Optimise Waste Collection Routes in Your Municipality

By optimisation of waste collection routes, the Municipality and Public Utility Company can make savings and revenues.

Good Practice

Public Utility Company "Stari Grad" Šabac, Serbia

The collection, transport and disposal of waste from the place of its generation to landfills is one of the costliest operations in the waste management system, so therefore, it should be well analysed and planned. Given that the waste generation scheme is getting increasingly more complex, while the total amount is increased as a result of the economic growth in the region, the logistics of waste collection and transport is becoming more and more complex. Public Utility Companies responsible for this activity usually face problems deriving from their chronic lack of funds. This generally results in outdated collection and transport vehicles, insufficient staff not matched with actual needs and relatively low wages in the sector.

- Sabac Municipality has an area of 800 km2, 47 villages and 115,000 users and all of these should be covered by the existing equipment and personnel. We were simply forced to find a solution. By following the movement of some vehicles via GPS and by comparing their routes on ordinary glass, we realized that their routes were overlapping. For us, this was a signal that something was wrong, says Snežana Đokić, Executive Director of the PUC "Stari Grad" – Sabac.

To overcome this challenge, Sabac became a pilot municipality where a business process of optimization of routes for waste collection and transport was conducted as part of the Project "Business cases development for improved waste collection and valorisation", implemented by GIZ, in collaboration with partner organizations NALAS and SeSWA from Serbia. The analysis showed that very often, routes between certain areas were intersecting or two vehicles were appearing in one route, which was an irrational, costly and outdated solution.

- We did the optimisation of routes in all 8 urban and suburban areas, in order to establish the streets and directions' geo-plan. We checked if the street was narrow or one-way, if such optimal route could be passed provided the traffic regulations. Further, we had to determine the exact number of users, the number and type of garbage bins located on these streets. By using software and based on the material, and literally by using trails marked on maps and expressed in words, every street route was determined, as well as every vehicle, where it turned, how it behaved, how many containers it took and how long it all took, says Zoran Damjanovic from Sabac.

The plan with routes is so simple that any new drivers can easily interpret it, because it gives them information on where and when to set off, down which route to drive, where to stop and how long it will take to empty a certain type of container or waste bin depending on their size and total length of the route. In the first six months of the business process implementation, i.e. from January to June 2019, the first results were visible. First, it was noted that some time was saved while improving simultaneously service efficiency.

- By optimising the first and eighth area we came to a situation where, in the first area, instead of five days, the work could be completed within 3 days, while in the eighth area, instead of 5 working days, the work could be completed within 2 working days, which created significant savings. Thus, citizens are not harmed at all, only we have optimised and reduced the costs in our operations, Ms. Đokić stated.

PUC "Stari Grad" has a large number of vehicles. Probes were procured through the Project and built into the garbage trucks, thus controlling their fuel consumption.

- Fuel consumption is significantly lower compared to the previous period, added Ms. Đokić.

This means that vehicles spend less mileage to complete the same job, making savings on tyres, oil and spare parts. Expressed in specific amounts, based on 6-month projections, on all these grounds, the company managed to save nearly 18,500 euros, while the largest cut was made in the number of working hours and engaged workforce. Moreover, there was a decrease in working hours by 5.8%, meaning that the same services were performed while saving 564 working hours. On the other hand, during the first 4 months of applying the business process implemented, the work that had been performed by 19 vehicles until then, required 16 trucks by the end of the period.

- The result of this optimisation conducted under the pilot project is that literally we saved one manned vehicle, says Zoran Damjanovic.

The vehicle and its crew can now be used to perform other tasks, such as go to the industrial areas where higher volumes of waste are generated and where containers should be emptied quickly.

- In this way, we have had the opportunity to reduce the existing burden, because the quantities of waste generated by legal entities are big. Now we have a crew that will help in collecting this type of waste, says Ms. Đokić.

What is specific is that monitoring results show that costs have been reduced, while the level of service is the same or increased, which allows the company to take a flexible approach to the market. Also, as the network of roads is getting more complex and larger and requires more vehicles for its coverage by this activity, a possibility is created to achieve greater cost savings. On the other hand, an optimal number of vehicles on the streets means less emissions, cleaner environment, less traffic jams, which ultimately results in satisfied citizens.

The methodology for Local Governments and their Public Utility Companies (Terms of Reference) for optimisation of waste collection routes is available at NALAS website www.nalas.eu and SeSWA website.

This model has been developed by the Project "Business cases development for improved waste collection and valorization", implemented by the GIZ Open Regional Fund for South East Europe - Modernisation of Municipal Services, commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ). The Project was implemented in Western Balkan partner economies, in the period October 2017-October 2019, in partnership with the Serbian Solid Waste Association (SeSWA) and the Network of Associations of Local Authorities of South East Europe (NALAS).