



Applying routing software to postal operations

Productivity gains well worth the challenges

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Each one minute increase in daily productivity can translate into savings of \$1,000,000 US per year for an organization with 15,000 routes.

Sounds simple. The problem is that postal operations present many particularities and complexities, and these are not addressed by most routing software products.

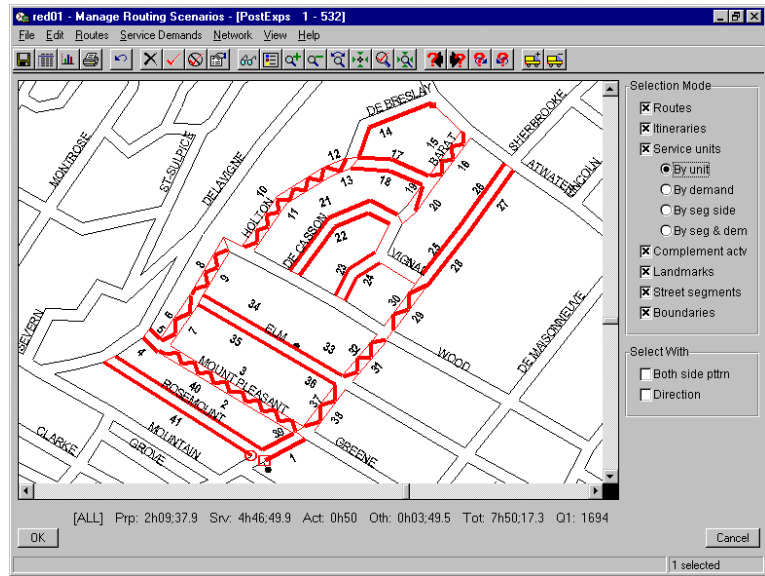
Over the last 10 years, GIRO Enterprises has acquired an excellent understanding of the specific routing requirements of postal operations, working with organizations such as Deutsche Post AG, Canada Post Corporation, and Royal Mail in the UK.

What are these requirements? How can advanced software meet these challenges and increase the productivity of mail delivery, mailbox collection, parcel delivery, and courier services?

Mail delivery

Mail delivery typically involves the largest number of routes within postal operations.

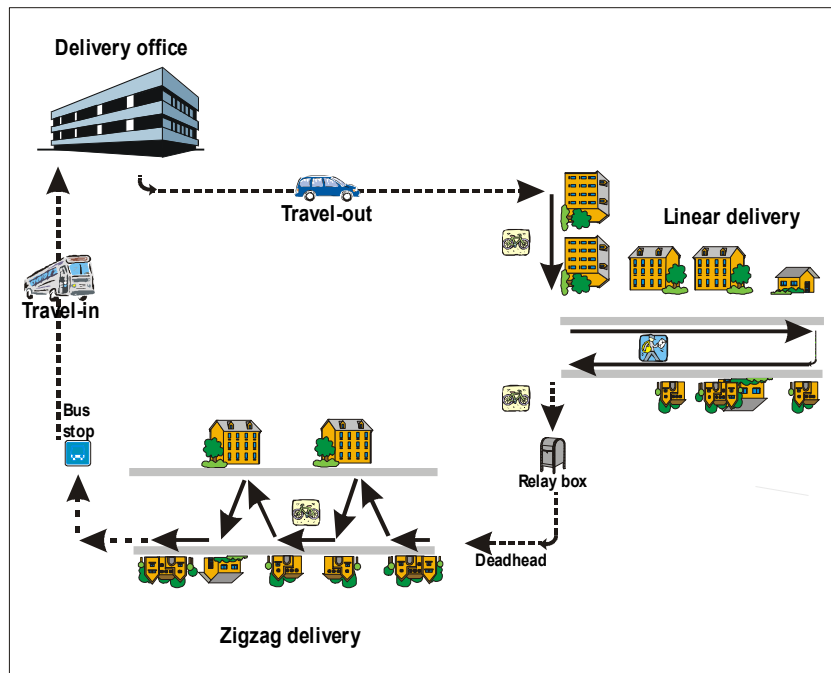
It is also the most complex activity from a routing perspective.



Route display in GeoRoute 5, showing servicing sequence.

High density of delivery points

Mail delivery routes in urban areas can include 300 or more delivery points. This prevents the use of standard route optimization techniques ("traveling salesman", etc.), normally designed for a much smaller number of points. Instead, arc routing techniques must be applied. These are specifically intended to create routes that visit most street segments in a given area, as opposed to a limited number of points.



Defining zones for parcel delivery.

Intricate travel paths

Accurate estimation of travel times and distances is difficult. Usually, a street will be walked twice, once on each side of the street.

However, a street will only be walked once if delivery can be made to both sides of the street at the same time. It can also be walked three times or more if it is used to access another street. Achieving sufficient accuracy in estimating travel times requires that the routing software recognize these possible patterns, while making use of detailed geographic data that is becoming available in many countries.

Multiple travel modes

Estimating travel times is further complicated by the fact that a variety of transportation modes may be used, often within the same route. For example, a single route can involve:

- Travel to route start point using a staff shuttle.
- "Park and Loop" delivery combining use of a bicycle and walking.
- Return to the delivery office using public transit.

Work rules, sometimes part of the labor agreement, may dictate which mode should apply based on the characteristics of each route. When a vehicle is used, one-ways and turn restrictions will influence the itinerary.

Sophisticated route sequencing tools are needed to determine efficient travel paths, including best route start/end points and decisions on where to service both sides of the street at the same time.

Volume related activities

Another particularity of mail delivery routes are volume related activities. In most pick-up and delivery operations, preparation time before leaving the depot is expressed in minutes and is fairly constant. In the case of mail delivery, and where sequence sorting has not yet been implemented, sort time is expressed in hours and will fluctuate significantly based on the delivery points assigned to each route.

Another example of volume related activity that the routing software must reflect are mail bag refills at relay boxes or facilities. These may result in additional travel time and distance.

When address information is available in electronic form, routes may be reviewed on a daily basis. Optimization may be limited to sequencing the stops within each zone, or re-balancing the zones as required.

Conclusion

With thousands of daily routes, and millions of locations to service, routing of postal operations is a complex task. New routing software, such as GIRO's *GeoRoute 5*, have shown they can handle the stringent requirements involved, and generate enormous paybacks by increasing the productive time of each route.

These capabilities become even more valuable when large scale route revisions must be conducted to reap the full benefits of introducing automatic sorting of mail by route or delivery sequence.