

# ALK<sup>®</sup> | FleetSuite<sup>™</sup> Suite of Products



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## **PRODUCT SUITE OVERVIEW**

ALK|FleetSuite is a collection of integration software created specifically to reduce operating costs and improve customer service. The ALK|FleetSuite suite of products is based on the core functionality of PC\*MILER, the transportation and logistics industry's leading routing, mileage and mapping software solution.

ALK|FleetSuite packages PC\*MILER's truck-specific routing, driving directions, and map display capabilities in an installed Microsoft-based XML Service. The resulting modules easily integrate with your existing production environments and in-vehicle communication equipment.

Because you have the freedom to purchase only what you need with no costly per-vehicle fees, connecting your mobile office (vehicles on the road) and your back office (your server and workstation environments) is now easier than ever.

Here is a brief description of each ALK|FleetSuite module. For more detailed information, see the section dedicated to each module on the following pages.

**ALK|FleetSuite Directions** allows drivers to ask for truck-specific directions and location information using their in-vehicle communication devices. It also provides tools for populating such data into an existing transportation management, ERP or other custom-built system. Requesting information in-vehicle using a mobile communications device allows your company to save on character transmission costs associated with your satellite technology provider's data plan. It also offers a value-added service to the driver, as they can now quickly update their itinerary with reliable and accurate driving directions.

**ALK|FleetSuite Mapping** allows you to view the exact locations of multiple trucks based on their real-time latitude/longitude coordinates and to create "what-if" scenarios for complicated distribution problems. When a truck is reported as being out of route, you'll be able to pin-point its location on a map. If a vehicle is lost or stolen, you'll know exactly where it is. You'll be able to monitor and track service performance in real-time map displays and also view the historical positions of your vehicles for post-operations analysis.

**ALK|FleetSuite ETA/OoR** enhances your route and lane analysis by identifying estimated arrival times (ETA) and out-of-route (OoR) vehicles. The ETA data generated by this module enables you to provide your customers with accurate arrival times based on a vehicle's precise location. OoR data helps you monitor the efficiency of a lane's dispatched route, and when combined with ALK|FleetSuite Mapping and ALK|FleetSuite Directions, gives dispatchers the ability to send optimized driving directions to drivers that take them from their current OoR location to their destination on an efficient route.

## **ALK|FLEETSUITE DIRECTIONS**

ALK|FleetSuite Directions generates dock-to-dock driving directions, with customized levels of text compression, that can be transmitted via satellite technology to an in-vehicle device. Using this module, cross-country and/or street-level truck-specific driving directions can be sent to a driver using complete detailed directions or in a condensed format that uses 90% fewer characters.

When fully condensed, the direction reports generated by ALK|FleetSuite Directions are the lowest cost transmissions available.

ALK|FleetSuite Directions gives users the tools to select from seven (7) levels of condensed directions before transmitting information.

### **Output Options – Text Compression Levels**

<b>Condense Level</b>	<b>Information Provided in Output File</b>
Level 0	Provides the least amount of characters in the direction report
Level 1	Provides the turn instruction and distance to travel
Level 2	Turn instruction, distance, and time
Level 3	Turn instruction and Interchange (i.e., more information about the road)
Level 4	Turn instruction, distance, and Interchange
Level 5	Turn instruction, time, and Interchange
Level 6	Turn instruction, distance, time, and Interchange

#### **Level 1 Example:**

Edison, NJ, to Hatboro, PA

S Reed St 0.0  
 L Central Ave 0.1  
 R Plainfield Ave 1.2  
 S US 1 21.7  
 S I 95 11.5  
 BR X 49 0.2  
 W PA-332 14.5  
 R E Montgomery Ave 0.2  
 S PA-263 0.4



#### **Level 5 Example:**

Princeton, NJ, 1000 Herrontown Rd to Warminster, PA, 1174 Nassau Rd

S Herrontown Rd 0.0 + Herrontown Rd US 206  
 S US 206 8.8 + US 206 Ramp  
 S I 95 9.6 + I 95 X 49  
 BR X 49 0.2 + X 49 PA-332  
 W PA-332 11.5 + PA-332 W Bristol Rd  
 R W Bristol Rd 2.2 + W Bristol Rd Log College Dr  
 L Log College Dr 0.3 + Log College Dr Nassau Rd  
 L Nassau Rd 0.1 1174 Nassau Road, Warminster, PA, 18974

**NOTE:** Turn instructions are abbreviated: S is South, N is North, W is West, E is East, BR is Bear Right, BL is Bear Left, L is Left, and R is Right.

The benefits provided by ALK|FleetSuite Directions include:

-  Reduced character count dock-to-dock directions transmission
-  Reduced costs associated with your satellite technology provider's per-character transmission charge

- Easy integration with your transportation management system, ERP or custom-built system
- Reduced costs associated with lost drivers
- Driving directions that are based on ALK's North American Highway Network, 30 years in the making and the industry standard for routing, mileage and mapping
- Reliance on the most accurate commercial truck-specific data available
- Calculate an immediate ROI based on real business success related to optimized efficiency, reduced operating costs, increased driver retention, and improved customer service.

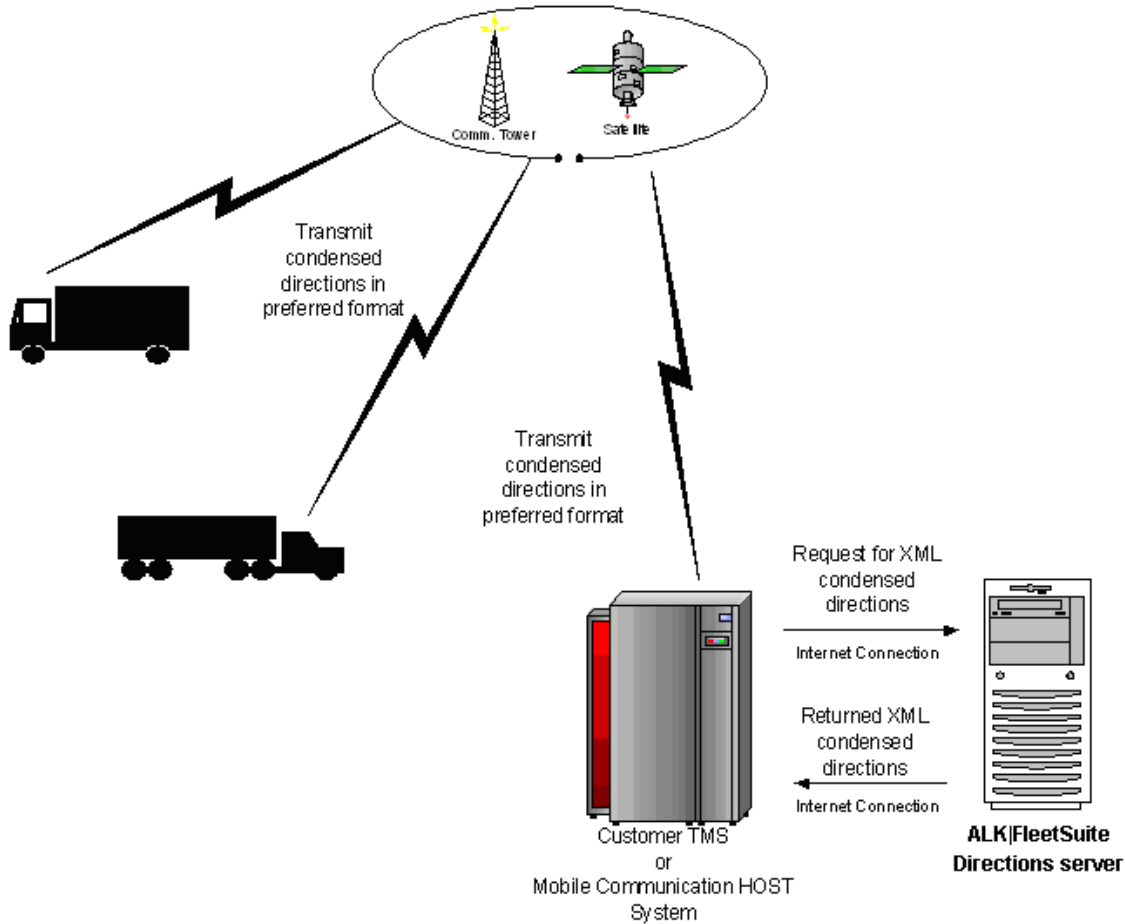
## **ALK|FleetSuite Directions Technical System Overview**

The interface utilizes Internet-based HTTP protocol accessed through an XML interface with a direct connection to a server to communicate information. The XML Interface allows the client (your software application that you wrote) to request information from the ALK|FleetSuite Directions web server to then send to your in-vehicle devices or third party software. It is set up just like any other Microsoft-based website; that is, an administrator must create the site using Internet Information Services.

The interface supports HTTP POST, HTTP GET and SOAP (Simple Object Access Protocol), but does not support the ability to push information to a client or device in the vehicle, the information must be requested. If you need to request and send directions to multiple vehicles (for instance, all the condensed text directions for an entire fleet of vehicles and drivers), users can set up their applications to request directions for each driver when needed. This can be initiated from a dispatch system, or a driver could request directions from the vehicle via a mobile communication device.

Because the ALK|FleetSuite XML Interface uses the HTTP protocol, it is possible to use a web browser to see and transmit the needed information without having to write any software to communicate to the interface. All requests are sent to the installed ALK|FleetSuite XML Interface and are made via web requests to the ALK|FleetSuite URL. Each request has a Result Tag and a Reason Tag.

Below is a diagram that shows the flow of information as it is requested from ALK|FleetSuite Directions:



## ALK/FleetSuite Routing Options

Routing options determine how a route is calculated and the weight (priority) of each road type in the routing algorithms. There are two basic routing types, Practical and Shortest, which can be combined with one or more of the other available routing types (Toll Discouraged, Hazardous Materials, Heavy/Light Vehicle, Borders Open/Closed, National Network, and 53'/102" Trailer Routing).

**Practical Routing** represents the distances and routes a driver would normally take to minimize time and cost. Practical Routes model the trade-off between taking the most direct path and staying on major, high-quality highways. Practical routes consider distance, road quality, terrain, urban/rural classifications, truck-restricted roads, and designated principal and secondary thru-routes.

**Shortest Routing** represents the distances and driving routes a vehicle would take to minimize total distance traveled while still following a reasonable, truck-specific route.

**Toll-Discouraged Routing** avoids long stretches of toll roads without taking impractical detours to avoid toll bridges and tunnels.

**Hazardous Materials Routing** generates point-to-point distances and driving directions for hauling hazardous materials while ensuring compliance with nationwide hazmat,

government and DOT regulations both in the U.S. and Canada. Routes can be generated for the following hazardous materials: Caustic, Explosives, Flammable, General, Inhalants, and Radioactives.

**Heavy/Light Vehicle Routing** allows you to override both truck-prohibited and truck-restricted roads if your vehicle weighs less than 80,000 lbs. (A “heavy vehicle” is one weighing at least 80,000 lbs.) When Light Vehicle routing is used, vehicle-prohibited roads will always be avoided, but truck-restricted roads are considered in route calculations. (Preference is normally given to Interstates, major highways, and major thru-roads where possible.)

**Borders Open/Closed Routing** applies to Intra-U.S., Intra-Canada, and Intra-Mexico routing. If Borders Open is active, the generated route will cross international boundaries when necessary to determine the best route. Otherwise, borders will not be crossed; for example, if all stops on a route are in the United States, the resulting route will stay in the United States even though the most practical or shortest route would normally involve some Canadian mileage.

**National Network Routing** is based on a government-designated highway system for over-dimensionalized vehicles.

**53'/102" Trailer Routing** is also based on a government-designated highway system for over-dimensionalized vehicles and incorporates the legal road designations for 53'/102" trailers.

### **Data Quality: ALK's North American Database**

In order to have confidence as you integrate truck-specific routes, reports, mileage and maps into your production environments, you need to understand where the supporting map data comes from, how it's built and how it's maintained.

Throughout its 30-year history, ALK Technologies has been a leader in advancing the state of the art in transportation map data. Because we develop and maintain our own proprietary database, we understand the intricacies of the underlying data. ALK's manufacturing processes are ISO 9000 certified to ensure quality products are delivered to our customers.

ALK's data development strategy has always included leveraging the major investments made by U.S. government agencies that invest in our efforts. ALK Technologies provides the worldwide distance standard for the U.S. Department of Defense (DoD) Defense Table of Official Distances (DTOD). Consequently, all motor carrier and logistics companies handling freight and personal property shipments for the DoD are bound by DTOD mileage for payment and audit purposes around the world.

ALK also leverages our own intellectual property and core expertise in map data, custom routing algorithm design, and proprietary network editing to achieve and maintain our industry leadership position. No other company can match ALK's unique blend of state-of-the-art map data, truck-specific routing expertise, and transportation and logistics focus, along with an established leading market position.

In 1989, ALK started development on our street-level map database by integrating data from the U.S. Census' TIGER files. Since then, ALK has enhanced its Master Map Data files with each new version of the U.S. Census TIGER files. This dataset includes updated U.S. Postal Service address locations and new streets throughout the continental United States.

Our database also includes information taken from the U.S. Geological Survey and direct feedback from ALK customers, other public and private data sources, state auditors, DOT professionals, and various other governmental departments; and our digital cartography team uses high-resolution aerial photographs to edit and improve the digitized information. Essentially 100% of ALK's proprietary interstate system, 100% of our National Network routing and 100% of the U.S. highway-level and street-level systems has been geographically aligned to GPS standards (20 meters, "3-sigma" error variance; 5 meters, "1-sigma"). For each road segment, we also have historic travel time and speed history. Every major interchange on these highway systems has been correspondingly GPS-aligned for accuracy. This data is used to determine a road's class, the accessibility of the road to truck travel, the historical road speed, as well as to determine truck-designated, truck-prohibited, and truck-restricted roads.

### ***Comprehensive Coverage***

ALK's quality map database is the back-bone of our award-winning industry-standard products. Our cutting edge products combine both our first-class data and our advanced routing algorithms to ensure that your vehicles get to the right place using the best route possible, always taking into consideration restricted and designated truck-specific routes.

ALK's map database provides the most comprehensive coverage available for North America. ALK was the first company to offer nationwide, seamless, address-to-address routing in 1997. In 1998, ALK released the industry's first commercial dock-to-dock routing solution and has since upgraded all of its commercial solutions to offer this leading edge competitive capability.

Since that time, ALK has continued to lead the market with enhancements to improve the accuracy of its address-to-address routing, and has incorporated extensive points of interest data, exit numbers, highway ramp structures, truck services and facilities information. ALK's North American products include highway-level detail for U.S., Canada and Mexico and offers an extensive street-level routing network for the U.S. and Canada.

### ***Data Collection***

ALK's map data has been developed, enhanced, and refined over the past 30 years. We collect some of the most important data from our customers – thousands of miles of GPS tracks each month are used to meticulously adjust our road network. This excellent source of field data is combined with thousands of public and private map data sources including detailed satellite imagery, digital orthoquads, and data from a variety of government sources including the U.S. Postal Service, U.S. Census Bureau, U.S. Geological Survey, and Statistics Canada.

## Quality Assurance

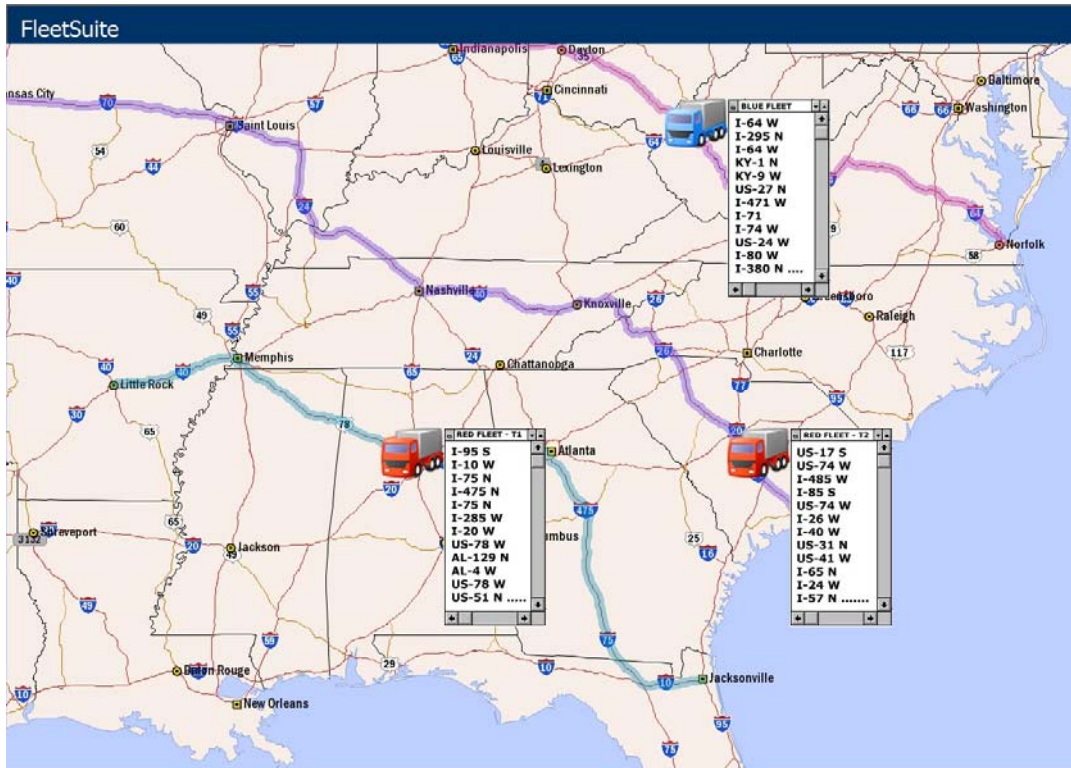
The ALK map database goes through an extensive quality assurance program that includes verification of street information with independent sources, review of field data, and a comprehensive internal and external testing program.

## ALK|FLEETSUITE MAPPING

It's one thing to know where your vehicles are, but sometimes it's necessary to see their exact location. When a vehicle is reported as being out-of-route by a user-specified number of miles/kilometers, ALK|FleetSuite Mapping lets you pinpoint its location on a map to help you determine why. Users can view the locations of multiple vehicles based on their real-time latitude/longitude information. If a vehicle is lost or stolen, you'll know exactly where to find it.

As an XML Service, ALK|FleetSuite Mapping is set up just like any other Microsoft-based website; that is, an administrator must create the site using Internet Information Services. The interface utilizes Internet-based HTTP protocol with a direct connection to a server to communicate information. The XML Interface allows the client (your software application that you wrote) to request maps from the server (the ALK|FleetSuite XML Interface web server). The request includes the information necessary to get the data or perform the operation to request information.

The interface supports the HTTP POST, HTTP GET and SOAP (Simple Object Access Protocol). The map is delivered as a Base64-encoded buffer. The Base64-encoded buffer is then converted to GIF image format using a standard decoder.



Simulated Image of ALK|FleetSuite Products

## Product Benefits

- 🚗 Visualize real-time geographic relationships in your data:
  - Where are your pickups and deliveries?
  - Where are your drivers compared to your loads?
  - Where are your customers in relation to your warehouses or distribution facilities?
- 🚗 Integrate real-time maps into your dispatch operation
- 🚗 Create ‘what-if’ scenarios for complicated distribution problems
- 🚗 Track equipment location and status in real time:
  - Map the current location of vehicles
  - Monitor and track service performance
  - See historical positions of your vehicles for post-operations analysis
- 🚗 Automatically update map displays when data changes
- 🚗 Customize icons and colors on the map to differentiate your data

## ALK|FLEETSUITE ETA/OoR

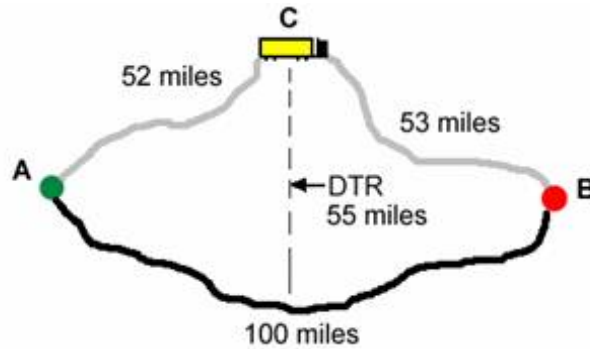
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### How are ETAs and OoR Miles Calculated?

ETA and OoR calculations assume that each vehicle’s planned route is using directions generated by ALK|FleetSuite Directions. ALK|FleetSuite routes are the industry standard for efficient vehicle routing and are therefore appropriate for these calculations. There are two basic routing types, Practical and Shortest, which can be combined with one or more of the other available routing types (Toll Discouraged, Hazardous Materials, Heavy/Light Vehicle, Borders Open/Closed, National Network, and 53'/102" Trailer Routing). *(Please see “ALK|FleetSuite Routing Options” on p. 5-6 for route type definitions.)*

**ETA times** are calculated from a vehicle’s origin, destination, and current position. ALK|FleetSuite runs a route between a vehicle’s current location and its destination, and the time estimate for that route is used to estimate an arrival time.

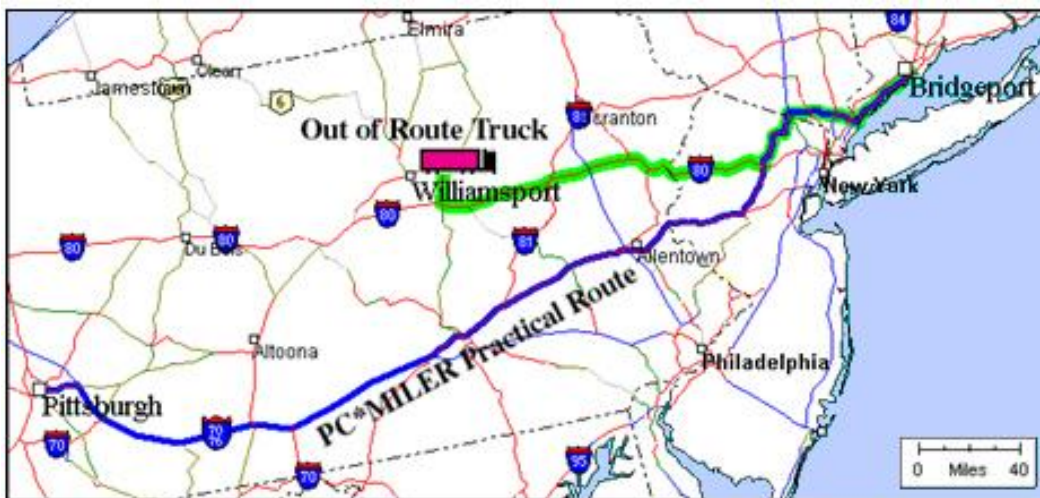
**OoR miles** are estimated as follows: Imagine a vehicle’s planned route goes from point A to point B, and the vehicle is currently at point C as shown below.



ALK|FleetSuite adds the distance from A to C and from C to B, and then subtracts the distance from A to B from that number. In the illustration above, the estimated OoR mileage for this vehicle would be 5 miles (105 minus 100). DTR (“Distance To Route”) miles in the illustration reflect the driving distance from a vehicle’s current position to the closest major intersection along the planned route. All distances are based on an ALK|FleetSuite calculated route between each set of points (A to B, B to C, C to A).

For example, let’s say you have dispatched a vehicle going from Bridgeport, CT to Pittsburgh, PA. The planned route starts on I-80 and takes I-78 around Allentown, PA and I-70/76 into Pittsburgh. Your driver, needing to detour around a major traffic accident, opted to stay on I-80 instead of following the Practical route. This is not a bad alternate route if he stays on I-80, although it is slightly longer and takes more time than the generated ALK|FleetSuite Practical route.

However, using the ALK|FleetSuite ETA/OoR component in conjunction with the ALK|FleetSuite Mapping module, suppose the vehicle in question leaves I-80 and travels north on I-180 to Williamsport, PA (as shown below on the map). In this case the OoR calculation may point to a problem that needs to be addressed, alerting you to a route deviation and visually confirming it on the map.



*Out of Route Truck in Williamsport, PA*

## **Product Benefits**

- Keep your vehicles on the most efficient routes to save time and money, making both the manager and the customer happy
- Receive out-of-route information for all your vehicles to ensure they're on the right track at all times
- Provide your customers with accurate arrival times based on a vehicle's precise location, boosting confidence in your services

## **SYSTEM REQUIREMENTS**

ALK|FleetSuite provides its information to customer applications through an installed Microsoft-based XML service. General system requirements are below.

### ***Hardware:***

- Intel 1.5 GHz processor or higher
- 512 MB of RAM minimum
- 2.5-6 GB of hard disk space, depending on the module(s) purchased

### ***Software:***

- Microsoft® Windows® 2000 Server (service pack 3 or higher), or Microsoft Windows 2003 Server, or Microsoft Windows XP Professional
- Microsoft Internet Information Services (5.0 or higher)
- Microsoft .NET Framework 2.0 or higher
- ALK|FleetSuite Software

## **ABOUT ALK TECHNOLOGIES, INC.**

ALK Technologies, Inc., Princeton, N.J., was founded in 1979 by Princeton University professor Dr. Alain Kornhauser. The expertise of ALK's team includes computer science, transportation, operations research, digital cartography, and management systems. For over 30 years, ALK Technologies has helped customers navigate the growth and transformation of transportation technology through consulting services, custom information systems and packaged software solutions. Headquartered in Princeton, New Jersey, ALK is a privately-held company with a focus on market leadership in transportation and technology.



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