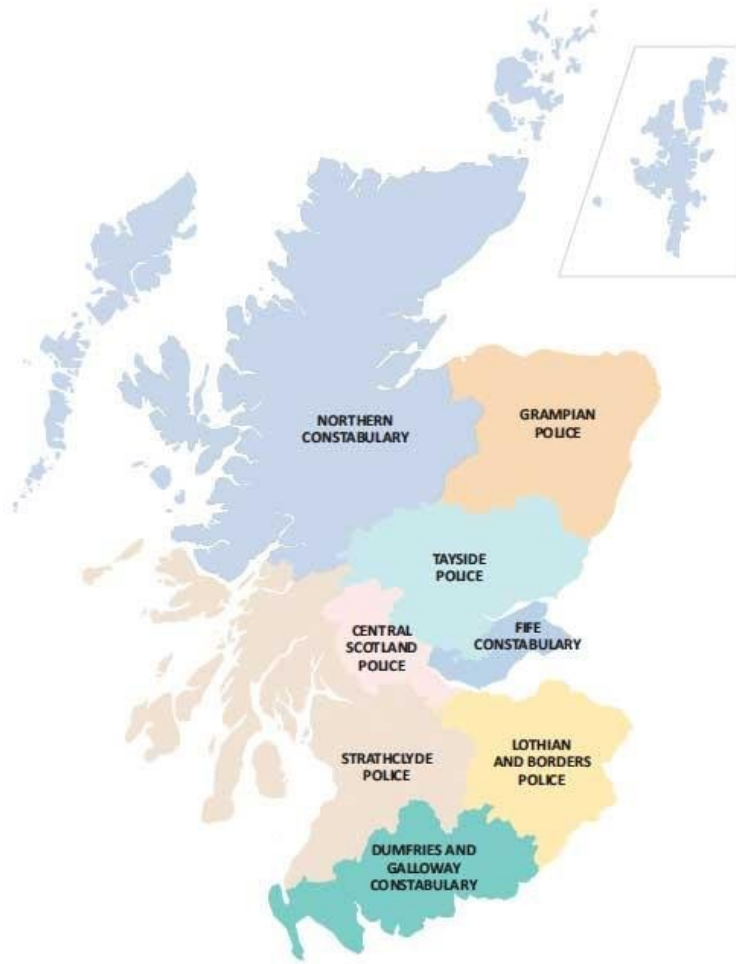
THE CHALLENGES

Police Scotland has many collisions
and a very diverse network

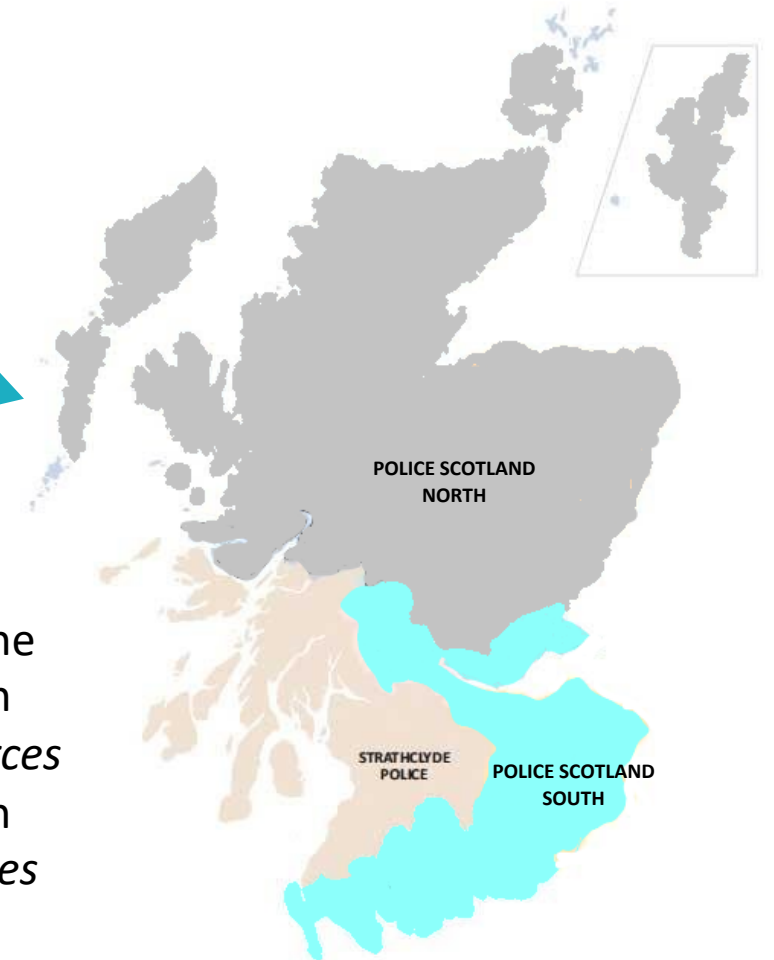


Metropolitan Police has very many collisions
and a unique network

SOLUTION FOR SCOTLAND



- Legacy areas were basis for solution
- Strathclyde was the only one of comparable size to English forces



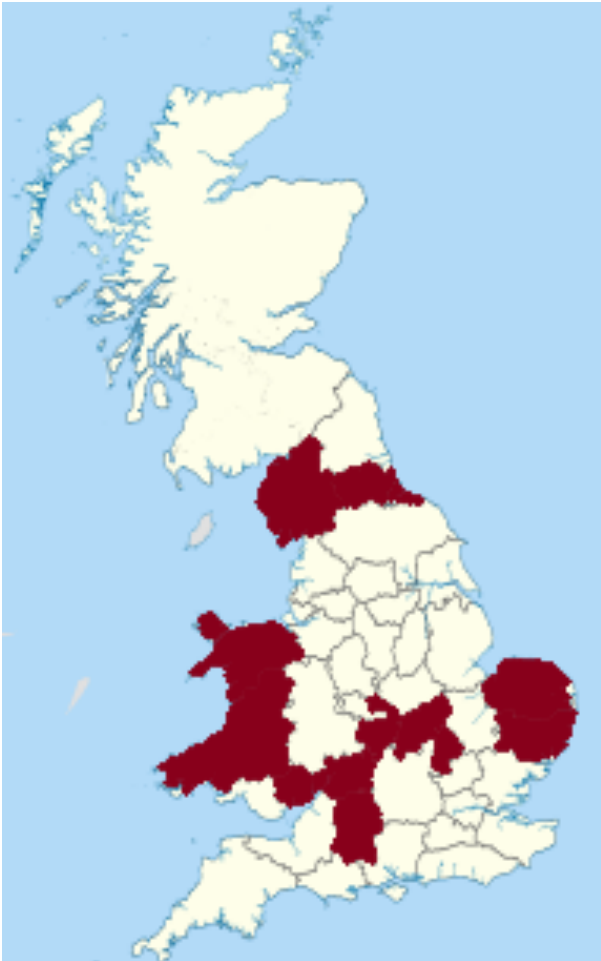
- Strathclyde used alone
- Police Scotland North
 - *Three legacy forces*
- Police Scotland South
 - *Four legacy forces*

SOLUTION FOR SMALL FORCES

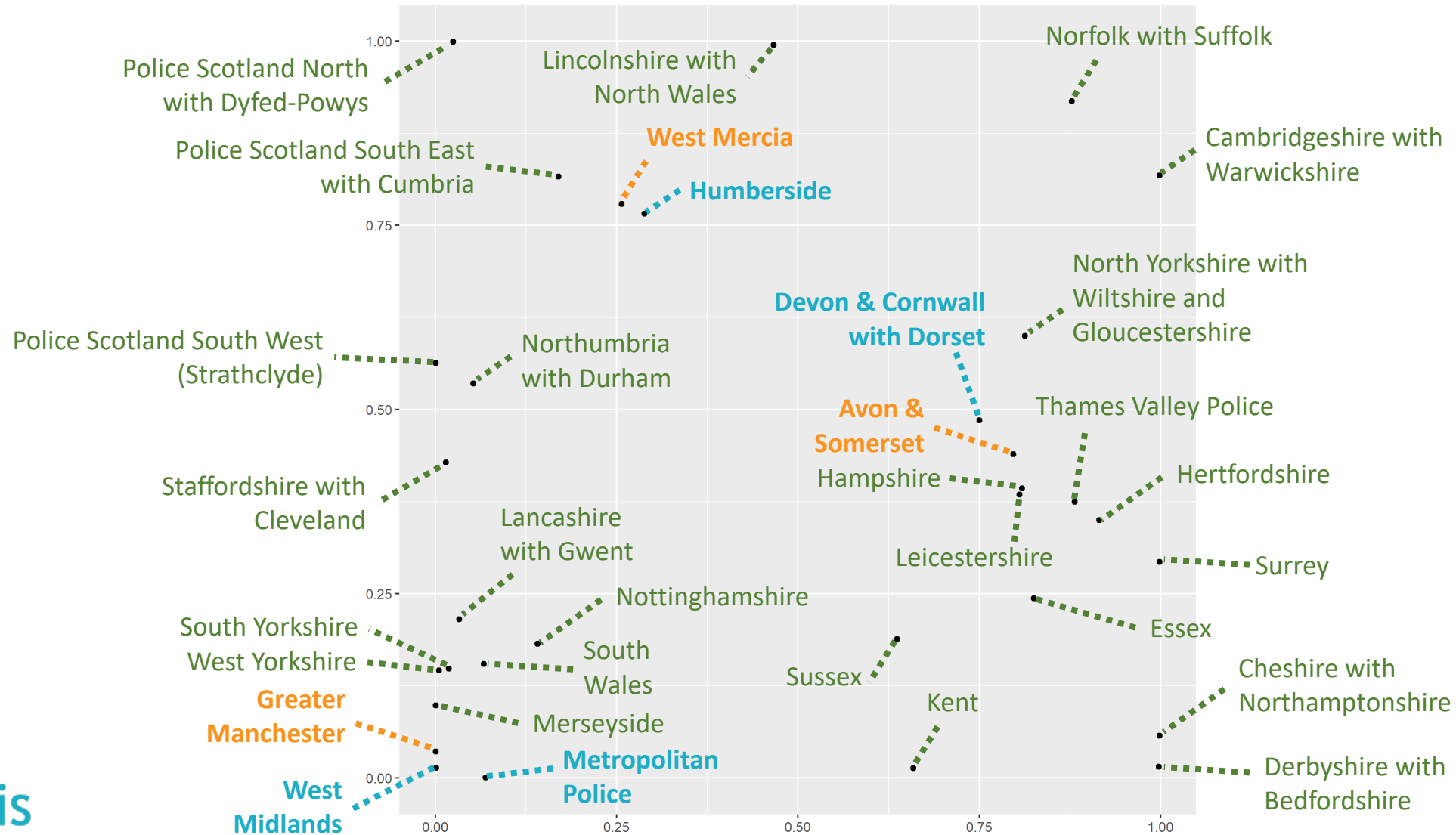
- Twelve forces have fewer collisions than Police Scotland North



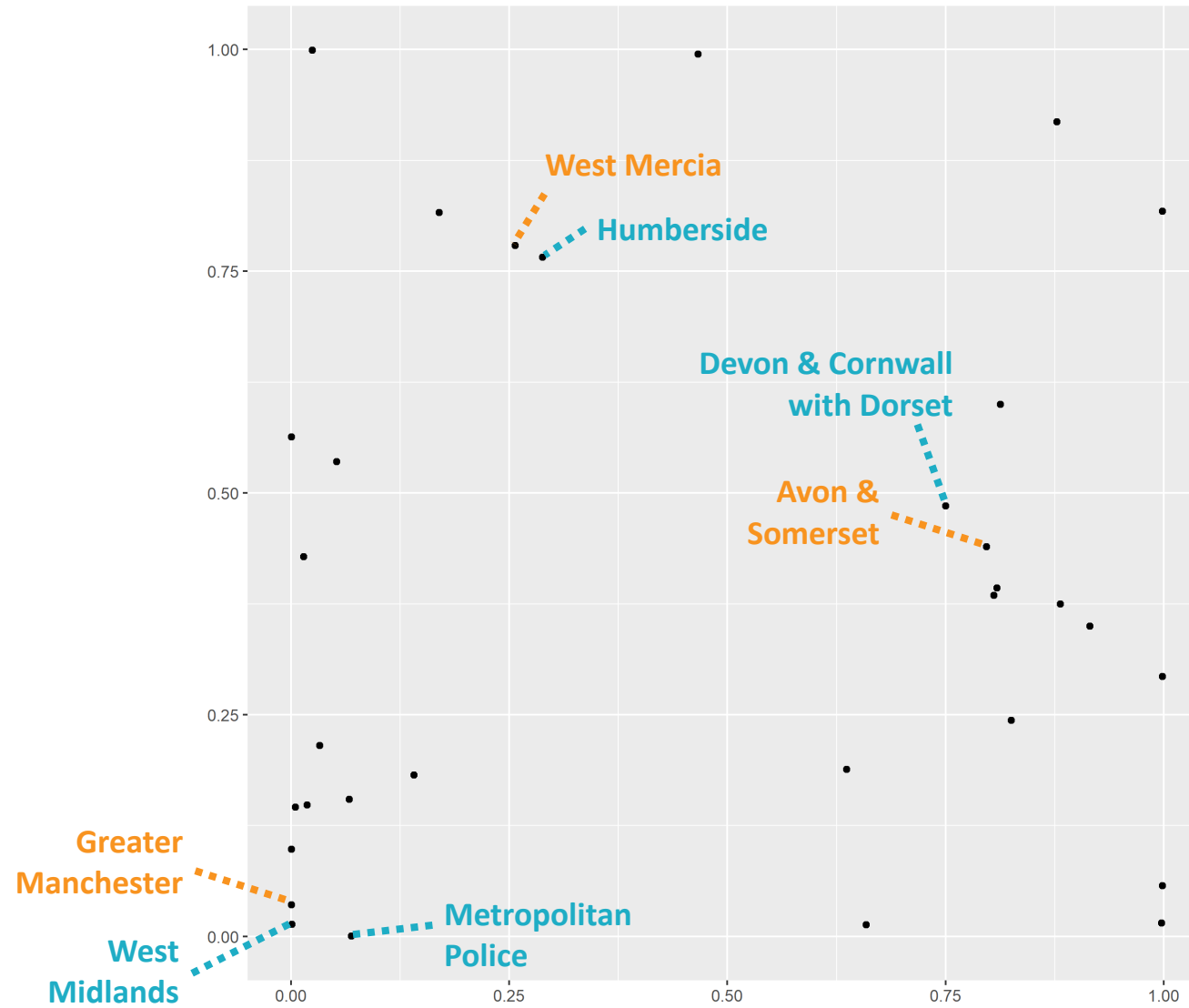
- Eight pairs of forces
 - *Only two pairs are contiguous*
- One set of three forces
 - *North Yorkshire with Wiltshire and Gloucestershire*
- Police Scotland areas also paired
 - *South with Cumbria*
 - *North with Dyfed-Powys*



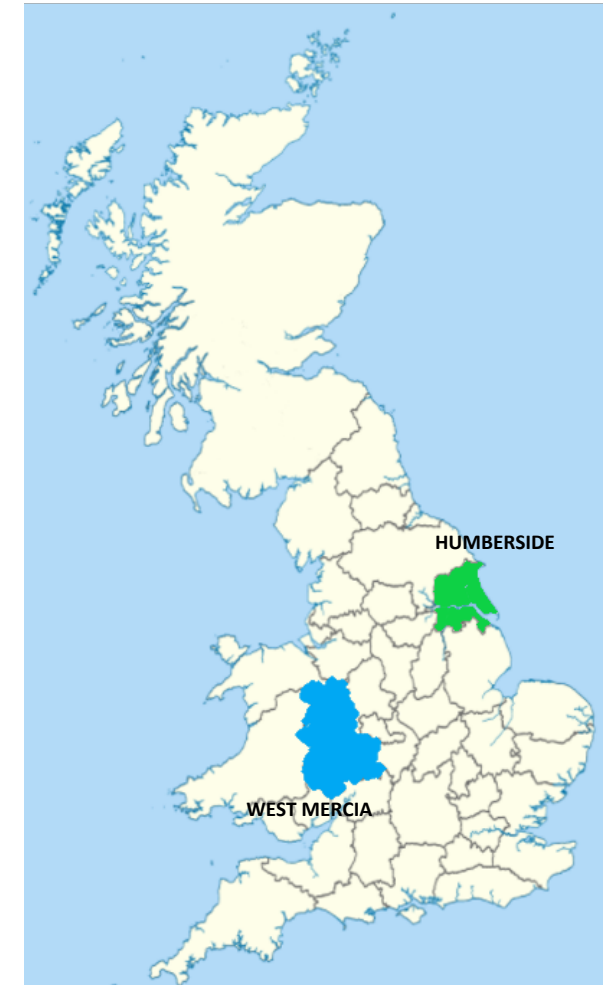
CLUSTERS

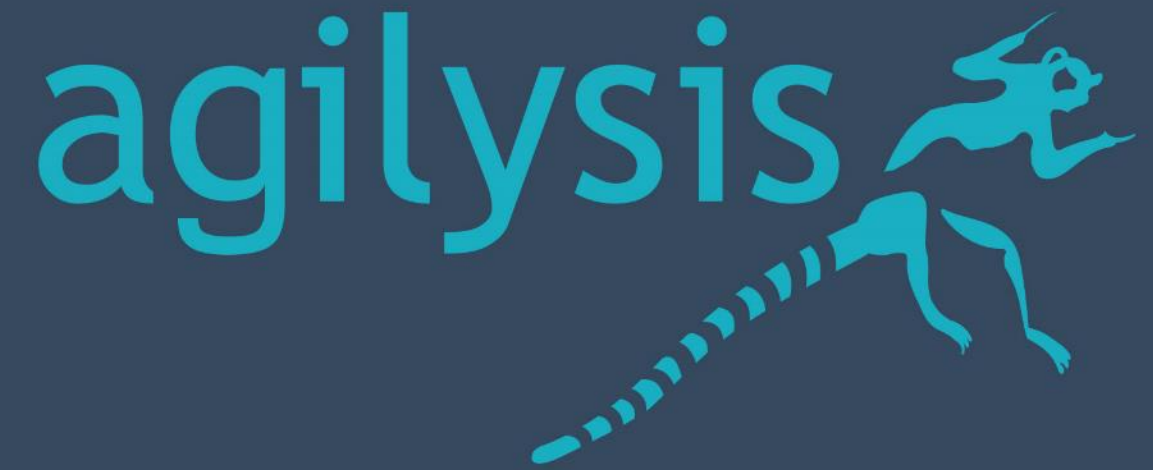


CLUSTERS



THE RESULT





DR CRAIG SMITH
BRUCE WALTON

CRAIG.SMITH@AGILYSIS.CO.UK
BRUCE.WALTON@AGILYSIS.CO.UK

