VIRTUAL

WHOLE-OF-GOVERNMENT

R&D SHOWCASE

SERIES 1:

ENHANCING PUBLIC HEALTH SECURITY AND RESILIENCE

Homeland Security

Science and Technology

The Department of Homeland Security Science and Technology Directorate (S&T) is working with U.S. Government Partners to mobilize research, science, and innovation to save lives and get the country moving again.

KEY S&T RESEARCH EFFORTS:

PREPARING FOR THE NEXT PANDEMIC

- Modeling Viral Spread on Aircraft
- Funding Testing and Validation of Contact Tracing Apps
- Studying New SARS-CoV-2 Variants
- Studying Disinfectant Efficacy on Security Screening Bins

SIMULATING SPREAD OF AIRBORNE PARTICLES ON MASS TRANSIT

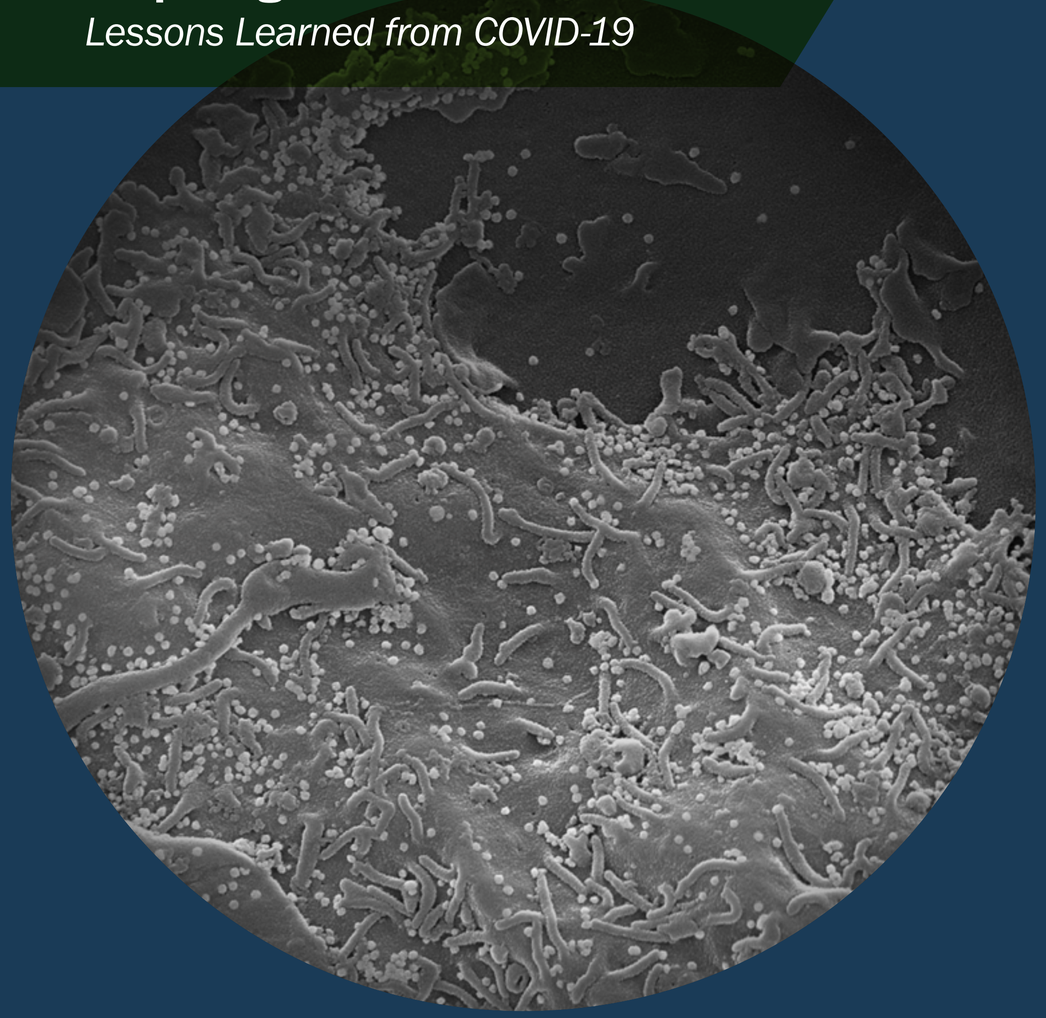
- Characterizing SARS-CoV-2 Under Different Environmental Conditions
- Advancing Canine Detection Science
- Researching SARS-CoV-2 Infectious Dose in Aerosols
- Assessing HVAC Systems' Effect on Viral Spread
- Developing a Tracking System for COVID-19 Related Inquiries

STANDARDIZING TEST PROTOCOLS FOR WASTEWATER SURVEILLANCE

- Patenting Ventilator and Face Mask Prototypes
- Maintaining a Master Question List for COVID-19
- Providing Temperature Screening Guidance for Return to Workplace

PARTNERING ON OPIOID DETECTION

Preparing for the Next Pandemic:
Lessons Learned from COVID-19



"Our response to the COVID-19 pandemic required us to shift research priorities almost overnight…the need to rapidly shift our research focus has provided insight to help us refine and streamline our planning processes and workflows, which will hopefully allow us to respond more rapidly to future outbreaks if they occur."

— Dr. Paul Dabisch,
Aerobiology Team Lead,
S&T National Biodefense Analysis and Countermeasures Center

"It's really a matter of identifying the highest priority gaps—the things that are most impactful for better understanding the disease and helping us to respond to it."

— Dr. Lloyd Hough,
Director, S&T Hazard Awareness and Characterization Technology Center

Preparing for the Next Pandemic:

Lessons Learned from COVID-19

S&T has been maintaining a Master Question List (MQL) for COVID-19 since March 2020, based on a similar product developed in 2014 in response to the West African Ebola outbreak. The MQL is a comprehensive document that provides an up-to-date authoritative summary of publicly available information about the virus. It has proven to be a useful resource, promoting a coordinated response and increased preparedness.

Until now, S&T's MQLs were focused on diseases that impact human health, but there are other diseases of consequence that, while not contagious to humans, may severely impact our livestock, and thus our food supply and economy. With up to a 100% mortality rate in pigs, African Swine Fever (ASF), which continues to spread in Asia, Europe, and Africa, is cause for grave concern in the United States. That's why S&T is being proactive and meeting this emerging threat now with a recently published ASF MQL.

Watch on-demand showcase panel 1.1 discussion

Read more about this topic

Detecting Public Health Threats with Wastewater Surveillance:
Standardizing Test Protocols

"Standard guidance documents and physical standards, such as reference materials, are critical for data comparability and help ensure that high quality results are provided to decision makers."

— Nancy Lin,
National Institute of Standards and Technology (NIST) Biomedical Engineer

"The proposed standards will help guide an appropriate sampling and testing strategy designed around the existing infrastructure. We can't get this job done alone. We are partnering to accelerate these solutions so that other communities across the U.S. can benefit as fast as possible and make more informed decisions using science-based guidance."

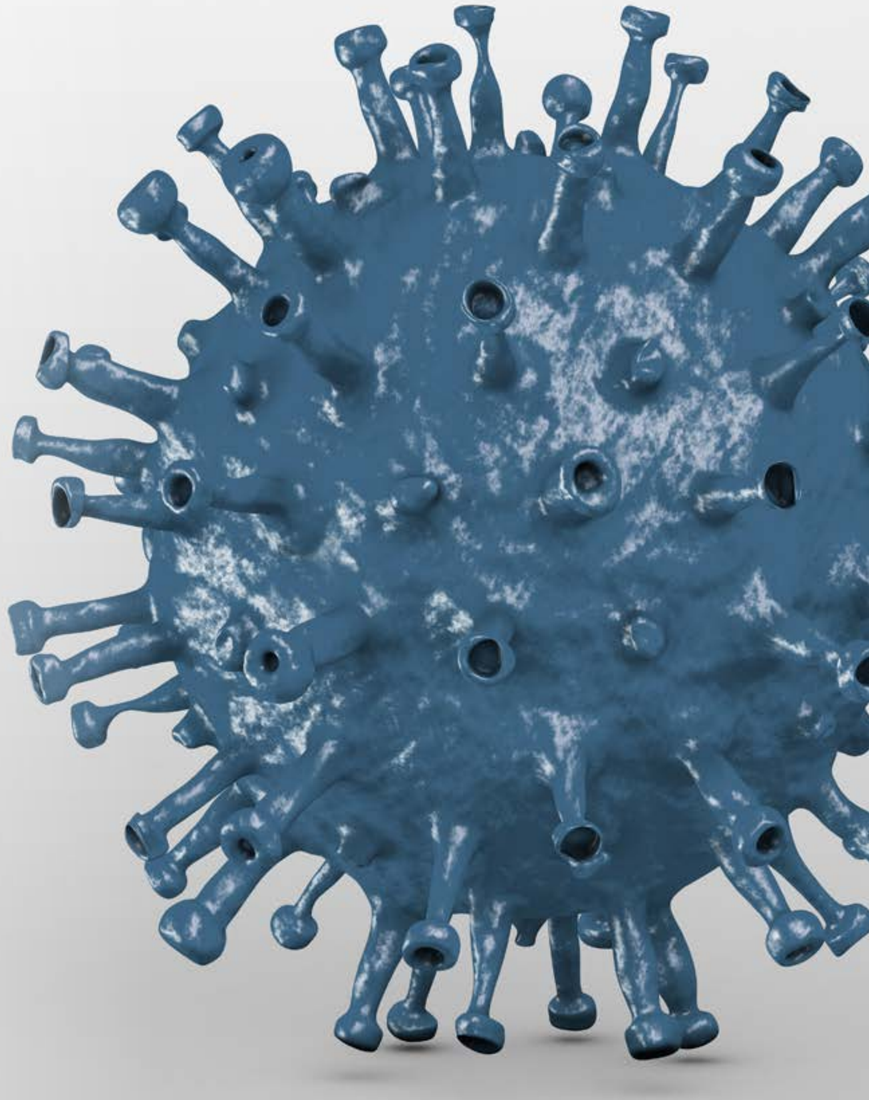
— Philip Mattson,
S&T Standards Executive

Detecting Public Health Threats with Wastewater Surveillance:

Standardizing Test Protocols

S&T is lending critical expertise to a multiagency wastewater surveillance initiative that will gather data from sewer systems and standardize the science used to analyze the findings. The U.S. Centers for Disease Control and Prevention's National Wastewater Surveillance System leads this coalition with the goal of turning sewers into health monitors and better understanding viral spread in communities. S&T is working with NIST and the University of Louisville School of Medicine to develop guidelines to standardize wastewater testing methods nationwide.

Having reliable data about where outbreaks are occurring and how severe they are can inform critical decisions about prioritizing personal protective equipment and immunizations as well as customizing countermeasures. These standards will not only help with the COVID-19 pandemic but also with future public health threats and ongoing population health risks.



Watch on-demand showcase panel 1.2 discussion

Read more about this topic

Opioids Detection and Partnerships:
Responding to a Public Health Crisis

"We are excited for this opportunity to partner with industry to improve detection capabilities and provide front-line operators with confidence in their detection equipment against opioids and other new and emerging synthetic drugs."

— Dr. Rosanna Anderson, S&T Program Manager

"The information sharing of threat libraries flows from the street to S&T and from S&T back to the street, which provides the ability to stay out in front of this public health issue. These collaborations and relationships translate to actual lives being saved."

— Col. Thomas W. Synan Jr., Chief of Police, Newtown Police Department Hamilton County Heroin Coalition, Ohio

Opioids Detection and Partnerships:

Responding to a Public Health Crisis

Deaths from opioid overdose are on the rise nationwide, claiming tens of thousands of lives each year. In partnership with the Department of Energy's Pacific Northwest National Laboratory, S&T is seeking to improve field detection of synthetic opioids.

This two-phase effort will provide an opportunity for industry partners to expand their existing threat libraries, enhancing the value of their products, while the government is able to assess the performance of various handheld devices and obtain useful reference data. This field detection equipment is used primarily by first responders, who rely upon a robust library of chemical signatures to save lives. S&T standards experts will guide the testing and validation of these instruments in the presence of fentanyl, fentanyl-related compounds, other drugs, and cutting agents.

Watch on-demand showcase panel 1.3 discussion

Read more about this topic

Securing the Nation's Public Transit Against COVID-19 and Other Threats

"We are developing capabilities, tools, and resources in New York City that other states, cities, and localities can use to better prepare for, respond to, and recover from the pandemic or other emergencies."

— Don Bansleben,
S&T Program Manager

"The value of this important work with the S&T Urban Security Initiative cannot be overstated. Almost immediately they approached us to help in practical ways with the pandemic, fast-tracking projects that can have an immediate impact and influence procedure and policy to keep people safe."

— Michael Gemelli,
New York City Transit Manager

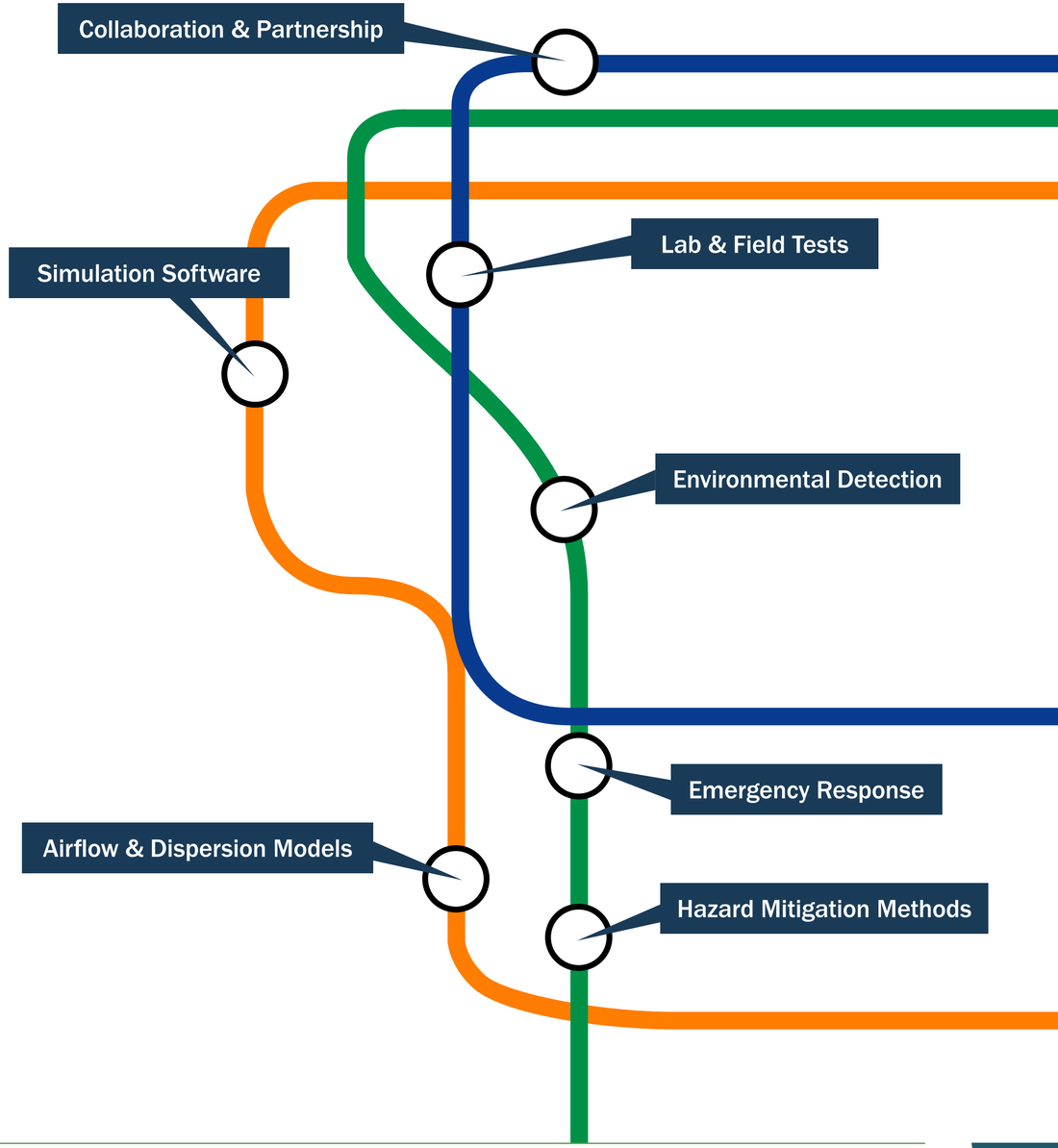
Securing the Nation's Public Transit Against COVID-19 and Other Threats

S&T has partnered with the Metropolitan Transportation Authority (MTA) in New York City to study how simulated airborne coronavirus can travel through transit vehicles and guide disinfection and other virus mitigation methods. The effort is part of an Urban Security Initiative to ensure the security of U.S. public transit systems.

S&T released non-toxic, inert particle tracers into out-of-service MTA buses and train cars to evaluate practical methods to reduce and mitigate airborne concentrations of aerosols. Outcomes from the initiative can be used to inform New York City and other U.S. cities' emergency response planning, including high-quality detection technology for subways, other urban environments, and modeling tools.

Watch on-demand showcase panel 1.4 discussion

Read more about this topic



THANK YOU TO OUR PARTNERS!

Click here for access to additional showcase series content and on-demand presentations

CONNECT WITH US:

@DHSSciTech