



1Point2

Public buildings: pedestrians and vehicles

SUCCESS STORY N° 2

⇒ ISSUES:

- Check the capacity of personnel and public that the building is able to receive.
- Validate filter point resources.
- Study the reactions in extreme conditions: rush hours, decision to evacuate.

⇒ SOLUTIONS:

- Simulation model able to take into account a wide variability of pedestrian and vehicle flows,
- Precise study of the density of people in the corridors, elevators, waiting rooms.

⇒ ADVANTAGES:

- Validation of control installations.
- Financially assessed recommendations provided to the different technical operators.
- Possibility to extend the study to optimize the reception and densities in the different types of surface.

Buildings housing administrations open to the public are the source of many dimensioning and security problems, which are fundamental for ensuring their proper functioning. With ExtendSim and simulation studies, 1Point2 provides an insight that is essential to validate fluid user movement.

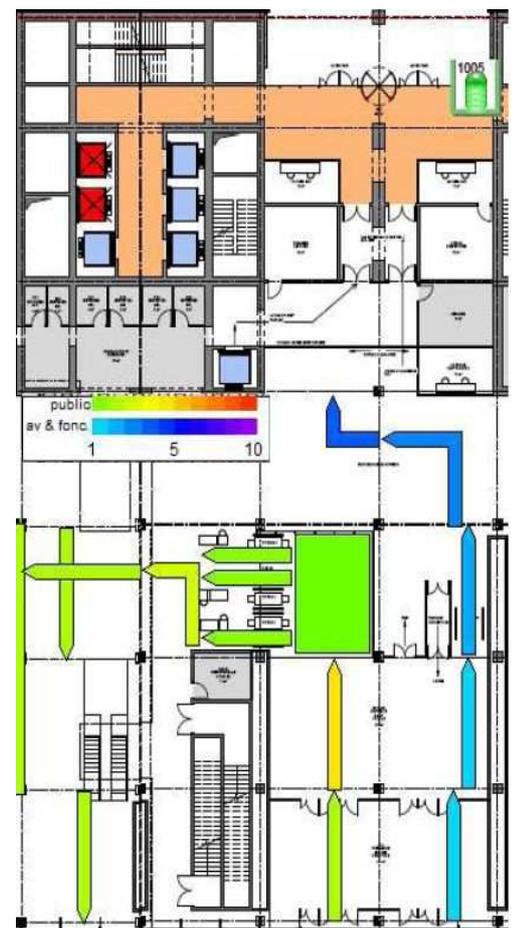
In the particular case of law courts, complex security requirements add to the numerous constraints:

- Extremely different populations (civil servants, public, escorted persons, badge-holding Officers of the Court), implying a distinction between public, reserved and secure areas,
- Arrivals on foot, by car or in an escorted van,
- Horizontal (from one room to another) and vertical (stairs and elevators) movement,
- Flow at lunchtime, if there is a restaurant in the building,
- Additional flows of deliveries and couriers,
- Dimensioning of public reception and switchboard teams.

The studies show the incoming traffic and its peak hours, as well as lunchtime cross-over flow. The ability of the simulation model to detect bottlenecks and blockage conditions depends on the precision of these statistics. In this case, it involves receiving over 8000 people in the time-slot 8 am—7 pm !

For the impression of efficiency and attention that the public expects from such an administration, the first two access stages (control station and general reception point) are essential: here the simulation has validated the choice of one single entrance, showing that 72% of the users do not wait to go through the security filter, 27% wait for under 30 seconds, and only 1% for longer. It also confirmed the size of the reception point (number of windows and « self-service » terminals).

Access for vehicles is no less problematic : in the rush hour, it is important not to congest the road, whilst vans and vehicles have to go through a barrier and park. But when the car park is busy, the maneuvers take longer and tailbacks are more likely to happen!

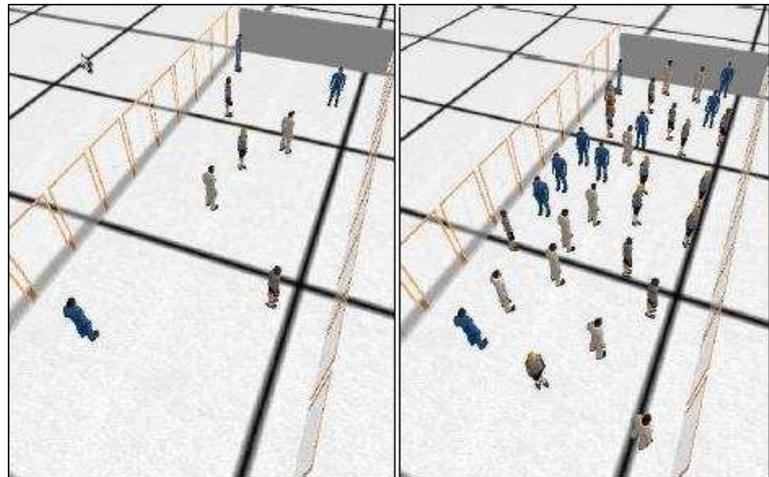


- Sky blue to dark blue (1-5) : fluid traffic, very comfortable
- Between blue and violet (6-9) : fluid but heavy , comfortable
- Violet (10) : people queue one behind the other

Evacuating people after an ordinary hearing, a high publicity trial or an alert requiring instant evacuation, tests the buildings' design. The simulation will highlight the bottlenecks, new circulations possible in the case of an exceptional event, densities that may or may not interfere with the fluidity of movements, as well as different types of human behavior represented in a stochastic manner from real-life observations. Open spaces around the building (square, car park, etc.) play their part in absorbing any flow that exceeds the site's usual attendance.

Flow simulation is one of the most powerful tools used to analyze complex systems :

- ◆ **Understanding** the system's dynamics: how long (minimum/ maximum time) does it take to get from one point to another? Where and when may long queues appear?
- ◆ **Anticipating** the operation of a new system, or **improving** the functioning of existing systems. Simulation can avoid making small or big mistakes!



Mean density

Most saturated density

The assumptions give an average of 9 people in the so-called GUG Civil waiting area. This corresponds to people waiting for a box, but also the lawyers present and people coming out from a consultation. This is equivalent to an average of 0,1 person/m² with a maximum of 0,25 person/m², thus a very acceptable density.



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