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Reopen the Workplace: Facility Mapping Solutions for COVID-19 Recovery

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Reopen the Workplace: Facility Mapping Solutions for COVID-19 Recovery

Executive Summary

Faced with reopening facilities, leaders at organizations of all sizes must address multiple, complex challenges and decisions. The White House recently released guidelines for states to reopen and employers and individuals to return to the workplace in a phased approach while recovering from coronavirus disease (COVID-19). However, these guidelines are still evolving. This white paper outlines how Esri and the ArcGIS® platform can help those tasked with providing a safe environment while adjusting to the evolving guidelines.

Social distancing requirements, for example, necessitate a new normal within facilities. Employers must rethink floor plans, especially if their facilities utilize an open floor plan concept. They may also need to designate routes that minimize interactions or avoid contaminated areas.

Additionally, employers will need to provide clear communications with staff. This will be especially relevant when or if an employee has been in contact with someone who tested positive for COVID-19 or has been to a contaminated location. Employees can reasonably expect to get a clear understanding of what spaces are off-limits, which areas have been sanitized, and the sanitization schedule for contaminated areas. Communication is especially important for facilities used in COVID-19 response for housing people at high risk of exposure such as medical personnel, first responders, and patients whose symptoms did not require hospitalization.

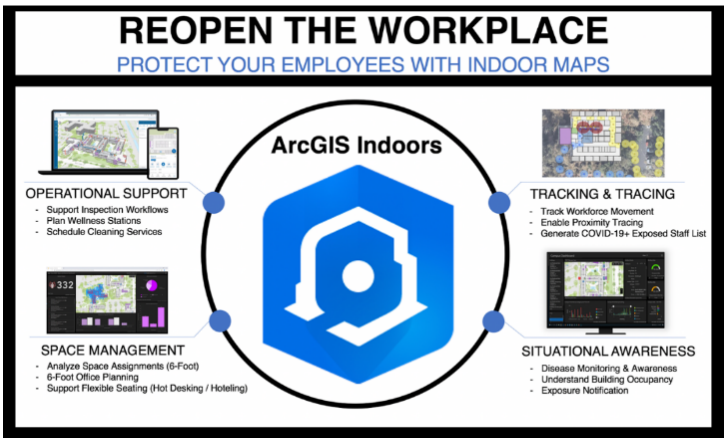
Since most employee contact occurs within buildings, organizations will need floor-aware, real-time monitoring of all occupants. By tracking movements and analyzing historical tracks, leaders can help determine employee contact, the spaces employees enter, and who has been in the same spaces. Organizations with floor plan-scale indoor maps and an indoor positioning system can achieve this level of awareness.

As the global leader in geospatial technology, Esri provides robust capabilities for location, analytics, and visualization. Here, we summarize how Esri® technology addresses major geospatially based requirements associated with reopening the workplace.

Solutions Based on ArcGIS Indoors

To meet requirements for a return to the workplace, employers will need a system that provides

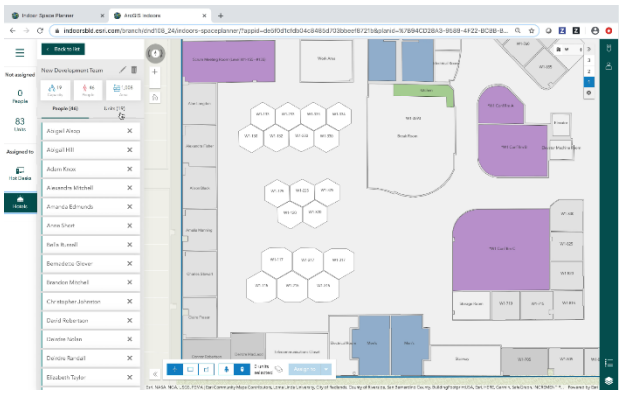
- Floor plan-scale mapping of facilities.
- An indoor positioning system to locate people within facilities.
- A management dashboard to display key metrics associated with employees in facilities.



Esri technology provides these capabilities through ArcGIS Indoors™ along with other components of the ArcGIS platform. Currently, the full capabilities of ArcGIS Indoors are implemented using ArcGIS Enterprise as a foundation in a cloud or on-premises environment. However, in summer 2020, ArcGIS Indoors will also be available to implement in ArcGIS Online.

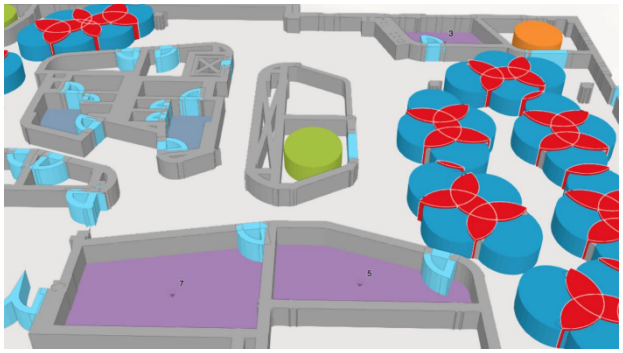
ArcGIS Indoors is a general-purpose indoor mapping and GIS platform that can be used in a variety of indoor mapping scenarios. With the implementation of an indoor positioning system, ArcGIS Indoors can also track people via their mobile devices. The ArcGIS Indoors capabilities position it to play a key role in any organization's COVID-19 recovery and return to the workplace activities by providing a foundation for the following use cases:

- Space Management



Currently, ArcGIS Indoors supports manual workflows to plan and assign work locations that conform to social distancing guidelines. In summer 2020, ArcGIS Indoors will offer an easy-to-deploy web application for office planning. This application will provide additional functionality to design seating compliant with social distancing. ArcGIS Indoors will also support the ability to define hot desking and hoteling areas as staff mix working from home with sharing office workspaces.

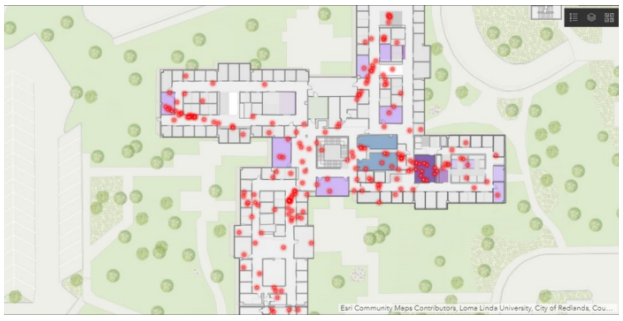
- Proximity Analysis and Tracing



ArcGIS Indoors can support multiple proximity scenarios for recovery activities. For instance, users can perform a spatial analysis of each work location using social distancing parameters. This helps determine intersections and identify insufficient space between work locations. Organizations can use this information to define work locations or redesign floor layouts that conform to the guidelines.

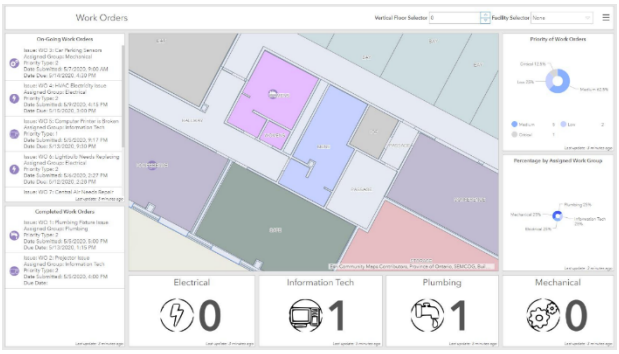
Another scenario involves tracking with the ArcGIS Indoors mobile application. Locations are recorded as employees move through facilities. If, for example, an employee tests positive for COVID- 19, these tracked locations can be analyzed to determine who that employee came in contact with and which spaces need to be sanitized. This proximity tracing analysis is a key component to communicating with employees and minimizing the spread of the virus.

- Density Management



Leaders from a wide variety of industries now need solutions to manage the flow and density of people inside and outside facilities. For example, at US airports, the Transportation Security Administration (TSA) is dictating how many passengers can move through security at the same time. There is also discussion of setting up virtual queuing zones to manage travelers through security. For offices or schools, similar density management techniques are needed to manage access to shared spaces like lecture halls, conference rooms, cafés, kitchens, and other common areas. Density management is especially important for managing crowds at sporting events and concerts. ArcGIS Indoors supports density management with tools such as tracking and geofencing.

- Operations and Maintenance

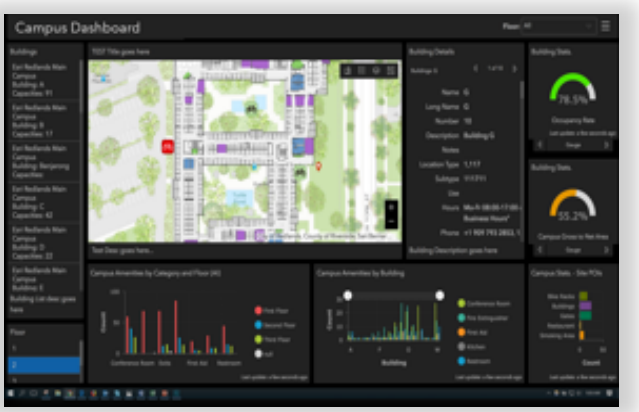


Organizations must also keep track of safety-related improvement projects and service requests. They will need to plan, manage, and communicate facility layout and safety and sanitization projects and identify restricted or off-limits areas. Managers, employees, and students will need to know the location and status of these projects to make informed decisions about where to travel in the facility. This information shares a common foundation—location. All key data is part of a spatial register of facility assets, from the room level and below. There are also related registers for service requests and projects. As people return to the workplace, employers need an effective way to manage and communicate operations and maintenance updates with various stakeholders. This approach ensures employees, contractors, students, and visitors can move and work safely and efficiently while meeting current guidelines. ArcGIS Indoors provides the foundation for these operations and maintenance needs.

- Security Operations

Organizations are seeking solutions that help protect lives and property. Many leaders need to understand the layout of a converted facility, anticipate threats, identify vulnerabilities, and manage risk—all without disrupting response operations. They need insight on where to direct security staff and assets to prevent disruptions or mitigate threats, whether the focus is within a building or outside. ArcGIS Indoors software, along with associated facility data, supports the operational environment from buildings to office floor plans, campuses, and event venues.

- Situational Awareness



ArcGIS Indoors supports situational awareness requirements for recovery and return to the workplace activities. Dashboards provide access to all relevant information collected across multiple business lines. This includes data about the facility, staff, incidents, assets, and equipment—all in the crucial context of location.

For instance, a situational awareness dashboard quickly summarizes who is in the facility at any given time and their current locations. Employees can update the ArcGIS Indoors dashboard when they plan to be on campus to provide management with building occupancy statistics. This information can be used to help make informed decisions such as approvals on who can be in the office, to keep on-site staff numbers low in support of social distancing, and to adjust building operations costs.

ArcGIS Indoors Implementation Patterns

To help your organization get started, Esri defined three ArcGIS Indoors implementation patterns, which we refer to as levels. You can move from Level 1 to Level 2 to Level 3 as your capability requirements increase. Here, we provide a brief description of each level.

1 Basic Recovery Capabilities

KEY CAPABILITIES

- Space Management
- Operations Management
- Security Operations
- Situational Awareness
- Field Mobility

The Level 1 implementation pattern provides basic capabilities for space management, security operations, and situational awareness. If an API or URL is available, this level also provides work order submission to an existing work or asset management system. A Level 1 implementation is intended for management and awareness at the building level and only requires a basemap depicting building footprints. Tracking can be performed at Level 1, but only outdoors using GPS. This implementation level gives users access to the basemap on a mobile device or a desktop. It also provides an operational dashboard view of facilities, plus the ability to display building information metrics along with the basemap.

2 Standard Recovery Capabilities

The Level 2 implementation pattern provides advanced capabilities for space management, security operations, tracking, situational awareness, and analysis. If an API or URL is available, this level also provides work order submission to an existing work or asset management system. A Level 2 implementation includes all the capabilities in Level 1 and adds the capability of mobile device tracking inside your facilities.

KEY CAPABILITIES

- Space Management
- Operations Management
- Security Operations
- Situational Awareness
- Field Mobility
- Indoor Positioning System
- Location Tracking
- Proximity Analysis and Tracing

Indoor mobile device tracking requires a basemap depicting building floor plans of the facilities where you want to perform tracking, as well as an indoor positioning system (IPS). This indoor tracking capability is key to an organization being able to perform proximity analysis and tracing within its facilities.

3 Advanced Recovery Capabilities

The Level 3 implementation provides additional capabilities that enhance a Level 2 implementation. At this level you can use notifications and alerts to extend your situational awareness capabilities. By adding supplementary information to the dashboard, the system can alert an operator when a specific event occurs. Routing makes it easier to navigate through facilities; and by adding geofences, you can help keep people away from restricted or off-limit areas. At Level 3, you can further enhance space management and situational awareness by incorporating work order information from a work/asset management system into your dashboards.

- Notification and Alerts

  Notifications and alerts are enabled via the implementation of geofences. You can use geofencing to set up zones—such as off-limit areas, areas for specific groups, areas for density management—to meet operational needs. For example, these zones can coordinate with individual tracking, enabling notifications or alerts if someone enters an off-limits area.

- Routing

  You can use ArcGIS Indoors to generate routes and waypoints that help employees get from one location to another. For implementations where the map detail only contains building footprints and where GPS is used for positioning, you can create a network to enable routing from one facility to another. For implementations where the map detail contains building floor plans and where an indoor positioning system has been implemented, you can create a network to enable routing between areas defined in the floor plans.

- Work Order Visualization

  You can add work order geospatial information to your ArcGIS Indoors dashboard by connecting to your asset/work order management system. For example, you may want to view work orders within a facility to get a picture of what work needs to be performed at that facility, or you may want to see all work orders of a specific type (such as room sanitization) to identify which facilities required this type of service.

Summary

The COVID-19 pandemic is driving the need for time-sensitive, location-based decisions for overall response and recovery. Returning to the workplace requires additional awareness of facilities—which are available for use, where people can work while maintaining social distancing, and where have people traveled in the facility. In support of COVID-19 recovery, Esri recommends facility mapping based on three strategic implementation levels. Esri technology and staff can help you get started quickly and enable incremental delivery of additional functionality to meet your specific organizational needs.

About ArcGIS Indoors

ArcGIS Indoors is a complete indoor mapping system for smart building management. Through an extended version of ArcGIS Pro, native web and mobile applications, and an indoor information model, ArcGIS Indoors provides a common operating picture for executives, workplace services personnel, and other employees and visitors to understand, manage, and use their workplace environment. Additional product information can be found here.

Please contact smartbuildings@esri.com for more information or to request assistance using ArcGIS Indoors for COVID-19 response.

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