



Best Practices for Better Business



Essentials for Commercial Truck Navigation

This document is designed to help companies that are actively researching commercial truck navigation solutions as well as companies ready to successfully implement their CoPilot Truck navigation solution.

COPILOT[®] TRUCK[™]

ROUTING → MILEAGE → MAPPING → NAVIGATION

Executive Summary

Ensuring a Successful Commercial Truck Navigation Implementation

Did you know?

- On average, a single truck wastes over **\$1,190** per year on Out-of-Route (OoR) costs¹
- Fines typically cost companies **\$1,000** to **\$40,000** per incident
- The average cost of a crash is **\$265,000**, if a fatality is involved **\$11M**²

Commercial truck navigation solutions can help to avoid these staggering costs. Proper navigation can save thousands per truck, per year, by efficiently routing drivers on safe, truck legal routes and reducing out-of-route (OoR) costs. In addition, the company saves potentially hundreds of thousands in fines by avoiding restricted roads, bridges and tunnels. Finally, although all accidents cannot be prevented, commercial truck navigation can route a driver on a safer route, helping to avoid potentially millions in insurance and legal expenses.

Correct implementation and proper configuration of truck and routing profiles with precise destinations is the key to driver acceptance and positive results for a company using a commercial truck navigation solution. Accurate profiles are critical. Sending a driver with a 24-foot straight truck on a 53-foot trailer route (which is much longer and circuitous) will damage the credibility of a new navigation solution and spread like wildfire among the rest of the drivers. By providing accurate truck dimensions and load information, profiles can be established to provide safe and efficient navigation for the best driver experience.

The Challenges a Driver Faces

Enforced Road Restrictions

- Traffic, MUTCD/DOT Signs
- Trailer length and width
- Weight (GVWR)
- Height
- Hazardous material

The number of vehicles on the road today is increasing as are the number of distractions for a driver, including in-cab technology.

Driver distraction has remained a huge concern among motor carriers and commercial drivers as evidenced by its 2014 breakthrough in the Top 10 Industry Issue Rankings.³

¹ An Analysis of the Operational Costs of Trucking, a 2013 Update; American Transportation Research Institute

² 2015 Pocket Guide to Large Truck and Bus Statistics; USDOT FMCSA; April 2015

³ American Transportation Research Institute. (2016, October). Critical Issues in the Trucking Industry 2016. Arlington, VA

The risk of missing important road signs for enforced restrictions has also increased, resulting in even an experienced driver going past the point of no return. Accurate profiles in your navigation solution are critical to ensuring the success of the driver. Map data, like road signs, can have almost all the necessary information to route a driver, but if the navigation software does not have the right parameters for the truck and its load, then the driver with a 53-foot straight trailer, for example, is at risk of being instructed to follow a car's prescribed route. This can result in the driver and company facing costly fines and delays.

Enforced restrictions come in the form of weight, height, length, width, and hazardous materials. Some regulations are federal and others are local, but all are factored into building an optimal and safe route.

This essential restriction data is available through ALK's proprietary map data and serves as the base for ALK's CoPilot® Truck™ commercial truck routing and turn-by-turn navigation solution. CoPilot Truck offers the key profile settings and selections to provide the right guidance.

In addition to enforced restrictions, traffic speeds, stop signs, stop lights, and safe turns need to be taken into consideration. Providing a driver with this accurate guidance enables them to stay focused on the road, improving both their efficiency and satisfaction.

The Essentials for Accurate Commercial Truck Navigation

Map Data Enhanced Daily

- Hundreds of data points per road segment
- Millions of miles updated monthly
- Quarterly releases

ALK is continuously updating map data to adjust to the constantly changing public infrastructure and laws.

ALK Map Data includes over 4.2 million commercial truck restrictions in North America and hundreds of attributes per road segment.

ALK's map of North America features over 6.7 million miles, over 100 million addresses, and 7.8 million Points of Interest (POIs). Globally, millions of miles are updated monthly and made available for ALK's web-based solutions (PC*MILER® Web Services and ALK Maps). ALK's CoPilot Truck and CoPilot Professional solutions offer quarterly map data releases that are available via USB stick updates or over-the-air through a high speed connection (e.g. LTE or WiFi) due to the file size. Updates to the application software itself can be performed over-the-air, eliminating the need to touch the truck or take vehicles out of service.

Sub-Second, Turn-by-Turn Navigation

- Local/Offline storage
- Accessible in remote or out of coverage areas

Great navigation starts with great routes but also requires sub-second response time for driver safety.

Did you know?

If a vehicle is traveling at 65 mph, it will have traveled 953 feet in 10 seconds, which is the distance of almost three football fields!

A company cannot count on a connection to a cellular network to provide urgent navigation updates that will leave their drivers in trouble. Data has to be immediately available in local storage to provide the constant feedback the drivers need. Supplemental real-time information can help but cannot always be depended upon for proper and safe navigation.

Driver-friendly User Interface

- In-cab warnings for speed limits and significant traffic delays
- Alternate routing options
- ClearTurn™ view and lane assist guidance
- Easily recognizable icons displayed on map screen to identify restrictions

How often have you missed a speed limit transition on a road you are traveling? CoPilot Truck provides real-time audible and visual notification to the driver when they are exceeding the speed limit so they can make quick corrections, helping to avoid a ticket.

There are many decisions a driver has to make, so assistance before and during navigation must be carefully considered. If the driver has local knowledge of road problems, CoPilot Truck can calculate up to three alternative routes along with the cost and time impact for each that will not violate the profile but can give the driver choices.

More and more ramps and intersections are being modified to have multiple lanes for turning making it critical to be in the proper lane when exiting. CoPilot Truck provides a ClearTurn view that displays the available lanes and provides audio/visual guidance as to which lane the driver needs to be in, thus improving the safety for the driver and other vehicles on the road.

Best Practices

Geocode Cleansing with PC*MILER

- Six digits of precision beyond the decimal place
- Validated address and geocode data

Addresses and the associated geocodes for most companies have evolved over time going from hand written instructions, or a partial address, to three digits of precision (365 ft. radius), to four digits (36 ft. radius) and finally to six digits (four in. radius). Often there will be errors in the address and the geocode puts them hundreds or thousands of miles apart. Additionally, the address is probably for the physical office location and not necessarily the proper point of entry for a truck.

PC*MILER has the capability to take a spreadsheet with addresses and geocodes, process it and generate a workbook with four different confidence levels and error messages to highlight the problem addresses/geocodes. Typically, 80% are good (about 20% of those need some cleanup) and 20% require further investigation.

Components of Truck Profiles

- Data rich maps
- Accurate Length, Height, Width, and GVWR
- Specify load type

ALK map data has dozens of data points for each road segment to provide the best navigation. The customer's responsibility is to feed CoPilot Truck the right truck/routing profile for planning the optimal route. CoPilot Truck starts off with Heavy Duty, Medium Duty and Light Duty vehicle profiles. To customize, start with Heavy Duty and select custom to create your specific configuration.

Heavy Duty is for tractor/trailer set-ups and focuses on the trailer for the dimensions and the weight which is the GVWR from the truck. There is a designated National Network and State Extensions for trailers that exceed 48 feet but not more than 53 feet long, exceeding 96 inches but not more than 102 inches wide and 13 feet 6 inches tall that drivers must follow or they will be ticketed. Selecting this category will also automatically check the box for National Network + State Extensions.

TIP:

A geocode needs to be the entry point for the truck to have proper and accurate navigation.

TIP:

When naming profiles, it is best to be very clear on the critical routing aspects that are easily recognizable by the driver as they will be selecting profiles based on the name (e.g. 48 ft, Flam, 60K lbs, 12 ft; 28 ft Twins, non-haz, 80K lbs, 12 ft 6 in).

Non-Standard Routing Needs

- ▶ For custom dimensions and weights over 26,000 pounds, the Heavy Duty category needs to be selected first and then customized. Heavy Duty is the default setting and provides the safest route; however, it will be the longest route. If a fleet includes smaller trailers, then we recommend configuring additional profiles for the smaller trailers (even if they are 48 feet long) as routing will change dramatically to shorter routes.
- ▶ There are options for pups, twin trailers, and custom lengths, widths, and heights. The more accurate the better; however, close common heights and widths can be grouped.
- ▶ Height variances of 6 inches should merit another grouping. Likewise, road/bridge weight restrictions can vary by individual tons so every 2,000 pounds (GVWR) can yield another group.
- ▶ Anything longer than 53 inches or twin 28-foot trailers, or taller than 13 feet 6 inches, requires permits and are not supported by ALK software and map data.

Routing Profiles

- Practical vs. Shortest
- National Network + State Extensions
- Hazmat class restrictions

Practical routing takes into consideration all the legal road constraints, geometries, traffic, road speeds, tolls and other factors.

Shortest routing determines the shortest truck-legal route but will invariably use routes that have more traffic, more stops, and more turns, which creates more driver stress and increases the probability for an accident.

ALK only recommends shortest routing for local delivery operations. Shortest routing is never recommended for trucks conveying hazardous materials. Practical should yield the best results on an ongoing basis.

By selecting Heavy Duty for a truck configuration, CoPilot Truck automatically checks the box for National Network + State Extensions. This is a double check for legal routing on 53- foot long, 102 inches wide, and 13-foot 6 inches tall trailers. Some customers will also choose National Network +State Extensions for safety reasons, fully realizing the routes will be longer.

Hazardous material (Hazmat) transport has many restrictions; however, restricted routing has been broken down into 6 categories: Corrosive, Explosive, Flammable, Inhalants, Radioactive, and Other/General. All the U.S. DOT Hazmat Classes can fit into each of these routing categories. It is critical to make the right selection here and if there are any questions, consult with your safety group.

Management Options

- International Borders Open
- Toll or secondary road preferences

International Borders Open allows a route to be created that will send a driver across international borders when deemed more practical than a route using domestic roads (e.g. going from Detroit, MI to Buffalo, NY). Most companies uncheck this box because they don't want to deal with the delays and paperwork needed for crossing an international border.

Note: By leaving this unchecked it will not affect cross border deliveries, only domestic deliveries.

ALK offers the ability to Use, Avoid If Possible (reasonable incremental distance), or Always Avoid. The "Avoid If Possible" setting to use that provides a compromise between time and money. The "Always Avoid" setting can prove troubling with the extra distance and time, so it merits deeper analysis for your situation.

Route or Trip Creation

- Manual entry or select POIs (Points of Interest) that are customer locations
- Work flow with navigation and RouteSync® integration (discussed in Best Practices Part III)

Once the foundational elements for creating legal, safe, fast, management approved routes are established, the next step is to create a trip. There are 3 easy ways to create a trip:

1. Manually entering/selecting stops
2. "Work flow" from a telematics service provider (TSP) or your transportation management system (TMS) that contains geocoded
3. RouteSync utilizing your TMS to generate the complete route and then sending a BLOB (Binary Large Object) to CoPilot Truck for execution.

Manual entry does not require integration so it is the easiest to get started, but has the most potential for errors. However, ALK has enhanced the process by allowing the driver to select from a wide range of options for automatic address input. They are "My Places" (frequented stops), contacts listings, selecting a spot on the map, and even entering exact coordinates. From there the driver can create the stops for a trip in any sequence, select a "Routing Profile" (based on the equipment and hazmat products), and select "Optimize Stops" in "Trip Options". CoPilot Truck will then calculate the options and re-sequence the stops for optimal routing.

TIP:

Tolls can represent a significant hidden expense when you consider the availability of non-toll roads.

Note: The “Advanced Optimization” option for CoPilot Truck can take into consideration Service Level Agreements (SLAs), delivery time windows, and other inputs to sequence a route that is optimal while maintaining the maximum number of commitments.

For more information about #2 and #3, see Part III of this Best Practices series.

The Road Ahead

The future is exciting for map data, data sources, and navigation enhancements. More sources for accuracy in weather predictions and forecasting ground conditions, traffic cameras, more traffic history, and vehicle cameras will allow companies to keep their drivers safer and make deliveries more predictable. ALK has built a strong foundation on which it will continue to grow as technology evolves.

Your Next Steps

- Know your fleet, your customers, and your cargo
- Select a commercial navigation solution that offers a comprehensive set of commercial truck restrictions, reliable offline access and a driver centric user interface

Great navigation requires the input of great details. By gathering the data customized specifically to a fleet and hauling criteria, the time spent on the road will be compliant and cost-effective. Utilize ALK to analyze your customer addresses and geocodes easily, helping to maintain the health and integrity of your address database and safely guide your fleet.



Take the extra steps to customize your navigation solution to suit your company's needs. Contact us at bestpractices@alk.com to use our actionable checklist to get you started.

Additional Resources

- 1 Contact your ALK Sales Representative for the actionable checklist specific to this whitepaper
- 2 Navigation Best Practices Part II – Advanced Commercial Truck Navigation
- 3 Navigation Best Practices Part III – TMS Integration for Customization and Tight Control

ALK Technologies is a transportation technology company dedicated to defining the optimal route to success through innovative routing, mileage, mapping, and navigation solutions.

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