

New dispatch system could save money for trucking industry, make life easier for drivers

EurekaAlert!

CORVALLIS, Ore. – Engineers at Oregon State University are studying a new approach to organize and route truck transportation that could save millions of dollars, improve the quality of life for thousands of truck drivers and make freight transportation far more efficient.

The findings, published recently in *Transportation Research Part E*, show the feasibility of the new system. More research is still needed before implementation, but there's potential to revolutionize the way that truck transportation is handled in the United States and around the world, some experts say.

Loads could be delivered more rapidly, costs could be lowered, and the exhausting experience of some truck drivers who often spend two to three weeks on the road between visits back home might be greatly reduced. This difficult lifestyle often leads them to quit their job as a result.

That turnover problem is sufficiently severe that more long-haul, full-truckload drivers quit every year than there are trucks of that type on the road.

"The perceived quality of life for long-haul truck drivers is poor, and it shouldn't have to be that way," said Hector Vergara, an assistant professor in the OSU School of Mechanical, Industrial and Manufacturing Engineering, who is working on this project in collaboration with researchers at the University of Arkansas.

"It will take a transition for companies to see how the approach we are studying can work effectively, but it should help address several of the problems they face," he said.

In truck transportation, some of the existing approaches include "point to point," in which one driver stays with a full load all the way to its often-distant destination; "hub and spoke" systems in which less-than-full loads are changed at selected points; and "relay" networks in which the drivers change but the load stays on the truck.

None of these systems by themselves are ideal for long-haul transport. The hub and spoke system is among the most popular with drivers because they get home much more frequently, but it can be costly and inefficient for full-truckload transportation. Relay networks make sense in theory but are difficult to implement.

The new approach under study combines the relay system and the point-to-point system for full-truckload transport. The researchers at OSU developed a new mathematical approach to optimize the design of the dispatching system for the

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Published on Electronic Component News (<http://www.ecnmag.com>)

movement of goods and to minimize the impact on drivers. It's one of the first models of its type to create a mixed-fleet dispatching system at a large scale.

"We now know this approach can work," Vergara said. "Compared to point-to-point, this system should cut the length of trips a driver makes by about two-thirds, and get drivers back to their homes much more often. We can also keep loads moving while drivers rest, and because of that save significant amounts of money on the number of trucks needed to move a given amount of freight."

The computer optimization determines the best way to dispatch loads and tells where to locate relay points, and how different loads should be routed through the relay network.

Truck transportation systems will never be perfect, researchers concede, because there are so many variables that can cause unpredictable problems – weather delays, road closures, traffic jams, truck breakdowns, driver illnesses. But the current system, especially for long-haul, point-to-point transport, is already riddled with problems, and significant improvements based on computer optimization should be possible.

Disillusionment with existing approaches led to a shortage of 125,000 truck drivers in 2011, the researchers noted in the study. The negative economic impacts of this system also reach beyond just the trucking industry, they said.

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Source URL (retrieved on 12/19/2014 - 8:05pm):

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