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Noorjax Consulting

Developing a Warehouse Traffic Managem
Internal Logistics

Warehouse Operations

Smooth warehouse operations are crucial for the success of any business. Implementing a thorough warehouse traffic management plan plays a vital role in optimizing internal logistics, enhancing productivity, and reducing disruptions.

Noorjax Consulting is a company that works with the simulation of various business processes. They create simulation models using AnyLogic software and demonstrate to clients the simplicity of decision-making with simulation modeling implementation.

This case study examines a simulation scenario for efficient warehouse operations. The client under analysis is a major British logistics company with a global presence, specializing in automotive retail and rail services.

Problem

made it hard for the system to operate smoothly, leading to order delay issues.

The highway observed for warehouse traffic management planning

The client initially tried using Excel and other simulation software to solve the issue, but those solutions failed to accurately represent warehouse logistics intricacies and testing optimization scenarios.

Seeking help from Noorjax Consulting, the client aimed to develop a plan for area operations optimization. Noorjax, known for utilizing AnyLogic simulation software in modeling projects, was chosen to enhance warehouse efficiency and traffic management plan layout.

Solution

To create a model and use it for warehouse traffic management plan development, the Noorjax team selected the agent-based modeling approach in AnyLogic as the most suitable. By employing this, engineers can benefit from unparalleled flexibility and accuracy in capturing the intricate movements of agents (objects) to reflect warehouse logistics.

To ensure accurate simulation of complex interactions, the consultants developed a custom collision detection framework with the AnyLogic Material Handling Library. So, the simulation performs detailed movements of material handling equipment with the utmost accuracy, capturing even the smallest interactions.
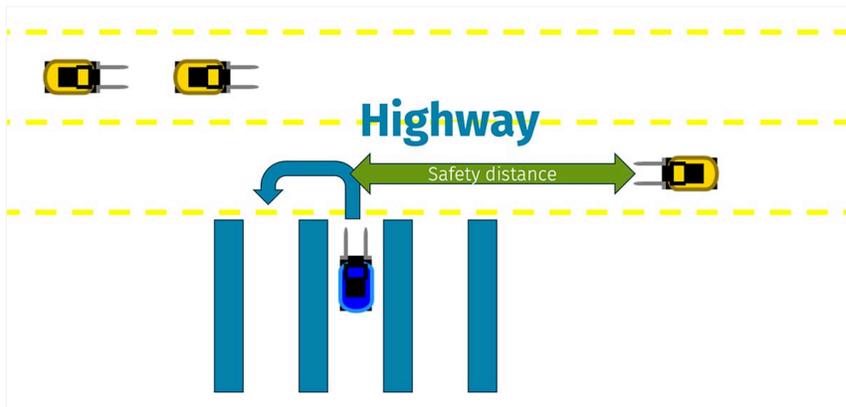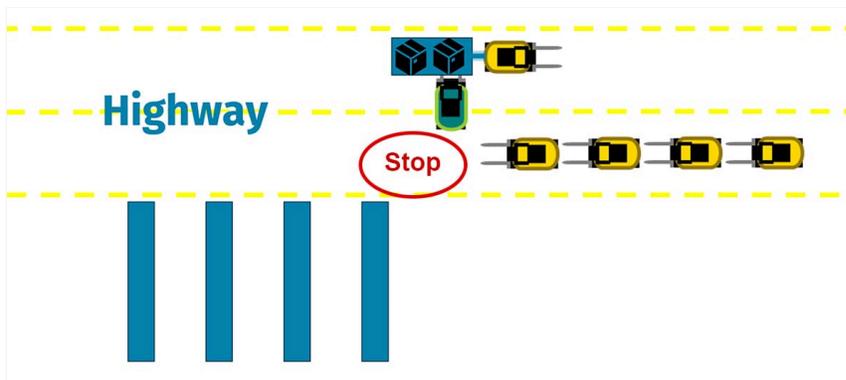
Scheme of rule №1

2. Consider the safety distance on both sides of the road at a right or left turn.
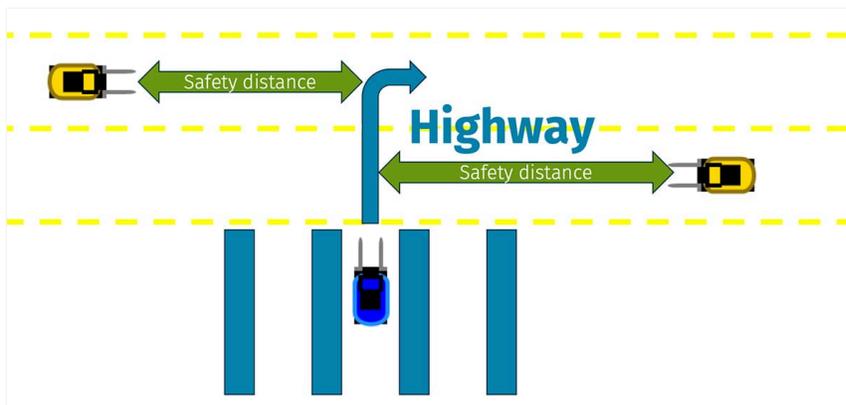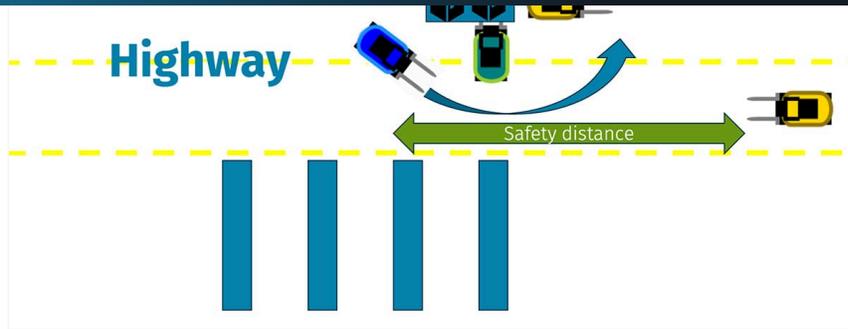

Scheme of rule №2

3. When a forklift crosses the road, everyone must stop, even though there isn't an obstacle in between.

Scheme of rule №3

Scheme of rule №4

Through the flexibility of agent-based modeling, Noorjax had control over every aspect of the simulation. This enabled them to customize the model to meet the client's requirements for the warehouse's internal logistics, including replicating traffic patterns, material handling equipment configurations, and unique area layouts.

The solution primarily aimed to simulate realistic movements of material handling equipment, including replicating complex maneuvers. For example, a machine overtaking and negotiating safe passage. The simulation had to accurately reflect real operational conditions.

To make the simulation results more useful, Noorjax combined the output from AnyLogic simulation with business intelligence tools like Power BI. With this, the client could analyze the simulation data and make informed decisions.

Results

Noorjax Consulting offered the client a detailed simulation modeling approach, helping them create effective warehouse traffic management plans. This solution pinpointed operational issues accurately, enabling clients to make informed decisions for optimizing warehouse logistics.

The warehouse traffic simulation in AnyLogic showed that traffic congestion was in poor shape. It became clear that the current setup of material handling equipment wasn't handling the workload well. With this insight from the simulation, the client took several actions:

- Overhauled the warehouse area.
- Reconfigured the company fleet.
- Renegotiated contracts with their current material handling equipment supplier.

By leveraging simulation in AnyLogic, Noorjax identified critical operational inefficiencies and empowered the client to make informed decisions. The reconfiguration of the fleet increased the warehouse's operations efficiency, resulting in **smoother processes and enhanced order fulfillment rates**.

The Noorjax Consulting case highlighted the transformative potential of simulation in optimizing complex warehouse logistics and driving organizational success.

The case study was presented by Felipe Haro, of Noorjax Consulting, at the AnyLogic Conference 2023.

The slides are available as a PDF.

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