

Traffic Congestion Solutions

For City Planners & Transport Authorities

LEGION *for* AIMSUN

INTEGRATED PEDESTRIAN AND TRAFFIC SIMULATION

Legion is proud to announce the release of Legion for Aimsun – a fully integrated pedestrian and vehicle simulation solution. This product takes Legion’s patented pedestrian simulation solution and puts it inside TSS’s Aimsun 6.1 traffic simulation product to create the only existing concurrent simulation of realistic pedestrian movement along with vehicle movements.

This means it now becomes possible to run simulations where Pedestrians will be able to negotiate crosswalks blocked by traffic spillback, board and alight public transportation vehicles, taxis and private vehicles as well as exhibit normal sidewalk behavior like entering and exiting buildings, stopping at newsstands and patronizing ATMs and other types of kiosks.

Combining **Legion’s** calibrated and validated pedestrian movement algorithm with **AIMSUN’s** traffic simulator allows the user to accomplish many types of studies that were previously not possible. In dense cities like London, New York and Hong Kong the pedestrian is an overwhelming part of the transportation network. Prior to the integration of Legion pedestrian simulation and Aimsun vehicle simulation, it was impossible to accurately measure the actual effect of pedestrians on vehicular traffic. This meant that when measuring vehicle delay, travel speeds and Level of Service (LOS) the results were often significantly skewed and were not reliable. Additionally, vehicular traffic blocking crosswalks inhibits pedestrian crossings which was also not easily measureable. It was virtually impossible to effectively measure any traffic system where pedestrians and vehicles shared the same space.

Implications for Transportation

Around the world the need for more efficient and safe public transport has never been greater.

National and local government, transport bodies and other operators of public infrastructure are under pressure



The problem is acute in many 'passenger' industries, especially in rail and metro, where unprecedented increases in passenger numbers compete with physical limitations of available space. Growing populations and increasing urbanization are the long term trends driving demand. The basic problem is easily described: how to transport more people through fixed and limited transport infrastructure in within a reasonable time frame at a reasonable cost.

Simply adding infrastructure is no longer good enough. More intelligent solutions are needed. Governments around the world are spending money to develop transport infrastructure to address the problem, and the issue will be at the heart of the planning of cities in the 21st century.

Effective transport is central to a city's economic competitiveness, and severe congestion is known to have an equally severe economic cost, estimated as high as between 1 and 3 percent of GDP in developed and developing countries.

Legion for Aimsun creates the capability of delivering smarter solutions. The potential returns are not only significant from a financial perspective, but essential to the urban population from the perspective of life quality and effectiveness.



What is Unique about Legion simulations?

Legion is the only pedestrian simulation software that calibrated to actual pedestrian measurements from around the world and has been validated by independent agencies including London Underground, Madrid Metro and the London Fire Brigade. The movement algorithms have been calibrated to actual measurements of walking speeds, personal space preferences and the elastic tolerances of these measurements.

The components of this simulation engine result in the prediction of how people will move in spaces with accuracy to 95 percent. As a result the movement algorithms have been patented, making the Legion pedestrian simulator the only technology that can be based on the measured behaviors of people.

The robustness of analysis is unprecedented in a simulation that accurately predicts how people will use the space, whether that space exists or is a design of something not yet constructed. Evacuation times, density analysis, journey times between locations, delay, route choice and other metrics are now accessible with the user secure in the knowledge that the results are accurate.

Legion software is the technology of choice for the world's metro and transit agencies, Olympic Games, major events, urban developments, and emergency planning needs.



What is special about AIMSUN 6.1

Aimsun is the only traffic simulation software that allows for macroscopic, mesoscopic and microscopic simulation within the same program. This feature allows the user to take a large area and immediately analyze the effect of macro level changes on a microscopic area. Aimsun's movement algorithm has been subjected to significant rigorous testing and is completely open to the public for scrutiny, a feature that few traffic simulation software's allow. Data from almost every traffic forecasting software, shape file and simulation software can be input into Aimsun, allowing the user to work with all historical data in any format and not to duplicate work.

Aimsun was designed with the user in mind; its engine is fast enough to simulate an entire city center in faster than real time. Smaller models simulate over 20 times faster than real speed. Less computing time means more time can be spent testing scenarios, analyzing the effects and developing solutions for traffic issues. Aimsun is quickly expanding its market from Western Europe and has already become the modeling software of choice in cities such as New York City and Toronto.

What are we making POSSIBLE?

Police Departments, Emergency Management Agencies, City and State Departments of Transportation and City Planners now have a reliable tool that allows them to examine the transportation network of an entire city center, inclusive of all type of passenger vehicles, surface transit, bicycles and pedestrians. The applications of such a tool are limitless. When paired with Aimsun Online, these agencies can simulate any condition or event to determine the outcome and a proper response if necessary in real time.

Operators of the city's infrastructure will not only be able to analyze a situation and quickly have a response that has been tested and proven to be effective, but the online systems will actually alert them to impending issues before they happen. These will include not just vehicular traffic issues, but issues related to pedestrians. As cities of the world focus more and more on walk-ability and providing alternatives to automobile use, the ability to optimize all the different modes of travel in real-time will set apart the cities that function and thrive from those that do not.



Full City Evaluation

Legion for Aimsun software provides many exclusive features that enable the user to model an entire city center faster than real time. By including pedestrians into the models, a full working simulation of a city is now achievable. The possibilities for such a simulation can allow for a detailed evacuation study in the event of an emergency as well as provide the baseline for studying how significant land use or transportation changes will affect the traffic in the entire city. Detailed studies include:



- Full city evacuation by vehicle and foot as in the New York City blackout in 2003 or during the closures during the London bombings in 2005
- Studying the effect of new highways, bridges and roadway changes on traffic and pedestrian patterns
- Evaluating the changes in traffic patterns due to significant land use changes
- Risk management for evaluating different evacuation scenarios for different areas of a city

Typical Traffic Engineering and Planning Studies

The concurrent simulation of vehicles and pedestrians now allow accurate results when conducting typical types of traffic assessments:

- Accurate Vehicular LOS for right and left-turn vehicles when conflicting with pedestrians
- Crossing times and delay for pedestrians (including the effects of traffic spillback)
- Realistically project the number and distribution of calls at push-button operated pedestrian crossings
- Evaluating sidewalk MPT plans both by LOS, journey time and other Legion metrics including inconvenience and discomfort
- Sidewalk neckdowns and bump-out studies



Public Transit Assessments

Legion for Aimsun allows pedestrians to board and alight public transit vehicles. By providing this feature, a detailed analysis of the following is possible:

- Near side versus far side bus boarding effects on traffic delay and signal progression
- Proper sizing of street-car and light rail stations when shared with vehicular traffic
- Effects of crossings to center versus sidewalk platforms for transit vehicles
- Effects of bus boarding on sidewalk flow and operations including BRT vehicles (both at bus stops and formalized queuing locations)
- Boarding and alighting effects of transit vehicles on different types of signal systems including priority, pre-emption, etc.
- Effects of taxi stands on sidewalk and curbside travel lane usage (especially when that curb lane is a bus lane)

Stadia, Major Events and Airports

In addition to public transit vehicles, pedestrians within Legion for Aimsun can also board and alight private vehicles and taxis, this feature allows a myriad of applications and will be of specific use for major events and places of interests such as stadiums, airports and train stations. These studies include both the vehicular traffic effects as well as curbside and sidewalk requirements for staging pedestrians.



These types of applications will include:

- Lane requirements for airports that allow for both throughput requirement and curbside studies including sidewalk requirements for the different types of operations (bus, taxi, private vehicles, hotel shuttles, etc)
- Curbside usage at stadiums and arenas
- Major event operations such as political conventions and events, parades and street fairs



Other Solutions from LEGION

Make the most of your facility & investments - enhanced capacity for your assets.

Whether your organization is a Transit Agency, Urban Planning agency, a Sports Venue or Major Event Planner, Legion is able to deliver significant increases in capacity of your facility (**10% or more**) for the same limited set of assets. This is achieved through the combination of Legion's unique predictive simulation technology, 12 years of expertise in its delivery and by integration with leading industry methods.

Legion is the only validated solution in the market that uses real data to provide real solutions. It is based on an unprecedented measurement program of actual people from over 1000 hours of video footage of pedestrians in 14 cities on three continents, covering more than 40 discrete contexts.

Legion's value to an organization goes well beyond the data and analysis its tools provide. The Legion solutions true benefits are realized in reduced capital expenditure, project cost savings, revenue opportunities and improved safety.

Think LEGION



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