

How to Integrate Pedestrian Simulation in the Design Process



- Global population growth and urbanization are projected to add about **2.5 billion** people to cities by 2050.*
- Urban infrastructure is becoming more crowded, and safety and security risks are becoming a major concern for city governments.
- To maximize profits, owner-operators of infrastructure are under pressure to reduce their capital and operating expenses and open alternate revenue streams.

GUESS WHAT?



In the last decade, the number of rail passengers has increased by **50%** and the number of air passengers has increased by **100%**, globally.**



Are you equipped with the right technology to build fit-for-purpose infrastructure to address these concerns?

Bentley's **LEGION Simulator** is a companion application with OpenBuildings Station Designer (multidiscipline rail station design software) that enables people movement simulation to analyze building performance for design improvements. It replicates space and activities in simulations that support people behavior visualization for a broad range of infrastructure assets that include:



Rail and Metro Stations



Airports



Stadiums



Shopping Malls

LEARN MORE ABOUT **LEGION SIMULATOR**

#1

Improve Safety

LEGION Simulator's wayfinding visualization, crowd management, and evacuation planning features help you:

- Test and improve different emergency and evacuation scenarios
- Ensure compliance with infrastructure safety regulations

VIEW THE TECH TALK
Introduction to LEGION

Enhance User Experience

LEGION Simulator accounts for individual decision making, crowd formation, and patterns of movement behavior, enabling you to:

- Test multiple what-if scenarios across design, operation planning, and execution
- Ensure the most efficient distribution of space and activities

Benefits include:

- Minimizing passenger congestion
- Reducing journey times
- Delivering improved capacity

#2

THINK ABOUT IT

Efficiently run transportation hubs, such as airports, rail stations, and bus depots, help to raise the satisfaction level of travelers, leading to increased spending in ancillary business.



Easily Compare Design Alternatives

LEGION Simulator enables you to re-imagine your design or existing building by simulating different near real-life variations of all types of activities. Easily test variations of demand inputs for:

- Whole model population or specific groups
- Entire period or for a specific time
- All or only specific entrances
- Completely change demand, activities, or space

#3

Share Output Seamlessly

With **OpenBuildings Station Designer**, **LEGION Simulator**, and **LumenRT**, you can easily bring your design and scenarios to life with various visual maps, graphs, and 2D/3D animations that represent the accurate simulation results. These outputs can be easily analyzed, shared, compared, and referenced.

For example:

- **Evacuation Maps** show you how the building will perform during emergencies
- **Space Utilization Maps** reveal where the most heavily used areas are
- **Density Maps** reveal areas with sustained high density
- **2D/3D screen captures, videos, and immersive VRs** provide visualization of the building, people, activities, and alternative scenarios

#4

LEARN MORE ABOUT:

OpenBuildings Station Designer
LumenRT

Reduce Capital and Operating Costs

Optimizing design and operations with LEGION Simulator helps you reduce your infrastructure asset's whole lifecycle costs and boosts alternative revenues by:

- Testing and optimizing design and operations options against standards, anytime
- Ensuring fit-for-purpose space utilization and activity distribution

#5

DID YOU KNOW?

Transport for London (TfL), the owner-operator of the London Underground (the world's oldest metro system), reduced its operating costs by nearly **GBP 40 million** for the year 2017-2018. LEGION Simulator played a key role in helping TfL achieve these results.#



#6

Increase Indirect Revenue

Use LEGION Simulator to create the best user experience and boost the building's commercial revenue by:

- Planning, testing, and improving maintenance
- Maximizing commercial and advertisement space
- Targeting activities to the intended customer groups
- Planning and executing an efficient wayfinding strategy

To learn more about LEGION, connect with a Bentley Expert today!

Source:

* The 2018 Revision of World Urbanization Prospects

** Statista, 2019 and Network Rail, 2016

TFL Capital Strategy, 2018

Bentley
Advancing Infrastructure

