

Internet of Postal Things

Using extensive postal infrastructure to create new data products such as commodity flow estimates.

CASE
STUDY

Freight Challenges	Congestion, Land Use, Last Mile Access, Final 50-Foot Access
Data Sources Used	Administrative Records, Global Positioning System
Analytical Approaches	Speed, Location

WHAT ARE THE FREIGHT CHALLENGES?

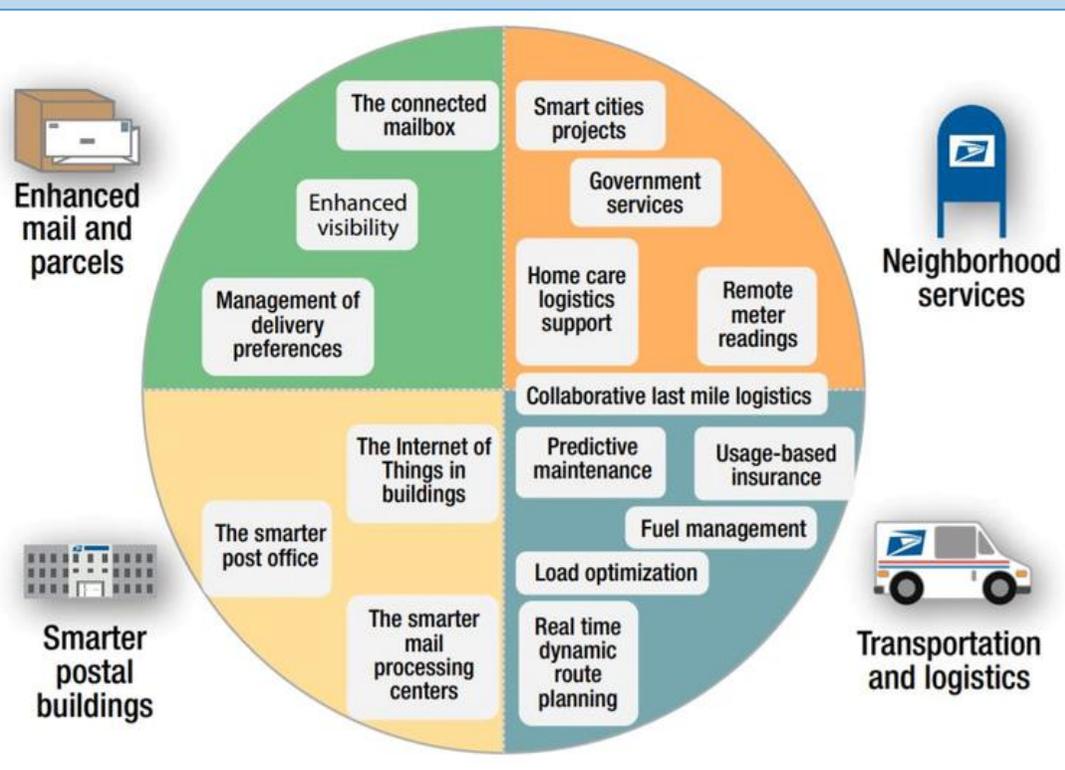
The United States Postal Service operates over 214,000 vehicles and delivers billions of shipments each year. The large size and scope of its operations mean that it is uniquely positioned to collect freight-relevant information down to the street level. In the future, data from instrumented postal vehicles and mail carriers' personal electronic devices could be used to generate data relevant to the freight challenges of congestion, land use, "last mile" access, and the "final 50-foot" access.

WHAT WAS THE GOAL OF THE PROJECT?

Researchers in multiple countries are trying understand how postal infrastructure and records can be used to generate useful data on a variety of topics such as commodity flows, road infrastructure condition, and air quality. This research often refers to networked postal infrastructure as the "Internet of Postal Things."

WHAT DATA SOURCES WERE USED?

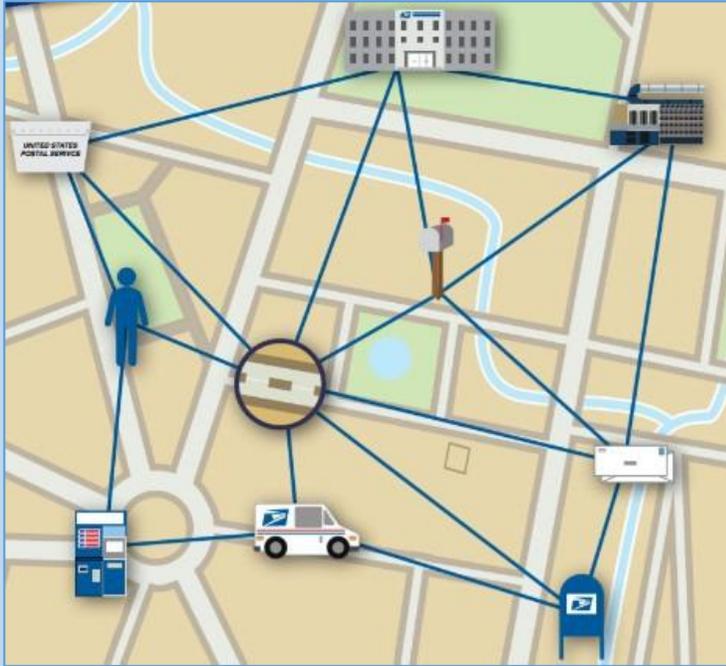
There are two types of current data sources related to postal flows. First, there is the potential to collect administrative records on the origin, destination, and volume of mail shipments. Second, GPS tracking data can be collected from instrumented postal vehicles and the electronic hand-held mail scanners carried by delivery staff. Additionally, some researchers have proposed equipping mail delivery vehicles with specialized sensing equipment capable of collecting specific information on a variety of phenomena such as pavement condition and air quality. This data collection can also extend to mail carriers themselves, who have qualitative knowledge about transportation conditions at specific times and locations.



Areas of Application

Source: USPS Office of Inspector General, *The Internet of Postal Things* (2015). RARC-WP-15-013.

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USPS Internet of Postal Things

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WHAT ANALYTICAL APPROACHES WERE APPLIED?

To date, most research has focused on the potential use of already-collected postal transaction data, such as records on the origin and destination of packages. Information about the origin, destination, and volume of mail flows can be archived and analyzed in near real-time, and can provide visibility on freight flows down to specific addresses. However, the need to protect privacy may mean that flow information may need to be aggregated to a larger geographic scale. Additionally, comparisons of the time, location, and speed recorded by GPS devices carried by delivery staff can be used to generate estimates of travel times through a transportation network.

WHAT WERE THE RESULTS?

Research on the Internet of Postal Things is still relatively new, but the promise of potential applications is already emerging. For example, researchers have found that the proportion of postal flows between nations is very similar to overall trade balances, and have proposed monitoring the volume of postal exchanges between nations as a near-real-time estimator of trade flows between countries. In the future, analysis of postal flows could be used to provide more frequent commodity flow estimates than the Commodity Flow Survey.

The USPS is also experimenting with using its infrastructure and carriers to collect data and is engaged in pilot projects studying how postal assets can be used to monitor pavement conditions, monitor the structural integrity of bridges, identify leaking water infrastructure, measure air quality, and identify urban blight.

HOW WERE THE RESULTS VISUALIZED OR COMMUNICATED?

Internet of Postal Things research is still in a mostly conceptual phase, so communication has been facilitated by written reports accompanied by graphics showing potential applications of postal data, such as the figures from USPS presented on the previous page and on the left side of this page.