atSim™

AtLink Communications Inc.

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Executive Summary

AtSim simulation- based and design services from AtLink provides you with - a novel 3-D visualization & simulation service platform designed to study and present construction and traffic management projects. AtSim takes a simulation-based approach, creating realistic digital models in a flexible environment to support the ever-changing nature of these projects. Our simulation service technology provides an accurate, high-value, data driven output of information for review and visualization with real-time traffic.

Background

AtLink is inspired by the evolution of advanced technologies and their application to modern traffic management systems. Taking advantage of the deep knowledge in 3D technology, and simulation, AtLink created AtSim Service. AtSim is based on the belief that in the future traffic simulations will require the ability to integrate traditional static estimation approaches with dynamic historical or live traffic data with environmental data (Terrain, elevation, lighting, etc.).

AtSim offers you a simulation-based and design service that integrates

- 3D simulation environment (AtSim Core)
- Intelligent Traffic Simulation Engine (AtSim Traffic)
- Floodwater mapping (AtSim Hydro)

To provide highly dynamic capabilities to model and simulate time-varying traffic flows (peak & off-peak periods) combined with the influence of road geometry and environmental effects to produce a realistic traffic simulation that will identify undesired problem areas that cannot be forecasted or analyzed with static, average based systems. AtSim has the ability to enhance realism by optionally integrating the effects of rain and flooding on traffic flows in addition to other environmental factors.

At its core AtSim is built to support flexibility, so that any road infrastructure, or any traffic network can be simulated accurately. AtSim allows the user to move and fly freely within the simulation environment. Creating videos or viewing the project is only a matter of choosing where to go by flying there in the simulation, enabling the user to create videos in minutes at any angle or height.
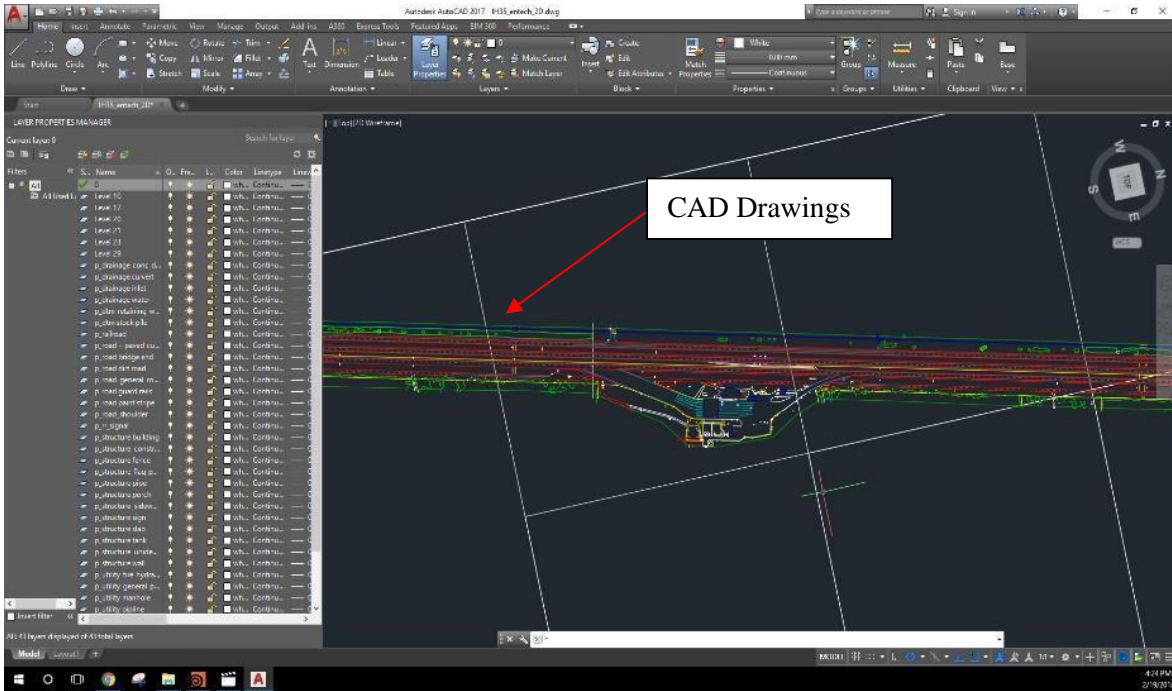
Features

3D simulation environment (AtSim Core)

AtSim models and captures the entire network of roads, bridges, buildings, vehicles, traffic lights, road signs, lighting, pedestrians, etc. into a realistic representation.
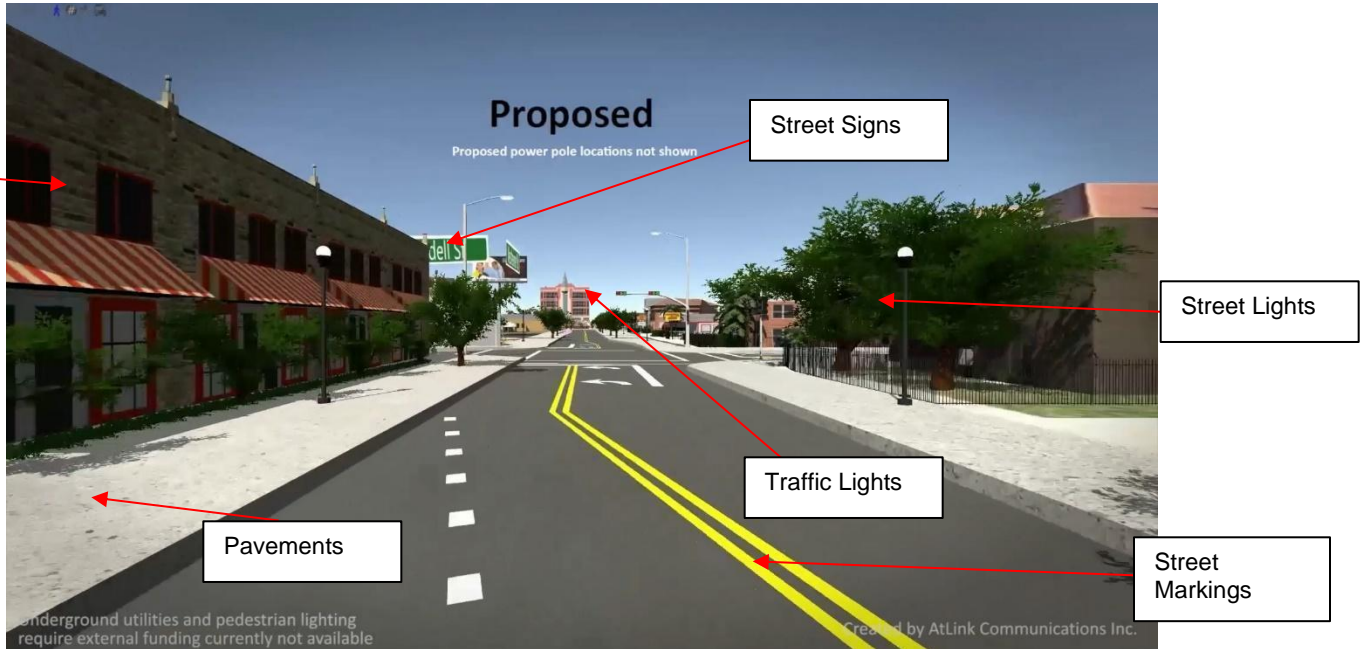
AtSim sources 3D model information from:

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AtSim brings realism into traffic simulation by incorporating features such as ground elevation changes, time of day, light, foliage, waterways and weather conditions. Our 3D environments combine automated and hand-crafted texturing to bring 3D visuals to life.

We are also able to provide realistic lighting and contextual data to our 3D environments and traffic simulations. AtSim has the ability to simulate varied lighting conditions including day/night conditions.

We can contextually show data such as accident data, and public transportation data on our 3D simulations.
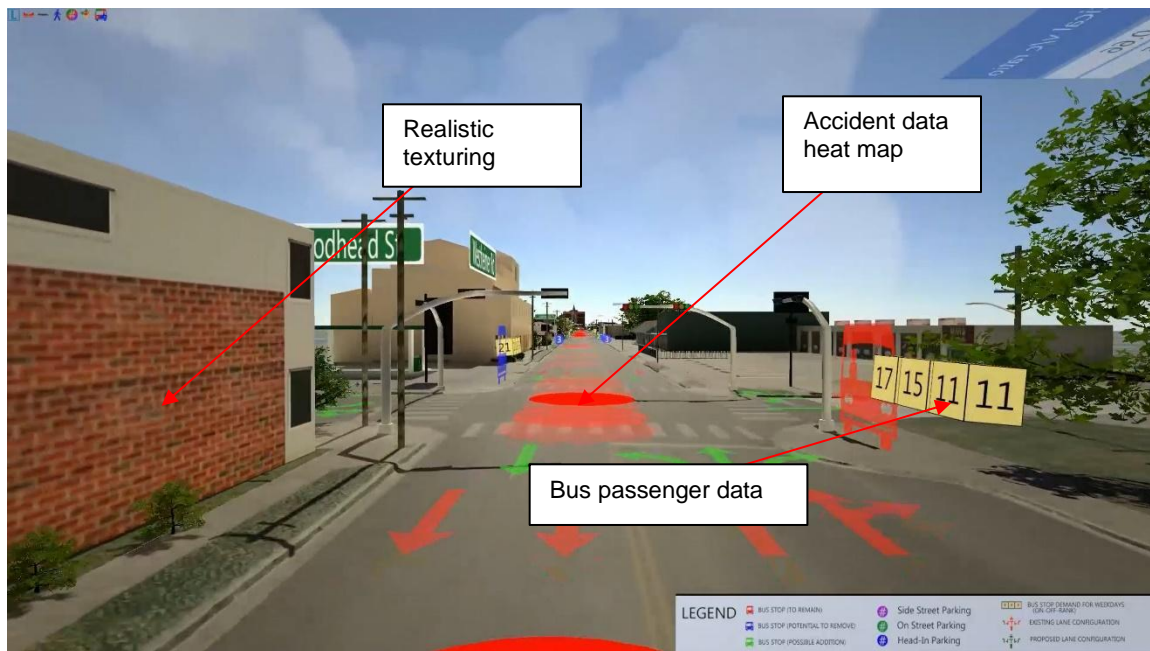
Real-time interactivity

AtSim creates a 3D environment for displaying digital models and simulating traffic in real time. This provides the AtSim users the flexibility to navigate and travel the virtual world at ease, providing users the option to move freely while observing the traffic flows from any angle or height. Users can also select a "1st person" view (as if sitting in a vehicle).


Integrated network 3D models

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In game 1ˢᵗ person view

# Intelligent Traffic Simulation Engine (AtSim Traffic)

AtSim's ITSE incorporates the following features:

- Self-driving autonomous cars (raycasting to detect line of sight and angular calculations)
- Scalable volumes based on actual traffic data (Macroscopic, Microscopic, historical or live)
- Customizable Collision avoidance systems (On or OFF)
- Smart AtPoint traffic flow mapping system to predefine traffic options
- Flexible variety of vehicles (cars, trucks, flexible semi-truck and trailer, etc…)
- Realistic acceleration and braking (Physics based and published data)
- Realistic lane changing to avoid slowing or stopping in traffic (Sensor and data based)
- Variable speed based on vehicle type and speed limit
- Supplemental data/signage displays in 3D (Floating signs always facing camera)
- Automobiles are built with intelligent lane change capabilities.
- Pedestrians and bicycles are core entities with special built in behaviors that can be integrated into any traffic simulation network.

ITSE Smart AtPoints

Autonomous Vehicle Raycast

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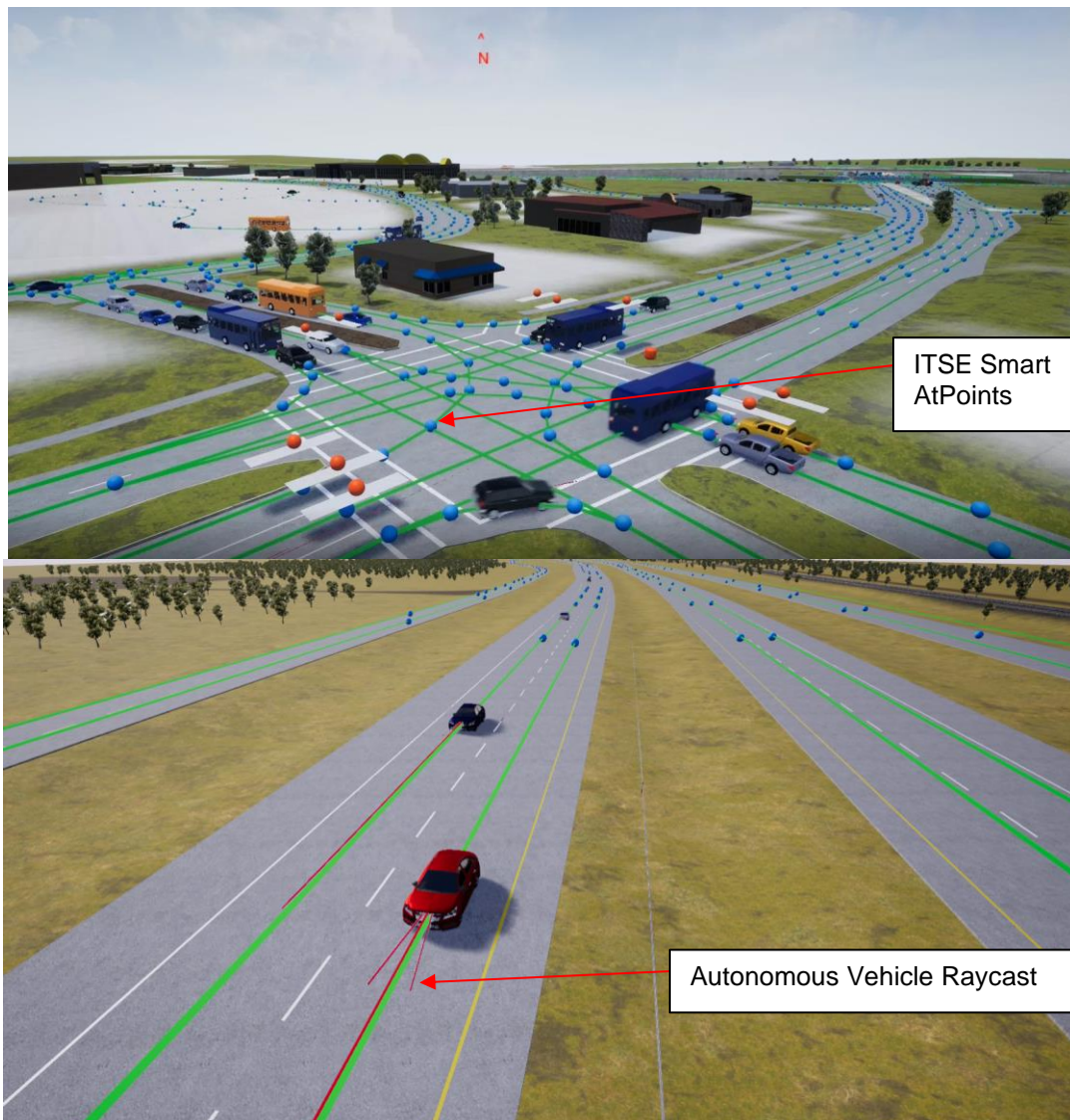
AtSim's ITSE takes into account environmental factors to provide a more realistic simulation. AtSim integrates with external data sources to use historical or live traffic data in its simulation. This enables realistic simulations that can simulate traffic flow of a given date and time interval to be utilized in a user's traffic study. Using the Microscopic model with ITSE AtSim can identify problem areas in the traffic network for existing or proposed conditions. AtSim offers mesoscopic, microscopic, and nanoscopic simulation, all in a single unified real-time environment.
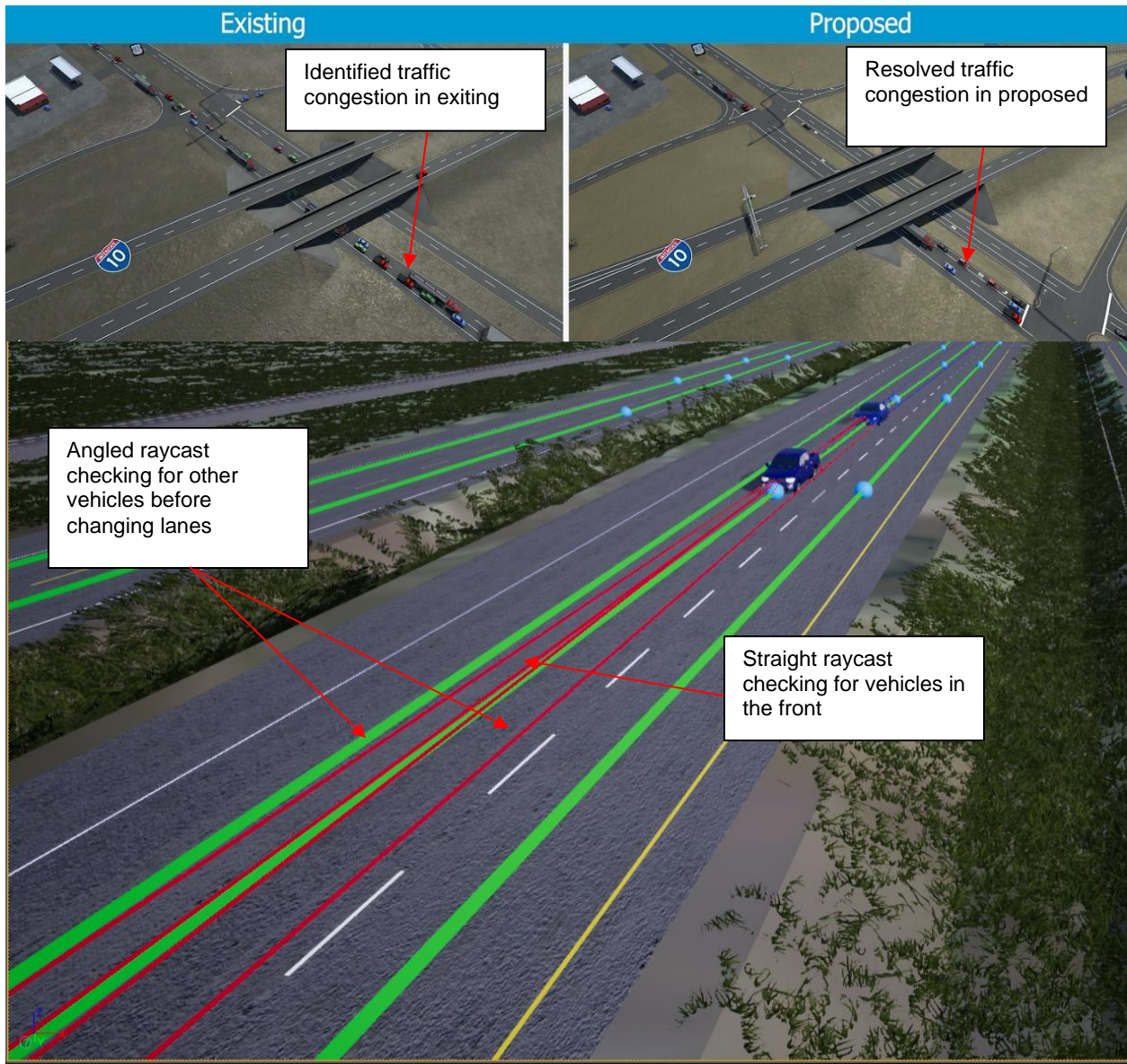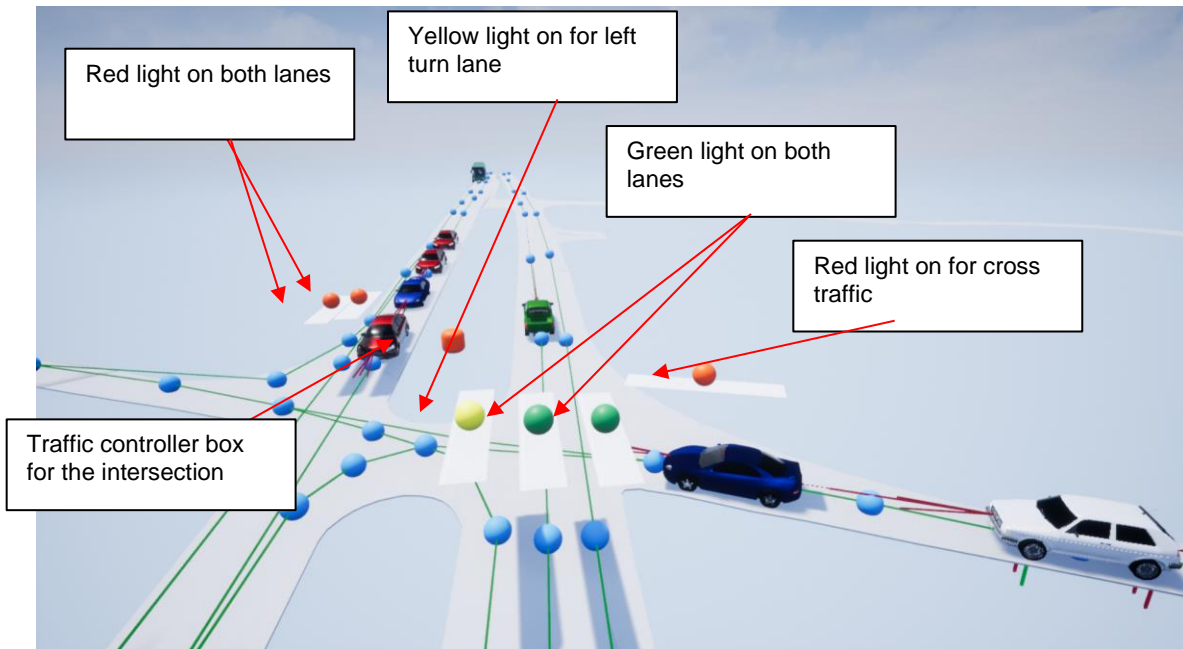

Vehicle checks adjacent lane before changing lanes

Traffic control devices in AtSim

AtSim can simulate the following traffic devices with real world control patterns:

- Traffic lights for any number of lanes including turn lanes that supports multiple patterns
- Stop signs for all way stops or partially controlled intersections

Traffic light with multiple lanes

Floodwater mapping (AtSim Hydro)

AtSim has the capability to incorporate accurate floodwater mapping based on raster images of historical data. AtSim Hydro features include Flood Water pooling and traffic affect integration. Traffic integration includes slowing down, changing lanes, and stopping for areas of deep water. AtSim Hydro uses modifiable settings to control flood water traffic interactions, by default AtSim Hydro uses the current TxDOT safety recommendations.