EGRESS FROM A HOSPITAL WARD: A CASE STUDY

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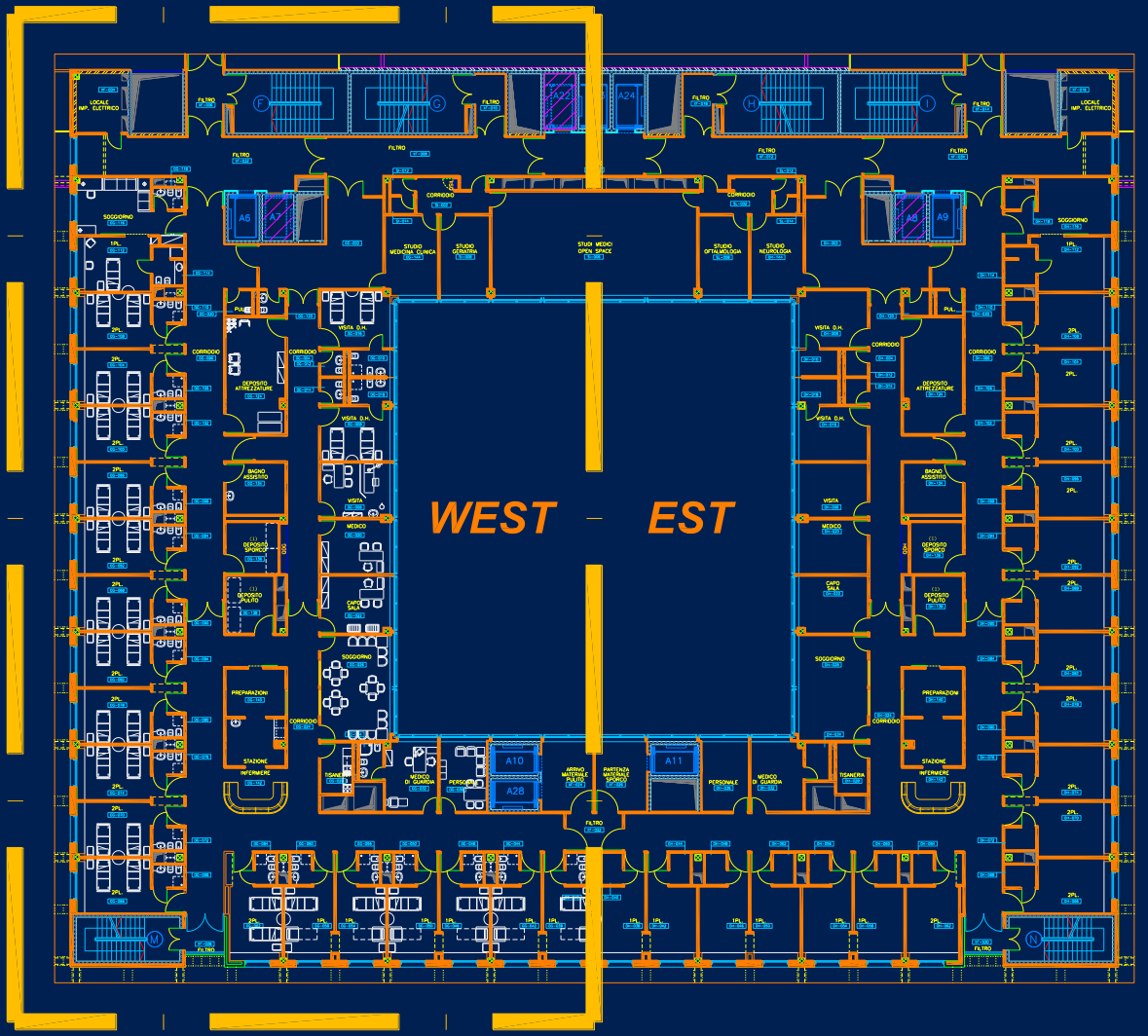
Why egress from an hospital is a difficult topic ?

- Medical unstable or bed-bound patients
- Staff
- Building complexity

Modelling the evacuation of a single ward

- Importing the DWG file in Pathfinder
- Survey to determine number of patients and staff
- Profile and behavior for each occupant



Profile and Behaviour of each occupant

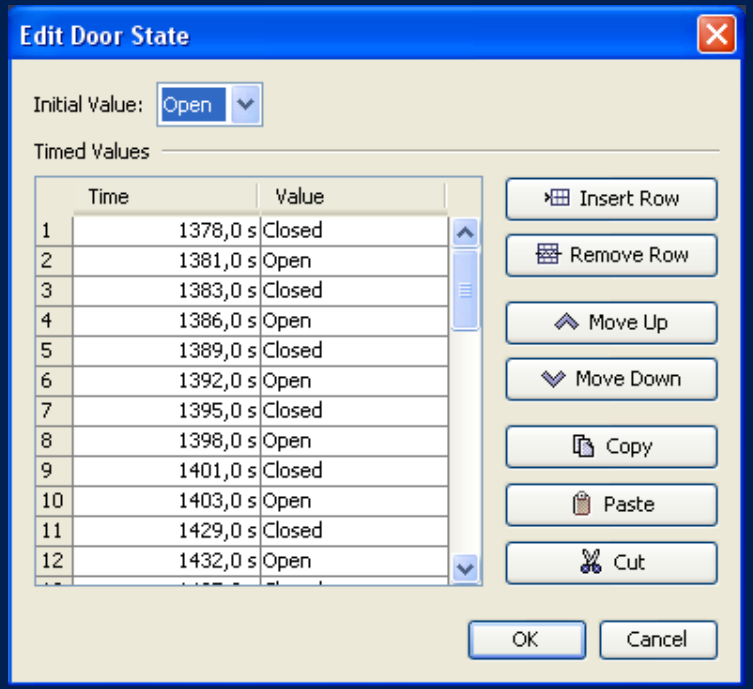
Mobility feature	Profile	Speed [m/s]	Shoulder Width [cm]	Current Door Preference [%]	Reduction Factor	Comfort Distance [m]
mobilise with bed	geriatric_patient_2	0.25 – 0.40	77	100	1	1.73
able without assistance	nurse	1.10 – 1.60	42 - 46	90	0.9 - 1	0.1 – 0.15

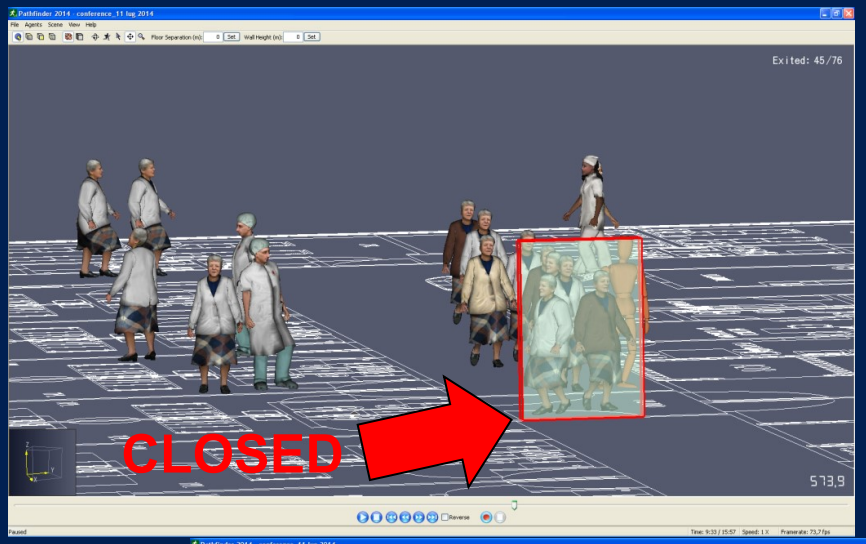
Number of person with same behaviour	Type	Initial delay [s]	Exit	Actions order	Behaviour
1	nurse_1	110	F30	A+C+B+C+B+C +B+C+B+C	nurse_1 smells burnt, alerts another nurse and tries to extinguish the fire, while nurse_2 alerts the control room.

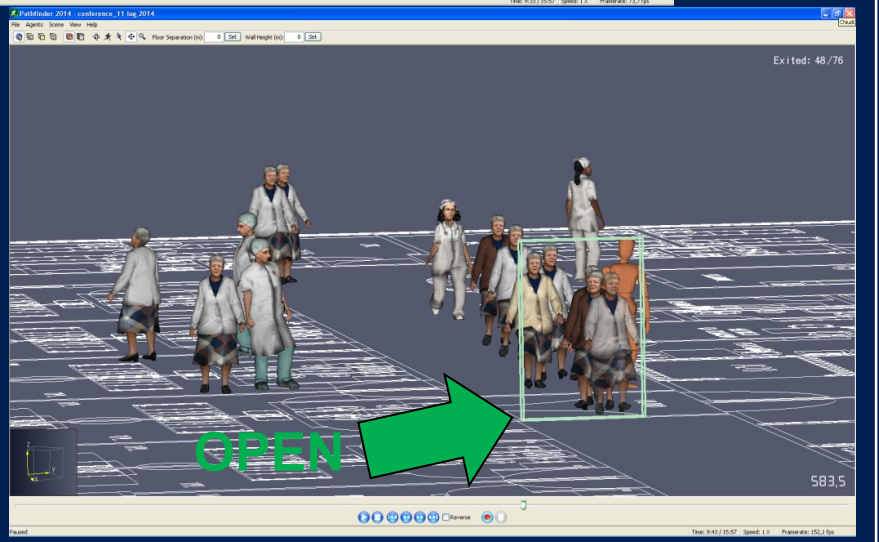
Bed-bound patients

- Larger shoulder width
- Larger comfort distance

Bed-bound patients



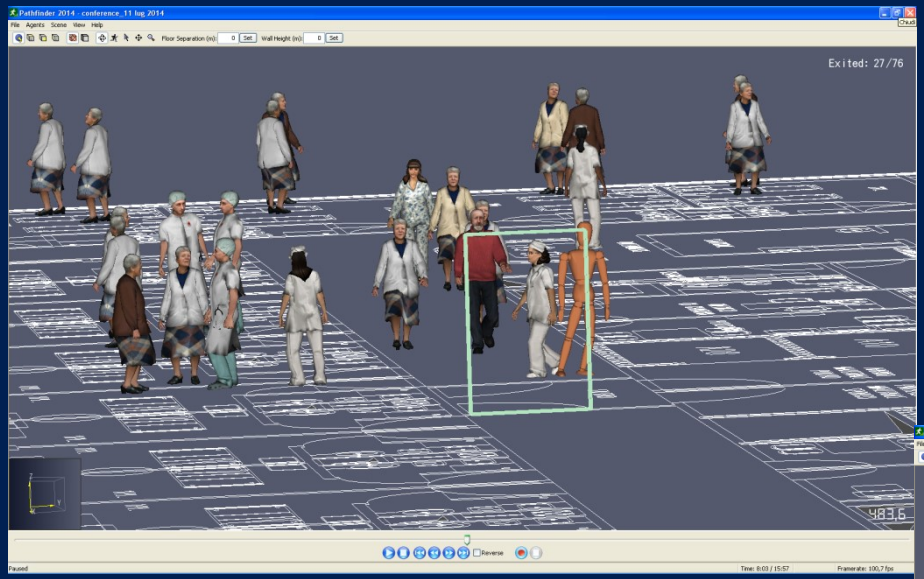


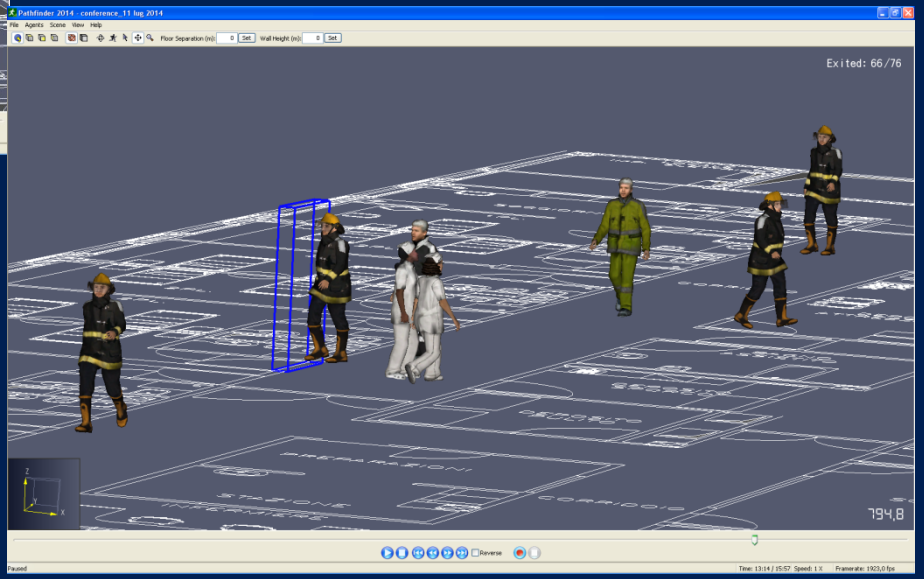


Supposed scenarios

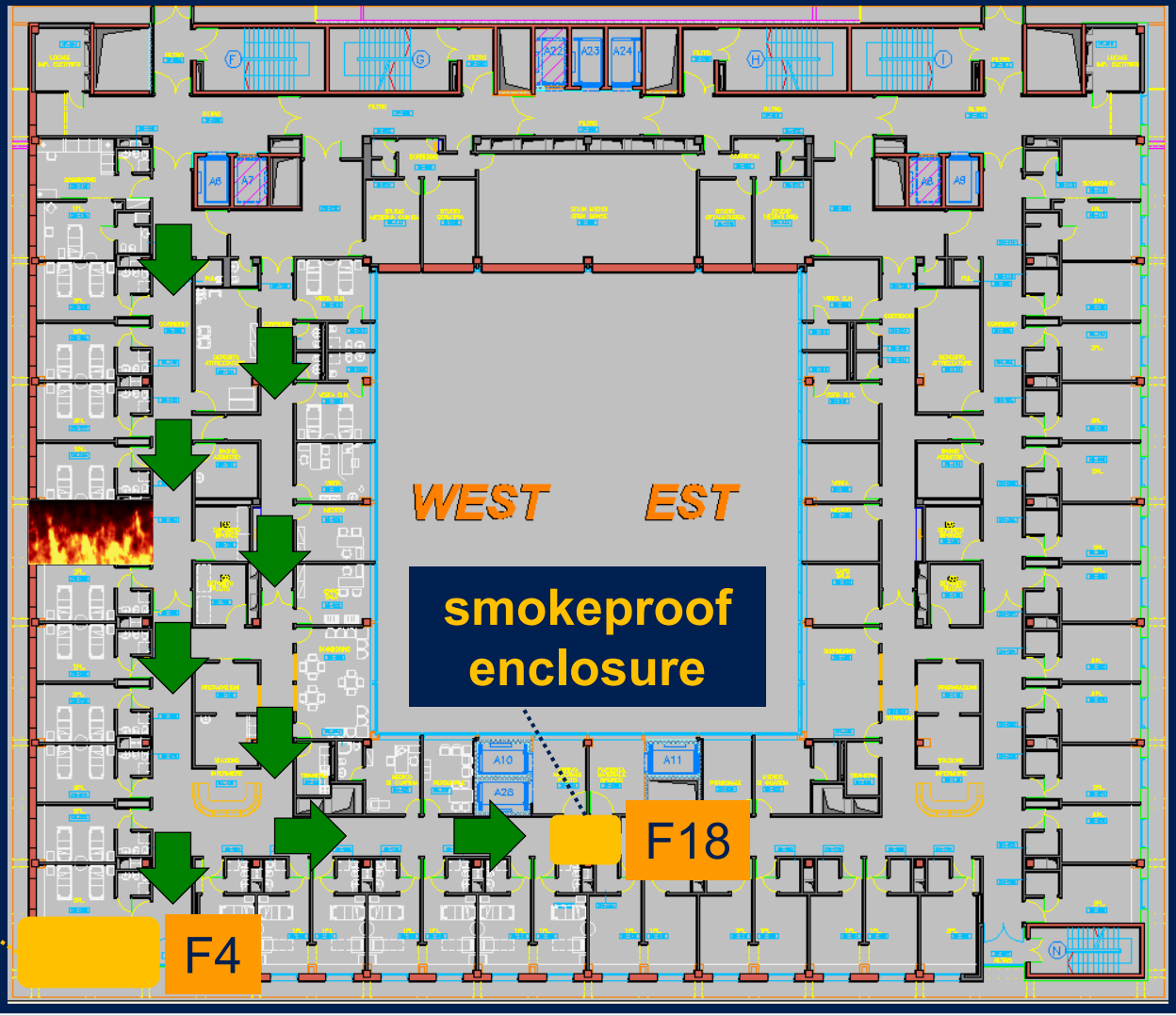
- Fire in the local kitchen *SW*
- Fire in the electrical room *SW*
- Fire in a patient's room *SW + REAL DRILL*

Fire in a patient's room: software modelling



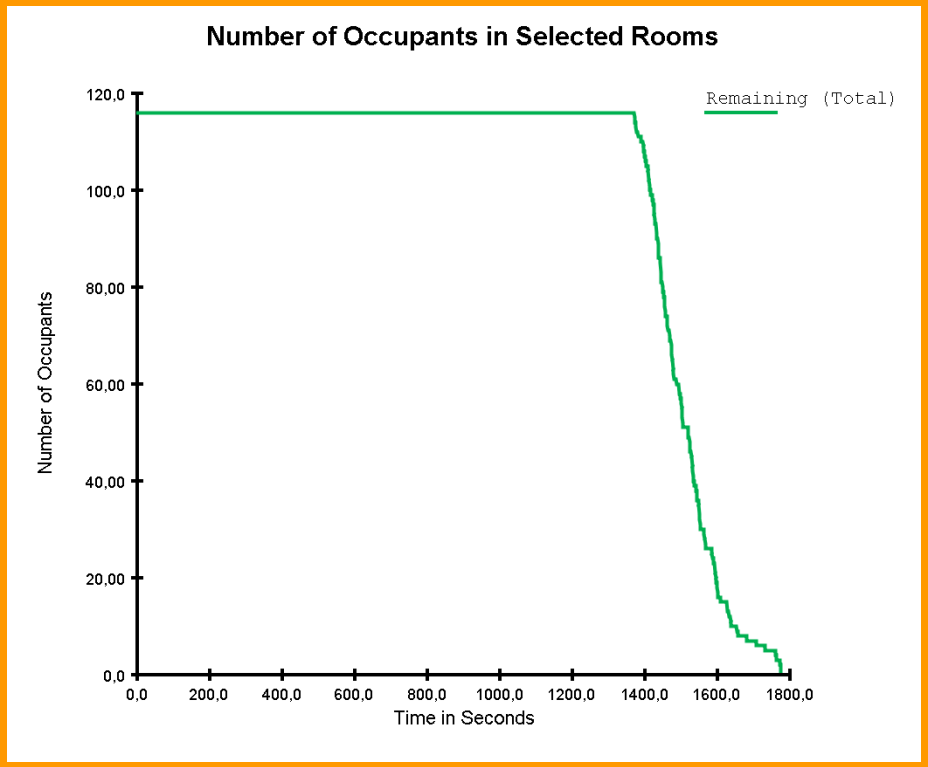


Fire in a patient's room: available exits



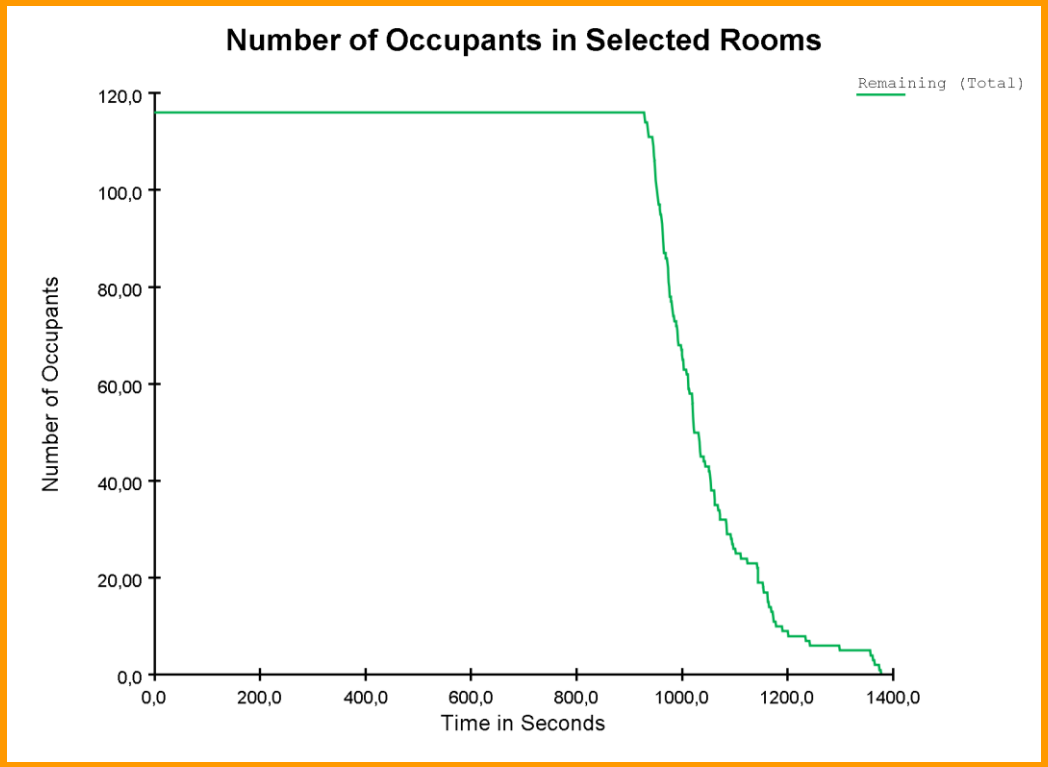
Fire in a patient's room: real drill

Results: egress time



Fire in the electrical room: 1800 sec

Results: egress time

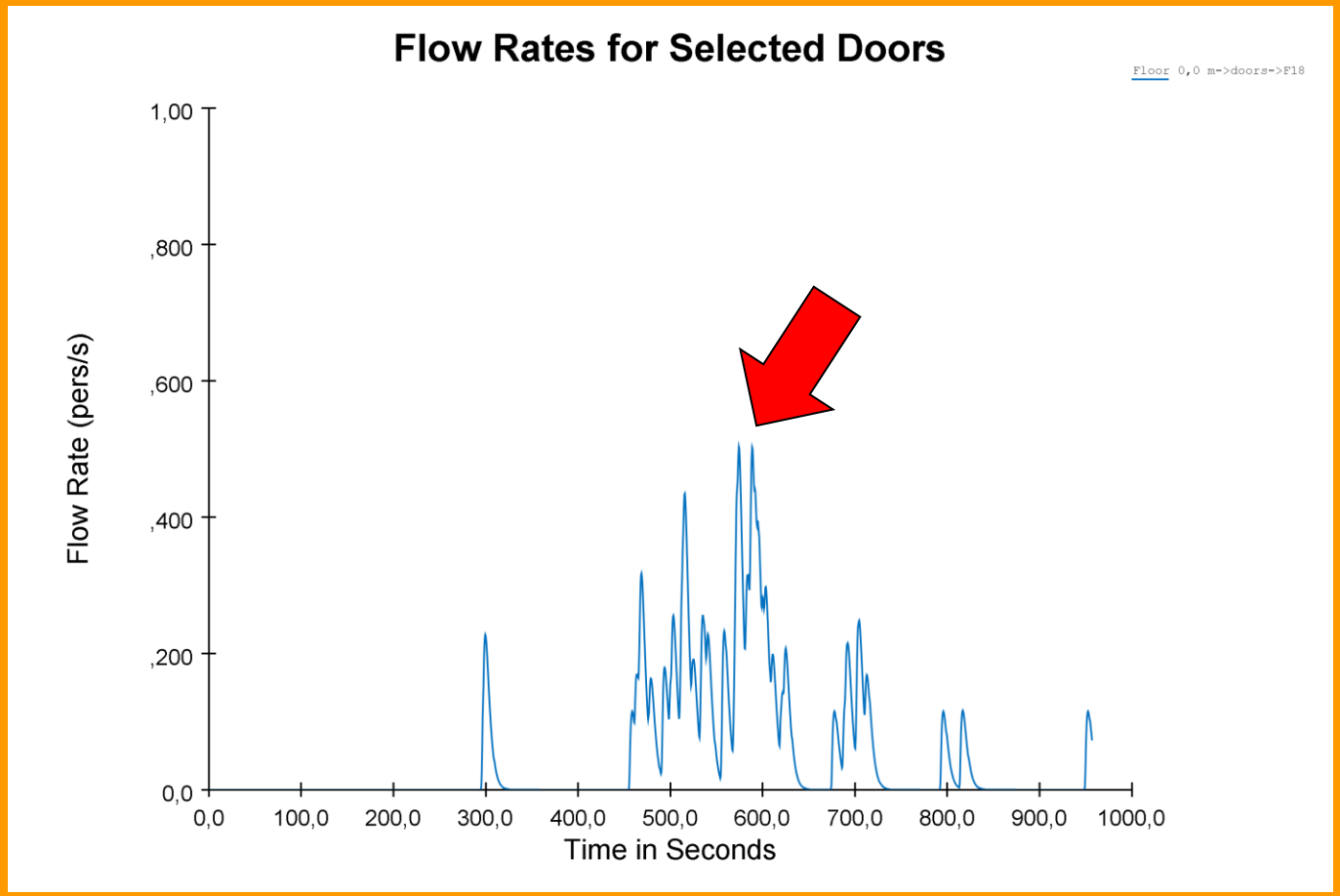


Fire in the local kitchen: 1370 sec

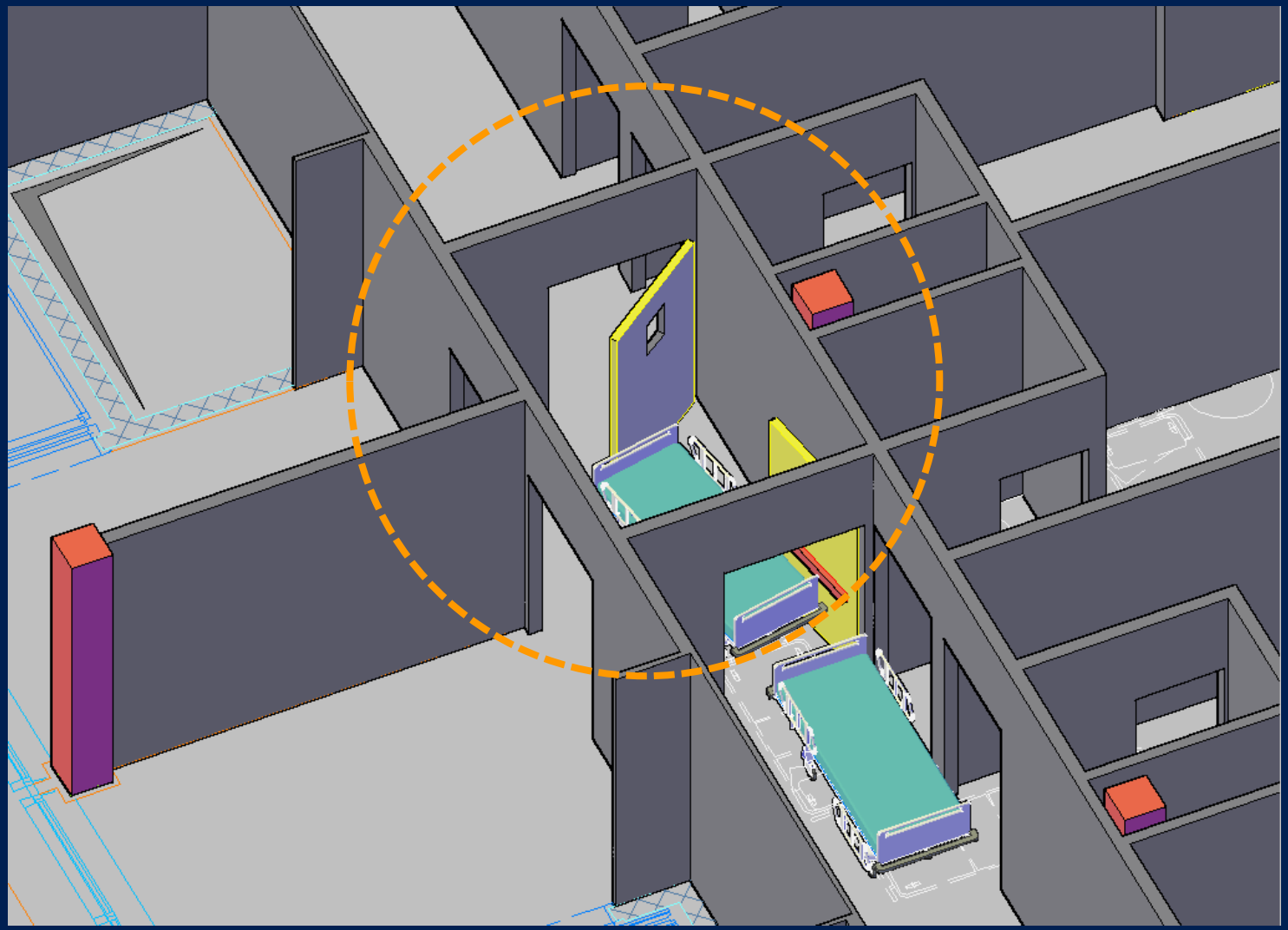
Results: egress time

Fire in the patient's room from simulation: 667 sec

Results: bottleneck in exit F18



Results: bottleneck in exit F18



Conclusions and Outlook

1. Similar egress time
2. Testing different scenarios and educational purposes of software
3. Need for further validation exercises
4. Needs of improvements in software tools
5. Better architectonical design of the building

Thanks for your attention!