

Way.Pro auto

This is the optimization of automobile routes

Automatic route generation system



reduces logistics
costs



considers the nuances
of your business



optimizes operational
performance



About the company

We create intelligent solutions that cover all supply chains:

from product planning and distribution to route optimization and management of last-mile logistics

Our technologies allow businesses to



reduce costs



make logistics
efficient



increase customer
satisfaction



Smart Machines LLC

developer of integrated
logistics optimization

We ensure efficient movement of all types of cargo

from small parcels to oversized goods,
ensuring minimum costs and maximum speed
of delivery

The importance of efficient routing



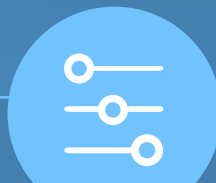
Cost reduction

Save fuel and reduce maintenance costs



Increased reliability

Minimizing delays and improving service levels



Increasing resilience to change

Flexibility in management and adaptation to new conditions



Increased delivery speed

Fast delivery and improved inventory management



Decision-making Center

Decision analysis and transparency of processes

Analytical block - reports and metrics with assessment of changes



Delivery

Analysis of delivery time and downtime



Route density

Number of delivery points, average distance, departure frequency



Efficiency

Empty mileage ratio



Cost of transportation

The cost of transportation per route, vehicle, kilometer, unit of goods, type of cargo.



Analysis of changes

'Was-became' assessment, consideration of scenarios



Expenses

Transportation costs and separate routes

Main advantages

Optimization of the entire contour transport logistics

- first mile
- trunk line
- last mile
- courier delivery
- clustering and zoning



Powerful mathematical apparatus

Mathematical apparatus with optimal solution for a specific task



A strong Math and Data-Science team

A team with experts with many years of experience in mathematics and DS in logistics



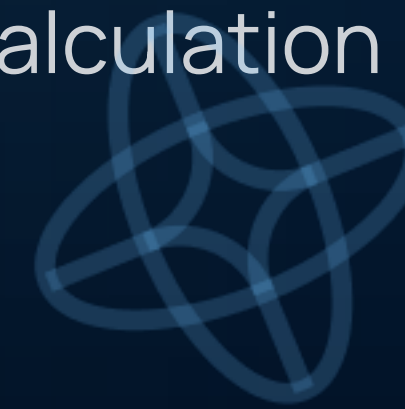
Scaling

Maximum number of logistics facilities and calculation parameters



Working with BigData

Working with millions of data matrices with amazing calculation speed



Cartography

Integration with cartographic services and visualization of solutions



Considered parameters

✓ Type of transport

Type of transport and its capacity

✓ Points

Number of points in the route

✓ Traffic

Taking into account the situation on the roads and traffic

✓ Frequency

The frequency of accumulation of goods and departure

✓ Zonality

Formation of transport operation zones and accounting for the density of delivery points

✓ Time windows

Accounting for time windows and work schedules of facilities

✓ Restriction

Restrictions on distance and working hours



Technological Features



Algorithms

Optimized, reliable algorithms tested on real-world tasks



Architecture

Flexible micro-service architecture designed for load any product issue



API

A simple and consistent API with clear parameters



Changes

Quick changes and CI/CD without interrupting the system operation

Mathematical Features

Working through a variety of mathematical algorithms and choosing the optimal solution for each type of problem



A multi-step solution

Optimization of calculation using several solution methods



Using heuristic algorithms

Large Neighborhood Search (LNS) method and simulated annealing



Using precise methods

Using integer linear programming



Accounting for a subset of graph edges

The Minimum Connected Tree (MST) method

The efficiency of solutions

The DataSet of the largest logistics companies was used

more than 1000

own warehouses of the Russian Federation and the CIS

Positive feedback from experts and logisticians

- approval of implemented solutions from logistics specialists has been received
- the result surpasses manual labor and previous solutions

The tasks of the main stages of logistics have been solved

more than 500 thous.

last mile routes per month

more than 200 thous.

trunk lines per month

More than 1 millions

courier routes per month

Main usage results >>>



- Distance
- Delivery time

↓ **10%**

- Waiting for the goods

↓ **12%**

- Costs of transportation

↓ **11%**

- Transport usage rate

↑ **14%**

- ↓ reduction of transportation costs for all types of logistics
- ↓ reduction of the total distance and delivery time at all logistics facilities
- ↓ reducing the waiting time for goods in stores and pick-up points
- ↑ significant increase in the transport utilization rate

UI Example*



* custom implementation for the client

Analysis of the calculation of last-mile routes

General indicators

Calculation details

General indicators

Сравнительный анализ:

Field name:

Value

Unit

Number of selected points:

272

unit

Number of routes generated:

274

unit

Number of units product per day:

27 425

unit per day

Number of units product per 1 point:

100

unit per point

Field name:

Was

Became

Difference

Unit.

Total distance:

8 582

7 783

- 799

km

Average route distance:

536

563

+ 27

unit

Departure frequency:

0,9

0,7

+ 0,2

per day

Density of points:

15,2

14,8

- 0,4

km

Units of goods per 1 km:

3,4

3,6

+ 0,2

per km

Waiting time:

03:40

03:19

- 00:21

Close

Analysis of the calculation of mainline routes

Comparative analysis:

Indicator

Metric

Calculation 1

Calculation 2

Difference

Pallets

Number of pallets (units)

151 776

115 270

-36 497

Streams, routes

Number of pallets (units/km)

6,6

7,5

+0,9

Number of unique routes (units)

3 385

3 344

-41

Share of direct routes (%)

1222

1 125

-97

Distance

Share of transit routes (%)

29

23

-6

Distance of unique routes (km)

71

77

+6

Average shoulder distance (km)

995 677

859 308

-136 369

Time

Average route distance (km)

815

764

-51

Time on unique routes (hour)

1 665

1 579

-86

Average time on routes (hour)

5 933

5 209

-724

Main routes

Route

Departure

Transit

Arrival

115

Moscow_1

Rostov

Pyatigorsk

115

Moscow_2

Kazan

Surgut

115

St Petersburg

Moscow

115

Yaroslavl

Volgograd

Kemerovo

115

Kazan

Omsk

115

Tomsk

Krasnoyarsk

115

Tula

Volgograd

Krasnoyarsk

115

Barnaul

Irkutsk

115

Novosibirsk

Irkutsk

Pyatigorsk

Choose a route

Departure Warehouse

Route number

Calculated ones only

Apply

Clear

Details

Route № 113 Distance 452

Points 15 Time 04:35

Warehouse MSK_1 Speed 45

Volume 1765

Details

Route № 15 Distance 327

Points 13 Time 03:28

Warehouse Msk_1 Speed 39

Volume 2173

Details

Route № 165 Distance 462

Points 17 Time 04:54

Warehouse Msk_1 Speed 46

Volume 1958

Details

Contacts



smartmachines.pro



info@smartmachines.pro

