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By ANGUS LOTEN



Matthias Winkenbach, director of the MITs Megacity Logistics Lab — Angus Loten / WSJ

CAMBRIDGE, Mass.—High-tech logistics systems have quickened the delivery of goods from manufacturing hubs to big-city markets in recent years. But speeding up the so-called last mile, from a local distribution center to a retailer or a customer's home, has remained a challenge, especially in crowded urban centers.

That's a crucial hurdle, since the last mile of delivery routes tends to be the slowest and least cost-effective, according to Matthias Winkenbach, director of the Massachusetts Institute of Technology's Megacity Logistics Lab, an initiative of the MIT Center for Transportation & Logistics.

It's also where big-data analytics and the Internet of Things can be a powerful resource, Dr. Winkenbach told chief information officers, supply chain managers and other attendees at an MIT supply chain management R&D conference on Wednesday.

"More and more companies are sitting on tons of data, but they don't know what to do with it, or how to understand it," he told CIO Journal.

The MIT Megacity Logistics Lab team is trying to rectify that. It has worked with Anheuser-Busch InBev NV, the global brewery, and B2W, an e-commerce firm based in Sao Paulo, Brazil. The team's former director, Edgar Blanco, was recently hired by **Wal-Mart Stores Inc.** WMT +0.25% as senior director of strategy and innovation, in order to apply the lab's last-mile data analytics.

Until recently, he said, gauging the efficiency of shipping routes has been limited to knowing when a package left a given depot, how far it travelled and the amount of time or fuel consumed in getting it there.

But thanks to the consumerization of IT tools through smartphones, GPS-enabled

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devices, and IoT sensors and scanners — as well as the emergence of a fast, mobile Internet to collect and transmit large amounts of data from anywhere — shippers can now have a near-complete view of a given delivery route at any point in time, he said.

That's driving a hot new market for data-driven software firms that can help companies offer same-day deliveries. **United Parcel Service Inc.** UPS -0.19% in February **led a \$28 million funding round for Deliv Inc.**, one of a growing crop of last-mile delivery startups vying for accounts with retailers, restaurants and grocery stores. Deliv says it has roughly 4,000 retailers using its service including Kohl's Corp. and Macy's Inc.

Dr. Winkenbach said data-collecting tools can be used to better track the progress of delivery vehicles and inform route planning, by identifying patterns in delivery times.

But they can also provide "transactional data" in the form of a clearer picture of what happens between a delivery truck and a customer's doorstep, he said.

Many shippers want to know why some drop offs take much longer than others, an area Mr. Winkenbach calls the "black box" of delivery data, since for years so little off-vehicle data was available.

He said geospatial data shows longer doorstep stops often occur in the most densely populated parts of a city, where many people live in high-rise apartments, he said. That means delivery workers are struggling to park, walking more or farther after parking, and climbing stairs when they get there.

Beyond that, so-called "crew traces" from smartphones, GPS and other geo-locating sources connected to delivery workers, can reveal key customer behavior — customers who chronically aren't home, for instance — that is rarely factored into route planning, he said.

Together, all this data can be fed into creating better delivery training programs, more efficient routes, and helping companies determine the best type of delivery vehicles. Sometimes multiple short-route deliveries on smaller vehicles, including bicycles, makes more sense than bulk deliveries in large trucks, for instance.

In most cases, Dr. Winkenbach said, his data shows that deliveries in big cities are almost always improved by creating multi-tiered systems with smaller distribution centers spread out in several neighborhoods, or simply pre-designated parking spots in garages or lots where smaller vehicles can take packages the rest of the way.

One variable he has yet to crack is weather. "It's a challenge to get accurate data on weather," he said. "And all it takes is a big rainstorm and deliveries slow way down."

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