



Aptean Routing & Scheduling

The Ultimate Guide to **Route Optimization**





Introduction

If you operate a delivery fleet, you could be sitting on a gold mine of incremental profit and customer goodwill—and not even know it.

Whether you're a distributor, manufacturer or retailer, your trucks and drivers take up a huge percentage of operating expenses. Efficiency gains in fleet performance can deliver six- or seven-figure savings straight to your bottom line. All while improving your delivery services.

The key to unlocking these benefits is **route optimization**. Basically, making sure your fleet operates at maximum efficiency every day.

It's a term used mainly by fleet managers, but one whose impact resonates powerfully throughout a distribution business—from the dispatch room to the board room.

In this guide, we'll explore all aspects of route optimization, from the nuts and bolts of how it's done to advanced optimization strategies for larger fleets.



By reducing the amount of time and miles it takes for trucks to complete routes, you **reduce the cost** for trucks, drivers, and all other vehicle operating costs over time.



Table of Contents

- › What is Route Optimization and How Can It Make Your Business More Competitive?
- › What Market Forces are Driving the Need for Route Optimization?
- › How Can Route Optimization Help Your Business?
- › How Do You Know When You Need Routing Software?
- › What Benefits Can You Expect From Route Optimization Software?
- › How Can Advanced Route Optimization Software Drive Even More Value?
- › What Role Does the Driver Play in Route Optimization?
- › What is the ROI on Route Optimization Software?
- › What Metrics Can You Use to Measure Route Optimization Success?
- › Making the Case for Route Optimization Software



What is Route Optimization Software? (And How Can it Make Your Business More Competitive?)

Route optimization is the process of determining the most efficient route for a vehicle to take based on a set number of stops and all the outside variables that can impact the journey.

Using route optimization software to complete this process can realistically cut fleet operating costs by 10-30% and significantly increase customer satisfaction by reliably meeting ETA objectives.

Fleet operators that have prioritized route optimization enjoy the following competitive advantages:

More Efficient, Profitable Operations

By reducing the amount of time and miles it takes for trucks to complete routes, you reduce the cost for trucks, drivers, and all other vehicle operating costs over time. Below is a breakdown of truck operating costs, by percentage of total costs, based on data from the [**American Transportation Research Institute \(ATRI\)**](#). Route optimization software helps reduce every one of these cost buckets:

Truck Operating Costs	% of Total
Vehicle Based	
Fuel costs	24%
Truck/Trailer lease or purchase payments	16%
Repair and maintenance	9%
Truck insurance	4%
Permits/Licenses	1%
Tires	2%
Tolls	2%
Driver Based	
Wages	32%
Benefits	10%
Total	100%



Happier, Loyal Customers

A **Walker study** found that customer experience has overtaken product and price as the key brand differentiator. The final mile presents an ideal opportunity for distributors to enhance this customer experience. When you create more accurate routes with route optimization software and utilize its real-time tracking capabilities, your customers develop greater confidence in your ability to meet delivery promises.

According to **Bain and Company** (the inventors of Net Promoter Score), reliably satisfying customer expectations makes them more likely to stay, and a 5% increase in customer retention produces more than a 25% increase in profit.

More Agile, Responsive Business

Manually organizing multi-stop routes for an entire fleet is painfully time-consuming.

Specialized route optimization software has built-in algorithms that help you quickly adapt delivery operations to meet changing customer requirements or company strategies.

Here are just a few examples where automation empowers you to plan changes in minutes instead of hours:

- › Change duty time in line with evolving legislation
- › Reduce all your delivery time windows to two hours
- › Change route plans to meet all customer delivery requirements with a smaller fleet

It's a mistake to view route optimization as purely the concern of the transportation team. Better fleet performance leads to improvements across the business. As your delivery service becomes more reliable and efficient, you create an organization that is more agile and customer-centric. That's a great formula for beating the competition.



What Market Forces Are Driving the Need for Automated Route Optimization?

Rising customer expectations and industry trends make delivery fleet management more complex and more critical than ever before. Here are just some of the factors impacting today's fleets:

Tighter Time Windows

- › Customers want more accurate and precise ETAs. In general, there's an Amazon effect on freight, with both B2C and B2B customers expecting fast, accurate deliveries at the same or lower cost.

More Frequent Deliveries

- › Leaner supply chains mean less inventory on the shelf, in the warehouse and on the production line. It also means smaller, more frequent shipments delivered just in time—and that translates into more complex delivery requirements.

Demand for Greater Visibility to ETAs

- › Customers want to know exactly when products will arrive, regardless of whether it's a delivery of fresh grocery products to a convenience store or animal feed to a farm. Businesses that get this information can schedule staff to receive the products, ready the receiving area and gain the efficiencies that come from good advanced planning.

Volatile Fuel Costs

- › Fuel accounts for about 24% of the cost of a truck-mile. The heat is on to make the most of every single mile driven in order to mitigate the financial impact of diesel fuel cost hikes.

Restrictions on Urban Deliveries

- › Municipalities are increasingly restricting commercial deliveries during certain hours to address congestion and environmental concerns, adding to the complexity of route planning.

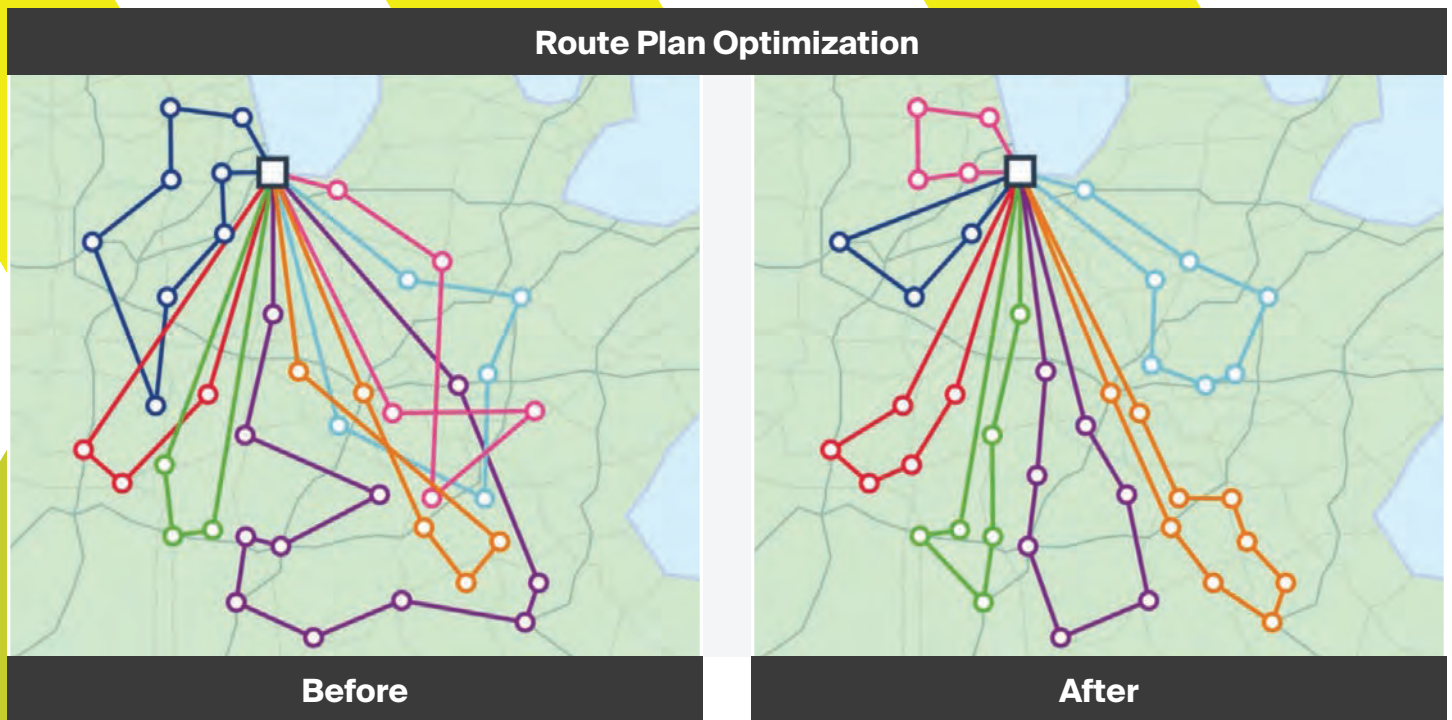
Driver Shortage

- › According to the American Trucking Association (ATA), the industry is short about 60,000 drivers. The average age of a US truck driver is 55 (Bureau of Labor Statistics), so the shortage will worsen as these drivers retire. Attracting new drivers is expensive and difficult, so it's more critical than ever that route plans get the most out of the existing driver force.

These complexity-driving trends all lead to one conclusion: without the aid of transportation route optimization software to address routing challenges, fleet managers simply can't generate an optimized plan in the allotted time. As customer needs change and new stops are added, profit-draining inefficiencies creep in without anyone noticing.

So how does route optimization software help?

Here's a picture of the daily delivery path of just seven vehicles before and after route optimization.



In the before image, routes overlapped, adding over 10% more cumulative miles than needed. Using the pre-optimized route plan, the company would:

- ▶ Pay more for fuel and truck maintenance linked to the excess miles
- ▶ Make fewer deliveries with the same number of trucks
- ▶ Invest more in trucks and driver hours than necessary

Bottom line: inefficient delivery fleets suck your profits dry, and unreliable delivery schedules erode customer confidence.



How Does Route Optimization Software Work?

Imagine someone asks you how to solve a challenging math problem.

You could explain the process. But for most people, the simple answer would be “use the calculator on your smartphone.”

It’s much the same for the question of how to optimize truck routes. Manual methods are cumbersome, time-consuming, less accurate and, most importantly, not necessary. Route optimization software is purpose-built to quickly arrive at the best route combinations from millions of possible options. It’s a case where the human brain is no match for smart algorithms and a powerful computer.

For example: a simple routing problem involving ten vehicles and ten calls per vehicle produces approximately 125,631,301,911,058,044,000 route permutations.

Even if a human *could* evaluate 1,000 options per second, the exercise would take almost **4 billion years**. Specialized route optimization software can handle the same analysis in minutes.

Optimized routing solutions use complex algorithms to calculate the most efficient routes. But the underlying principle of smart routing is quite simple. It combines what you know (your customers, what products they want and within what delivery windows) with what is knowable (things like average road speeds at different times of the day, the location of low bridges, and dozens of other variables). It then calculates the most efficient way to make deliveries while still meeting customer expectations.



How Do You Know When You Need Routing Software?

If your company's transportation team is still relying on basic tools to plan delivery routes, chances are your operations are less efficient than they could be.

Here are six clues that route planning could be a problem in your operation.

1. Transportation Costs Are Increasing Faster Than Revenue

Business growth often triggers knee-jerk requests for new vehicles or more people in a manual route planning environment. In our experience, this can inflate total fleet costs much faster than business growth. Every business is different, and there's no hard and fast guide about how many drivers, trucks or planners you should have to fulfill delivery commitments. However, every company can get important indicators of improvements (or declines) by monitoring transport costs over time and measuring how they're changing.

2. You Can't Confidently Meet Delivery Promises

Route planners simply can't account for all the variables that can impact delivery times without advanced route optimization software. ETAs are inaccurate and customers become frustrated as a result.

3. You Can't Get Crucial Information About the Efficiency and Performance of Your Delivery Operations

For such a huge cost center, it's a real red flag when you can't assess even the most basic performance and cost data like:

- ▶ Percentage of on-time deliveries
- ▶ Cost per drop and miles per drop
- ▶ Number of drops per driver

4. Customers and Sales Prospects are Pressuring You to Offer Later Order Cut-Off Times

This could indicate that route planning is taking too long. You may view your current timetable for processing orders, planning routes, picking products and loading trucks as an unchangeable reality of business. But it can change. With a more automated approach, the route planning process can shrink from hours to minutes.

5. Your Drivers Are Complaining or Leaving

You can't afford to lose drivers, so you want to avoid the frustration that sets in when workloads are unbalanced and when shift end times are unpredictable. Fair, predictable, workable shifts increase driver retention. If your current operation is undermining this goal, it requires a careful look.

6. Your Dispatch Team is Changing Driver Assignments Because They Don't Trust the Plan

Many transportation operations still don't consider driver availability when constructing route plans. This means dispatchers may need to adapt the plan to consider things like driver availability, flexibility of start times and hours of service (HoS) limitations. Such changes undo the efficiencies of the original route plan. A truly optimized routing solution should include **resource management functionality**. You can't optimize truck routes and ignore the drivers. It doesn't work.

When you're sick, your body gives off signals of pain and discomfort. Your fleet does not! Truck route optimization software can help address unhealthy fleet performance, but you've got to recognize the symptoms.





What Are the Benefits of Route Optimization Software?

There are many benefits of implementing delivery route optimization software, including reduced costs, improved customer service and lower carbon emissions.

Let's look at each of those benefits in more detail.

Reduced Costs

In our 30 years of routing experience, we've found that, on average, businesses that optimize delivery performance with routing software can reduce fleet operating costs by 10–30%, with the least automated operations being at the high end of that savings range.

Say you're a distributor with 30 trucks in your fleet, each logging an average of 50,000 miles per year. That amounts to 1.5 million total annual fleet miles. By applying the **National Private Truck Council's** average fleet mile cost of \$2.80 (fully loaded), we can put that fleet's yearly operating cost at about \$4.20 million. When you cut fleet miles by 20%, costs are reduced to \$3.36 million for a yearly savings of \$840,000—savings that you continue to enjoy in each successive year.

Let's unpack these savings. Where do they come from?

- ▶ **Increased truck and driver utilization.** This is your biggest upside. Advanced routing software automatically allocates deliveries to the most suitable trucks and the drivers with the right skills and hours of service available under HoS restrictions. This ensures that you are making the absolute best use of your vehicles each day while maximizing the number of deliveries drivers can complete during their shifts. **John Lewis**, a leading retailer renowned for its customer service, benefitted from an 8% increase in vehicle utilization and overall efficiency gains since the implementation of *Aptean Routing & Scheduling Paragon Edition*, across the operation.
- ▶ **Lower fuel costs.** A move to route optimization software typically results in reduced miles and, therefore, less fuel consumed. After driver-related expenses, fuel represents the largest cost component for fleet operations. Hagopian Cleaning Services, a 27-van operation in Michigan, cut its miles by 10% with route automation, realizing savings from day one of going live.
- ▶ **Reduced need for contracted carriers.** More efficient use of your vehicles and drivers lessens the need to contract with third-party delivery services. One large caterer, Marigolds & Onions, cut its use of third-party couriers by 50% in the first few months after automating its route planning process.
- ▶ **Ongoing improvement.** Optimizing fleet performance is not a one-time event. Without truck route optimization software, there's no ongoing feedback loop to drive continuous improvement and incremental savings.

Improved Delivery Service and Customer Satisfaction

Route optimization not only makes routes more efficient; it makes them accurate with highly reliable ETAs. This significantly enhances customer service. Happy customers stay, and some might even pay a little more for the benefit of reliable delivery.

Let's look at just some of the ways route optimization software improves the customer experience.

- › **Helps distribution companies meet the increasing demands of their customers.** The ability to confidently commit to aggressive delivery timeframes can be a huge competitive advantage.
- › **Allows customers to plan ahead for efficient receiving of products.** Whether it's fresh food being delivered to quick-serve restaurants or bricks to construction sites, reliable delivery times help customers increase the efficiency of their own operations. Your customers can confidently schedule staff to unload a truck or clear retail shelf space to make incoming goods available for immediate sale.
- › **Allows customers to submit orders later in the day.** By reducing planning time, you may be able to accept orders later in the day for next-day delivery. Retail customers love that because it allows them to dynamically respond to demand surges, such as when a sudden hot spell unexpectedly drains their cold drinks inventory.
- › **Keeps customers informed.** When route optimization software is linked to your in-cab telematics system, customers can receive automated notices of delivery status via SMS or email alerts, including a precise ETA when the vehicle is on its way. Customers appreciate distributors who use technology to keep them in the loop proactively so they don't have to contact customer service for an update.

Lower Carbon Emissions

The first principle of sustainability when it comes to hauling freight by truck is to burn less fuel. And the easiest way to do that is to reduce fleet miles. One of our food service customers cut more than 1 million miles a year from its operation. That's a lot less carbon being released into the atmosphere.

But green freight practices encompass more than simply finding the shortest way of going from A to B to C to D on a multi-stop delivery trip. It enables other **fleet optimization practices that save fuel and emissions**, including:

- › **Deliver on time.** This reduces the chance that drivers will be left idling in line and burning unnecessary fuel while picking up or delivering a load.
- › **Drop off heavy items first.** Heavier trailers use more fuel. Route optimization software can factor in the weight of each delivery and ensure that the heaviest item(s) are delivered first to minimize fuel consumption.
- › **Identify backhaul opportunities.** Software can also identify opportunities to pick up another load on the way back to the warehouse or move loads between distribution centers on the way to a delivery. Fewer trips mean fewer miles, which means less gas and emissions.

When it comes to freight, fuel consumption is the element that really matters. A fully optimized delivery fleet burns less fuel and emits less CO2. It really is that simple.



How Can Advanced Route Optimization Software Drive Even More Value?

Advanced route optimization software has capabilities that go far beyond “plan today for tomorrow’s deliveries” functionality.

Let’s look at just a few strategies that can pave the way for dramatic cost savings and customer service improvements.

Compare Planned Activity To What’s Happening Live on the Road

Integrating routing software with your telematics system allows you to automatically identify discrepancies between planned and actual performance and adjust accordingly. Benefits include:

- › **Improved customer communication.** Live ETA updates and “running late” alerts allow you to update customers about their scheduled deliveries.
- › **Continually improved routes.** When live GPS data is fed into advanced route optimization software, exceptions to the plan are flagged. That helps identify problems, such as habitual delays at a particular customer drop or regular traffic jams at specific times in specific areas. With these insights, you can update data so future plans are more accurate.

Model “What If” Scenarios to Determine the Value of Strategic Changes Before Implementation

Powerful modeling tools let you explore any number of changes using your actual data to assess the cost and service implications of the change.

Examples of questions that these tools can answer include:

- › What if I changed my warehouse location or opened a new one?
- › What if I changed the size or type of trucks in my fleet?
- › What if I changed my delivery routes?
- › What if we merged with another company and combined delivery fleets?
- › What if we won a large new contract that significantly increased delivery points?

Blakemore Logistics in the UK distributes to 1,100 SPAR stores, a multinational franchise that manages independently owned and operated food retail stores across England and Wales.

Blakemore Logistics targets continuous improvement by using Aptean software to model different aspects of its distribution operation to understand the benefits of proposed changes. It can create multiple scenarios using its own transport data to gain better operational insight and make informed business decisions regarding its network and fleet profile.

Often fleet operators fail to explore strategic questions because they lack the time and resources required to do the analysis manually. A modest investment in route optimization software lets you run “what if” modeling exercises to explore strategies that can deliver dramatic cost savings.

Assess the Profitability of a New Customer

Sometimes, to close a deal, over-zealous salespeople make expensive promises to new customers before understanding the true cost to serve that customer. Without the support of sophisticated software it's a complicated analysis. Excel spreadsheets simply can't cope with the complexity involved.

Exactly where are the new delivery points? When are they open to receive delivery? What is the normal order size and how will it vary? How will these deliveries fit in with other existing deliveries?

Route optimization software models these and other factors in developing the best routing plan for the new locations and the impact of the changes on profit margin. Not all new business is profitable business. Sometimes it takes careful analysis to make that determination.

Beyond these efficiency-driving optimization strategies, the data you gather from your delivery operations can provide a constant flow of intelligence that makes your business smarter. That's right—your trucks are a lot smarter than you think. The data they reveal answers questions that aid decision-making at just about every level in just about every department—from customer service to the corner office.





What Role Does the Driver Play in Route Optimization?

The most efficient delivery route plan is still only that—a plan. Unless your drivers execute that plan, none of the benefits accrue. That's why it's so critical to make an effective driver debrief part of your overall route optimization program.

The driver debrief is a quick, post-route discussion to determine if routes went as planned and, if not, why not.

Avoiding the driver debrief is like a business spending \$50,000 on advertising to grow sales and not asking how the ads performed.

If you're not regularly assessing routes with drivers, your routes are likely performing about as well as that poorly monitored advertising program.

Questions asked during a debrief will depend on what the available data suggests about the route and how it deviated from the plan. Some examples:

- › Why did you use so much fuel?
- › Why were you out for 10 hours instead of the planned 8?
- › Why did you take a different route to your third drop?

The answers may suggest a need for the driver to better follow the plan or a need to change the plan to align with the reality of driving conditions and time required at drop-off points.

The Impact of Live Data on the Driver Debrief

The nature of the driver debrief will be different depending on whether or not live data from your in-cab telematics is integrated with your route optimization software.

Without telematics data, you are relying on the driver to record events manually, like when the route started and ended, the length of time for each drop, and any difficulties encountered along the way. Depending on a driver's memory is just not reliable.

With telematics data integrated with your routing software, discussions with drivers will be based on actual performance. There's no hiding the fact that the driver went 20 miles off the planned route. The only question is *why*.

The Best Driver Debriefs Are Collaborative, Not Confrontational

Truck drivers enter the profession, in part, because there is an element of freedom and independence. When businesses view post-route debriefs solely as a means to monitor drivers and hold them accountable, they strike a dissonant chord.

The best driver debriefs are not “us vs. them” discussions. They are about managers and drivers teaming up to create a win-win outcome for **managers and drivers teaming up to create a win-win outcome**. Perhaps some of the main benefits to come out of this include:

- › Companies increase profits by reducing fleet operating costs
- › Customers are happier when deliveries arrive within designated time windows
- › Drivers improve their day’s work by helping planners create realistic routes with predictable finishing times

Interactions with drivers should underscore the value of their input and the collaborative nature of the debrief process. Drivers hold the key to continually fine-tuning routes to both improve company performance and their quality of life.





What is the ROI on Route Optimization Software?

In our experience, ROI is realized within a year. But it depends on the company; we've seen businesses realize ROI in as little as three months.

The actual cost of route optimization software can vary from \$25,000 for simple installations to hundreds of thousands for huge fleets with sophisticated routing requirements.

The ROI calculation will differ depending on whether it is installed software with an up-front cost or a software as a service (SaaS) solution with an ongoing monthly payment.

A simple way to put a cost savings number against this investment is to multiply your total annual fleet miles by NPTC's \$2.80 cost-per-mile estimate, then multiply this sum by 10% to identify the lower end of the savings range and by 30% to identify the higher end.

Some savings are clear and measurable for an ROI calculation. Others, not so much.

We've already reviewed the main sources of the hard-dollar savings. If you complete your routes in less time and fewer miles, you can, over time, reduce the size of your fleet and driver force, while you also cut fuel and fleet maintenance costs.

In addition, there are other softer benefits that pack quite a punch, but may not be factored into an ROI calculation:

- ▶ **Improved visibility and KPI reporting.** This enables transportation and C-level staff to more easily recognize fleet-related problems and opportunities.
- ▶ **Reduced calls to customer service.** Automatic updates regarding late or missed deliveries eliminate the need for customers to call and inquire.
- ▶ **Reduced route planning time.** A software-aided process frees up hours of time, allowing you to redirect valuable staff to more strategic tasks.
- ▶ **Happier drivers.** They'll appreciate route plans that are fair and result in predictable finish times.

It's important to remember that all savings from route optimization software continue year on year, so the lifetime boost to the bottom line could be enormous.



What Metrics Can You Use to Measure Route Optimization Success?

There is no set formula for measuring the success of your route optimization program. Obviously, there is a cost component and a customer service/satisfaction component. But the benefits of efficient fleet operations can reach far beyond truck miles and costs. For a distribution business, your entire value proposition is built on the foundation of reliable delivery.

Your first step should be to select the metrics that are most important to your business and establish an accurate baseline.

The accompanying chart lists just some of the key performance indicators that fleet operators use to assess program effectiveness. Focus on the **fleet operating metrics** that mean the most to your business and measure them religiously and accurately.

Beyond some of these more obvious fleet efficiency metrics, route optimization software can drive value across many departments within your business. Some examples include:

- › **Finance.** CFOs can easily see granular data on costs and performance.
- › **Human Resources.** HR staff can monitor overtime and other driver data to aid driver retention efforts.
- › **Sales.** Detailed cost-to-serve data can be reviewed for existing customers, and performance KPIs are accessible when proof points are needed to support new business pitches.
- › **Marketing.** Smart routing software can help determine how many more drivers and trucks would be needed if a sales promotion were to double or triple product demand.

Clearly, your trucks can provide a gold mine of actionable intelligence—if you’ve got the tools to monitor and report on fleet performance.

Sample Route Optimization Success Metrics	
› Total fleet miles	› Drops per shift
› Fuel costs	› Planned versus actual stops
› Total fleet operating costs	› Hours invested to plan routes
› Cost per mile	› Third party/agency driver costs
› On-time arrival time	› Inbound call volumes
› Fleet capacity utilization	

Making the Case for Route Optimization Software

In today's economy, route optimization is a vastly under-rated strategy for business success.

From a customer service perspective, expectations for more frequent and precisely timed deliveries have never been greater. And the bar is rising every day. It's challenging for companies to differentiate on product and price, but excellence in delivery is a highly valued and achievable competitive lever.

From a cost perspective, private fleets represent a huge percentage of total operating expenses—and a huge drain on profits if they are not managed well.

For businesses that continue to rely on manual methods to plan delivery routes, there's never been a more opportune time to make a case for automating the process.

But the effort needs a champion. Maybe you?



Are you Ready to Learn More?

Interested to see how Apteian Routing & Scheduling can help improve your transportation operation?

Contact us at info@apteian.com or visit www.apteian.com.



About Apteian

Apteian is one of the world's leading providers of industry-specific software. Our enterprise resource planning and supply chain solutions are uniquely designed to meet the needs of specialized manufacturers and distributors, while our compliance solutions serve specific markets such as finance and life sciences. With both cloud and on-premise deployment options, Apteian's products, services and unmatched expertise help businesses of all sizes, across many industries, to scale and succeed.

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