Optimizing Nashville Last Mile Delivery: AI-Driven Routing for Modern Logistics

Abstract: With the increase in demand for commercial activities of buying and selling products and services on online platforms, companies in the E-commerce field will face significant challenges in optimizing last-mile delivery, particularly in managing dynamic traffic patterns while balancing efficiency in travel time and distance. Due to this, there is the need to efficiently optimize travel patterns which will result in a decrease in these measures of effectiveness. This study will explore different optimization approaches that would be integrated with real-time traffic data from the Google Maps API to enhance delivery route planning and optimization for Amazon in the City of Nashville. Delivery locations will be grouped into clusters which would rank routes according to how close they are to a warehouse/depot and automatically alter routes when each cluster is completed. The overarching goal of this system is to minimize driver's workload, cut down on fuel use, shorten trip times and turns by integrating real-time traffic information. The future model is projected to enable sustainable and economical urban logistics management in addition to improving efficiency of operations, productivity and customer satisfaction. Researchers, Transportation Agencies, and Logistics Companies can collect data for the desired geographical area and feed them into the model to accurately give them a prediction of dynamic traffic patterns and optimization desired by calibrating to suit their needs.