HOW SAFE ARE WE? GOING THE DISTANCE WITH GEOSPATIAL TECHNOLOGY

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Clementi Mall: Some crowd.

Nearby options: West Coast Plaza (1.3km away), Star Vista (2.8km away), IMM (3.0km away).

Checking the crowd status before heading out to parks and malls has become second nature to some, much like how we have gotten used to standing on taped lines spaced a metre apart. Staying safe was hardly that literal just six months ago. As many of us were retreated forcefully to our humble abodes, the Geospatial Technology (GST) world conquered with a vengeance.

GST refers to technologies that allow us to obtain, interpret and store data with locational information. Our friendship with GST started since the days of remote sensing. The birth of Google Maps saw us grow closer, and with Space Out and Safe Distance @ Parks, we are now the best of friends!
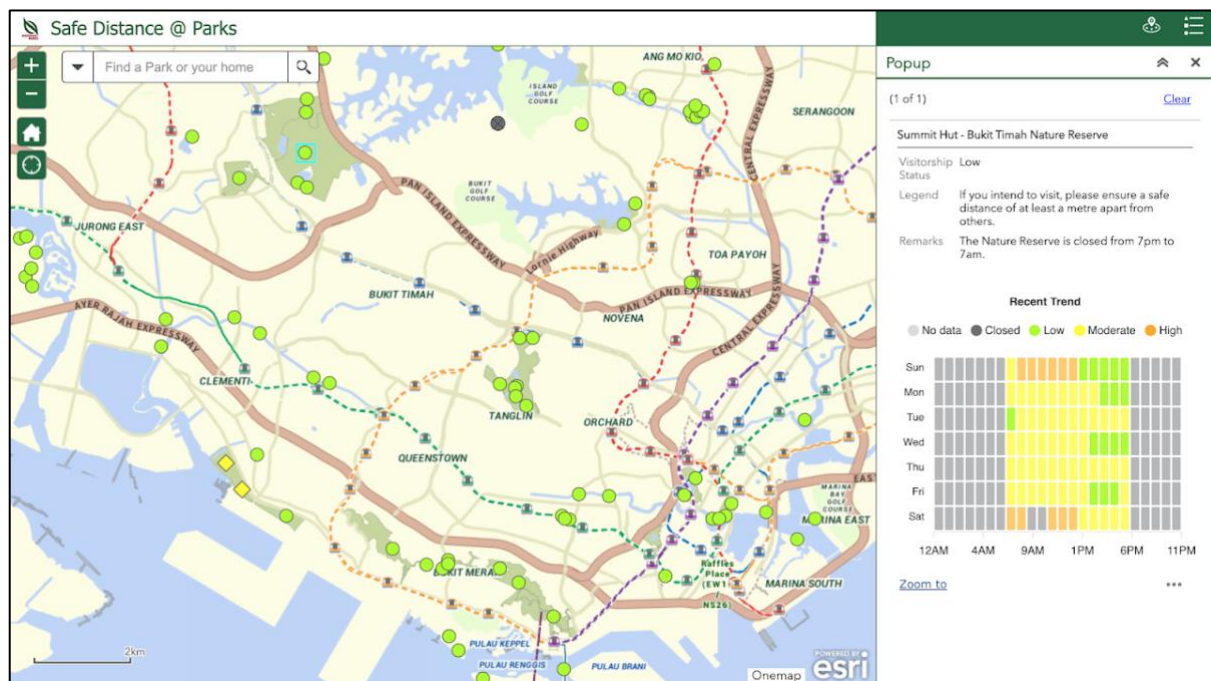

30 drones are deployed in specific parks and nature areas so that officers have a high vantage point to obtain visitorship numbers quickly. In collaboration with GovTech, the SPOT robot is deployed to navigate parks with more challenging terrain. Ground observations are also used to complement this data.

GST indeed has the potential to keep us safe through these apps. But really, how useful is GST in the context of safe distancing? We turned to an Esri representative, Miss Xara Villavicencio (X), a park and mall user, Mr Goh Tiong Ann (T) and a safe distancing ambassador at parks, Miss Jean Tan (J) for their thoughts. We also attended the Esri Singapore User Conference 2020 to gain insights on the development of these apps.

#1: HOW WERE THESE APPS CREATED?

X: NParks collaborated with Esri Singapore to build the first version of Safe Distance @ Parks. This app is a real-time map that colour-codes and displays crowd levels at parks. Developed and launched within three days, it has since been upgraded three times. Space Out was created by URA using Esri's map technology and engine to provide an interactive map of Singapore, to display and colour-code malls based on crowd levels.
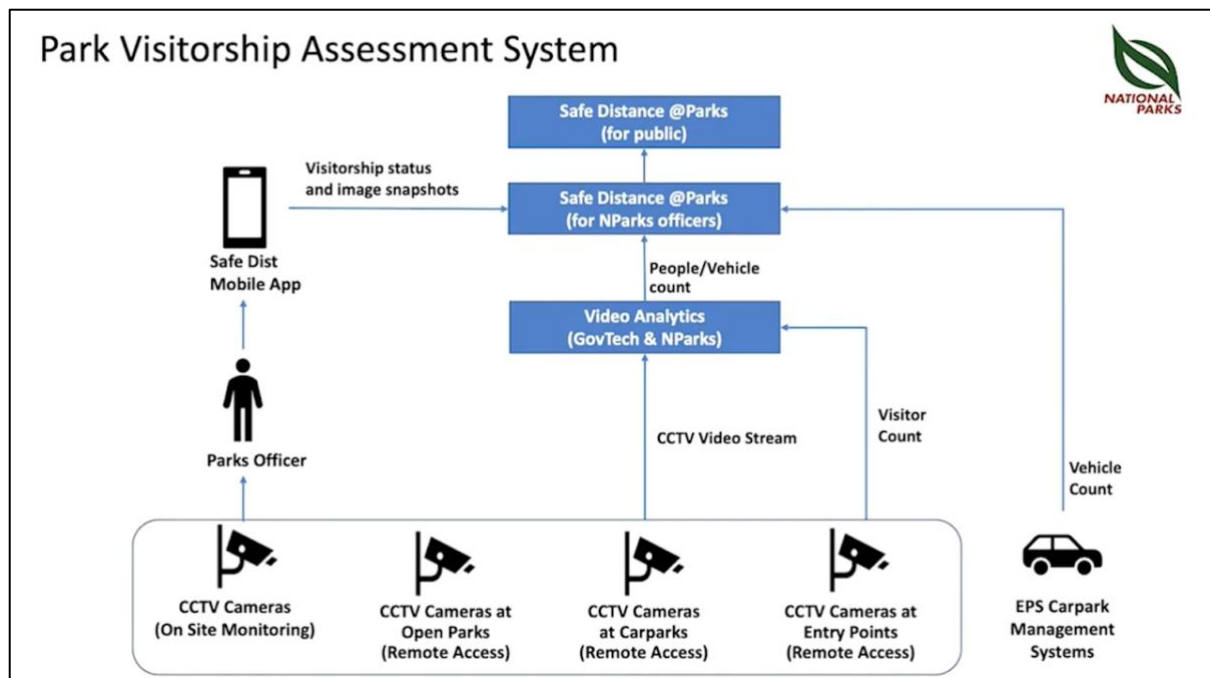
Credit: ESUC 2020

CCTVs are also used to survey and monitor parks. These images are transmitted to a backend server every 15 minutes, and video analytics is then used for people counting. To safeguard people's privacy, images only recognise the physical body but not the face. However, among the limitation of using images is that vegetation may block the field of view.

#2: HOW HAS GST HELPED WITH SAFE DISTANCING?

X: Since the public is empowered with information to adjust their schedule accordingly, they can make conscious decisions to ensure the safety of themselves and the people around them. This creates a staggered effect on crowd levels across Singapore.

T: During the Circuit Breaker, GST had allowed me to check the crowd levels at malls hence helping me to avoid long queues at the supermarket.

J: GST provides an overview of a park's visitorship so that people can plan a trip to the park before setting off. A map is more easily understood than having to pore through a long list of updates on park status. When parks reached their maximum capacities and had to be closed, we could direct disappointed visitors to the website so that they can monitor crowd levels before making a return visit.

#3: DID YOU OBSERVE DISCREPANCIES BETWEEN THE REPORTED AND OBSERVED CAPACITY AT PARKS OR MALLS?

T: I noticed that although a mall might be labelled "max", people can still enter because there is a roughly equal number of people exiting at the same time. There is also some lag time between the reported mall capacity and the actual capacity when you reach the mall due to travel time.

J: Some visitors questioned the visual inspection done by officers to estimate real-time visitorship at parks.
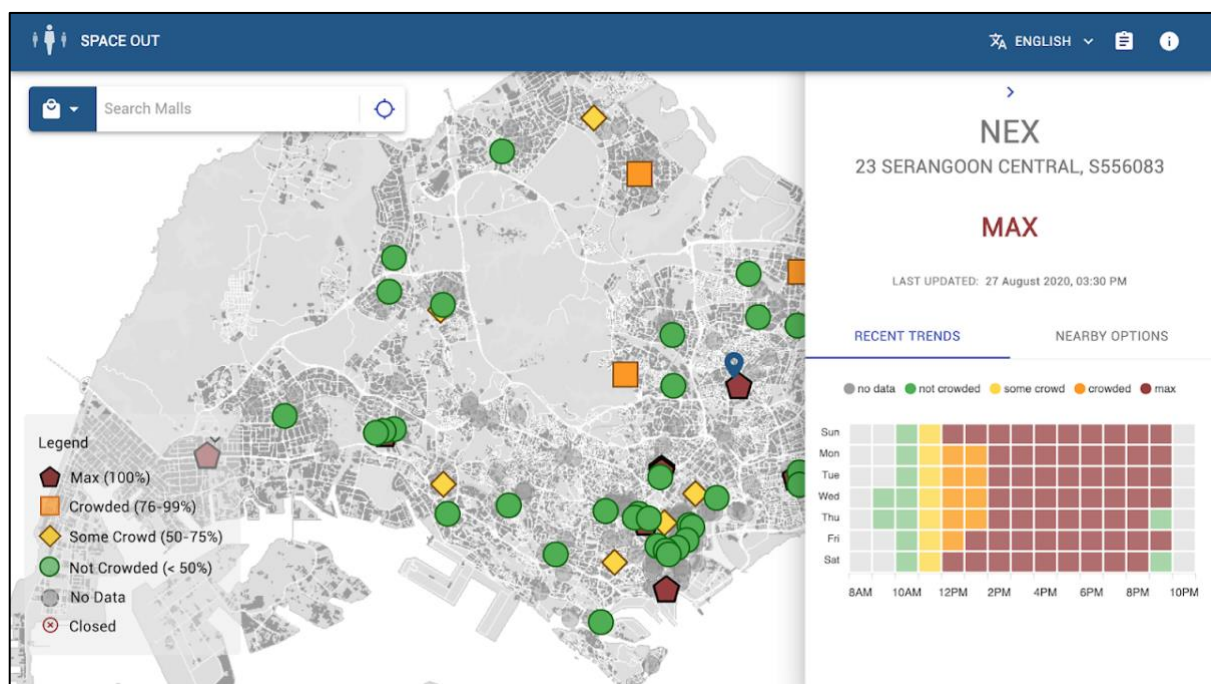
The maximum capacity of malls is determined from safe distancing guidelines for retails malls by Enterprise Singapore. By comparing shopper traffic data provided by retail malls and their maximum capacities, percentage figures are derived to indicate the crowd levels at these malls. The app has been refined to include features like enhanced map symbols, queue length at markets, nearby less crowded mall options and multi-language functions.

#4: WHAT LIMITATIONS DO YOU THINK GST MIGHT HAVE WITH REGARD TO SAFE DISTANCING?

X: GST is only as useful as the number of users on the apps. There are still many who are not aware of the existence of this technology. Even with this information, people may still choose to access goods and services at their preferred convenience.

T: I think that GST would be less effective for parks because a long stretch at a park is represented as a single point. Therefore, it is unclear if only a particular section of the park is crowded, or if the entire park is crowded.

J: There may be difficulty in estimating visitor numbers at parks, resulting in a lag time between status updates and actual numbers. For example, Windsor Nature Park is connected to MacRitchie Reservoir Park through trails. Hence, it is difficult to count visitors moving to and from both parks and those walking along the trails accurately. In comparison, retail malls might have a more accurate visitor count due to fewer entrances and exits albeit a small lag time between reported and observed capacity.

Credit: ESUC 2020

In the early stages of safe distancing, malls were using manual counting. As the situation progressed, different partners began exploring more practical and efficient ways of gathering data to publish data that is as real-time as possible. Some partners now estimate crowd levels from SafeEntry check-ins and check-outs.

#5: HOW CAN USERS HELP TO INCREASE THE RELIABILITY OF DATA SHOWN ON THESE APPS?

X: It would be valuable to have crowdsourced information from the public. A large volume of data from a digital-savvy population increases the quality of data gathered from technology. It provides insights that are far greater than data collected from more traditional and manual methods. However, with regulations like PDPA in place, we also need to be sensitive with crowdsourced information.

#6: HOW ELSE DO YOU THINK GST CAN BE USED TO MANAGE SAFE DISTANCING?

X: GST can provide analytics to understand how crowd levels of ongoing activities in public spaces evolve to help us identify areas that may become high-risk. Government agencies can then access and integrate this information into work processes for smarter management and to ensure greater public safety. We also see the need for rapidly-deployable mobile apps that help business owners understand how their facilities and operations are affected by COVID-19.

T: I hope that these apps can be integrated into a one-stop app for ease of access. Users could possibly access these apps from Tracetogether or Singpass. These apps can even be linked to Google Maps or Citymapper. Thus, people looking for directions to a mall can be told of its capacity before they even start travelling there.

J: Perhaps more malls can consider estimating visitorship using the number of Safe Entry check-ins. This data can be made available real-time to the mall to ease manpower on current manual counting practices and to reduce time lags.

Watch the ESUC 2020 presentations by NParks and URA in full:

Parks and greenery management: Learning from and adapting to COVID-19

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Powering data-informed decisions through spatial collaborative tools

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