



Minneapolis- Saint Paul International Airport (MSP) serves more than 38 million passengers every year. In 2016 and 2017, MSP was named the top North American airport for efficiency excellence in its size category.

CASE STUDY

3D sensors help create momentum for growth at Twin Cities airport

SURPRISINGLY SHORT WAIT TIMES EVEN ON BUSY DAYS SUCH AS SUPER BOWL LII

CHALLENGE

Managed and run by the Metropolitan Airports Commission (MAC), Minneapolis-Saint Paul International Airport (MSP) processes more than 38 million passengers per year. As the 17th busiest U.S. airport and important driver of economic growth in the twin cities regions, MSP aims to strengthen its reputation as an efficient and customer-friendly hub. To do so, a queue and people flow measurement system shall help master challenges such as:

- How to gather passenger flow-related data that is crucial to provide the best possible passenger experience?
- How to share the collected real-time data, enabling passengers and airport stakeholders to take measures?

SOLUTION

Swift security control has a strong positive impact on passenger satisfaction and retail spending. On average, 30,000 passengers a day are screened at MSP, more than 40,000 passengers a day during the busy spring break period. 215 ceiling-mounted Xovis 3D Sensors cover five security checkpoints at MSP, counting and tracking passengers anonymously. The Xovis software receives data streams from the all the sensors, calculates and visualizes the targeted KPIs:

- Queue lengths for different categories of passengers (General, PreCheck)
- Wait times for different categories of passengers (General, PreCheck)
- Process times per X-ray line

“The real-time data the Xovis 3D Sensors provide is shared with all of the stakeholders and helps the Transportation Security Administration (TSA) manage its security lines more efficiently. The Xovis Passenger Tracking System is also useful to passengers, who can choose the shortest lines based on wait times displayed on digital signs in the departure lobbies.”

Phil Burke

Director of MSP Operations, Metropolitan Airports Commission

BENEFITS

The Xovis Passenger Tracking System, the combination of Xovis 3D Sensors and software solutions, is an important part of MSP's vision to accommodate growth and provide a seamless travel experience:

- As host airport, MSP screened more than 60,000 passengers at security the day after Super Bowl LII. Xovis helped surprise them with short wait times.
- The real-time data collected with Xovis can easily be shared with airport stakeholders, supporting them in streamlining the processes on their end.
- By sharing KPIs such as wait times on screens, MSP enables passengers to choose the shortest lines and spend more time and money in other areas.

XOVIS

CASE STUDY

How does it work?

Long queues make airports look bad and frustrate passengers. Xovis provides airports with a powerful tool to move passengers more smoothly through their facilities, optimize staff and infrastructure planning and ultimately increase customer satisfaction. The combination of Xovis 3D Sensors and software solutions helps improve efficiency all over the airport and prepares the ground for innovative business models.

Counting and tracking passengers anonymously, the Xovis system combines 3D sensors with software solutions to measure the targeted KPIs in real-time. A broad portfolio of Xovis 3D Sensors with ultra-wide viewing angle accommodates the specific architectural conditions of any airport. Mounted on the ceiling, one sensor covers up to 100 m² or 1100 sq.ft. and can be mounted from 2.2 to 30 m or 7.5 to 100 ft. high. A high-resolution 3D image, often also referred to as stereo image, of the covered/ recorded area is calculated up to 30 times per second, providing the basis on which every person that is entering the covered area is counted and tracked anonymously.

Based on the 3D images computed on the sensor, the software receives data streams from all the installed sensors, calculates and visualizes KPIs such as waiting times and passenger throughput on real-time dashboards. An unlimited number of sensors can be connected into a Multisensor

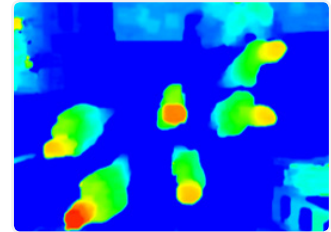
to continuously track passengers through large areas anonymously. The system also features an automated queue detection that measures waiting times only for passengers excluding staff, meeters and greeters even in unstructured, dynamic multi-queue areas.

Passengers are recognized individually even if they are standing shoulder to shoulder. Constant sample rates of 98% are guaranteed, meaning that 98% of passengers in the covered area are registered. The 3D stereo vision technology does not depend on signal-emitting devices and is highly robust against all kinds of external influences such as shadows, light changes and heat emissions.

Power over Ethernet (PoE), combining data connection with power in one cable, and a Mean Time Between Failure (MTBF) of 25 years simplify installation/maintenance and keep total cost of operation low. Implementing FPGA technology, the image processing is performed on the sensor. No video stream leaves the sensors and data privacy is guaranteed. Only a constant stream of moving dots, representing the counted passengers, is sent out. Only one server is needed to run the system with up to 600 sensors. The Xovis system can easily be integrated with other software solutions. For example, waiting times can be exported automatically from the system and displayed on screens at the airport or on the airport's mobile app.

„We aim to create a seamless passenger experience, using passenger flow technology to link together every touchpoint of the departure lobby area, the checkpoint locations, and all the way to the gate.“

Eduardo Valencia, VP, Chief Information Officer, Metropolitan Airport Commission



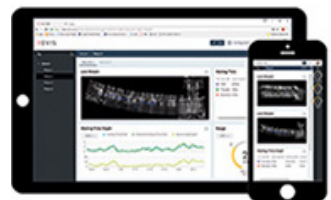
3D image computed by a Xovis 3D Sensor indicating heights and distances by different colors



Xovis 3D Sensor, PC2



The Xovis software receives data streams from the sensors, calculates and visualizes the KPIs



Web and mobile clients of the software are also available



Xovis data can be shared with passengers via digital signage to help them save time

CASE STUDY

Technical Data

WORKING PRINCIPLE:	3D stereo vision / distance measurement
INSTALLATION ANGLE:	+/- 15° in x-axis +/- 5° in y-axis
OPERATION TEMPERATURE:	0°... 50 °C
WITH OUTDOOR HOUSING:	-20°... 50 °C
STORAGE TEMPERATURE:	-20°... 70 °C
AIR HUMIDITY:	20 ... 80%
CONNECTION:	RJ-45 Ethernet
POWER SUPPLY:	PoE Class 0 / (IEEE 802.3af)
POWER CONSUMPTION:	< 5W
REQUIRED ILLUMINATION:	min. 2 lux
SIZE (LxWxH):	PC2/ PC2R: 13.0 x 9.4 x 3.0 cm PC3: 33.0 x 6.1 x 4.0 cm PC3-0: 38.5 x 9.0 x 8.6 cm
WEIGHT:	PC2: 350 g/ PC2R: 250 g PC3: 600 g/ PC3-0: 1700g
MOUNTING HEIGHT:	PC2/ PC2R: up to 6 m PC3/ PC3-0: up to 20 m



Taxi Ranks



Duty-free



Check-in



Gates



People Movers



Baggage Reclaim



Terminal Entrances



Emmigration & Immigration



Security



Customs



Escalators



Transfer Security

ABOUT XOVIS

Swiss-based Xovis is the market leader in people flow monitoring. More than 65 international airports count on Xovis to measure numerous KPIs such as waiting times, process times and passenger throughput. Based on the gathered data airports optimize the planning of resources and the use of infrastructure. The combination of 3D sensors and software solutions stands out with unmatched accuracy, reliability and ease of use. The system includes a sophisticated data privacy concept and does not depend on signal emitting devices. Founded in 2008, Xovis has evolved from a three-man start-up to a high-tech company with more than 80 employees. The US office is in Boston, MA.