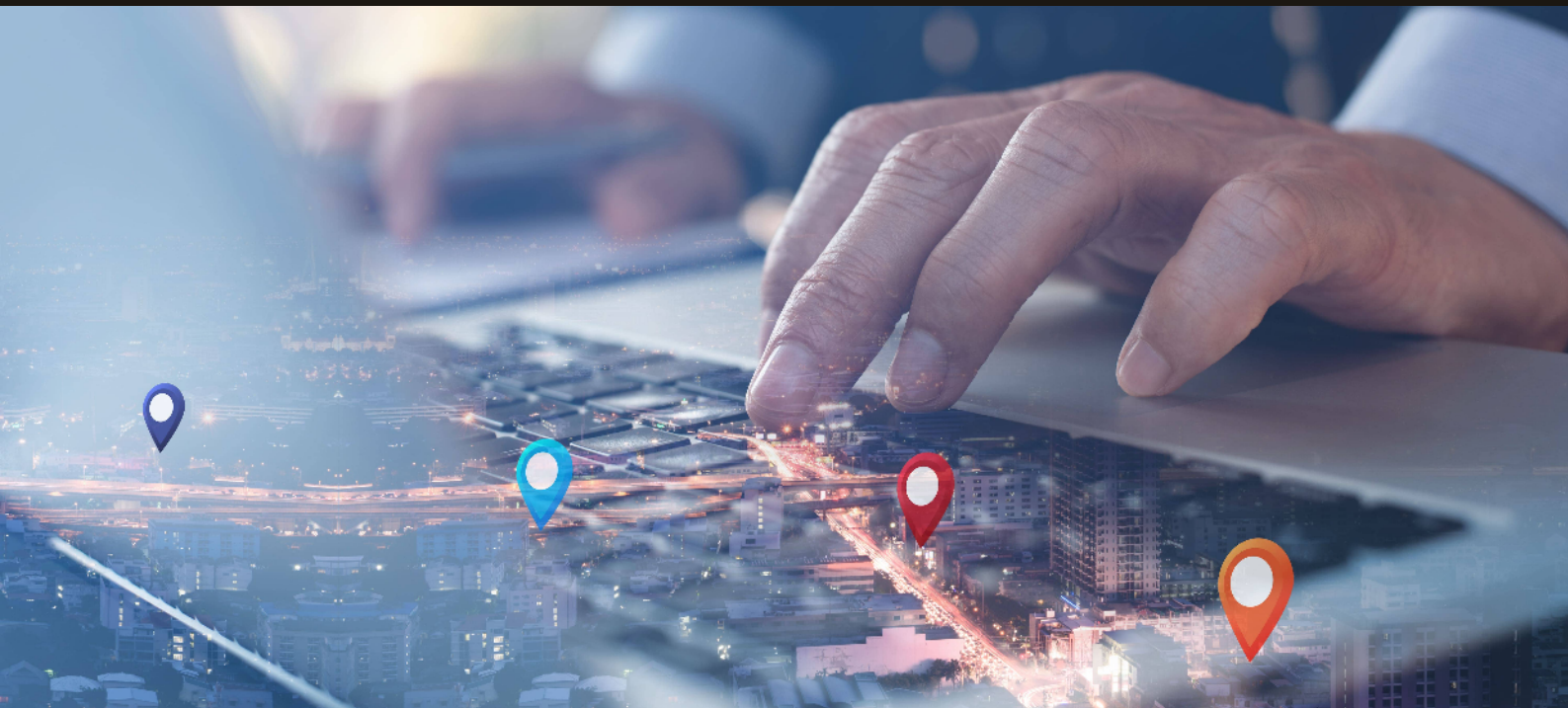


REPORT

From manual planning to continuous optimization

The different types of route optimization



Route optimization, a strategic issue

Route optimization means finding the least costly way to visit every point while respecting specific constraints: time slots, vehicle capacities, technician skills, and so on.

For logistics and field-service companies, it is a direct lever on three fronts: transport costs, the service quality perceived by the customer, and the carbon footprint of the routes.



Transport costs

Fewer kilometres driven, less fuel wasted, and fewer resources to mobilise.



Service quality

Time slots and promised deadlines kept, and so a higher customer satisfaction.



Carbon footprint

Kilometres avoided, and so lower emissions across the whole fleet.

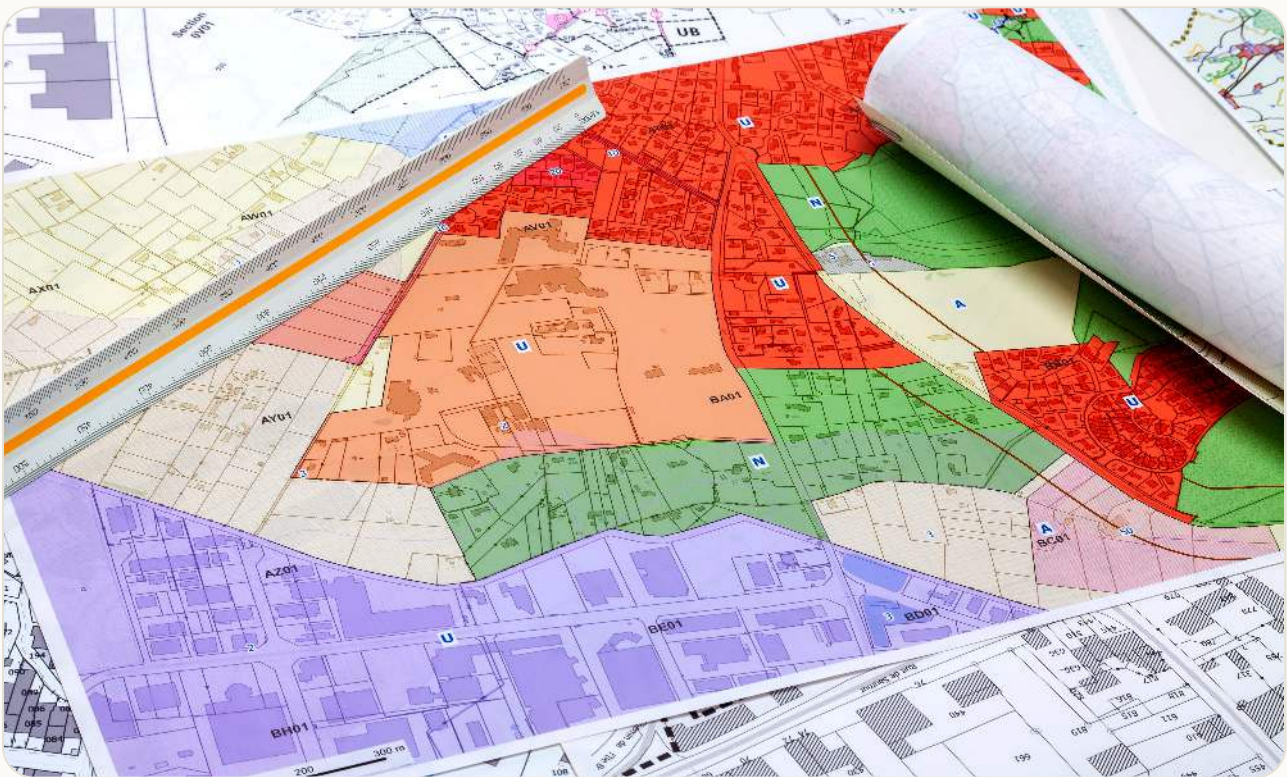
20 to 30%

That is the extra cost a poorly controlled optimization can add on the same volume of routes, and just as many savings within reach with the right approach.

01 Manual optimization by experts

In practice, route optimization is most often handled manually by a planner. Drawing on their field experience, they build the schedules from patterns whose effectiveness they have confirmed over time.

But as soon as the points, constraints and vehicles number in the dozens, it becomes humanly impossible to explore every combination: the planner settles for the first "acceptable" solution rather than the optimal one.



● ADVANTAGES

- ✓ Strong ability to manage business priorities.
- ✓ Strong ability to handle the unexpected by adapting decisions to the context.
- ✓ Takes into account information that is not in the database (customer relationship, local context).

● LIMITATIONS

- ✗ Beyond a certain volume of variables, the planner can no longer compare the options, which mechanically degrades costs and service quality.
- ✗ Heavy dependence on the experience of a single person, hard to pass on or to bring others up to speed quickly.

02 "Static" optimization

This approach covers the most common software on the market, which automate the calculation and the assignment of routes to individuals.

It is called "static" optimization because, once the schedule has been generated, it can no longer be recalculated automatically.

If a piece of information changes after the calculation is launched (an urgent order at 11 a.m., a sick technician), the planner must either ignore it or restart the entire calculation, losing the optimization already done.



● ADVANTAGES

- ✓ The algorithms calculate theoretically optimal routes, accounting for the stated costs and constraints.
- ✓ Significant time savings compared with building schedules by hand.

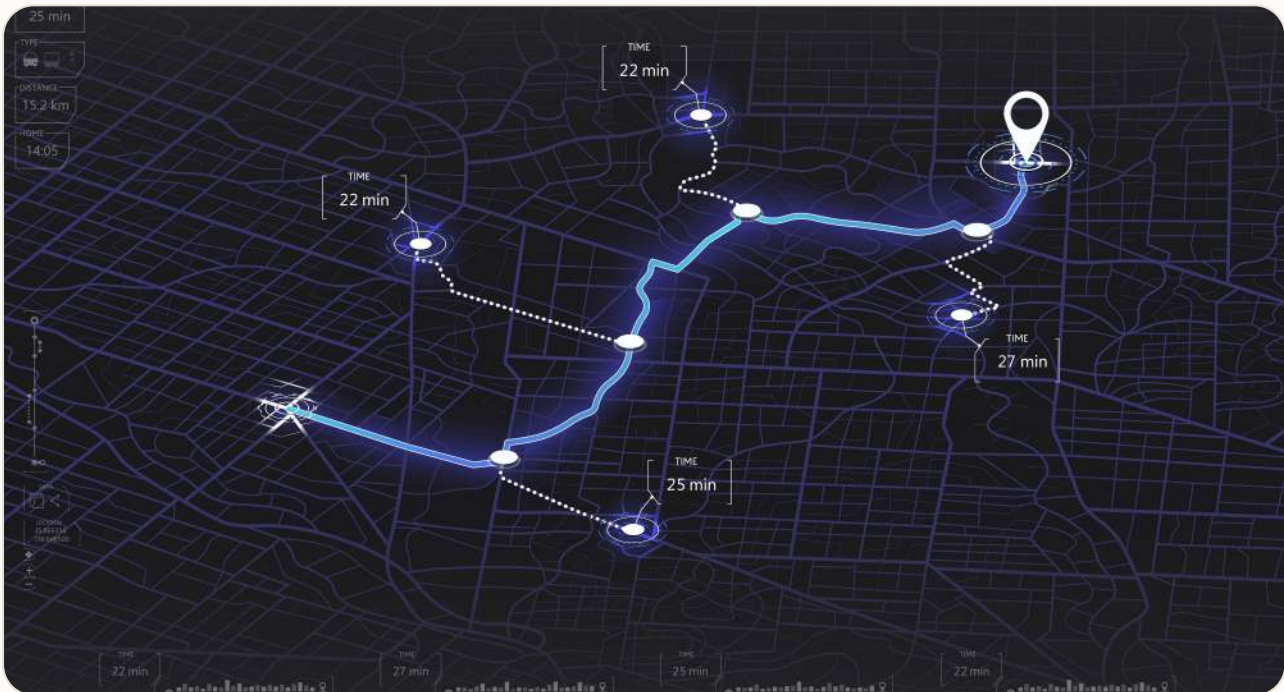
● LIMITATIONS

- ✗ Inability to incorporate information that arrives after the calculation has begun, without recomputing everything from scratch.
- ✗ Gradual degradation of the plan's performance over the day, as the field diverges from the initial scenario.
- ✗ No tracking or reporting on what was actually carried out versus the plan.
- ✗ Rigid process: you must wait until all the data is available before launching a calculation.

03 Optimization with real-time tracking and adjustments

Some more recent software makes it possible to track the progress of routes in real time and to react when something unexpected happens, for example by warning a customer of a foreseeable delay.

The main limitation: the software observes but does not recommend. It is up to the planner to identify the problem themselves and then adjust the route manually. Tracking improves responsiveness, but never automatically recalculates a fully optimized route.



● ADVANTAGES

- ✓ Theoretically optimal routes at the start, as in the previous type.
- ✓ Real-time tracking of what is actually carried out.
- ✓ Ability to alert customers when a problem is identified.
- ✓ Manual correction of a route: reassign a stop, shift a time slot, remove a task.

● LIMITATIONS

- ✗ Optimization opportunities that appear during the day (a vehicle finishes early, a stop near another is cancelled) are not used automatically.
- ✗ Recalculation stays manual and occasional, neither systematic nor global.

Continuous optimization, known as "Always On"

Conventional optimization rests on a simplifying assumption: at a given moment, all the data is known and fixed. In the field, that assumption rarely holds for more than a few minutes (a technician breaks down, a customer cancels, a traffic jam, an urgent order after the calculation).

Continuous optimization answers differently: the algorithm stays active and triggers on every significant event reported from the field. Each trigger launches an incremental recalculation: it does not start from scratch, it locally adjusts the routes concerned, within a few seconds to a few minutes.

EXAMPLE

An urgent order received at 11 a.m. is automatically inserted into the existing route that is least costly to change, without disrupting the other vehicles or waiting for the full schedule to be rebuilt.

WHAT IT CHANGES IN PRACTICE

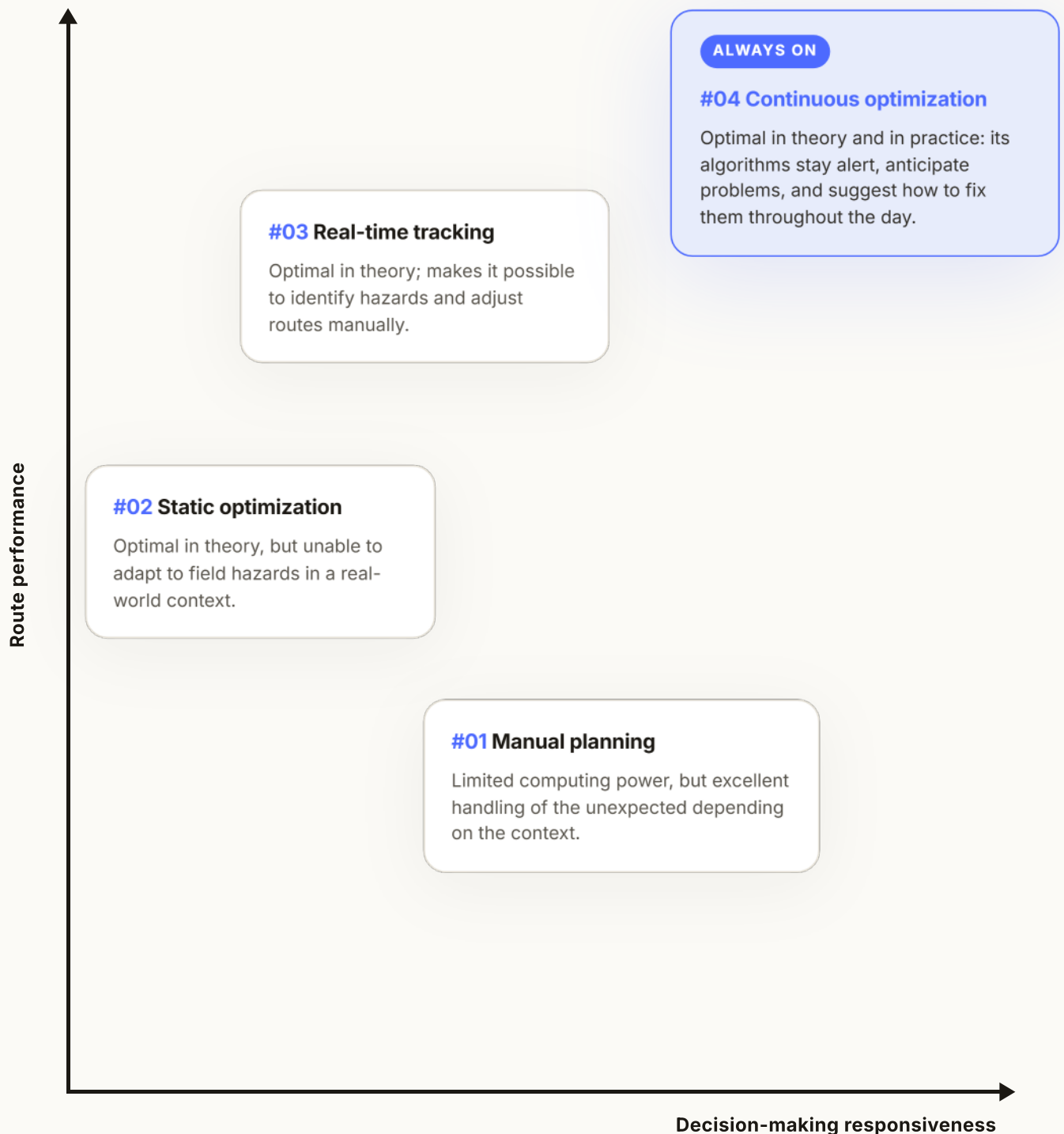
- Schedules stay optimal even when reality diverges from the plan.
- Human decisions (priorities, exceptions) can be injected at any time without breaking the overall optimization.
- The reaction time to an unexpected event drops from hours to a few minutes.

WHAT IT REQUIRES

- ⚙️ Reliable, frequent field data feedback (geolocation, real-time mission statuses).
- ⚙️ Integration with existing systems (TMS, ERP, field applications).
- ⚙️ An adjustment period for the teams, who move from an execution role to a supervision and arbitration one.

Positioning the four types of optimization

Each type reads along two axes: its **decision-making responsiveness** to the unexpected and the **performance** of the routes produced. Only continuous optimization is optimal both in theory and in practice.



How to position yourself by your maturity

Before aiming straight for the “Always On” level, it helps to assess where your organization stands today.

1 Still planning by hand or on a spreadsheet?

Moving to type 2 (static optimization) already brings an immediate, measurable gain, with little organizational change.

2 You have an optimization tool but no field visibility?

Type 3 (real-time tracking) is the natural step before considering automatic recalculation.

3 Do your teams spend their time manually adjusting routes?

That is the signal that type 4 (continuous optimization) can deliver a real productivity gain.

The right type is not necessarily the most technologically advanced one, but the one that matches the maturity of your data, your systems, and your teams.



Ten years of logistics optimization, within reach.

For ten years, Kardinal has solved the logistics problems that generic solutions work around: real business constraints, complex operations, actionable results.

Two ways in: our API for the teams that build, and our experts for those who want support.

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