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Covid-19 and beyond

How to Regain Trust in Public Transportation

7 video technologies to increase safety and efficiency

◆ milestone

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A new normal for public transportation

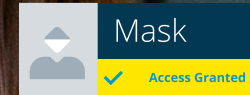
The Covid-19 pandemic has changed the world dramatically. And with a new reality, comes new challenges in the way we meet, greet, and commute. Video management software (VMS) solutions can help you adapt and create a new normal in public transportation.

Public transportation — buses, metro, trains etc. — has seen a significant decrease in passengers as a direct consequence of Covid-19 and related lockdowns around the world. People have become uncertain about their safety in larger crowds, have raised awareness about health, and feel insecure about travelling in general.

However, public transportation is crucial in making our cities and societies function. So, how can we regain the public's trust and reassure our passengers in the face of the Covid-19 pandemic and beyond? We need long-term solutions to solve the immediate issues as well as ensure healthy environments in public transportation for years to come and if a new pandemic should occur. Video technology combined with advanced analytics can be a solution to help adapt and optimize your business.

In this ebook, you can take a deep dive into how video solutions can be applied to public transportation in a Covid-19 perspective. You get an overview of specific video technologies and their core use and impact across the entire journey — from passengers approaching the station or waiting on a platform to those sitting comfortably on a train, bus or metro. We provide you with inspiration and advice on how to increase safety and operational efficiency to regain the public's trust in a time of uncertainty.





How video solutions make a difference

Every day, public transport companies serve millions of customers across their vast networks, infrastructure, and buildings. Situational awareness is essential to ensure that passengers and staff are always safe and secure.

Leaders, security teams, and facility managers in public transportation need to find better, more intelligent and long-term solutions to create safe and healthy travel environments. Here, video can be the solution to help prevent and detect the spread of Covid-19 — and also to regaining the public's trust long-term.

Video technology provides an almost infinite array of opportunities — from enhancing situational awareness and help turn data into insights to reduce costs. It can be effectively applied to improve both security and safety efforts, which enables you to react faster and make informed decisions and identify new opportunities.

This also means that video technology is not in itself a cost, but rather a sound investment in making public transportation available, efficient and comfortable.

It is time to move forward with a technology that will aid in establishing a new normal. Video is a big part of this, as it can optimize operations, improve passenger experiences and create end-to-end safe and healthy public transport sites.

Enable a safe passenger journey – all the way

Video management solutions can help public transportation companies create healthy environments during travel and in turn help detect, prevent and react on a potential spread of Covid-19 – and potential outbreaks in the future.

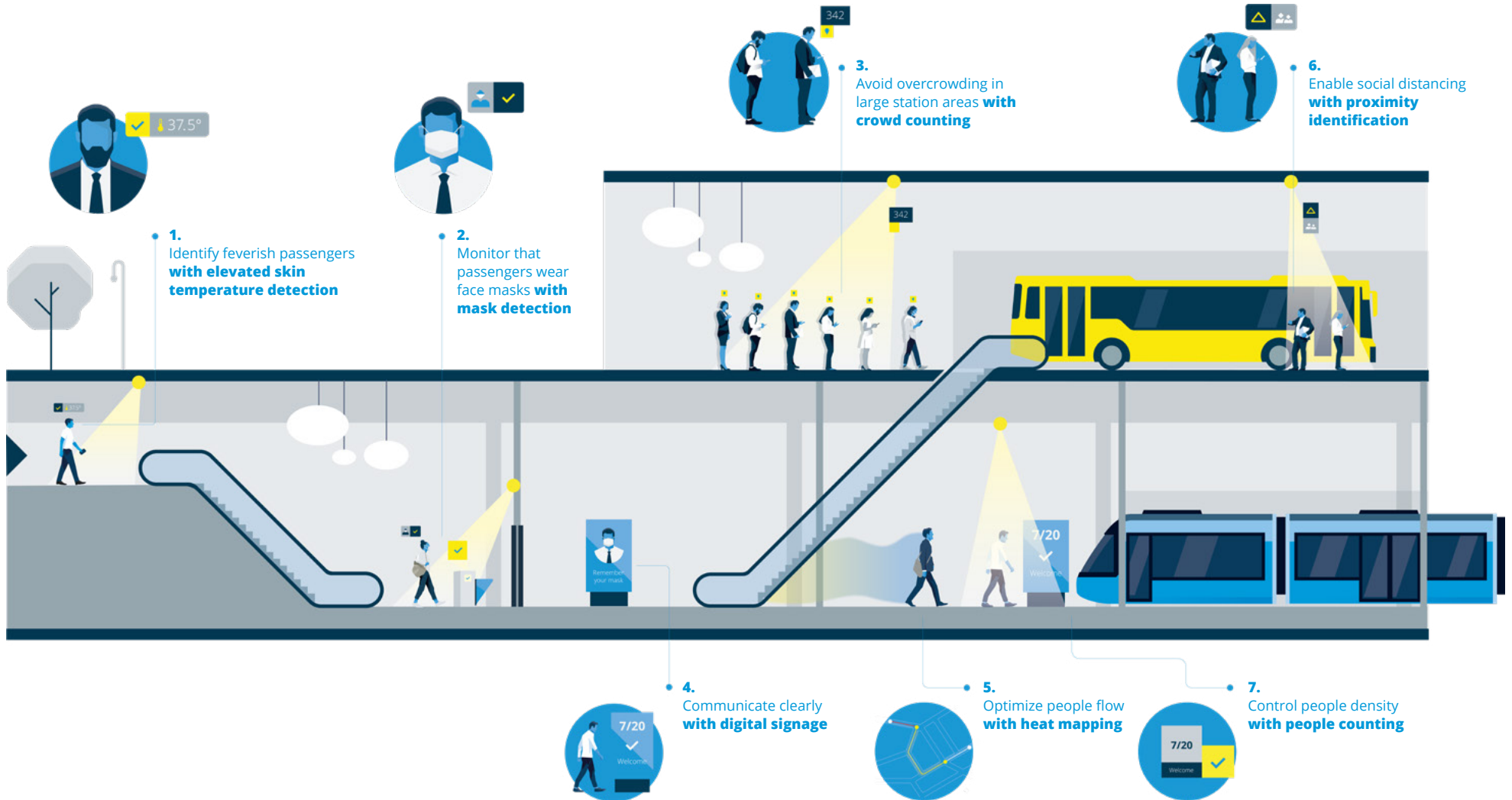
Keeping public transport running puts pressure on resources and introduces new challenges that must be solved here and now, such as:

- Which stations are the most crowded and when?
- How do we make sure a station does not get overcrowded?
- How do we know when people are getting too close to each other?
- How do we respond to and address people?

The questions are numerous. And the answers can be found within video technology.



7 video technologies to increase safety and efficiency



Identify feverish passengers with elevated skin temperature detection

The ability to quickly identify potential virus carriers is key to breaking the chain of contagion. Monitoring elevated skin temperatures can help provide you with an indication. However, the challenge lies in doing it in a way that ensures people are comfortable and can travel with ease.

Obtain critical information with minimal disruption

As a rapid way of identifying potentially ill passengers, thermal camera screening can assist transportation sites in detecting individuals with elevated skin temperatures during outbreaks. No-contact infrared thermometers or thermal imaging cameras can help transportation companies and staff obtain critical information with minimal disruption of travel. It's a technology that can help you put health and safety first and mitigate risk of infection throughout the station premises.

NB. Carefully consider objectives, use, and application of this technology. Other infections or conditions may cause elevated temperatures and elevated skin temperature detection is not a diagnostics tool in itself. Thermal cameras do not detect virus of any kind. They can only give an indication of elevated skin temperature. Those persons whose temperature is above the threshold need to be examined by a medical professional to identify if the individual is infected with Covid-19.



Key benefits

- Measure and display with minimum contact or intrusion
- Screen large crowds quickly and accurately
- Ease the people flow throughout the station premises
- Proactively detect and respond to potential spread
- Help people feel safe during daily travel



Monitor that passengers wear face masks **with mask detection**

Face masks have become a staple of life in many areas across the globe and will likely continue to be in the near future. As such, greater pressure will be put on mitigating measures by public transport organizations to check and increase their usage. Using face mask detection based on video technology is among the most efficient routes to take to ensure both safety and compliance.

Receive automatic alerts about missing masks

Wearing face masks and other protective face wear in public transportation has been widely introduced by governments globally to hinder the further spread of the Covid-19 virus. Video technology can help identify whether people are complying to the regulation. This makes it possible to be alerted quickly and ensure the use of masks, decreasing the risk of spread while enabling people to travel with ease. For transport companies, this decrease the staff needed for manual monitoring, reduces personnel costs while speeding up the identification process through instant alerts. Data can also be used for reporting and analysis purposes.

Key benefits

- Quick identification of compliance through automated face mask check
- Decreased personnel cost as staff can be focused on peak periods
- Enable immediate action with alerts in real time
- Document alignment with regulations



Face mask detection - in practice

No-mask detection in station lobbies or entrance areas

The cameras and video management system work in such a way that if an approaching passenger is not wearing a mask, the person will automatically be denied access or staff will be notified.

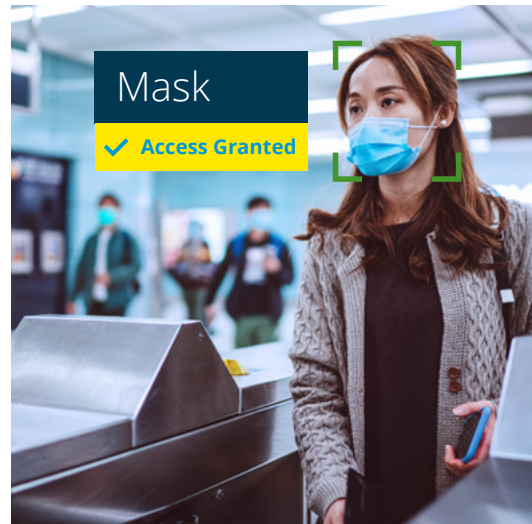


Facial recognition versus face mask detection:

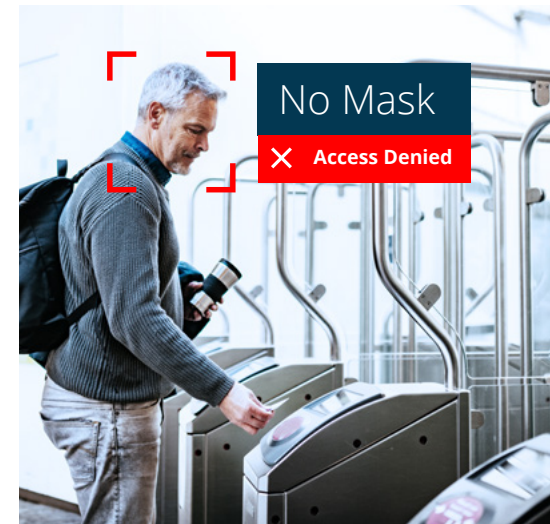
Face mask detection uses the same technology core as facial recognition — i.e. using face analysis camera software to interpret complex patterns to authenticate a specific person. However, the goal with face mask detection is not to identify individuals, as such. Rather, it is simply to detect if the individual is wearing a mask or not. With a video mask check solution that's privacy proof, no user's personal data is retrieved or stored because the system anonymously checks only face masks.



Make the entry process smooth and the station premises safe by monitoring people that pass through an entry point. For example, when entering a station lobby.



Video cameras help monitor if people are wearing a face mask or not, which is managed in the VMS in real time.



When no mask use is detected, the passenger may not be granted access and/or passengers will get notified through ie. digital signage.

Avoid overcrowding in large station areas **with crowd counting**

Travelers need to be able to move through the terminal with ease — while keeping the proper social distance. Crowd counting solutions based on video analytics can help provide insights and inform authorities and operators to when large areas get too crowded.

Creating safe spaces

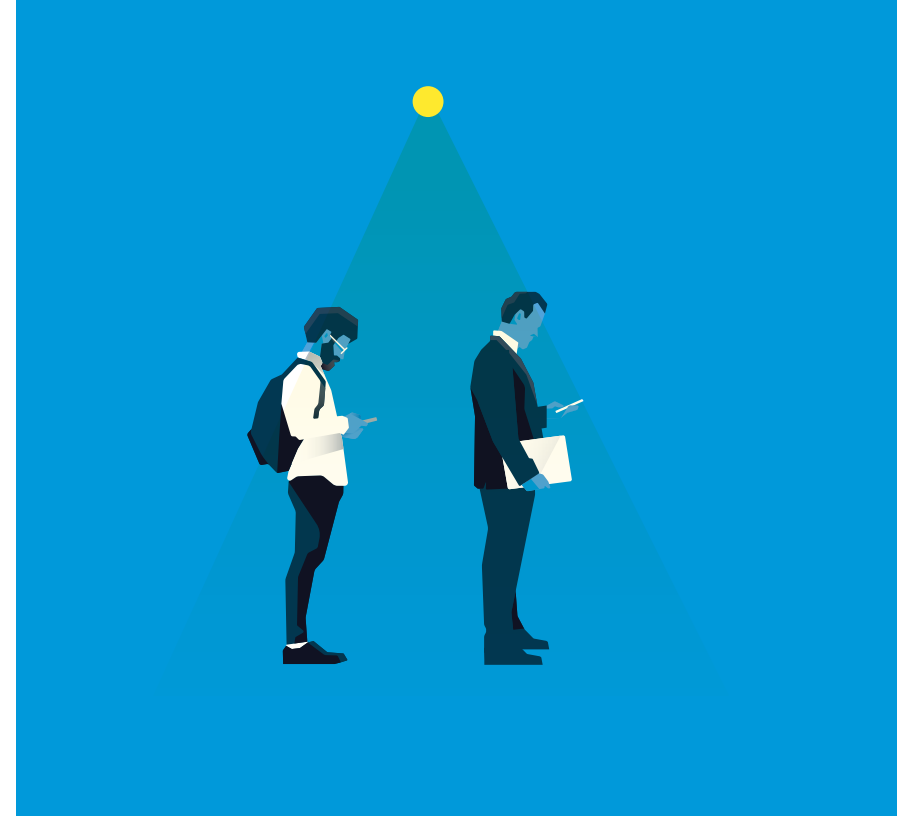
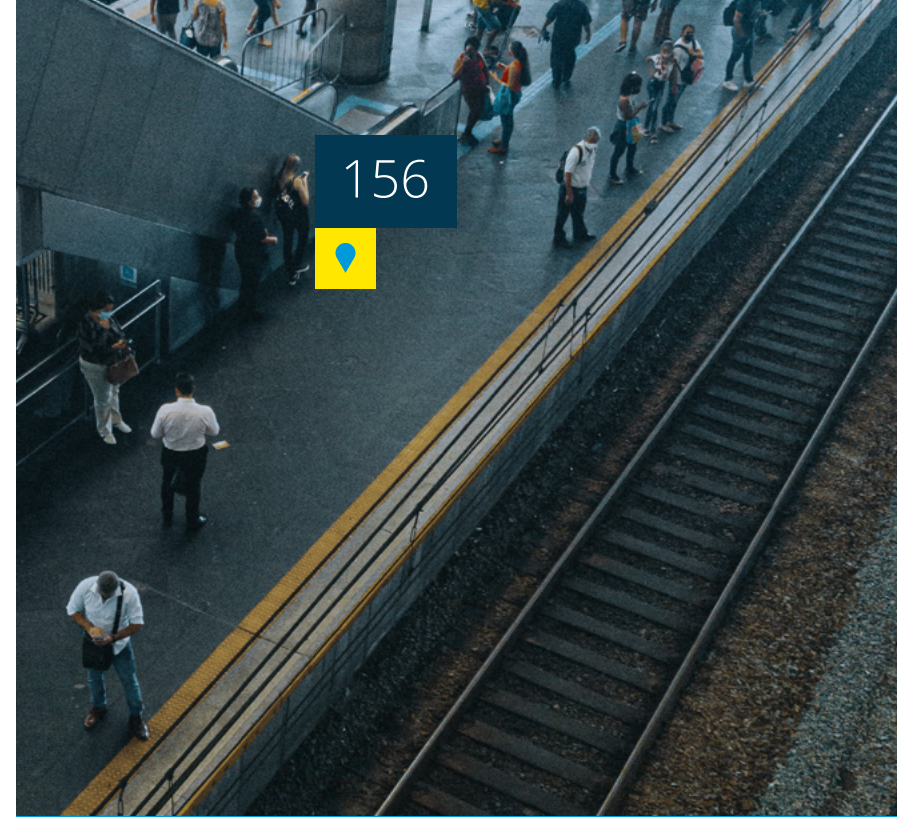
Transportation companies need to create healthy and low-risk environments and premises in lobbies, on platforms, etc. These are areas that do not always have just one clear entrance, exit or route. Thus, people tend to zigzag without a clear path, which in turn makes social distancing difficult.

Crowd-counting is relevant as a solution that is able to scan and count people in large crowds. In such areas, available spaces can help balance out crowd density and enable people to accommodate social distance requirements. And with people counting as part of your video solution, you can get real-time data to enable immediate action, as well as insights that can help optimize your premises and enhance situational awareness overall.

By employing IP cameras and intelligent video analytics data, you can compare the number of people to the available space, define the maximum safe capacity for station spaces and identify where special attention or optimized area management is needed.

Key benefits

- Manage density levels in real time
- Obtain information for scheduling and forecasting
- Minimize risk of overcrowding
- Save costs on training and personnel
- Achieve reliable and accurate data at a low cost



Communicate clearly with digital signage

Keeping passengers well informed is a cornerstone in managing the measures surrounding Covid-19. In order to comply with preventative measures, they need to understand how to do so, be it by knowing about available premises or the right way to move around.

Provide key information on digital monitors

Having video management as a core solution provides the benefit of issuing visual messaging through digital signage systems. You can integrate all your data sources and use digital signage to inform in real-time and control what will be presented on displays. This means that you will be able to direct people to the correct areas for travel or give reminders of safety guidelines.

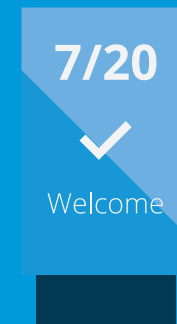
Remind passengers of safety regulations with automated cues

A video management system can be programmed to react automatically with cues, e.g. speaker notifications, every time there is a breach of guidelines or other relevant service information. The cues are empowered by video software and will happen in real time to enforce quick action from the right personnel – or, even better, through an intelligent video or audio system that reacts automatically.



Key benefits

- React in real-time empowered by video data
- Inform passengers or employees
- Prevent exposing employees or passengers to unnecessary risk
- Inform clearly about guidelines and limitations
- Reduce the number of staff needed to respond to breaches



Optimize people flow with heat mapping

For people to uphold the rules of social distancing, they need for their environment to allow it. Here, authorities and transportation companies have a responsibility to ensure that travelers have enough free space to move around in. Video analytics can help with crowd control and provide data that enable you to redirect passengers into less busy areas.

Identify the highest occupancy rates

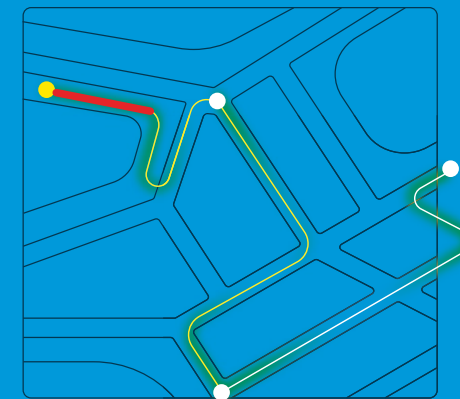
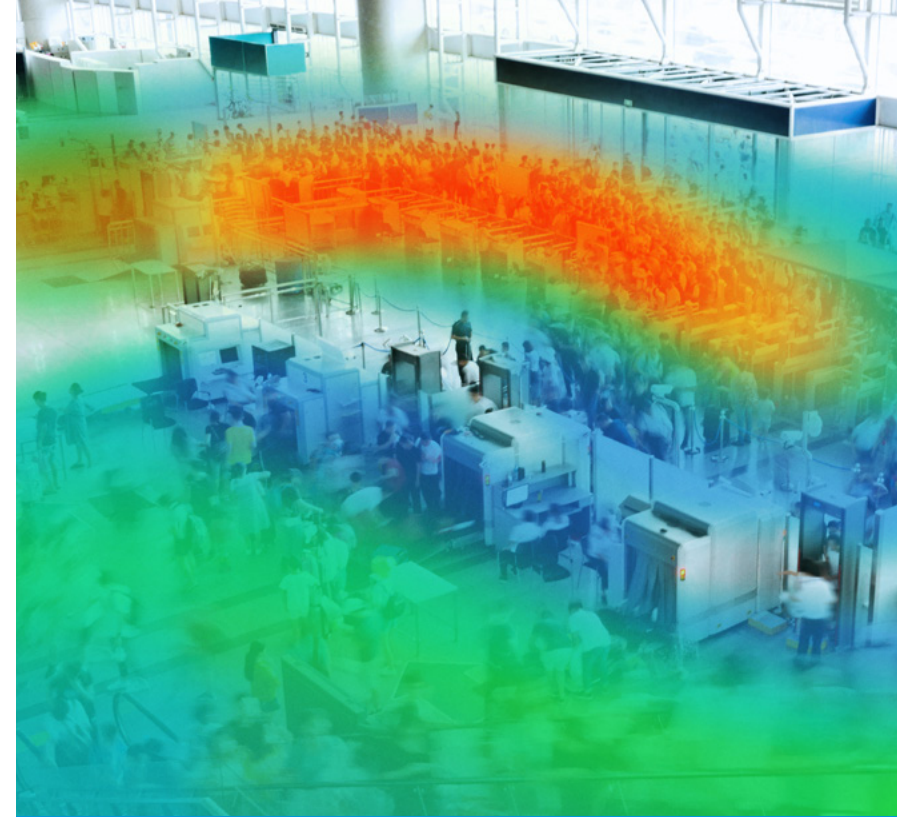
Start by understanding the flow of people and density levels at your station, recording the length of time people browse, where they linger, and how they choose to exit and enter platforms. Gathering this insight can be done with behavioral data through heat mapping software.

With the power of video, you can identify the areas in a station that typically have the highest occupancy rates. This can be done by creating heatmaps or occupancy statistics based on the images the cameras have captured. Intelligent video analytics solutions can provide this information historically or in real time. This way, it's seamless to figure out where to deploy preventive measures like dispatching enforcement personnel, mounting digital signs or create audio notifications.



Key benefits

- Define where and how to place information displays
- Optimize the facility design
- Improve planning based on forecasting on passenger volume
- Allocate more personnel and capacity in peak periods
- Reduce the need for staff to guide people



Heat mapping -in practice

Optimize people flow with behavioral data and heat mapping

Object counting, extensive statistical data, intuitive visualization and easy reporting help optimize people flow on station premises.

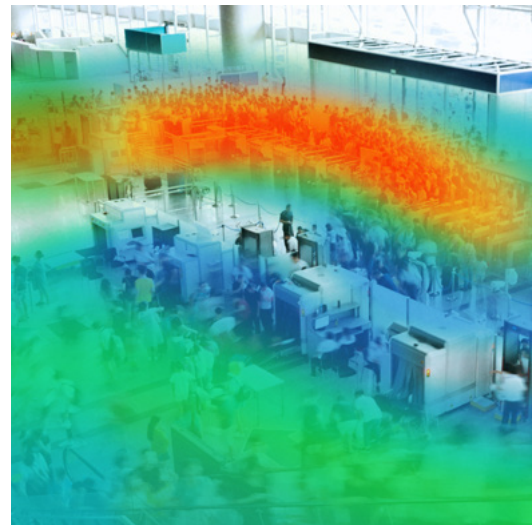


Introduce one-way systems to control crowds

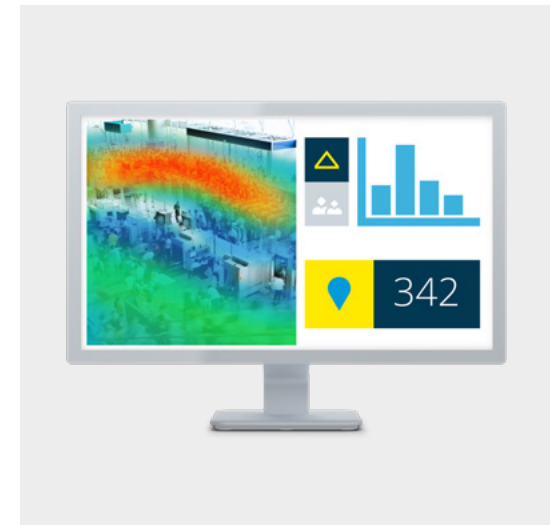
To avoid close contact and congestion in station premises, facility and area managers can set up one-way passageways and control these by using one-way detection based on video analytics. At the same time, valuable information is gained through statistics about the effectiveness of the defined routes to continuously optimize routes and number of personnel needed.



Do people or object detection and behavioral analysis within a predefined occupancy area.



Track objects, how they move, and the density in the designated area - all visualised through heat signatures.



Use intuitive and customizable dashboard to show data such as occupancy statistics, object count and heatmaps.

Enable social distancing with proximity identification

Always keeping the proper distance from another person can be difficult, especially when you are traveling and naturally on the move. Video technology allows you to detect when people aren't social distancing well enough, and can send out alerts and other real-time information to increase safety.

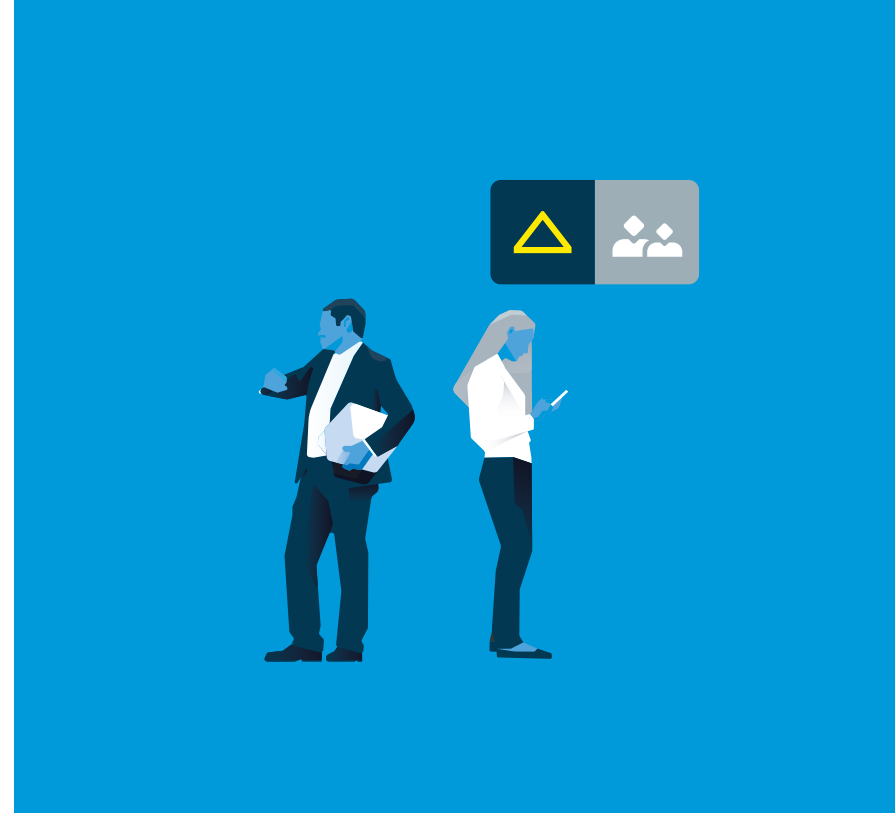
Receive alerts when people get too close

It can be difficult to control crowds in busy environments such as bus and train stations, metros and similar. At the same time, it can become a high-risk area when people are eagerly entering the train or bus. By determining the standard surface area required for each person, video-based social distancing features and people counting analytics, among other tools, can provide real-time alerts when spaces get overcrowded.



Key benefits

- Ensure compliance with social distancing measures
- Quantify and analyze the distance between individuals over time and location
- Reduce the need for staff to manually monitor density
- Enable visual or sound messaging to passengers with video monitoring



Proximity identification -in practice

Prevent crowd density on platforms with proximity identification and alert.

With video technology, you can ensure proper waiting and queuing, prevent train rush and get alerted if social distancing is neglected.



Assist authorities in contact tracing

Breaking down a chain of contagion requires contact tracing and is a vital part of virus containment. Video data combined with facial recognition can help authorities trace a Covid-19 patient's contacts so containment can be achieved. However, objective and of this technology must be considered carefully in the light of GDPR restrictions, and we urge you to seek advice on how to best integrate and apply the technology.



Monitor that people are keeping their distance during their commute. For example in a waiting area or when queuing up on a platform.



Detect when people are too close and not keeping their distance and notify staff by triggering an alert.



Integrate with digital signage or automated cue to let passengers be informed instantly without manual intervention.

Control people density with people counting

Controlling the number of passengers entering the facility, bus, or train, is key to ensure proper distance. However, assigning personnel to control traveler count at the entrances may be too costly and can be difficult to do accurately in busy environments. An automated occupancy control system — powered by video — can be a cost-effective and efficient way to manage this.

Get real-time updates on occupancy levels

Occupancy control systems accurately count how many travelers are going in and out of a train or bus, or are in specific areas of a facility. Further, integration with digital signage can inform people that they should enter, or whether the maximum occupancy has been reached and they should wait.

Managers can set a predetermined threshold on the number of passengers occupying a certain space. Furthermore, a centrally managed dashboard keeps staff and operations posted on the current occupancy levels in real-time. In the event that passengers disregard the guidelines and the threshold headcount is exceeded, an alert can be sent to staff so that they can take immediate action.



Key benefits

- Monitor how many people enter and exit automatically
- Address people and notify staff if threshold has been exceeded
- Allow businesses to forecast and balance the crowd evenly
- Improve the operation capacity using occupancy data
- Ensure peace of mind for drivers and service staff



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Welcome

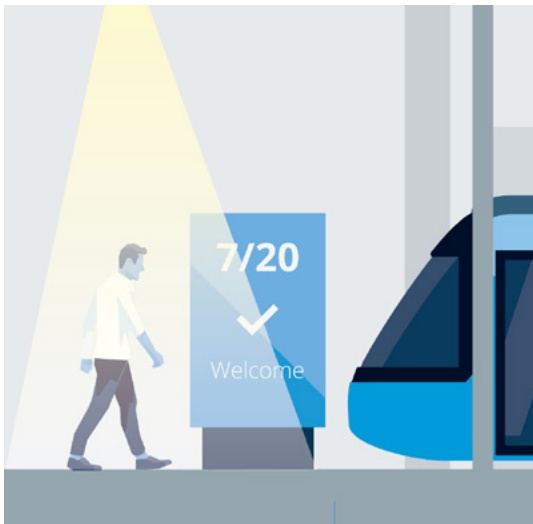


People counting in practice

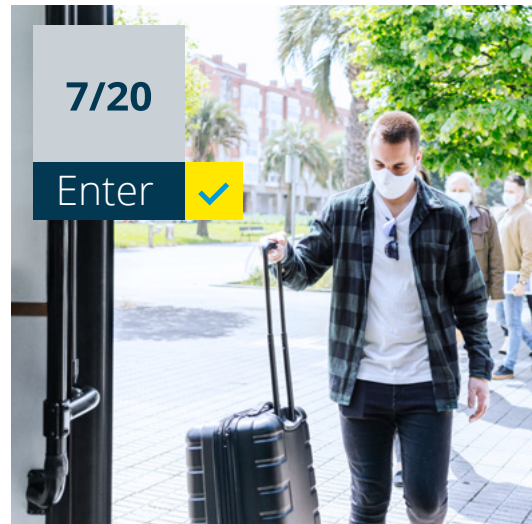
Limit the number of people

By using video technology, you can monitor occupancy by counting how many enter or leave the premises in real time. This allows you to alert people, notify staff or even close the entry automatically.

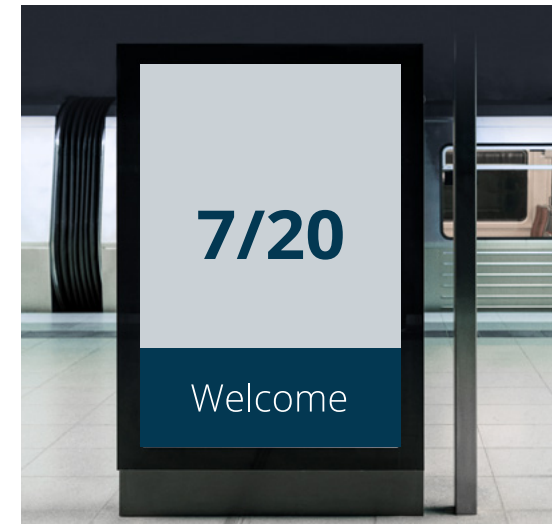
- **Measure distance between passengers with LiDAR Sensor**
With a LiDAR sensor, you can accurately measure the location of and distance between people, as well as the number of passengers in a given location. LiDAR sensors are an advanced 3D-sensing technology used to determine the movement, range and angle of moving objects via laser beams. The technology enables you to count passengers entering and exiting station areas and platforms and provide an automatic notification if the maximum allowed number is exceeded. Paired with thermal cameras, LiDAR sensors can even identify individuals with elevated skin temperatures.



Video management software, combined with advanced sensors, count how many people enter/exit trains or buses.



Set rules on the headcount and control it by counting the people entering/exiting in real time. Whenever a threshold is met, info is sent to the access system or staff notified.

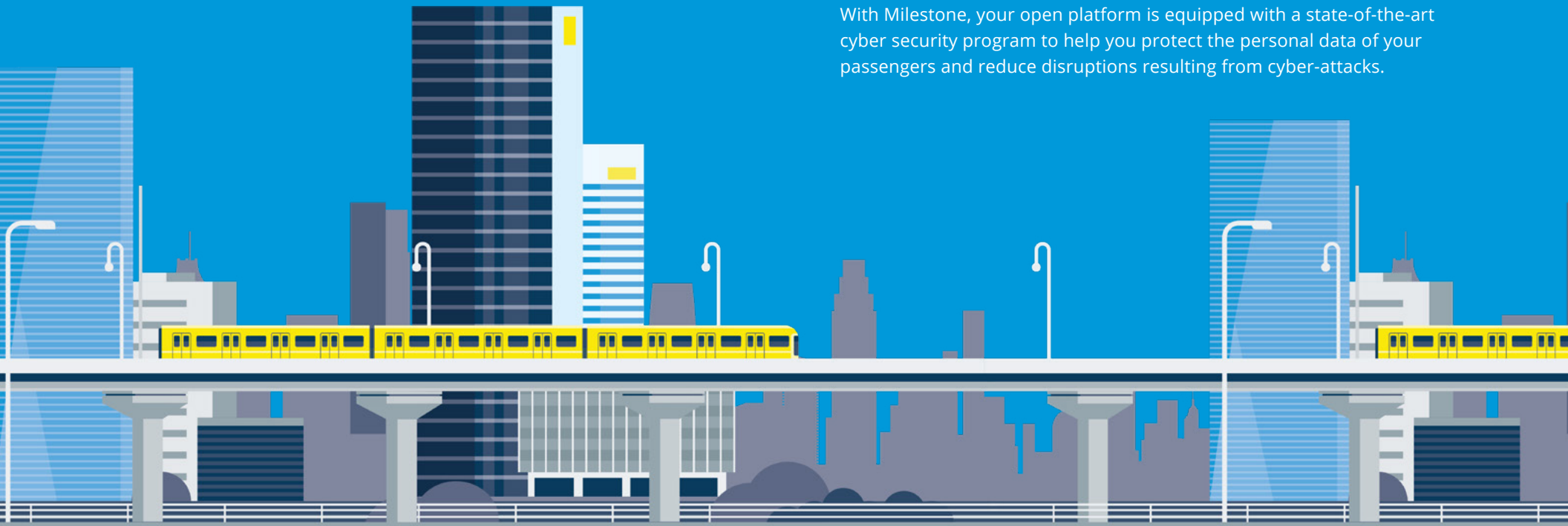


Integrate people counting technology with digital display to instantly inform passengers while enabling a seamless experience.

Benefits of video management solutions beyond Covid-19

Video technology combined with advanced analytics is one of the most efficient tools for both current and future challenges. While it is not a cure for Covid-19, it is a hands-on measure of compliance and safety. All the technologies and solutions covered in this ebook will remain relevant beyond Covid-19, as they can also be used for safety and security matters, such as:

- ▾ **Threat detection and prevention**
Video management solutions can provide public transportation with a much more proactive approach in anticipating and preventing future threats and challenges. With Intelligent video technologies you can seek out threats before they strike.
- ▾ **Crisis management**
Transport systems are generally sensitive to the effects of any crisis. Video technology can visualize massive amounts of real-time data within the context of an incident. This makes it possible to respond in a timely manner and even reduce or prevent a crisis.
- ▾ **Passenger security**
To manage increasing passenger threats in the transportation industry, security management is looking to leverage new surveillance technologies to streamline operations and build stronger security programs.
- ▾ **Cybersecurity and privacy**
A comprehensive proactive strategy can eliminate many cyber threats. With Milestone, your open platform is equipped with a state-of-the-art cyber security program to help you protect the personal data of your passengers and reduce disruptions resulting from cyber-attacks.



The protection of data privacy

Because video technology processes personally identifiable information, data protection and privacy must be considered when video technology is used to assist in public areas. Europe's General Data Protection Regulation (GDPR) helps ensure that all systems deployed comply with the rules and legislation of data protection, data processing, and privacy. Depending on the domain (private or government) and the use case, GDPR may or may not apply. Requirements can also vary from country to country, and it is advised to seek legal advice.



Responsible use of technology

At Milestone Systems, we are proud to see how video technology is coming to the forefront as a major means of support for businesses and workers, governments and citizens. At the same time, we take the responsible use of technology very seriously, as stated in the Copenhagen Letter.

We encourage all Milestone Systems partners and end-users to respect local laws regarding data protection and data privacy, and we may terminate the entire license for a product with immediate effect if it is used in a way that we consider to be a material breach of our end-user license agreement. Innovations in technology should be celebrated, but we must acknowledge our role in developing new technologies responsibly.

copenhagenletter.org

The Copenhagen Letter

It is time:

- Time to take responsibility for the world we are creating.
- Time to replace the empty rhetoric with a commitment to real action.
- Time to organize, and to hold each other accountable.

Because Milestone's business is shaping technology for the future, this message inspired us to act. The letter clearly speaks to Milestone's culture and core values, People First is how we describe our management style, putting humans at the center of technology development. Having helped create the letter, Milestone responded with real action through an initiative to guide how we innovate and use technology; we call it the Responsible Use of Technology.

Let's get started on your solution

The software is the core of the solution that creates ongoing value by enabling all the other components; Even those not yet known. Once the core is there, other components can be integrated as you see fit, when you see fit.

Milestone video management software brings all the puzzle pieces for video surveillance together in a perfect combination to create a solution that keeps people and property safe today – and tomorrow.

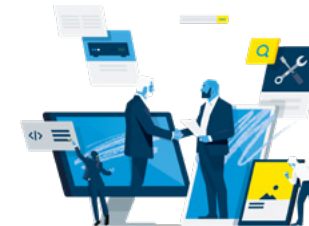
Ready to get started?
Please reach out to us [here](#).



Choose Milestone XProtect® video management software

When you invest in a video surveillance system, you invest in the safety of your premises, business, passengers, staff and assets. That's why you should invest in Milestone XProtect® – one of the world's leading video management solutions. With Milestone's XProtect video management software (VMS), you can take your pick of pretty much any type of hardware on the market and then add all the application and analytics layers you need.

 **+500,000 INSTALLATIONS WORLDWIDE**



Find your solution through Milestone Marketplace

We have more than 1,000 Technology Partners who have developed a wide range of flexible, scalable and future-proof video solutions. Through the Milestone open platform, our partners offer endless integration opportunities, including many that allow you to increase safety for passengers, make your operations more efficient, decrease need for service staff and positively impact your business.

 **1,000+ TECHNOLOGY PARTNERS**

MAKE THE
WORLD SEE

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Any questions?

Please reach out to us [here](#) if you have any questions or inquiries.



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