

AUTOMATED LOGISTIC PLAN OPTIMIZATION

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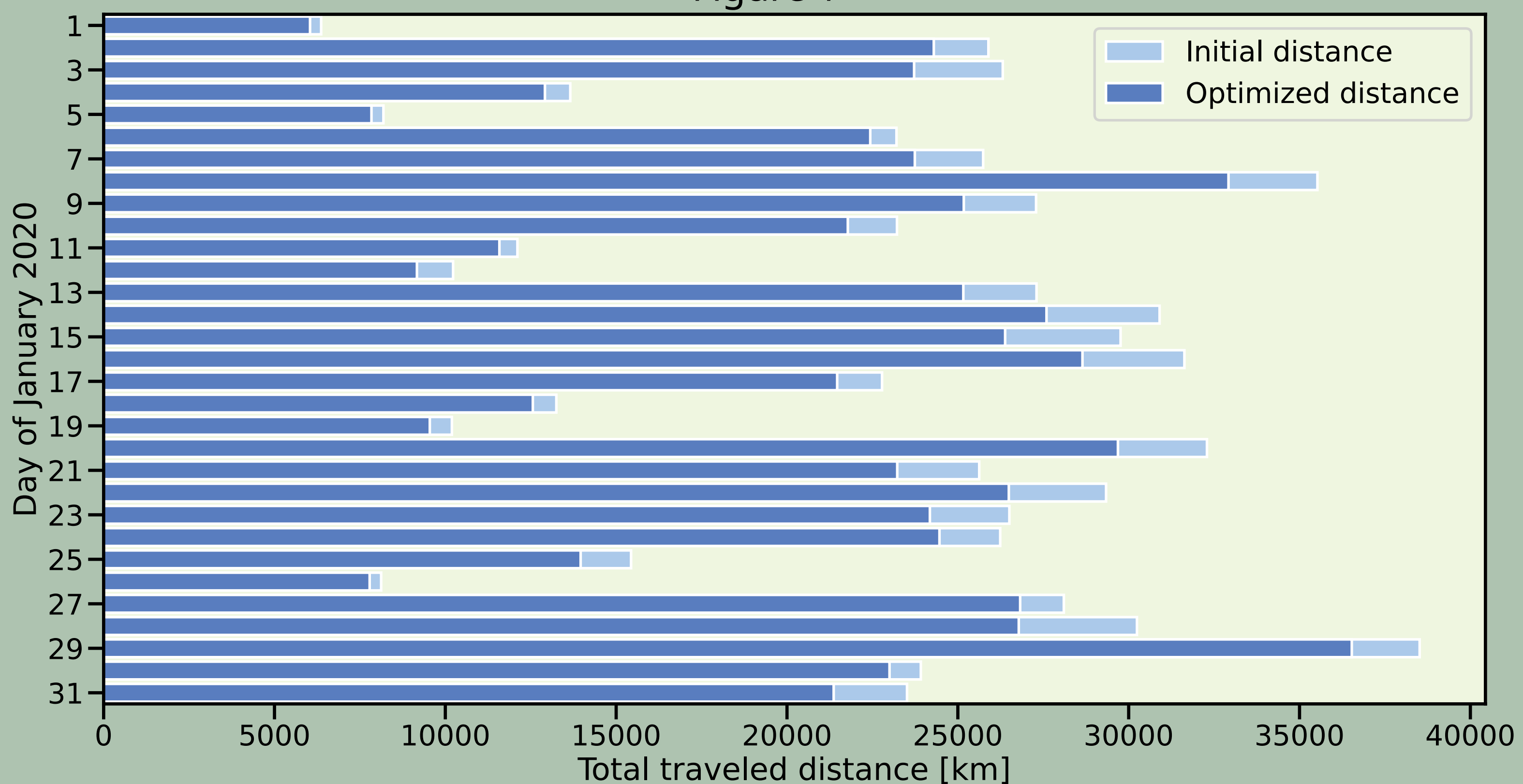
Introduction

Logistic companies have to deal with planning the transportation of their orders, typically daily. Even though this type of problem, called Vehicle Routing Problem (VRP), has been extensively studied in past decades. Due to complex real-world requirements, even companies with large transportation volumes still rely solely on hand-made logistic plans.

In this study, we investigate whether handmade logistic plans used by a particular Czech logistic company can be automatically improved while considering all the real-world constraints.

Results

Figure 1



By means of stochastic optimization methods, we were able to automatically optimize provided historic plans from January 2020, on average, by 7.6 %. Totalling around 54 thousand potentially saved kilometers in a single month.

The optimizations were more significant on days with greater transported volume in both total and proportionally.

Conclusion

Considering the complexity of real-world logistic planning, where many contradictory conditions have to be met, the stochastic optimization approaches showed to be a promising addition to manual planning. The current solution could be already used by the logistic company in cooperation with handcrafting the plans. But the further goal of our research is to completely eliminate or at least reduce the need for human operators to handcraft the plans while producing plans with better properties.