COVID-19 and Transport

- Transport is a key sector for reopening the economy
- Transport has been at the forefront of mitigating the risk from COVID-19
- This has required a significant scientific response by DfT
- Transport was the first sector to put in mandatory face coverings for the public
Scientific Challenges

- DfT has faced a range of scientific questions around key areas of evidence such as:
  - Transmission risk
    - COVID-fundamentals
    - Directionality
    - Travelling population infection rates
  - NPIs/Mitigations
    - Distancing
    - Face Coverings
    - UV disinfection
    - Fumigation
    - Ventilation
    - Reduction in service
    - Messaging
  - Outbreaks
  - Testing
  - Temperature Screening
  - Hazard interaction (COVID-19 & flu, flooding etc)
  - Public Confidence
  - Messaging impact
  - Transport & Epidemiology
SAGE subgroup on Environment and Modelling Group (EMG) and DfT, along with academic partners and PHE, have developed a programme of work to create a transport risk model. This will:

- assist operators to better assess the risk of infection of coronavirus for passengers and staff on the transport network, and;
- help policy teams to design effective interventions to mitigate the risk of transmission.

UKRI have approved £1.6m of funding to be made available for TRACK. DfT are providing £156k to fund DSTL support with modelling.

Kick-off 22 September.

Initial modal focus on buses and trains, with geographical scope limited to Leeds, London and Newcastle.

It will likely be applicable to other transport modes and workplaces and areas of interaction, and as such can inform the restart and recovery of other modes and sectors.
WP 1: Transport risk model

- **Lead: University of Leeds, DSTL**
- Develop computational models to assess the likelihood of COVID-19 infection through aerosol, close range and contact transmission during typical bus, tube and train travel scenarios.
- Data from across the WPs will be incorporated into the risk model to understand the exposure someone might have to the virus and their risk of infection, along with future projects that will gather data on travel behaviour and ethnographic modelling.
WP 2: Surface sampling

- **Lead:** PHE

  - Pilot sampling exercises will be carried out by PHE staff and then training materials and protocols will be provided to selected transport companies.
  
  - It is hypothesised that the prevalence of SARS-CoV-2 will be low and, for added value, the presence of other respiratory viruses will be used as a marker.
  
  - The level of bacterial contamination will also be determined and will be used to indicate general surface ‘cleanliness’.
WP 3: Transport user behaviour and demographics

- **Lead: University of Leeds**

- To create understanding on *who* is using public transport (PT) modes, *when* and for *what* journey purpose.

- **Sources:**
  1) established databases and on-going contemporary data collection (e.g. by PT operators, City Councils)
  2) short-term sampled surveys (delivered through online, through major employers and to households)
  3) longer term (3-month) passive data collection via a wristband sensor and
  4) longer term (3-month) passive data collection via a mobility profiling smartphone app,
WP 4: CCTV analysis to characterise social distancing and surface contact

- **Lead: Newcastle University**
- CCTV analysis to determine social distancing and creating a ‘touch map’ of surfaces on transport modes.
- This will be done by providing a range of statistics that characterise proximity and surface contact, allowing the potential transmission risks associated with public transport to be modelled:
  - Proximity at stations and interchanges;
  - Proximity within vehicles; and
  - Contact with surfaces that may be contaminated with the virus; and
  - Successive contacts with the same surfaces.
WP 5: Environmental transmission and mitigation

- **Lead**: Cambridge University, Imperial College London

- Measuring the pathways for airborne transmission on public transport and the effects of mitigation measures (e.g. increased ventilation rates, screens etc) through:
  1. Measurements on transport vehicles;
  2. Lab studies;
  3. Computational models.
Transport Risk Model - WP structure

WP 1: Transport risk model
*Leeds University, DSTL*

Aim to develop computational models to assess the likelihood of COVID-19 infection through aerosol, close range and contact transmission during typical bus, tube and train travel scenarios.

WP 2: Surface sampling
*PHE*

WP 3: User behaviour and demographics
*Leeds University*

WP 4: CCTV analysis to characterise social distancing and surface contact
*Newcastle University*

WP 5: Environmental transmission and mitigations
*Cambridge University, Imperial College London*

Other COVID-19 research projects
- e.g. UCL’s VIRAL project

Outcomes
- Quantification of risk through different transmission routes
- Support on mitigation actions

Other COVID-19 research projects

Outcomes

Moving Britain Ahead
Conclusion

- Transport is a key sector impacted by COVID-19 with its own scientific challenges
- Evidence on the risk of transmission on transport is a key challenge
- TRACK is a significant programme of work towards this
- DfT will continue to work with academia going forwards