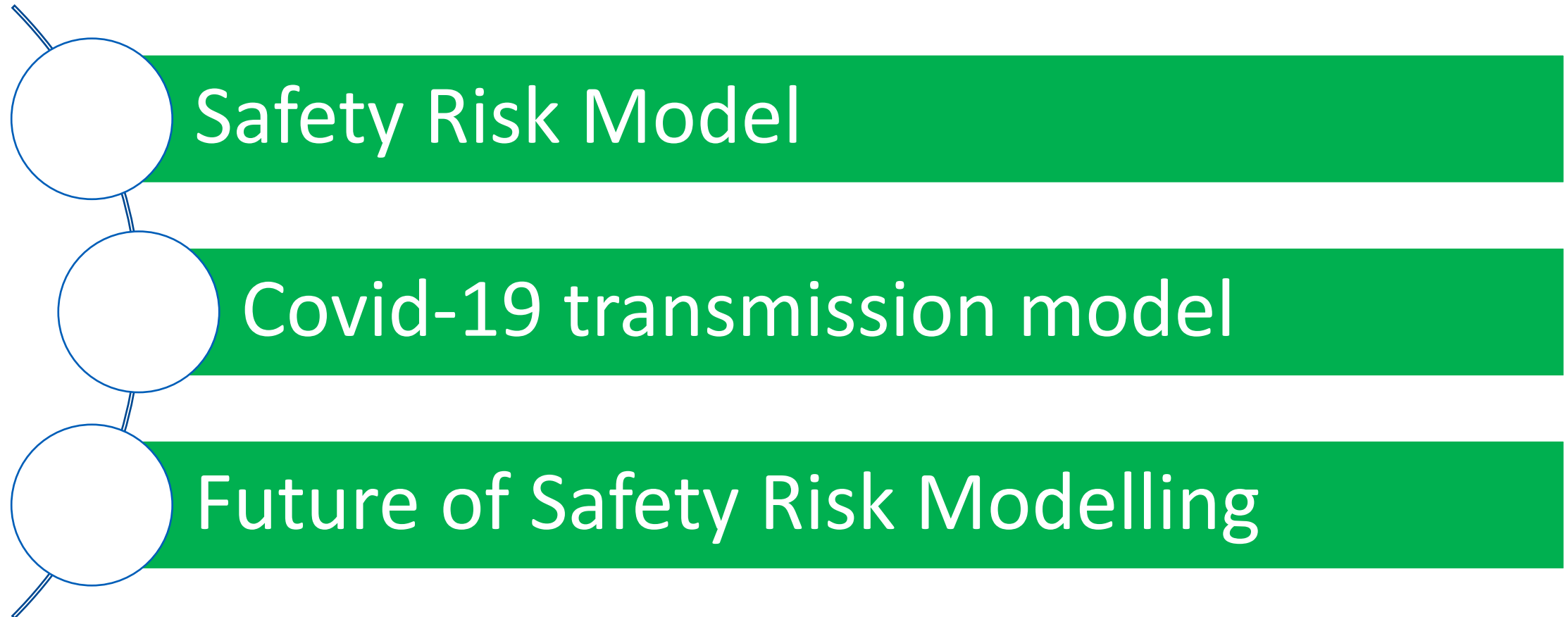


Risk analysis of the future

Presented by Chris Harrison & Namrita Kohli
12 October 2021



Contents



Safety Risk Model

What is the Safety Risk Model (SRM)?

A quantified representation of the underlying safety risk arising from the operation and maintenance of the GB railway



- Consistent means of assessing risk from different hazards
- Grounded in reality of past events but not constrained by them
- Common approach: pooling data and experience from across GB rail
- Trusted by operators and regulator: mature, well-used and robust
- The starting point for quantified risk analysis in GB rail

Risk = Frequency x Consequence

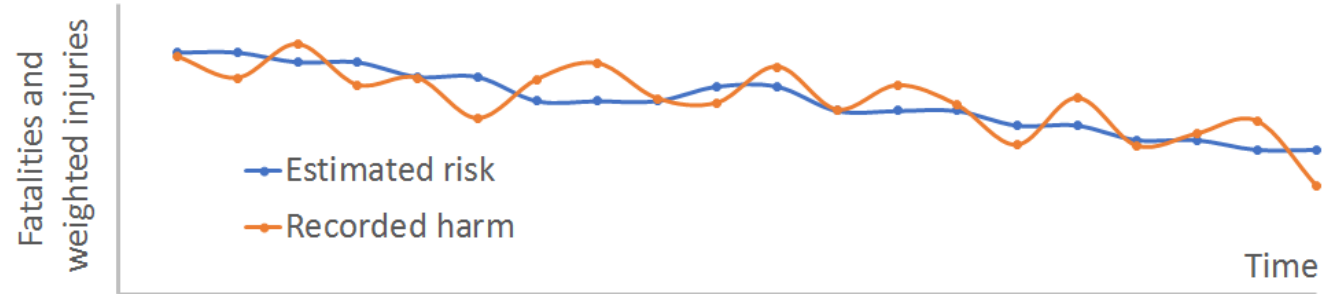
How
often?

What can
happen?

Safety Risk Model (SRM) - Calculations

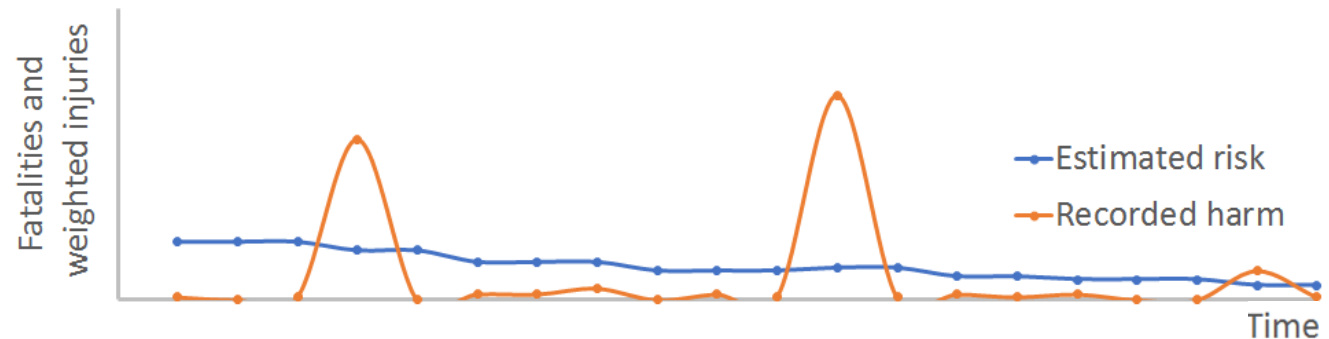
Frequent events (eg slips, trips and falls)

- Based on Safety Management Intelligence System (SMIS) data
- Statistical modelling



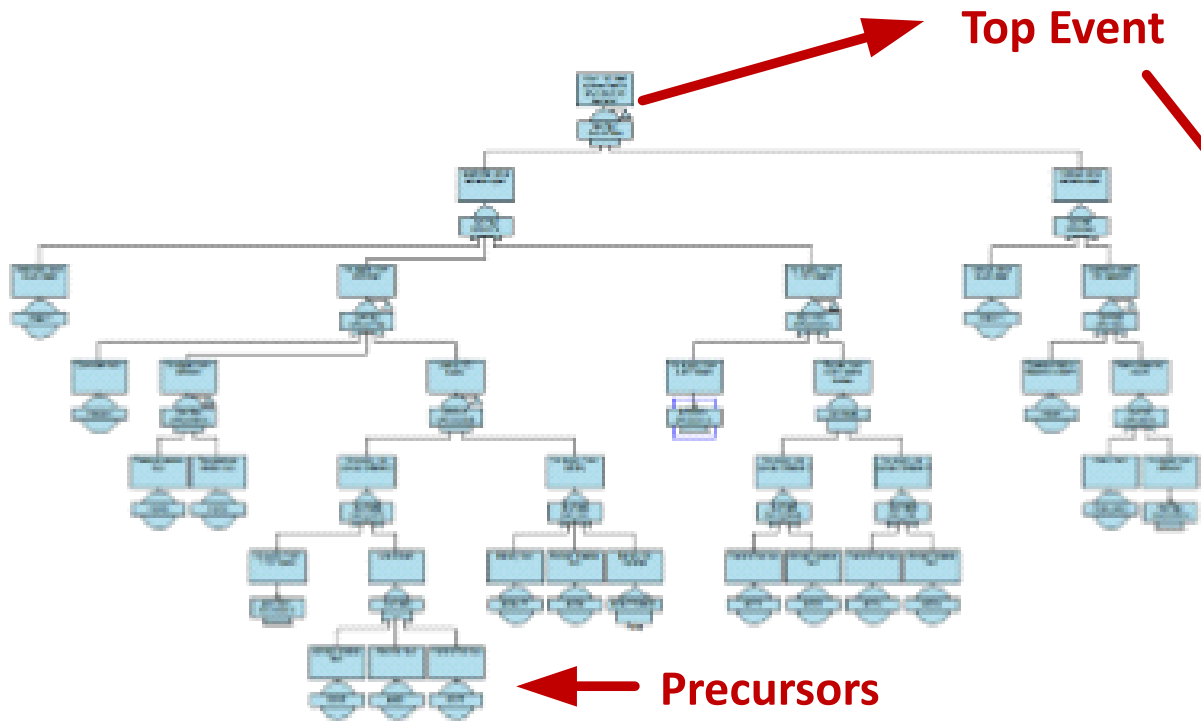
Rare events (eg train accidents)

- Includes scenarios that have never happened or have not happened for a long time.
- Sophisticated, scenario modelling

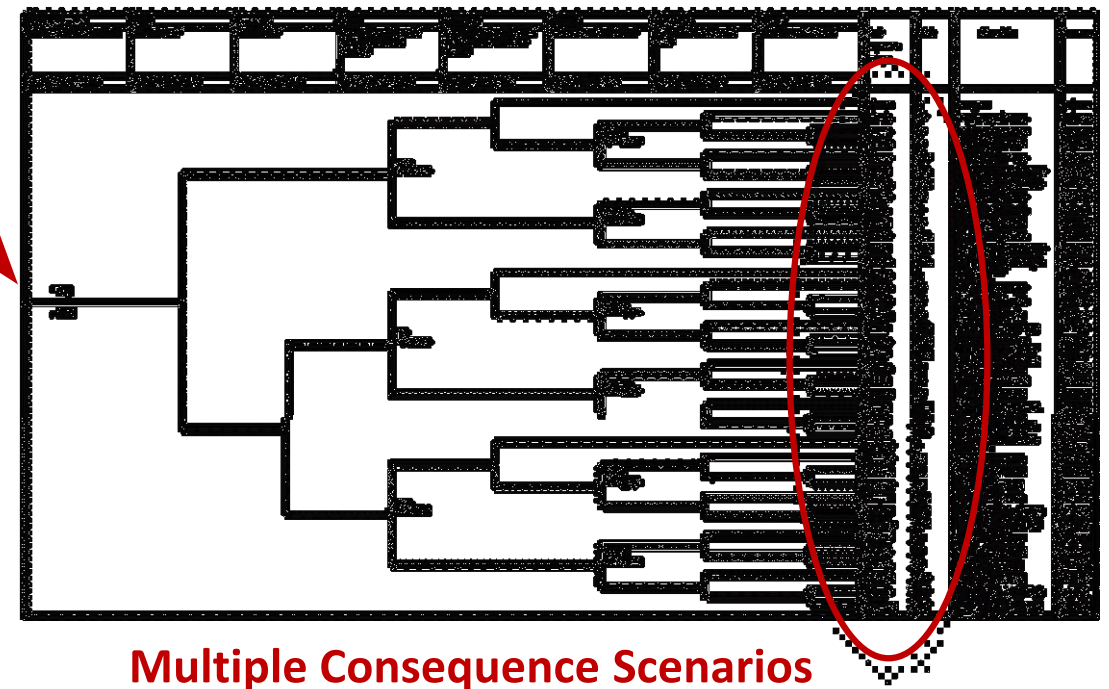


Fault and Event Tree Modelling

Fault Tree Modelling



Event Tree Modelling

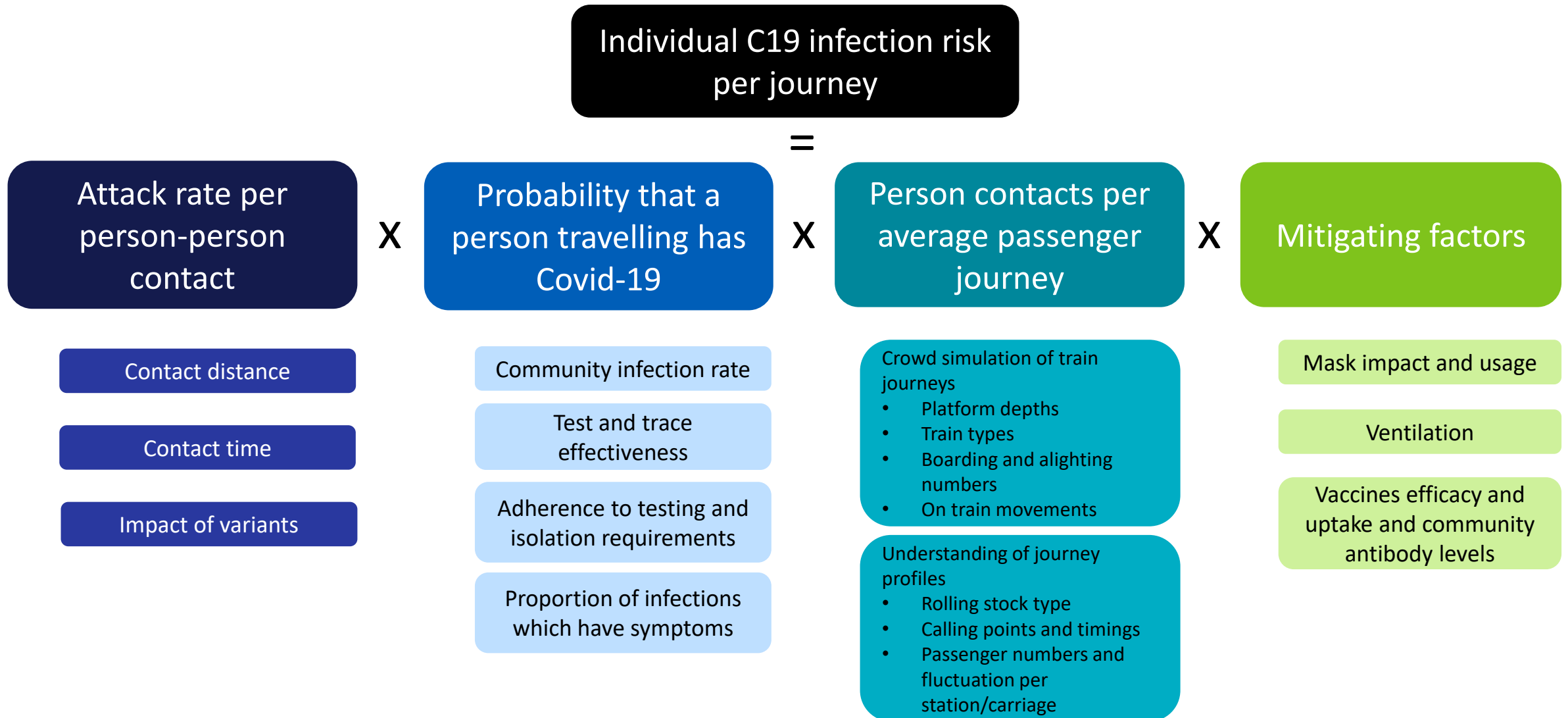


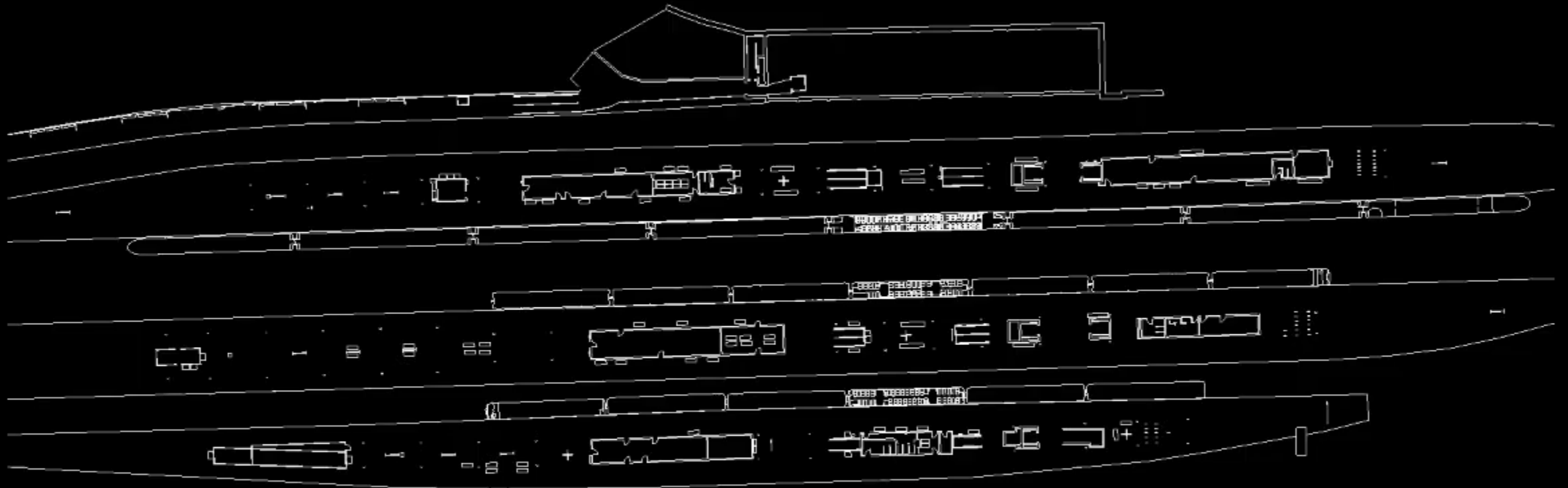
Why have a Safety Risk Model?

- Structured representation of what can happen on the railway
- A common basis for carrying out quantified risk estimation
- Starting point for further assessment
- Helps to inform decision-making

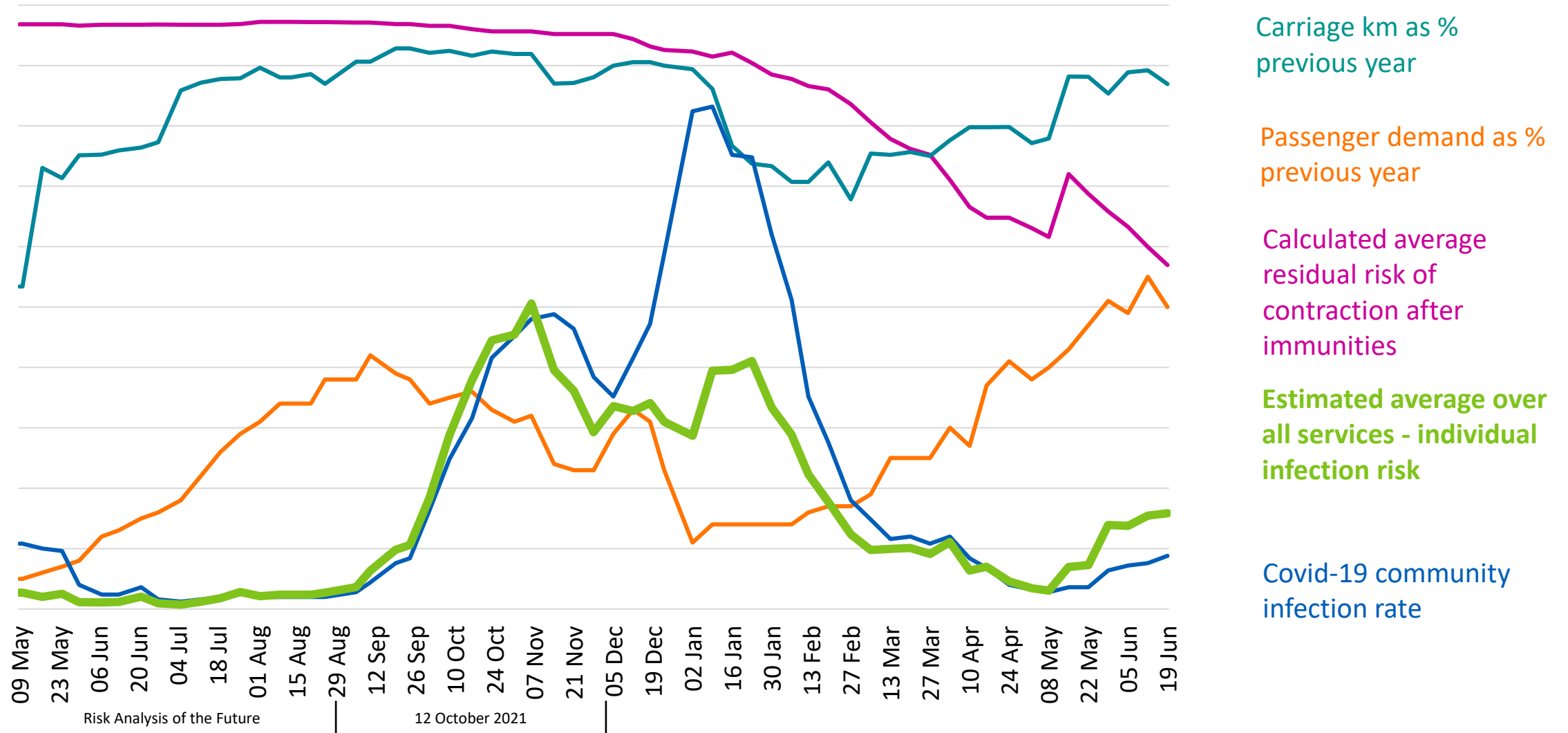
Covid-19 transmission model

Covid transmission model outline





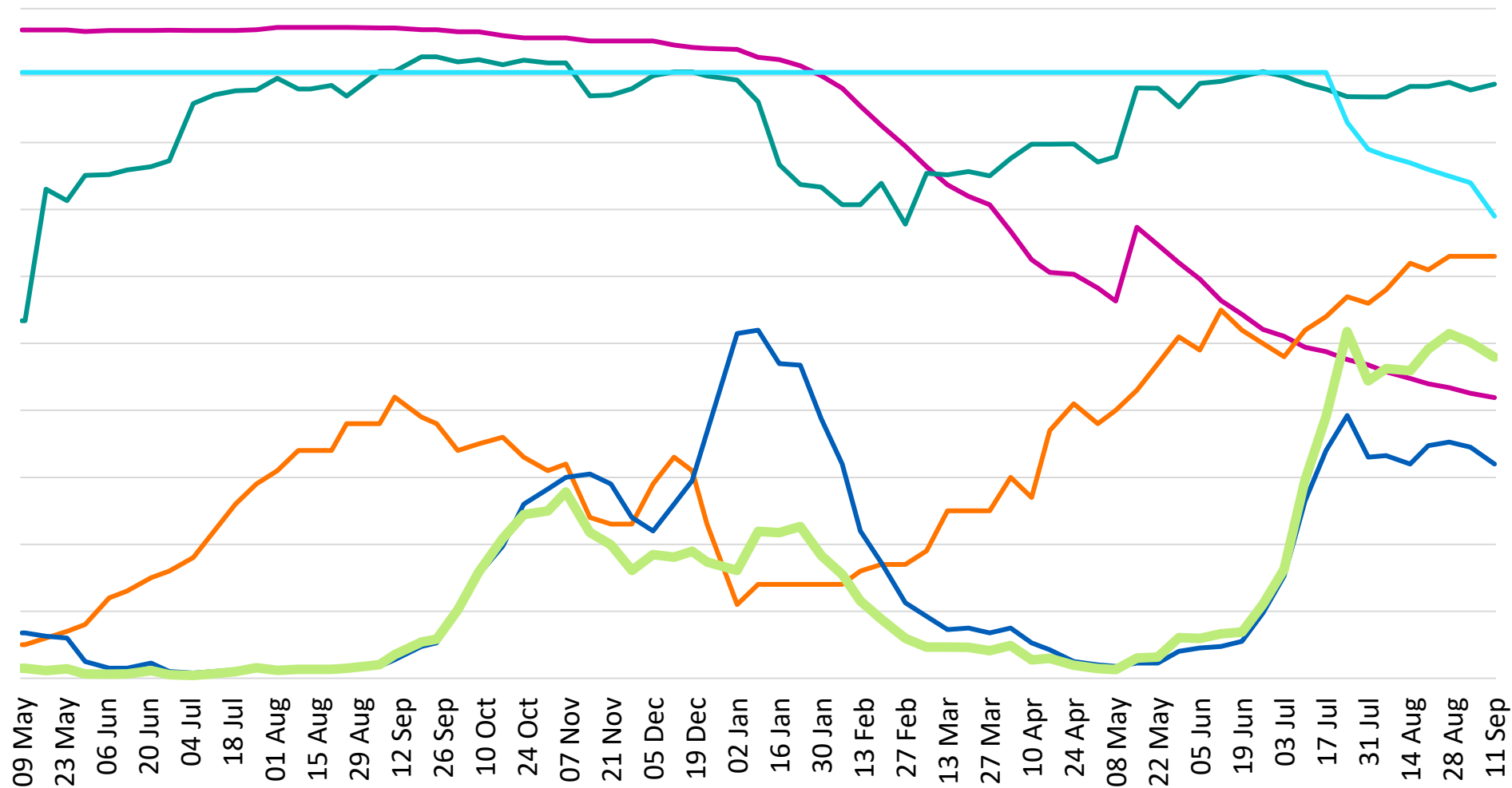
Passenger individual risk over time



Risk Analysis of the Future

12 October 2021

Passenger individual risk over time



Carriage km as % previous year

Proportion of passengers using masks

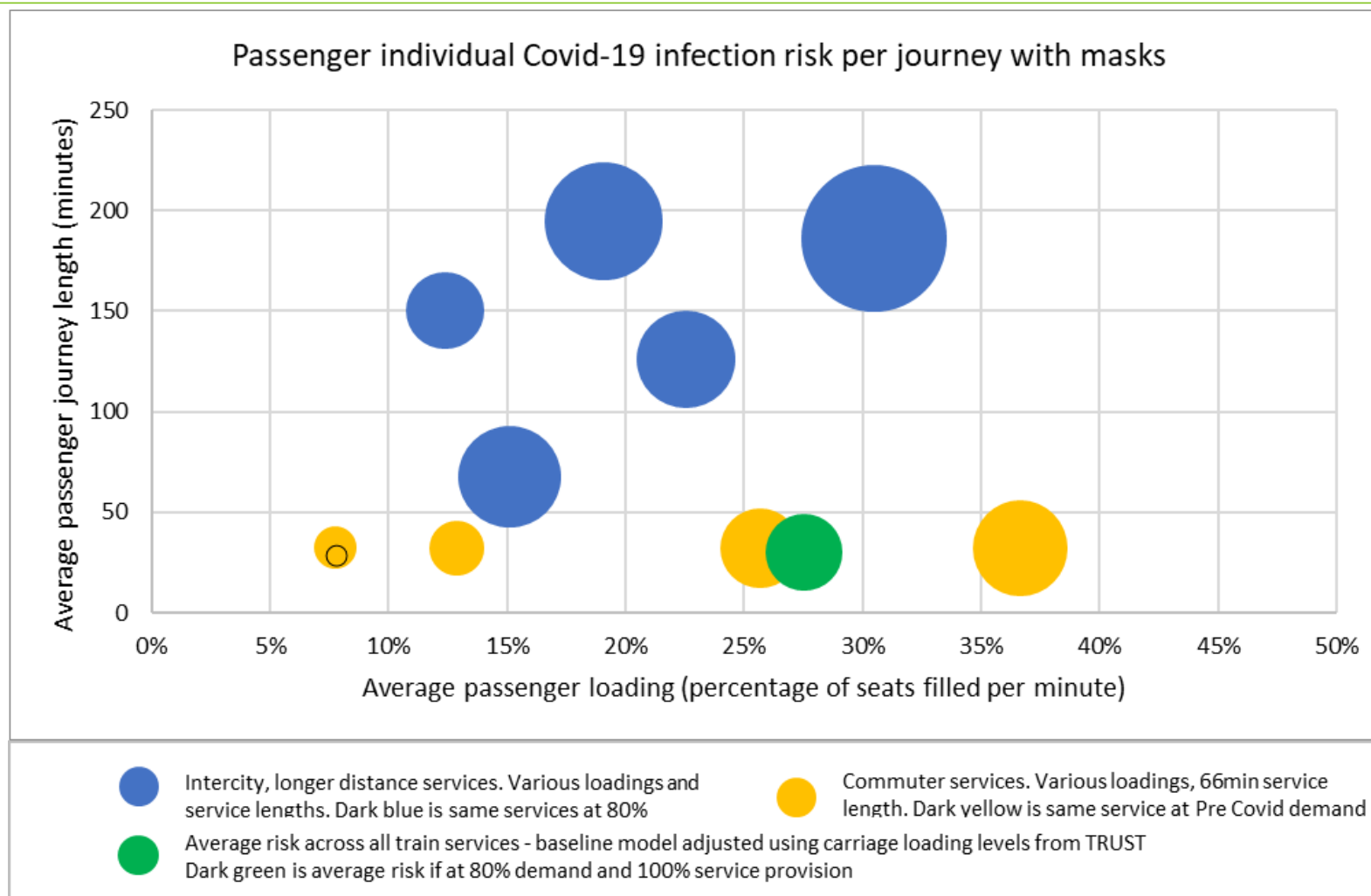
Estimated average over all services - individual infection risk (x40 for visibility)

Passenger demand as % previous year

Calculated average residual risk of contraction after immunities

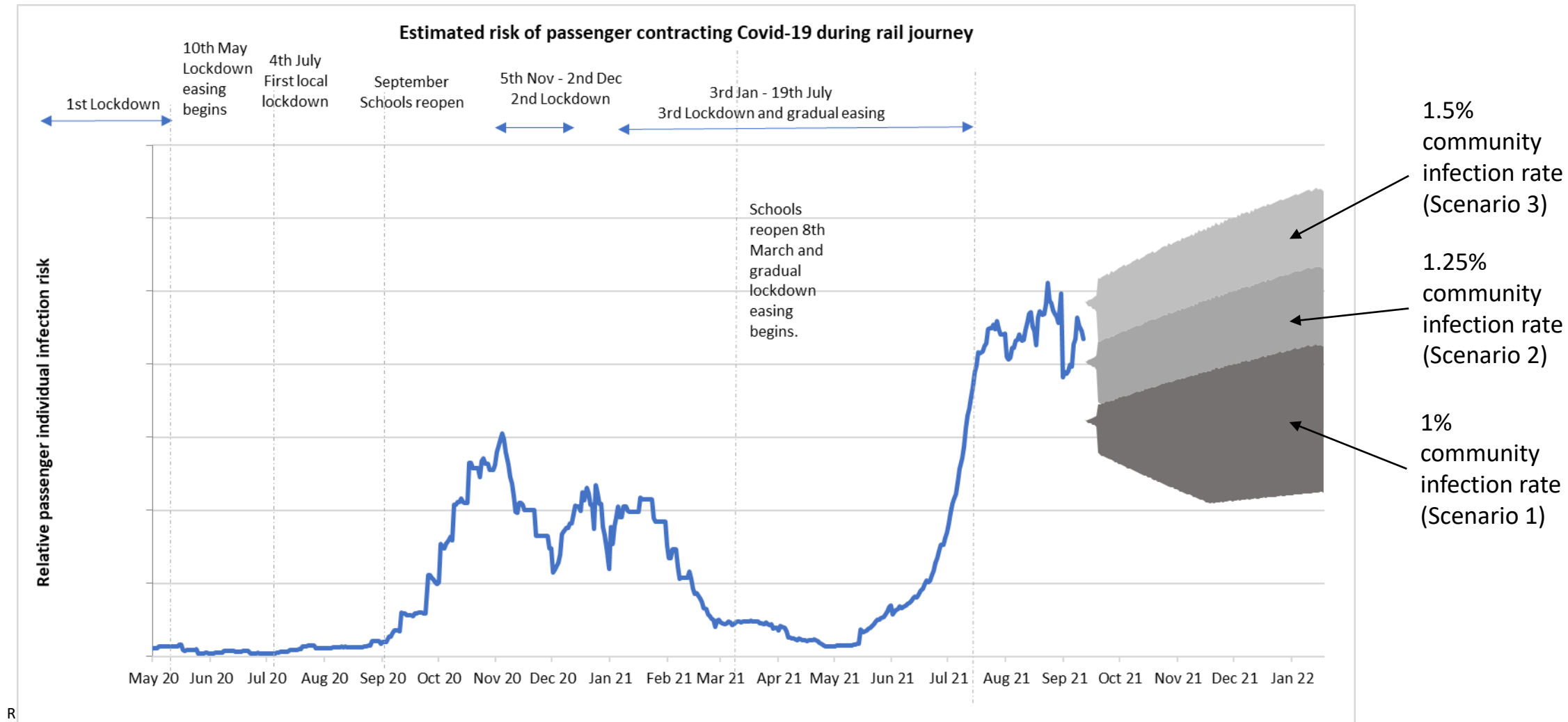
Covid-19 community infection rate

Variation of results over some specific train services



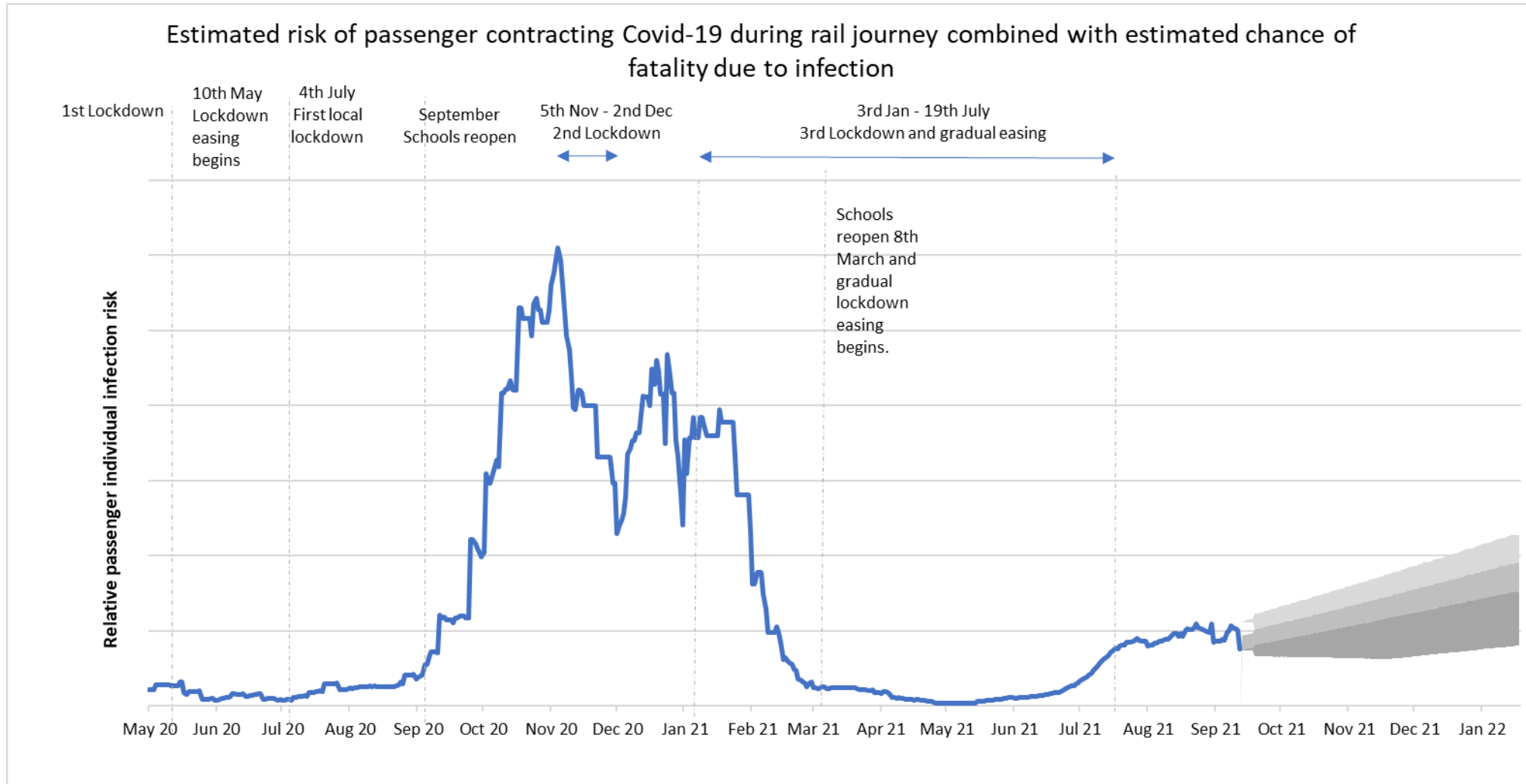
Possible futures

Calculated passenger individual Covid-19 infection risk

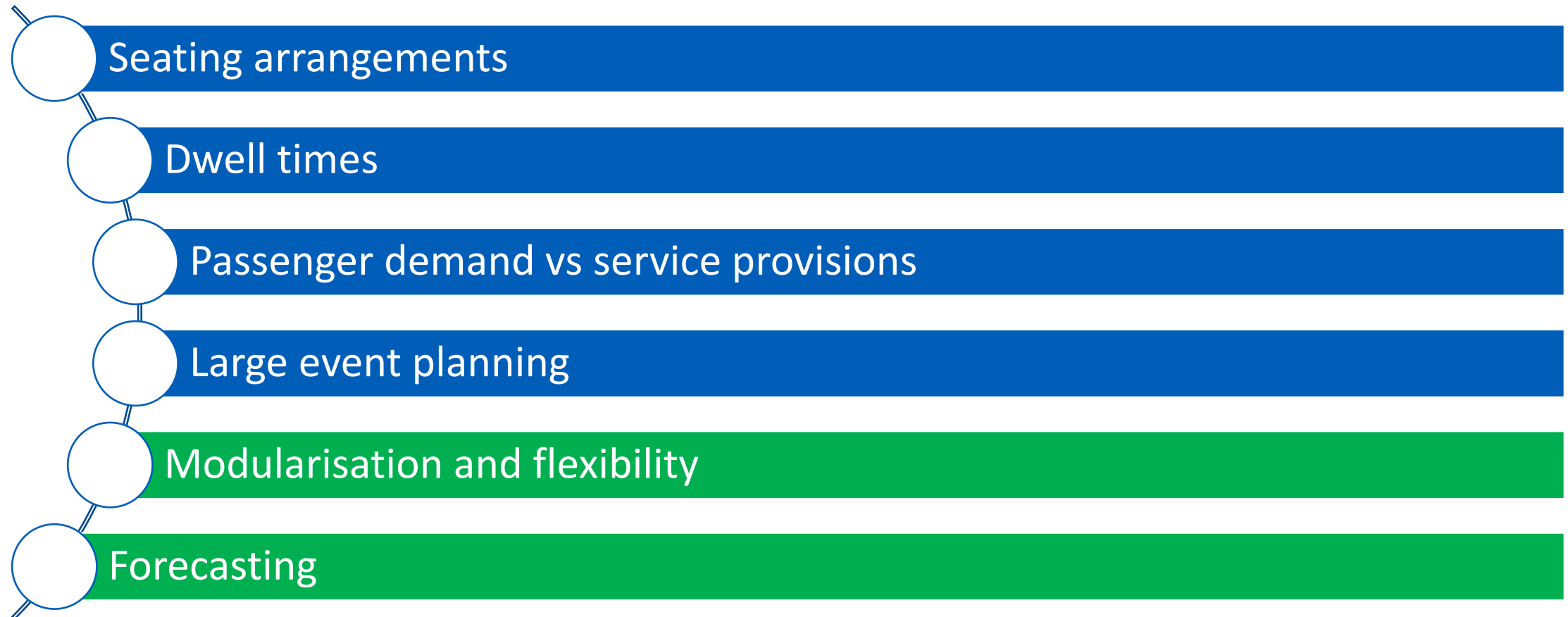


Possible futures

Combined with national average chance of death following infection



Benefits provided



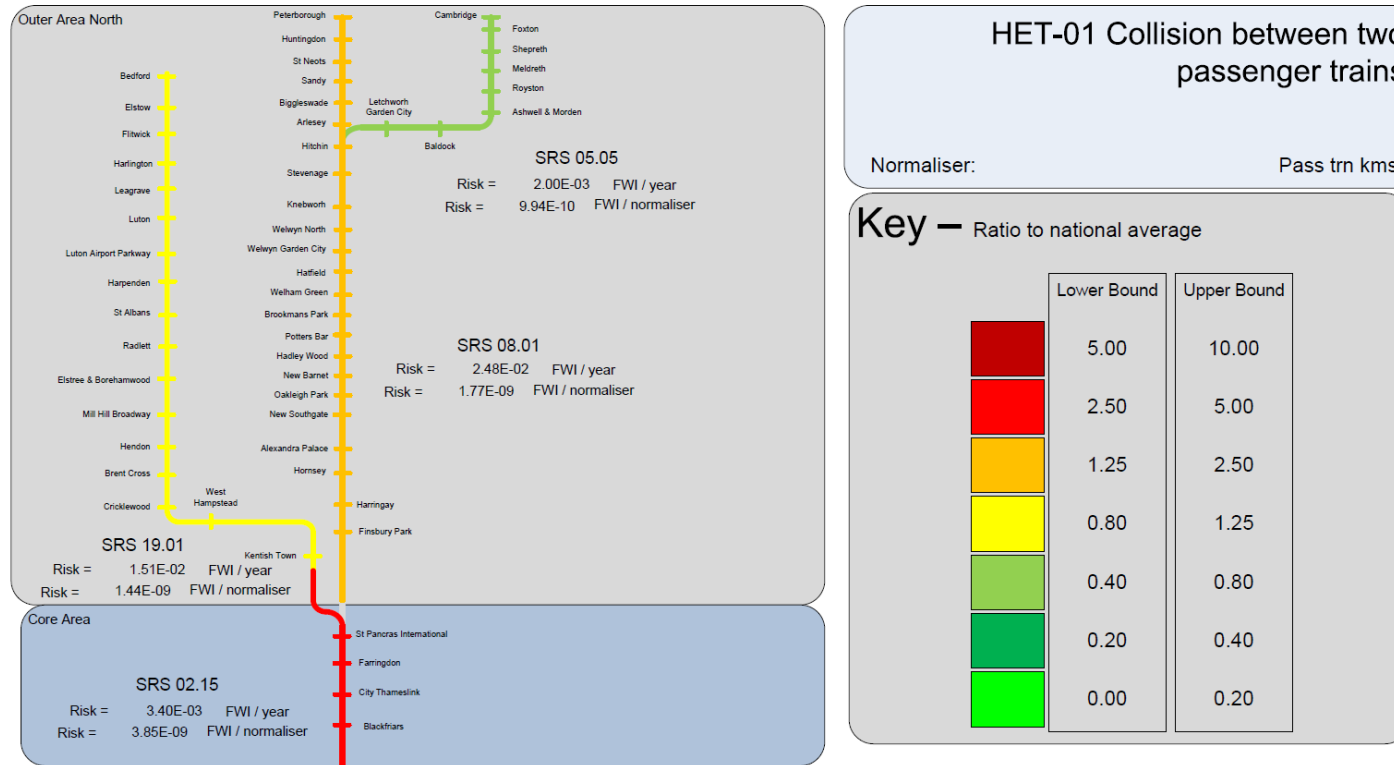
Future of Safety Risk Modelling

Safety Risk Model Rebuild

Requirements:

- Rationalise and update to fully reflect today's railway, its risk profile and industry structure – and build in the flexibility to evolve.
- Achieve efficiency from automation, modularisation and common processes.
- Be able to offer bespoke user support: develop detail where projects require.

Safety Risk Model Rebuild



SRM Rebuild Programme is underway with new model complete by March 2022.

Conclusions

- We have an established risk modelling and analysis capability
- We've been able to apply the underlying principles and respond to the issue of covid 19 transmission on trains
- We want to build on all of this further to:
 - Allow risk to be evaluated locally
 - Better support “what if” analysis
 - Enable better integration with other risk management tools
 - Enable insights and new understanding to be incorporated

The image features a central horizontal band of bright blue color. Above this band are three vertical rectangular blocks: a light green block on the left, a dark teal block in the middle, and a vibrant green block on the right. Below the blue band are three more vertical rectangular blocks: a medium blue block on the left, a dark navy blue block in the middle, and a dark forest green block on the right. The text "Thank you" is centered within the blue band.

Thank you