Supporting our clients to implement programs and projects for a Safe Return to Operations and implementation of initiatives for a phased Return to Service.
INTRODUCTION

ADDRESSING THE CHALLENGES OF OUR NEW NORMAL

Transit Agency Return to Service (R2S)

Transit agencies are facing unprecedented challenges due to the coronavirus pandemic. Across the world, transit operators are managing drastically reduced ridership and farebox revenues while delivering a vital service that not only enables essential travel but keeps staff and passengers safe.

Looking ahead, agencies will have very difficult choices to make—where, when and how will service resume? What short, medium and long-term strategies are needed for the safe return to operations? What funding streams can be accessed? What oversights will be implemented to sustain continued success and support resilience in the face of future shocks and stressors?

AECOM has the expertise and technologies needed to provide a rapid assessment of data sources to help you better understand your current situation and enable confident decision-making. We employ comprehensive scenario planning tools and techniques that test “what if” assumptions to inform critical strategies and approaches around immediate actions, and longer-term solutions for service planning and infrastructure design. Our professionals can also help you access, manage applications for, and understand and advise on funding and financing. As existing emergency funding streams are activated and new funding streams are established by the government in response to coronavirus, you need a trusted partner that understands that each federal funding source comes with its own implementing guidance and regulations. AECOM’s national Project Management Office (PMO) knows the rules of engagement necessary to navigate the grant formulation process, funding criteria and post-award monitoring of funds specific to this new nationwide challenge. AECOM can help transit agencies manage multiple colors of money such as Federal Emergency Management Agency (FEMA) funded emergency protective measures and Coronavirus Aid, Relief, and Economic Security (CARES) Act. As transit service resumes, our team can deliver on-going monitoring needed to support operations and safeguard your progressive return to full service.
INTRODUCTION

RETURN TO SERVICE: MASS TRANSIT

Service Planning
Capital Planning
Funding and Financing
Identification
PMO

BIG DATA
(telecom, connected utilities, etc.)

PHASE 1
R2S Data Analytics

PHASE 2
R2S Scenario Modeling

PHASE 3
Post Pandemic Monitoring and Modeling

FUNDING AND FINANCING
AECOM Plan$pend
Capital Planning Tool
Stimulus Funds
CARES Act
Agency Capital Plan

Safeguarding R2S–AECOM SH&E Best Practices
- Leveraging industry wide safety, health and environment (SH&E) best-practices for transit facilities
- Operations and design to safeguard transit employees and riders
- Pedestrian simulation modeling to inform safe return to service
- Applying global lessons learned

AECOM Mobilitics™
- In-house proprietary scenario planning tool
- Evaluates future mobility scenarios
- Informs policy, design and investment decisions today

Regional Model
- Travel demand data
- Origin and destination
- Population and employment

AECOM Ridership Survey App
- In-house developed app
- Tailored questions to determine new transit patterns

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Virtual Public Meeting consultation.ai/demo/

R2S Safety Plan
Alternative Scenarios to Inform Service Reinstatement
Service Planning Capital Planning Funding and Financing Identification PMO
MASS TRANSIT R2S: A PHASED APPROACH TO IMPLEMENTATION

We recognize each agency has unique circumstances and that implementation of a return to service program will need to be tailored and appropriately phased to meet specific needs. The following outlines a proposed approach that can be adapted as we learn more about your particular requirements.
A Phased Implementation Approach

Phase 0: Safeguard R2S
Objective: Identify and deliver strategies to assist in the safeguarding of employees and the public during the immediate re-opening and return to service through maintaining social distancing in transit facilities and on transit vehicles as service resumes and reopen to the public. This would include managing inflow and outflow of people and visual queues on physical separation.
Deliverables:
• Toolkit of safeguarding solutions.
• Development of initial re-occupancy disinfection and ongoing operational cleaning plans.
• Development of adjusted space planning and wayfinding to embrace social distancing recommendations.
• Mitigation of exposure risks through integration of touchless technology.
• Identify smart building technology to monitor air quality and occupancy density.
• Identify adjustments to the ventilation systems.
• Safety, Health and Environment best practices.

Phase 1: Data Analytics
Objective: Determine data analytics goals and define key metrics. Evaluate existing data sources and the potential need for new data collection. Obtain and evaluate data to determine existing conditions around key metrics, for example which modes and infrastructure are being impacted now and in what ways and how have trip patterns changed over the last several weeks.
Deliverables:
• Draft and final data analysis project goals and key metrics, project purpose and outcomes.
• Summary of existing and new data source opportunities and limitations.
• AECOM developed ridership survey app.
• New data sets procured through commercial sources and gathered through app.
• Summary of data evaluation findings in infographics and report.

Phase 2: Scenario Modeling and Phased R2S
Objective: The objective of scenario planning is not to predict the future, but to evaluate potential futures to make more informed decisions today. The objective of this phase is to create a platform to evaluate “what if” scenarios to inform decisions about current and future service provision and infrastructure design. For example, scenarios can consider and include the rate at which people return to work and socioeconomic factors to determine anticipated levels of service and usage to define a critical network. Scenarios will be used to bookend potential future outcomes and, based on reasonably foreseeable future scenario, inform short, medium and long-term actions for service provision and infrastructure. Scenario results can be summarized and shared via dashboards customized to your agency’s needs.
Deliverables:
• Scenario planning draft and final metrics.
• Model analysis and recommendations.
• Draft and final model architecture.
• Future scenario concepts (up to three).
• Modified model.
• Scenario model runs (up to three).
• Customizable results dashboards.

Phase 3: Post Pandemic Capital Program
Objective: Recognizing that the current situation is dynamic and changing day-by-day, the objective of this task is to monitor changes in ridership behavior and key metrics to validate assumptions made during the scenario planning phase and respond accordingly. Model assumptions and strategy recommendations will be updated per new findings from monitoring.
Model outputs and anticipated service use will be then be compared to the agency capital plan. AECOM’s Plan$pend capital planning tool will be used to help identify and optimize potential projects for submission for available funding and financing (for example federal stimulus funds).
Deliverables:
• Monthly updates to scenario tool based on changes in travel patterns.
• Capital planning updates using scenario planning tool.
• Draft and final short, medium- and long-term service and capital planning strategies.

Potential Future Phases: Transit Assets of the Future
Objective: Select Smart City technology tools and apply a Traffic Management Center style approach to managing the flow of passengers and employees through a transit facilities using Artificial Intelligence (AI) and Machine Learning (ML) with video analytics and thermal imaging. Use of connected devices to help communicate with riders in real-time based on geolocation to ensure rider and employee safety on transit vehicles. Guidelines on leveraging technology and modifying design approaches to deliver more resilient transit services and facilities.
AECOM is leveraging our industry leading knowledge of public health and safety across all forms of built environments. Combined with our expertise in transit scenario planning, virtual public consultation and capital planning, we are helping transit agencies safeguard riders and employees; adjust their service provision, and plan for a return to full service in the midst of the coronavirus pandemic.

It is through the deployment of digital solutions—combining big data, digital interfaces and dynamic scenario planning—that we are leveraging this knowledge to assist your teams in making smart, timely decisions as they look to redefine their new business operational models.
Safeguard R2S

As we consider what Return to Service looks like - public perception will necessitate a robust strategy be implemented to mitigate any risk of dormant pathogens remaining in the building that could put the returning occupants at risk.

Through the deployment of a comprehensive disinfection protocol that follows the CDC and WHO requirements, a combination of disinfection techniques including the likely widespread deployment of biocides will be used to achieve a level of confidence in the eradication of the virus.

We do however understand that what is needed today, may change tomorrow. As our understanding of the modes of transition and the virus itself continues to grow, we anticipate that the recommended disinfection protocols, and associated biocides will also evolve. This, along with the specific use case of the building, will likely require tailored solutions for each facility.

Driven by a digital strategy, we are taking a typology based approach to the initial and ongoing disinfection and cleaning procedures, allowing our teams to be able to use web enabled, data driven solutions to quickly deliver tailored solutions to meet the needs of each facility, and also ensure that the plans are kept current.

Mobilitics™

Our current situation is evolving rapidly — understanding how evolving factors may impact future transportation can help take the guesswork out of what comes next. Mobilitics, an AECOM-developed scenario-planning tool helps our clients prepare for the uncertainties that lie ahead. Designed and used by our technical experts who apply the latest research and information about mobility trends, behavioral and environmental changes and technology, Mobilitics highlights opportunities so you can chart the best path forward and make informed decisions to achieve community goals towards a safe return to service.

By considering multiple possible future scenarios, Mobilitics highlights the range of outcomes that are likely to occur, enabling smart decisions even in the face of uncertainty. A robust and customizable scenario planning tool, Mobilitics works directly with the inputs and outputs of travel demand models to quantify the potential impacts of changes in ridership behavior, service provision and infrastructure. Performance metrics can include mode split and transit ridership, Vehicle Miles of Travel, congestion, vehicle emissions, parking demand, travel times and vehicle occupancy.

View here: https://aecom.com/services/mobilitics/
AECOM Virtual Public Consultation Tool

AECOM’s interactive web-based tool allows clients to engage and consult stakeholders from their computer or mobile device. This tool allows clients to continue driving public engagement with their projects during the coronavirus pandemic. By providing a more resilient approach to community engagement, this new tool will allow clients to engage with a wider audience who cannot attend in-person meetings during consultation periods.

Through the new platform, a virtual event can be personalized to show consultation materials including virtual reality and sound demonstrations, videos, maps, plans and pop up banners. The tool allows for instant feedback so public reaction can be captured and saved for analysis and accurate reporting. There is also a chat function so on-hand experts can remotely answer questions as visitors look around the materials, similar to what would take place during an in-person event.

Plan$pend – Leverage Your Enterprise Data to Promote Informed Capital Planning Decisions

Quality data provides the foundation for making informed and justifiable capital expenditures. Capital planning decision making requires comprehensive knowledge of an asset’s condition, expected and remaining useful life estimates, accurate cost forecasts and a projection of quantifiable impacts.

Plan$pend provides the platform for information consolidation and a process to promote data quality control. Access to high-integrity asset data provides the power to optimize capital spending, facility operations and maintenance management activities. Key features include:

- Software-as-a-Service (SaaS) subscription, hosted on an encrypted, private cloud.
- Customized to your existing asset portfolio, component hierarchy and legacy data.
- Handles projects which mitigate physical needs and new capacity projects.
- Leverages maintenance management and legacy project data to evaluate impacts of proposed capital expenditures.
- Incorporates community, political and geo-spatial impacts for spending.
- Integration with Microsoft PowerBI enables effective communication of spending priorities using interactive story boards.

View here: https://consultation.ai/demo/
EXPERIENCE WHEN IT MATTERS MOST

From infrastructure master plans during normal business operations to industry-changing security measures post-9/11, our broad range of experience and technical expertise means we provide our clients with solutions that matter.
Predictive Spatial Analytics – Pennsylvania Department of Transportation

The goal of this project is to develop a set of statewide predictive analytical models to assist with transportation planning, facilitate Linking Planning and NEPA. Machine Learning (ML) models were developed to analyze the landscape across Pennsylvania and extrapolate identified patterns to all areas of the state. The model building process included the use of three ML algorithms that were employed in a best-practices framework that included feature selection, cross-validation for model parameterization and selection and evaluation on independent samples. This included 132 separate models and over one-billion calculations to construct three predictive layers covering all 40,000 square miles of the state.

Connected Data Platform Analytics – Georgia Department of Transportation

The Georgia Department of Transportation (GDOT) receives a wealth of data generated by a variety of systems that are used to operate and maintain their roadways. The data is often siloed which can result in significant work when data aggregation is required to support decision making and it limits GDOT’s ability to use the data to its full potential. AECOM, with our industry partner Teeze, developed a data aggregation platform for GDOT. The data sources ingested into the customer data platform (CDP) in phase one work included crash, incident (WAZE) data, ITS device characteristics and status, and freeway service patrol data. The CDP provides analytics, visualization, performance measures, dashboards, and reports for a variety of system users and has been designed to handle additional data sources, preparing GDOT for improved utility and management of the “big data” already generated its systems.
Metrobus Market Effectiveness Study – Washington Metropolitan Area Transit Authority

AECOM assisted WMATA in reviewing Metrobus services in the context of regional growth and local plans by identifying market constraints and opportunities, and strategically positioning Metrobus to better serve current and future demand, enhance productivity and efficiency, and improve system integration between Metrobus and local bus services. The project team analyzed the market and roles of Metrobus services in a growing region with multiple transit service providers and developed an innovative methodology to identify and analyze bus markets. The results of a MWCOG Version 2.3 travel demand forecasting model were then applied to this methodology to:

• evaluate alternatives based on a set of metrics;
• create a strategic plan to develop an effective Metrobus network; and
• develop a rolling Metrobus Survey Plan to collect and analyze data on an annual basis.

Autonomous Vehicle (AV) Study – DC Sustainable Transportation

Using Mobilitics, AECOM conducted a study to analyze the potential impacts of AVs and other emerging technologies on Washington, D.C. and its transportation networks. We identified potential impacts to help understand what can be done now to prepare for the future. We also explored the ways in which AVs can be shaped to help achieve community goals and developed recommendations for the next five years to ensure the District is prepared when these technologies are rolled out and can use them to benefit its residents.

Mobilitics™ used scenarios to quantify the range of potential impacts to key performance metrics resulting from changes in travel patterns, demand and operations. Impacts were illustrated in detail with heat maps depicting changes to two key performance metrics: Person-Hours of Delay and Vehicle Miles Traveled, and how these are expected to change between the existing conditions and 2045 with and without AVs.
Exploratory Data Analytics Program for Safety Mitigation

AECOM is partnered with a federal agency to provide Data Science and analytics in support of existing work being done to mitigate safety issues and monitor program efficiency. The analytics project leverages a multi-phase workflow defined by: 1) data inventory and characterize, 2) gap analysis, 3) Exploratory Data Analysis (EDA), 4) and statistical modeling across a wide-range of data sets and programs. This project takes advantage of the Data Science process to gain a more thorough understanding of value of the client’s data and bring together large quantities of data in a way that was not previously feasible. This will enable clear links to be made between their data and their safety and business goals, as well as ensure data of appropriate quality and quantity are addressed.

Sustainable Systems Integrated Model (SSIM™)

SSIM incorporates the unique aspects of building age, typology, condition, improvement level and mission-dependence criteria. This creates a sustainability program that targets energy and High Performance Sustainable Buildings (HPSB) mandates. Energy conservation measures can be identified and applied through facility prototype modeling to yield a preferred scenario that considers energy return on investment (e-ROI) criteria, stakeholder input, energy efficiency and other drivers.

AECOM partnered with NASA as part of a large-scale planning program to incorporate the ideas of sustainability, innovative problem solving and coordinated planning processes. Overall, the actions recommended through SSIM will help NASA achieve a 23.7 percent EUI reduction and cut energy-related facility operating costs by over $160 million by 2025, offsetting rising utility rates and declining facility efficiencies due to age.
Our Experts are Ready

Jay Duncan has substantial experience managing large multi-discipline projects for most transportation modes. The majority of his experience is in developing workable, environmentally sensitive and effective transportation solutions in complex and diverse environments. He has been involved with all facets of project development including feasibility studies, master plans, alternatives analysis, environmental analysis, design and construction for transportation services throughout the country. In addition to his project management duties, he manages the Americas Transportation Planning practice, responsible for supporting Planners throughout North America in securing and executing work for our clients and developing emerging technologies and solutions to address the mobility needs of users throughout the country.

Veronica Siranosian, AICP, LEED GA
Vice President, DCSA, Digital and Innovation

Veronica Siranosian, AICP, LEED GA is a Vice President in AECOM’s Digital and Innovation and Ventures groups, which focus on advancing digital delivery and innovation in infrastructure planning, design and delivery. With a background in public and private sector transportation and land use planning, she works with agencies to understand, proactively plan for, and realize the future of mobility, including micro-mobility, connected automated vehicle technologies, shared mobility, vehicle electrification, and the application of these technologies to existing and future transit networks. Veronica’s experience includes scenario planning for a variety of modes and geographies to address future uncertainties; policy and transit agency service planning strategy development for on-demand and flexible transit networks. Veronica’s experience includes scenario planning for a variety of modes and geographies to address the future of mobility, including micro-mobility, connected/automated vehicle technologies, shared mobility, vehicle electrification, and the application of these technologies to existing and future transit networks. Veronica’s experience includes scenario planning for a variety of modes and geographies to address future uncertainties; policy and transit agency service planning strategy development for on-demand and flexible transit networks. Veronica’s experience includes scenario planning for a variety of modes and geographies to address future uncertainties; policy and transit agency service planning strategy development for on-demand and flexible modes; and planning for the use of digital and innovative solutions to address transportation safety, efficiency, mobility, and equity.

David Roden has extensive experience in travel demand forecasting, traffic simulation, transportation planning, and commercial software development and support. He pioneered advanced analytical methods used in 24-hour simulations of regional highway and transit networks, tour mode choice and activity-based models, performance and scenario-based project priority analysis, and the impact of connected and automated vehicles in travel models. Mr. Roden developed AECOM’s proprietary Mobilitics scenario planning tool to evaluate the potential of connected and autonomous vehicles (CAV) on future travel conditions. Created relationships and analysis tools needed to estimate the impacts of CAV penetration rates, public acceptance, dedicated facilities, connected infrastructure, ride sourcing services, induced travel, parking management, electric vehicle subsidies, VMT pricing, zero-occupancy pricing, satellite parking, shared-ride incentives, and congestion pricing on miles and hours of travel, fleet mix and vehicle ownership, freight miles, induced spending, taxes, fees and jobs.
Matthew D. Harris
Design Consulting Services Americas (DCSA) Data Science Lead
Director of Geospatial Data Analysis, Northeast
Education:
MA, Anthropology, Temple University
BA, Anthropology, Kutztown University; Minors in Geology and Geography
Registrations:
Registered Professional Archaeologist, Reg. No. 989314
Years of Experience: 19
Matthew Harris is DCS-Americas Data Science Lead and Director of Geospatial Data Analysis for the Northeast region. He has 19 years of experience in applying innovative, technological, and quantitative solutions to wide range of problems in the transportation and engineering business lines. As the America’s Data Science Lead he is tasked with assisting teams in developing technological solutions to drive major pursuits, mentor developing colleagues, and to find new innovations to add client value through analytics and data governance. Additionally, Matthew is an instructor of the SmartCities Practicum class and Public Policy Analytics courses of the Masters in Urban Spatial Analytics program in the Stuart Weitzman School of Design at University of Pennsylvania. Co-leading students in client/deliverable based projects focused on Machine Learning, sensor mesh IoT, traffic modeling from big data, and public policy development. Topics such as ethical Machine Learning, data bias, and algorithmic transparency are highlighted in this curriculum.

Martha Boss, CIH, CSP, PCQI, CPM
Principal Industrial Hygienist
Education:
BS, Biology and Engineering, University of Nebraska at Omaha
BS, Biology and Chemistry, University of Northern Iowa
Registrations:
Preventive Controls Qualified Individual (PCQI)
OSH Construction Safety Certified Industrial Hygienist, Project Manager and Safety Professional
Years of Experience: 31
Martha Boss has over 20 years’ experience in conducting biological and chemical risk evaluations through industrial hygiene studies to determine contaminant spread, and dispersion analysis; statistical parameters, severity and probability assessments for health risks; and toxicological profiling. Martha is co-editor and author of the 1) Building Vulnerability Assessments; 2) Biological Risk Engineering Handbook and 3) Air Sampling and Industrial Hygiene Engineering texts published by CRC Press. Her work has included constructability and design review to include interface with standard operating procedures for the BSL3 plus laboratory constructed to receive unknown biologicals under the auspices of EPA and Homeland Security. EHS Auditor and IH Assessment. For the EPA Homeland Security Laboratory, OH; and Pandemic Planning and Re-Occupancy evaluations that included biocide efficacy analysis of decontamination methods for confidential clients and government agencies, with protocol development keyed to WHO staging and attendant CDC requirements. She has also prepared real estate, transportation, food safety, manufacturing, health center, and research protocols to address both normal and emergency operations.

Tom Prendergast
Transit Operations Executive, DCSA
Education:
Harvard Program for State and Local Government Executive
BS, Socio-Technological Systems Engineering, Urban Transportation Systems, University of Illinois
Additional:
Board Member Regional Plan Association; Eno Center for Transportation Past Vice Chair of the APTA Commuter Rail Committee; Standard Development Oversight Committee
Years of Experience: 45+
Tom Prendergast is a senior executive experienced in directing large, complex transportation systems and major projects with highly visible and politically sensitive public arenas. He has a solid educational background in transportation systems engineering and detailed knowledge and experience in operations, maintenance, engineering, stakeholder and labor issues. Tom has an established track record in engagement of all stakeholders in the development of overarching public transportation policy and the use of strategic plans to finance, promote and implement such. His experience includes financial, operational and risk management functions related to large PPP projects and comprehensive billion dollar capital programs. Tom has more than ten years in rail safety management, with an ongoing leadership industry role as well as an in-depth knowledge of security and anti-terrorist management strategies and the need to work closely with the appropriate police and anti-terrorist agencies at all levels of government.
About AECOM

AECOM is the world's premier infrastructure firm, delivering professional services throughout the project lifecycle—from planning, design and engineering to consulting and construction management. We partner with our clients in the public and private sectors to solve their most complex challenges and build legacies for generations to come.

On projects spanning transportation, buildings, water, governments, energy and the environment, our teams are driven by a common purpose to deliver a better world. AECOM is a Fortune 500 firm with revenue of approximately $20.2 billion during fiscal year 2019. See how we deliver what others can only imagine at www.aecom.com and @AECOM.

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