# The Supply Chain Visibility Roadmap

Moving from Vision to True Business Value

November 2006

Executive Summary

Supply chain executives identify improving visibility as their number one priority. They overwhelmingly desire better transparency to orders, inventory, and shipments across their extended supply chain. Yet most companies still have rudimentary levels of visibility, using a hodgepodge of spreadsheets, carrier tracking systems, and homegrown department-centric applications. Visibility leaders have deployed visibility software with cross-functional access and resolution and analysis capabilities, and they are achieving better results than their peers across key metrics (Figure i). For instance, they are **2.4 times as likely** to have reduced their inventory levels since 2004.

Figure i: Advantages of Using Supply Chain Visibility Technology
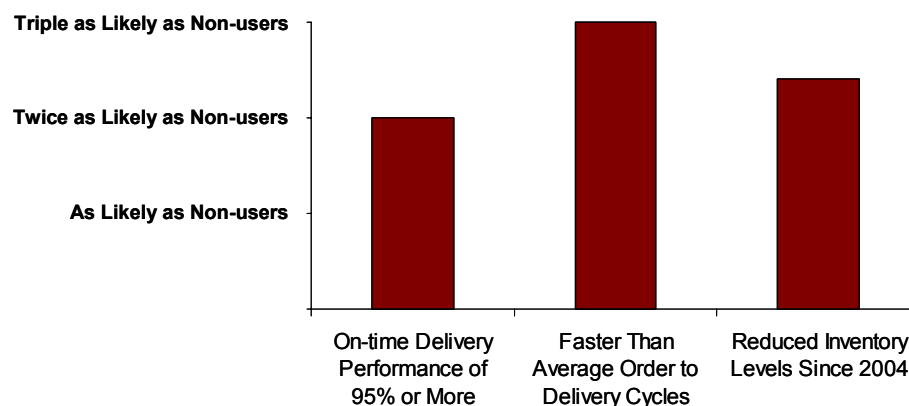
Source: Aberdeen*Group*, November 2006

Maximizing Visibility Benefits

Top performers avoid using visibility technology to create a turbocharged tracking system; rather, they use visibility systems to drive sustainable improvements in lead times, delivery reliability, and inventory reductions. Many of them are now focusing on using visibility information to protect gross margin and capture more market share.

The Roadmap to Visibility

Companies can learn from the stumbles and successes of the visibility trailblazers to create a lower-risk, higher-reward roadmap for success with visibility technology. This report identifies the steps for a successful visibility program that improves supply chain productivity, responsiveness, and reliability. Key areas addressed include:

- How to select an appropriate solution from the 10 styles of visibility technology

- Best practices in gaining accurate, timely status information from trading partners

- How to use visibility to improve your response to supply chain disruptions

- Top methods for using visibility technology to create sustainable supply chain improvement and market advantage

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Chapter One:
Issue at Hand

Key Takeaways

- About 80% of companies are taking action or implementing plans to improve supply chain visibility.
- Companies are prioritizing visibility programs to enhance customer satisfaction and reduce inventory and operational costs.
- Organizational and IT challenges are inhibiting companies from faster adoption.

Business processes at most companies are transforming from inward-focused actions to outward-facing processes that must harness knowledge and synchronize activities across suppliers, logistics providers, and customers. Unfortunately, most companies' IT systems have not kept pace with the speed of business change.

While early adopters in the late 1990s and early 2000s broke ground on creating visibility and control across externally focused processes, the majority of companies focused on deploying ERP and supply chain systems that would help them get their *internal* data and processes in order. Externally focused processes were often managed in manual-intensive ways with poor visibility. "We were managing the international aspects of our $1 billion business on spreadsheets," explains one company.

Aberdeen Group research shows a new focus today on externally focused supply chain processes, with improved supply chain visibility being the top priority. The good news is that companies can learn from the stumbles and successes of the early adopters to create a lower-risk, higher-reward roadmap for success with their visibility initiatives.

Top Priority: Improve Supply Chain Visibility

From May to September 2006, Aberdeen researched visibility usage in multiple surveys across a total of 524 companies (see Appendix A). Roughly 80% of respondents have taken action or are planning to take action over the next two years to enhance their technology for domestic shipment, global supply chain, and inventory visibility (Figure 1).

Figure 1: Percentage of Firms Deploying or Planning to Deploy Visibility Solutions
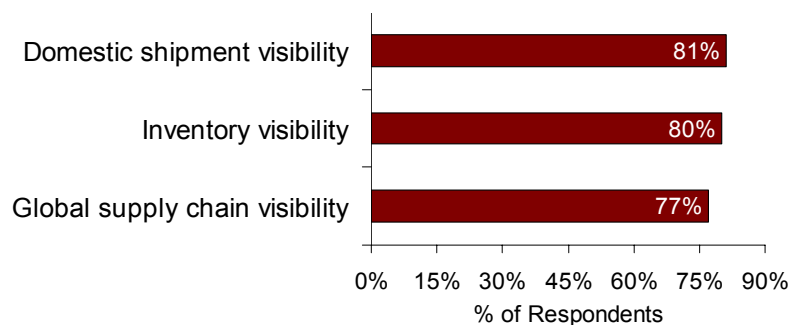
Source: Aberdeen*Group*, November 2006

Drivers for Improving Visibility

Why are supply chain organizations and their executive management so concerned with improving visibility? As Figure 2 shows, companies are foremost concerned with improving customer satisfaction and with reducing cycle times and lead time variability to lower inventory and operational costs.

According to the CEO of a midsize company, the delivery-related enhancement it has planned that will make the **biggest impression on customers** is "providing them with the ability to see the trucks en route for their deliveries and pickups with estimated times of arrival, all via the Web."

Figure 2: Top Pressures for Improving Supply Chain Visibility
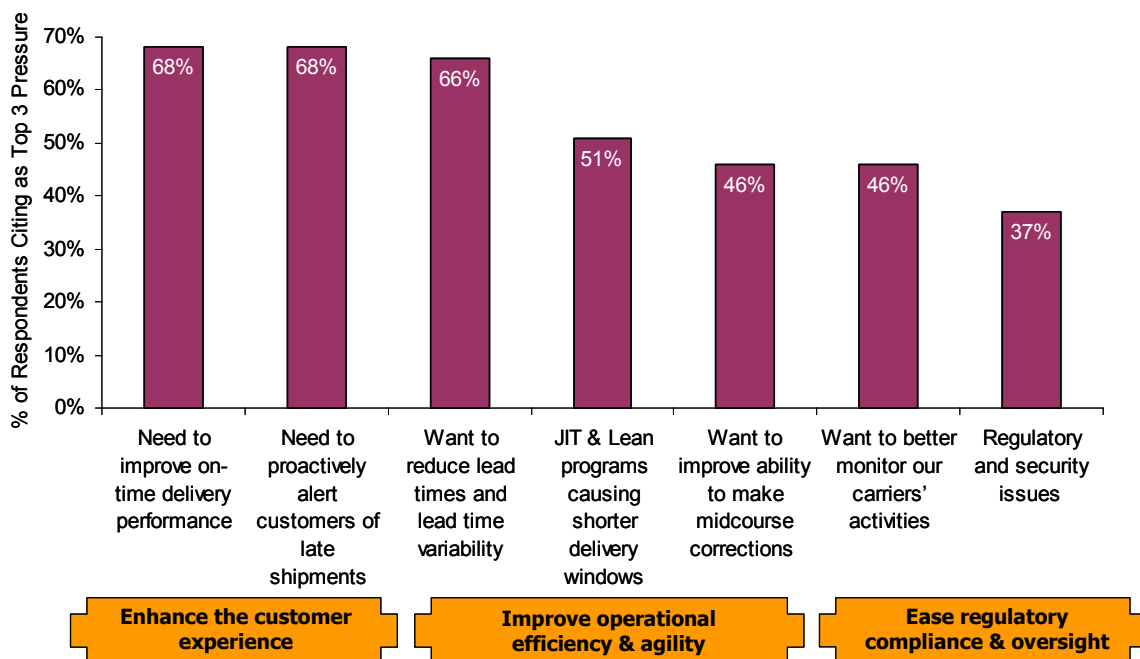
Source: Aberdeen*Group*, November 2006

Fully 79% of large enterprises (over US$1 billion in revenue) point to a lack of critical supply chain process visibility as their top concern for managing their global supply chain operations. Because global supply chains are inherently complex, multi-party processes with high degrees of uncertainty, visibility technology is essential to moving to a more productive, exception-based management practice.

Levi Strauss & Co., for example, uses an on-demand supply chain visibility application to track its international shipments. "The tool provides more complete and accurate data regarding finished goods destined for the United States, which has allowed us to better manage incoming products and proactively address issues by exception," says a Levi Strauss logistics process consultant. "As a result, the cost of tracking inbound shipments has been **reduced by 98%.**"

Obstacles to Achieving Visibility

Although companies desire better visibility, many hesitate to invest in the time and technology required to achieve it. Part of the issue is organizational: Who is responsible for visibility since the need for it typically cuts across organizational functions and regional boundaries? More important, who should actually fund the program given that the benefits are companywide?

Other challenges include technology deployment. One of the IT organization's greatest concerns with new technology projects is the amount of interfaces that must be built and maintained to other systems. Visibility systems have to gather information from multiple internal and external systems; this alone has been enough to dissuade many companies from moving forward with these projects. However, web services, B2B hubs, and transportation carrier portals are now making interfaces more manageable.

The third notable challenge is learning how to drive strategic business improvement from visibility information. Companies seeking operational improvement and financial value from visibility technology have to move from basic "where's my stuff" shipment tracking to supply chain disruption management and supply chain improvement. As will be discussed, additional technology and organizational capabilities are needed to achieve this.

Chapter Two:
Key Business Value Findings

Key Takeaways

- Companies that are best at minimizing inventory costs are more than twice as likely to use a supply chain visibility system.

- Visibility leaders track six or more milestones for their shipments.

- Over the next two years, more than half of companies plan to expand the number of trading partners and events tracked for international shipments.

Today, a "have" and "have not" situation exists with supply chain visibility. Best in Class companies have already deployed advanced visibility technology and are learning how to drive better customer service and internal productivity with these tools. Meanwhile, companies that are not actively monitoring their shipments and inventory positions are falling behind in supply chain performance and customer service.

Aberdeen research consistently finds that companies with better supply chain visibility are performing better and are gaining market advantages. Performance benefits include:

- **Inventory Reductions:** Companies that are Best in Class in inventory management are ***2.4 times*** *as likely* to use a supply chain visibility system. These top performers have customer service levels of at least 96% and have reduced inventory levels since 2004, often by 20-30%.

- **Cycle Times:** Companies using a visibility system are ***three times as likely*** to have faster order to delivery times as those companies that have no plans to adopt such a solution.

- **On-Time Deliveries:** Companies that track more than 80% of their domestic shipments are ***twice as likely*** as their peers to have an on-time delivery rate of 95% or higher.

This link between better visibility and better financial results is becoming clearly recognized across industries. A respondent at a large North American industrial equipment manufacturer explains: "To help improve the bottom line, we need more accurate overall supply chain visibility."

Benchmarking Today's Supply Chain Visibility

Table 1 shows the extent of companies' visibility today into their international orders and shipments. About 45% of companies report tracking zero to two milestones or events for their typical international transaction, 34% track three to five milestones, and 21% track six or more milestones.

Table 1: Global Visibility Events Tracked

Supplier Events	% Respondents Tracking Event
1. Order acknowledgement matches purchase order	37%
2. Raw material arrival at supplier	16%
3. Projected production plans	32%
4. Supplier production process events	19%
5. Advance shipment notice created	34%
6. Advance shipment notice matches purchase order	24%
In-Transit Events	% Respondents Tracking Event
1. Carrier pickup of goods	19%
2. Customs clearance	32%
3. In-transit events at shipment level	28%
4. In-transit events at order-line level	12%

Source: Aberdeen*Group*, November 2006

Tracking more international order and shipment events is especially important for companies that:

- Experience variability in supplier order fulfillment performance
- Seek to reduce cycle times and thus want to more actively manage shipments around bottlenecks
- Experience regional demand fluctuations and thus seek to reroute or reallocate shipments in transit
- Have consolidation and pooling strategies to lower freight costs

A European pharmaceutical company has 180 users worldwide that use an on-demand international visibility system to monitor 750 trade lanes on six continents. By effectively mining the information collected, the company found significant opportunities for consolidating shipments, lowering transportation spend, reducing expediting costs, and addressing potential shipping issues before they impact customer service. It also helped them exploit more opportunities for competitive advantage in new markets. All total, the company **cut its inventory costs by $55 million** in its first year of using the visibility system and lowered its total logistics spend by 5%.

For domestic shipments, there's a similar split between companies with widespread visibility and those that have minimal visibility: 41% of companies monitor only one or two milestones per domestic shipment, such as shipment departure and shipment arrival. On the other end of the spectrum, 28% of respondents track six or more milestones for their domestic shipments.

Companies seeking to provide more consistent customer service and wishing to improve manufacturing and warehouse throughput should evaluate the benefits of increasing their domestic shipment visibility. This is especially important for companies with:

- Time-sensitive, shelf-life sensitive, promotional-intensive, or high-value goods
- Significant quantities of less than truckload shipments, where goods can be delayed at carrier line-haul facilities
- Intermodal shipments, where delays can occur between mode changes (e.g., rail to truck movements)
- Private or dedicated fleets, where vehicles need to be rerouted in response to new order requests or delivery issues

P&G has begun tracking shipments from its 35 plants in the United States and Canada to its retail customers using the visibility capabilities in its on-demand transportation management system. P&G has been able to **improve on-time delivery performance from 94% to 97% on key lanes**.

Current Visibility Technology Usage

Today, almost two-thirds of companies surveyed by Aberdeen use some sort of global shipment visibility technology (Figure 3), though many of these systems provide just simple "where is my shipment" status information and often are department based. In addition, nearly a third of firms now report using commercial visibility software, which often includes order line-level tracking, event management, and analysis functionality.

"*Companies planning on building robust visibility systems internally should think twice,* as the upfront costs can be huge," warns a vice president of supply chain who attempted an in-house development project. "If you use an on-demand commercial system, your upfront costs are much lower. Moreover, if the system doesn't work as expected or your people don't use it that much, then you have a much easier exit strategy."

Figure 3: Technologies Used for Global Visibility
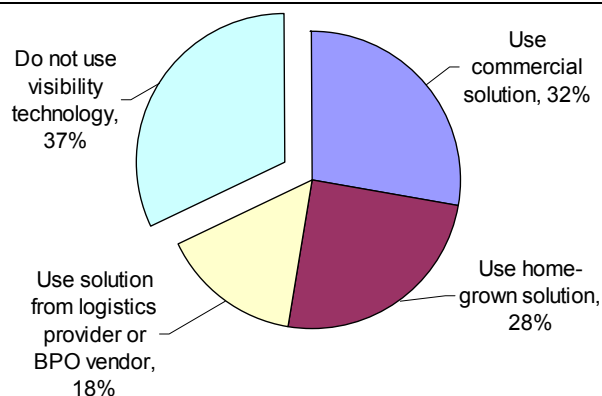
Source: Aberdeen*Group*, November 2006

Figure 4 illustrates the array of technologies used to track domestic shipments. Many companies are using multiple technologies, which leads to disparate information sources that are more time-consuming to use and more challenging to do reporting and analysis

against. Nearly a third of firms use a commercial transportation management system for domestic shipment tracking, and 17% use a commercial supply chain visibility system. More than half use their transportation carriers' online tracking systems, and more than a quarter use their third-party logistics provider's visibility solution. In addition, 44% of companies report using spreadsheets as part of the way they track domestic shipments.

Figure 4: Technologies Used for Domestic Visibility

Because respondents were asked to identify all systems used for domestic visibility, total chart %s add up to more than 100%.
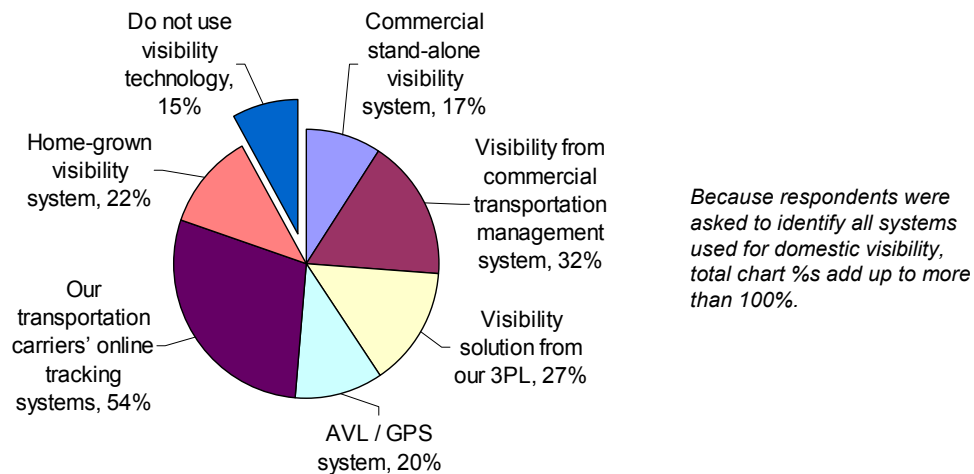
Source: Aberdeen*Group*, November 2006

International Visibility Enhancement Plans

Table 2 lists the Top 10 visibility improvements planned by respondents for monitoring their international shipments.

Table 2: Top 10 Enhancements Planned for *Global* Visibility Systems

Top 10 Enhancements Planned in Next 2 Years	% Respondents Planning to Enhance
1. **Expand number** of trading partners providing status information	54%
2. Incorporate **additional status events**	50%
3. Track **actual total landed cost** as shipment/order progresses	45%
4. Incorporate **resolution advice** or workflow (e.g., expedite advice)	45%
5. Add financial settlement or **financing triggers**	45%
6. Add **warning alerts** if actual events deviate from plan	44%
7. Add **RFID-enabled visibility**	43%
8. Add **escalation policies** to help manage alerts	43%
9. Performance trending and **root cause analysis**	42%
10. Add visibility into **mobile assets** (e.g., containers, equipment)	41%

Source: Aberdeen*Group*, November 2006

Companies are on a path to take their visibility systems far beyond basic order and shipment tracking. They are looking to turn these systems into exception-based process management platforms that enable staff to manage exceptions rather than micro-managing steady-state processes. Key elements include escalation policies to ensure corrective action is being taken, incorporation of resolution advice or workflow (such as expediting options and policies for late shipments), and performance trending and root cause analysis of disruptions and lead time fluctuations.

Innovators, especially in the retail community, report expanding their visibility solutions so they can see total landed cost build as transactions occur and identify discrepancies with cost targets. A company can then take action to protect its gross margins, such as shifting to a slower but lower cost of transportation for later legs of a shipment, ensuring product is moved before demurrage fees rise, or changing pricing or promotions.

Companies also desire enhanced insight into current and time-phased end-to-end inventory positions – in motion and at rest, including vendor managed inventory – as well as mobile assets such as containers and equipment. A key future enabler for this is RFID technology. Incorporating RFID data into their visibility solutions is on the roadmap for a surprising 43% of respondents. In fact, respondents express concern that few visibility systems today are set to handle RFID-tagged products, containers, or mobile assets – and they are also concerned that global RFID standards are still in flux.

Case Study: Bakers Footwear Improves Its Supply Chain Velocity

Bakers Footwear Group, a U.S. retailer with over 260 stores in 38 states, competes on its ability to bring fashionable footwear and related accessories for women with a passion for fashion. "Our primary supply chain challenge is moving inventory as quickly as possible from the Chinese factories into our U.S. stores and warehouses for quick replenishments," says Charlie Kantz, vice president of logistics.

Rather than adopt a visibility technology on its own, Bakers Footwear asked its international logistics provider, Transmodal Associates, to work with the company to select and deploy a commercial visibility solution. Transmodal plays a critical role as information gatherer, ensuring timely status updates from all the involved parties; this even includes Transmodal staff taking status calls by telephone from some suppliers and keying the status updates into the visibility system. Transmodal also uses the system itself to check the purchase orders' "start ship" date so it can prebook containers.

> To drive quicker inventory turns, Bakers Footwear focused on gaining visibility inside the third-party deconsolidation center.

Bakers Footwear's logistics team uses the visibility system to monitor the container bookings, delivery to the Chinese consolidation facility, loading into the shipping container, container arrival at the Los Angeles port, delivery and receipt into the third-party deconsolidation center, and tracking to the store. The company is able to change the allocation for in-transit goods (e.g., the quantity and store location to send the cases of shoes) right up until the goods enter the deconsolidation facility. This delayed allocation helps lower store stockouts and reduce markdowns.

Bar code labeling at origin: As part of the visibility project, the bar code labeling of cases (which had been done at the West Coast deconsolidation facility) was moved back to the Chinese factories and consolidation center. The Chinese facilities are able to print the barcode labels directly off the visibility system, ensuring high-quality labels and accurate case-level tracking of goods. The process change has eliminated the time and cost of having the U.S. deconsolidator do the labeling. The deconsolidator now just scans the pre-applied label and attaches the shipping document.

Labeling at origin has also dramatically reduced lead times for the company's air freight shipments. Bakers Footwear can now send the goods directly by air, prelabeled for final store destination, thus avoiding having the packages go through a U.S. distribution center. This has lowered freight costs and **reduced factory-to-store cycle times from 10 to 12 days down to five to seven days**.

Visibility into deconsolidation activity: To drive quicker inventory turns, Bakers Footwear concentrated especially on visibility into the third-party deconsolidation center. It now monitors activities at the West Coast deconsolidation center such as unloading and scanning of cartons, repacking and re-labeling activities, and outbound shipping. This helps the logistics team identify where delays are occurring (e.g., a carton was scanned at 11 a.m. but no other action was recorded for 90 minutes) and work with the deconsolidator to remove bottlenecks. By using the visibility system and shifting barcode labeling to China, the processing velocity at the deconsolidation center has **improved by 30%**.

Domestic Visibility Enhancement Plans

Companies are planning similar enhancements in their domestic visibility programs. Table 3 shows the Top 10 visibility improvements planned by respondents. Note the high percentage of firms wishing to calculate future inventory positions and new estimated times of arrival (ETAs), as well as improve issue escalation and resolution processes.

Table 3: Top 10 Enhancements Planned for *Domestic* Visibility Systems

Enhancement	Have today	Plan to add in next 2 years	Interested but no formal plan	Total Interest Level
1. **Warning alerts** if events deviate from plan	33%	19%	43%	**95%**
2. View current **at-rest and in-transit inventory**	29%	14%	52%	**95%**
3. Visibility down to an **order-line level**	32%	18%	41%	**91%**
4. **Escalation policies** to help manage alerts	14%	19%	57%	**90%**
5. **ETA updates** based on actual events	36%	23%	27%	**86%**
6. Role-based **views for other departments**	19%	5%	57%	**81%**
7. Visibility into **mobile assets**	14%	19%	48%	**81%**
8. Time-phased visibility of **future inventory positions**	0%	24%	57%	**81%**
9. **RFID**-enabled visibility	5%	24%	48%	**77%**
10. **Resolution advice** or workflow	5%	24%	48%	**76%**

Source: Aberdeen*Group*, November 2006

Case Study: Grocery Gateway Improves On-Time Deliveries

Grocery Gateway is Canada's leader in online sales of home-delivered groceries, offering consumers 90-minute delivery windows. To reduce lead time variability and improve customer service, Grocery Gateway deployed a visibility solution that equipped its drivers with GPS-enabled mobile phones that automatically update the planned delivery route and all its associated metrics. Drivers simply push two buttons on the phone on completion of deliveries to report back to head office. GPS pings are also sent from the phone, automatically updating the location, speed, and direction on maps that can be accessed anywhere through a standard web browser.

> Grocery Gateway deployed a GPS-enabled visibility solution to reduce lead time variability and improve customer service.

"Embracing technology has had a positive impact on our business," reports Kurt Mann, the company's operations manager. Within six months, Grocery Gateway **improved its on-time delivery performance by nearly 10 percentage points.** The company is now able notify consumers in advance if there will be a delay, enhancing customer satisfaction and retention. Improved visibility also has improved Grocery Gateway's fleet productivity, exceeding its stops per paid hour target by 12.4%.

Chapter Three:
# **Building a Visibility Roadmap**

Key Takeaways

- Plan a roadmap that will help you evolve from shipment tracking to disruption management and supply chain improvement that drives market advantage.
- There are 10 major types of visibility applications from which to choose.
- Data quality and role-based views and analysis are critical to user adoption and return on investment.

The vast majority of companies are planning to expand their supply chain visibility capabilities with the goal of driving out cost, time, and uncertainty from their operations. Basic shipment tracking is rapidly becoming a "must have" to satisfy customer and internal demand for status information. However, just knowing "where's my stuff" on an ad hoc basis provides relatively low business value.

Companies seeking operational improvement and financial value from visibility technology are moving from shipment tracking to supply chain disruption management and supply chain improvement (Figure 5). A critical success factor for these advanced processes is to prevent users from becoming overwhelmed with visibility data by using technology to filter and analyze the information so users can manage by exception.

Figure 5: Driving Increased Value from Visibility Technology
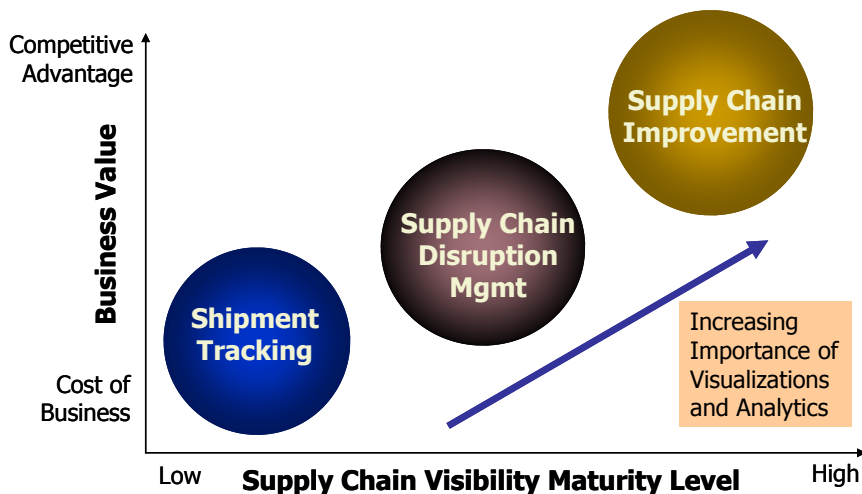
Source: Aberdeen*Group*, November 2006

- **Shipment Tracking:** Systems that provide shipment tracking answer the question of "where is my stuff." *Effective shipment tracking improves customer satisfaction and helps internal operations plan better for incoming workload.*

- **Supply Chain Disruption Management:** Disruption management adds the ability to alert users proactively if shipments are deviating from planned milestones (e.g., shipments are early or late or incomplete), provide escalation workflow, and assist in problem resolution. *Effective disruption management improves on-time delivery performance, lowers expediting costs, and reduces detention/demurrage charges.*

- **Supply Chain Improvement:** The greatest financial value comes from using visibility information to identify and eliminate root causes of delays. This requires statistical analysis and pattern recognition. *Effective supply chain improvement reduces lead times and variability, enables lower inventory investment, and cuts freight costs.*

Building a Roadmap for Supply Chain Visibility

There are five critical steps to succeeding with supply chain visibility technology: (1) defining the strategy, (2) selecting the technology, (3) creating a rollout plan, (4) improving disruption management, and (5) driving supply chain improvement.

1. Defining Your Visibility Strategy

Pitfall to Avoid: *Defining the grand, perfect strategy*

Devise a strategy to delivery improved visibility into the highest problem areas as soon as possible and then expand from there. Too many companies spend years talking about how to gain better visibility but never pull the switch on taking action. Visibility is an on-going journey that requires new organizational skills and many midcourse adjustments as trading partners and business strategies evolve. The sooner you start, the better you will become at it.

As part of the strategy process, create an "as is" assessment of the key metrics targeted for improvement. These can include cycle times, on-time delivery performance, safety stock levels, inventory obsolescence, out of stocks, expediting costs, staff productivity, detention and demurrage charges, etc. Identify both cross-functional metrics and department-based metrics (such as reduced freight costs from the logistics group or improved on-shelf availability and reduced order cycle times from the purchasing organization) and identify who in the organization has ultimate responsibility for improvement of each metric. Include in the strategy how improvements will be tracked, and how on-going internal marketing and incentive programs will be created around them.

> Visibility is an on-going journey that requires new organizational skills and many midcourse adjustments.

Building the Business Case

In building the business case for a visibility technology investment, the majority of companies interviewed report justifying it on headcount reduction (or the ability to handle increasing shipment volumes without needing headcount additions).

- "We had too many manual spreadsheets, emails, and follow-up phone calls to service providers," reports the logistics manager for Li & Fung, one of the world's largest consumer products export trading companies. "With an auto-

mated system, we were able to make the case that our logistics staff could do more and provide better customer service without increasing headcount."

- "Growth was our biggest issue," says the director of sourcing at Burton Snowboards, a fast-growing snowboard and apparel producer. "Our supply chain group was not able to keep up. We'd been managing off of spreadsheet-based work in progress updates from our vendors for our 56,000 SKUs and it was just too much manual work."

- A CPG manufacturer reports justifying its visibility system by showing how the system would tighten up inventory levels and help the company allocate inventory to where it is needed most.

- A retailer justified its visibility system based on anticipated improvements in vendor documentation and order compliance levels, such as minimizing purchase order document discrepancies that cause customs delays. "Time reductions equal inventory reductions equals saving money," explains the retailer's director of planning for international operations.

Six Sigma, Lean and other quality-oriented groups in organizations can also become important supporters of visibility initiatives. One pharmaceutical manufacturer reports that it was able to justify its visibility system because of the ability to deliver detailed, high-quality supply chain data to the corporate Six Sigma team, helping the team analyze where supply chain errors and delays were occurring and prioritize supply chain improvement projects.

Organizing the Visibility Project Team

Establish a cross-functional team with an executive sponsor, a dedicated project manager from the operations side, and dedicated IT resources. For inbound visibility programs, ensure that representatives are included from IT, purchasing/merchandising, logistics, trade compliance (if international shipments are involved), the EDI department, and customer service. Also consider making sales, marketing, and finance part of the extended project organization, as the information captured by the visibility system can also be leveraged by these departments.

Don't expect other departments to be supporters of the initiative out of the gate. ("Getting our merchants on board was challenging," says a retail vice president.) Clearly articulate the value for each role in the organization before, during, and after the rollout via a continuous marketing and education initiative. "We had our purchasing managers, IT department, and logistics group involved in the process of selecting our visibility vendor," reports a high-tech respondent. "To gain buy in, we made it a collective decision."

A retailer that has successfully deployed a visibility solution across hundreds of its suppliers further recommends that vendors and logistics partners be involved before a project is kicked off to lay their groundwork for their support.

2. Selecting Visibility Technology

Pitfall to Avoid: *Failing to leverage new advances in service-oriented architecture to ease integration and improve information access*

The good news and the bad news is that there have never been so many different options for gaining supply chain visibility. Table 4 describes 10 styles of visibility technology available to companies, which can be classified into three categories: (1) internally developed systems, (2) systems provided by logistics providers, and (3) systems from commercial technology vendors.

Table 4: Profiles of the 10 Major Types of Visibility Technology

Category	Description	Most Appropriate for:
Internally Developed Visibility Technology		
1. Homegrown Visibility System	System built internally or custom developed by your enterprise	Companies needing rudimentary tracking and having sufficient IT and logistics resources to build and maintain solution; building more complex visibility systems in-house has often led to large cost overruns and delays
Visibility System Provided by Logistics Provider or Portal		
2. Carrier or Forwarder Tracking System	Web browser access to "where's my stuff" using the shipment tracking number More advanced solutions support tracking by other reference numbers (e.g., PO #, SKU #) and alerts	Companies seeking low-cost (often free) system to track shipment events (vs. supplier in-process milestones or network inventories) Companies that don't mind having users go to multiple carrier sites to track goods
3. Cargo Portal	Hub that provides booking and tracking across multiple ocean carriers Statuses for shipments booked with member carriers are typically free	Companies that rely on multiple carriers for international shipments and seek a single, low-cost system to track shipment events
4. Visibility System from 3PL	Visibility system implementation and maintenance is handled by the third-party logistics (3PL) vendor Often deliver functionally rich solutions that provide similar features to commercial visibility solutions. They bring the added benefit of on-ground logistics and vendor management capabilities. Some 3PLs have built their own systems while others "white label" a commercial solution.	Companies with significant logistics outsourcing to a single 3PL vendor and that are willing to be tightly tied to that provider
Visibility System from Commercial Technology Vendor		
5. On-Premise Commercial Visibility System	Visibility application implemented at your company System typically contains flexible line-item tracking, alerts, escalation workflow, role-based dashboards, and analytics	Companies seeking comprehensive visibility into order, shipment, and inventory statuses across all aspects of their business and that wish to move up the value curve around shipment resolution and supply chain improvement Companies with sufficient internal IT and trading partner enablement resources to implement and maintain system

Category	Description	Most Appropriate for:
6. On-Demand Commercial Visibility System	Visibility application hosted by the software vendor and typically paid for on a subscription basis; sometimes part of a larger global trade management suite Often comes with pre-connections to carriers to speed implementation time or enablement programs to hook up suppliers System typically contains flexible line-item tracking, alerts, escalation workflow, role-based dashboards, and analytics	Companies wishing to leverage the vendor's IT resources and carrier and supplier enablement experts for faster implementation, easier ongoing maintenance, and lower up-front costs Companies seeking comprehensive visibility into order, shipment, and inventory statuses across all aspects of their business and that wish to move up the value curve around shipment resolution and supply chain improvement
7. Commercial Transportation Mgmt System (TMS)	Tracking capabilities that are an extension of a TMS; typically support transportation-related resolution workflow; may also support tracking of logistics assets Some systems also support tracking of shipments not managed via the TMS (e.g., inbound from supplier). On-demand TMSs may come with carrier enablement and pre-connection services	Companies seeking to leverage their TMS to track shipment events (vs. supplier in-process milestones or network inventories), trigger routing changes, and analyze shipment lead times, lead time variability, and on-time performance May need to work with TMS vendor to build out role-based views or leverage web services to distribute information to other departments
8. Visibility System from Electronic Messaging Vendor (e.g., EDI VAN)	Leverages your existing messaging connections with trading partners to feed relevant data into an on-demand or on-premise visibility system provided by the messaging vendor	Companies with significant purchase order and status message volume being handled by a single messaging vendor
9. AVL/GPS System for Fleets	Automatic vehicle location (AVL) system with GPS tracks the location of vehicles and display them as "breadcrumb trails" on a digital map; typically includes reporting capabilities Can be a stand-alone system or part of a fleet routing application	Companies with private/dedicated fleet operations
10. Supplier Collaboration Portal or Hub	Inbound orders, advance shipment notices, and inventory status are tracked via a supplier portal or B2B collaboration hub Typically have strong supplier in-process monitoring and resolution functionality but limited in-transit monitoring and analysis capabilities	Companies whose major tracking and reliability problems are supplier-related versus logistics related

Source: Aberdeen*Group*, November 2006

Many companies start by using a combination of homegrown and carrier tracking systems and evolve to using more robust on-demand or on-premise commercial solutions. Companies also commonly use a combination of technologies across different parts of

their supply chain (e.g., an AVL system for tracking their fleets, a visibility system for international shipments, and a TMS for domestic shipments).

"Find a provider that you are comfortable with, because there will be bumps," advises a vice president of logistics at a North American retailer.

One decision factor to consider when selecting a visibility technology is whether you require just shipment-level visibility or whether you also need order-line visibility. For instance, order line visibility helps companies identify not only that a truck is running late but what specific line items on a customer order, production line schedule, or sales promotion may be impacted. Views of at-rest and in-transit inventory positions and mobile assets (such as containers, trailers, and racks) are also capabilities found in some advanced solutions. These views are helpful for reducing the overall amount of assets and inventory in a supply chain.

> "Find a provider that you are comfortable with, because there will be bumps."

Be very clear in the evaluation process exactly what the solution will provide and what type of internal integration will be needed and what associated process and technology changes will be required. "Our implementation process was truly painful," reports one company. "We had to do lots of programming on our side because of the way we assign internal tracking numbers for containers. The visibility system we selected was not designed to do support this way of tracking."

Also be sure to identify what can be done within the visibility system and what is better handled in an external analytics tool or report writer. For instance, many visibility systems are limited as to which data fields can be reported on from the visibility system and whether data calculations can be made (e.g., summing up lead time data or calculating lead time variation by shipment leg). "The hardest part was getting the reports we needed from the system," confirms one study participant.

Anyone considering improving their visibility technology needs to educate themselves on service-oriented architectures. Web services and service-oriented architecture are making it easier to pull information from your enterprise's legacy systems and access data from transportation carrier, freight forwarder, and third-party logistics provider systems. In addition, service-oriented architectures support the construction of composite workflows that can span multiple applications; for instance, this can enable visibility technology to orchestrate the resolution of shipment delays by triggering an expediting action in a transportation system or a transshipment order in an ERP system.

Finally, carefully weigh the level of support you desire from your visibility solution provider when choosing your flavor of technology. For instance, a close partnership with a logistics service provider for visibility technology can drive competitive process advantage. However, because the tradeoff is being more tightly coupled to an individual provider, there needs to be a high degree of trust and joint commitment to innovation.

Case Study: Belkin Automates Its International Supply Chain

Belkin is a $1 billion global computer accessories manufacturer that distributes cables, networking equipment, iPod accessories, etc. Belkin sought to upgrade its international supply chain processes to reduce costs and improve information accuracy. "I was challenged to improve our supply chain," explains Glenda Welch, Belkin's director of corpo-

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rate transportation and logistics. "The traditional excesses of manual processing, repetitive emails, and poor shipment tracking were stagnating buyers and managers alike."

To help simplify and automate its international supply chain, Belkin selected a new logistics service provider that could deliver a robust visibility system and provide on-ground supplier management. "Even though we have overseas staff, we wanted a provider that would also represent us overseas," says Welch. "Vendors would often provide incorrect data about whether a shipment was on schedule or had left their premises, so we needed someone to police them.

> "The logistics service provider visibility solution we selected is much more than a tracking system."

"The logistics service provider visibility solution we selected is much more than a tracking system," she continues. "It gives us control of everything from purchase order management processes, to carrier allocations, document management, container capacity utilization, visibility to inventory on the water, and insight into when goods will hit our distribution centers."

Because Belkin's buyers now have access to the visibility system, Belkin's logistics group receives many fewer emails and "where's my shipment?" calls, improving staff productivity. Moreover, Belkin's purchasing operations has been able to reduce headcount by two staff members; these employees had previously been typing in ASN data manually. The system's reporting and KPI information also is helping Belkin improve its planning processes and more easily adjust to the inevitable changes and delays in the supply chain. Other benefits have included:

- **Improved overseas vendors' ability to meet their ship windows.** The system helped Belkin insert multiple checkpoints in the process, which improved vendor compliance. For instance, the system reminds the logistics service provider to contact the vendors 14 days before the expected ship date to check if the order is on track. If the vendor has not booked the shipment on time, the buyer at Belkin will receive a message that his vendor is overdue.

- **Improved container capacity utilization**, resulting in a 21% reduction in per cubic meter ocean freight costs. Before the system was implemented, some containers would only be 45% full. Thanks to the improved vendor compliance rules enforced by the visibility system, most containers are now at least 85% full.

- **Reduced ocean freight costs by $2 million** through a combination of rate negotiation and allocation management, improved vendor management and shipment compliance, and improved container capacity utilization.

3. Creating a Rollout Plan

Pitfall to Avoid: *Turning on too many alerts and status milestones in the initial rollout*

Selecting a technology is just a preliminary step, of course. The most important aspect of a visibility project is its rollout. Based on the experiences of early visibility system adopters, specific steps can be taken to improve the odds of a successful rollout.

Determine which areas of the supply chain to concentrate on first. Identify small, simple to digest projects. For some companies, this will mean concentrating on a certain domes-

tic region or a subset of international trade lanes; for others, it will mean concentrating on a certain transportation mode or a set of low-performing carriers; for others, their focus will be on shipments for key customers; still others will focus on creating end-to-end visibility for certain product lines, perhaps those product families with the greatest demand-supply fluctuations, highest value, or most time sensitivity.

Another consideration for determining the scope of the initial rollout program is to assess the availability of quality status data. Successful pilot programs often focus on areas in which better visibility will lead to significant improvements in lead times and on-time delivery performance *and* that involve suppliers and carriers that can provide accurate, timely status information in a structured electronic message (e.g., EDI). Some companies, for instance, start with receiving status messages from their freight forwarders and then work to hook up smaller carriers and the supplier community in later stages.

Gaining Trading Partner Connectivity and Data Quality

Many companies choose to rollout the visibility connection process in waves of 10 to 15 suppliers and carriers. Ideally, the chosen technology will support high-tech methods (e.g., XML or EDI) and low-tech methods (e.g., web forms or messaging appliances) – and in some instances even no-tech methods (e.g., fax-to-EDI conversion). When hooking up suppliers, it is important to have both purchasing and logistics departments involved in overseeing and promoting the enablement process, as well as internal IT resources or the technology vendor's enablement group.

Data quality must be a primary focus of this process. In fact, 47% of companies benchmarked by Aberdeen say they are making plans to improve the data quality of their visibility event messages.

> The quickest way to derail a visibility project is to shortchange the data quality process.

Companies that don't focus on data quality will find that users will not be able to find statuses for many of the orders they wish to track or will see data that is incomplete or makes no sense. This is the quickest way of derailing a visibility project. There are three key actions to take around data quality:

- **Start with the smallest set of event data possible that will still drive value.** Then incrementally add more status milestones as your company learns to use the information and ensure data quality. A frequent mistake that companies make is trying to collect as much status information as possible from day one. "Keep it simple," concurs a respondent. "The more complicated it is, the more open to data errors it will be." Focus on milestones where you can take direct action to mitigate delays. For instance, many companies find it valuable to monitor when overseas vendors have failed to make carrier bookings for their shipments on the date expected. This helps them intervene earlier in the shipment process, reducing delays and enabling them to manage down inventories accordingly.

- **Set up processes to monitor data quality** from each trading partner connected, measuring timeliness, completeness, and accuracy of data. Expect the quality of data to be poor at first: Many companies report data quality of 50% from their carriers when they first bring up a visibility system; by identifying issues and collaboratively working to resolve them, this level can be brought up into the 90+% range in a few months. You may also need to build cross-reference tables

to avoid receiving large amounts of "orphan" status data that cannot be linked to specific shipments, orders, etc. Some vendors provide trading partner enablement and data quality monitoring technology and services that can greatly assist in making the visibility data accurate and usable.

- **Ensure that data quality becomes part of the scorecarding and selection process** for your trading partners and logistics. Configure the visibility system so it will automatically monitor the date completeness, timeliness, and (for key data fields) accuracy from each trading partner. Make inputting status information (via EDI, XML, or web form) a requirement for suppliers and carriers to do business with your organization. Some companies apply penalties for noncompliance, such as a $50 invoice deduction for each day that a document is late.

Case Study: Cost Plus Improves Data Quality

Cost Plus, Inc., a U.S.-based specialty retailer with 286 World Market stores in 35 states, has successfully deployed a solution from an on-demand supply chain visibility solution provider. Prior to implementing the on-demand visibility system, the retailer had built an Access database system and uploaded status information from its consolidators twice a week. However, the poor timeliness and accuracy of the data was a big issue. "We needed to drive more confidence in our visibility system," explains Rhona Lishinsky, senior director of logistics and customs compliance. "Our merchants and inventory controllers didn't trust the data in our old system, so our logistics team was constantly barraged with questions from them on shipment status." The company selected an on-demand visibility provider with a strong track record of data quality management and pre-existing carrier relationships.

World Market has been able to improve data quality from its logistics providers from an initial 60% up to a current level in the high 90s.

"When we first activated the on-demand solution, it was like pulling teeth to get timely data from the steamship lines," says Lishinsky. "They were giving us about 60% data quality [as measured by the timeliness and completeness of data]. We now have most providers delivering data quality in the high 90s. Data quality is an on-going process; it will start to dip down again and we will have to go back to our providers and have them fix it."

"The ocean carrier may think it is not a big deal to have a delayed estimated time of arrival update. We have to explain that our distribution centers are doing their labor planning off this information, so it is a big deal," says Lishinsky. "Visibility is an initiative that touches our finance, inventory control, merchants, distribution center, and logistics teams, so the domino effect of poor data is extensive."

With confidence in the on-demand visibility system's data quality, Cost Plus' merchants are now managing by exception. "It is much faster for them to identify purchase order issues," explains Lishinsky. "Our merchants can scan for orders that are in jeopardy of missing their ship window vs. having to look at each purchase order. Or they can use the system's filtering capabilities to look at the status of just the purchase orders that are in-transit over the water and that are for a specific advertising campaign."

Enabling Cross-functional Information Access

Visibility systems collect an immense amount of data. Rather than expect users to wade around in the system to find the information they need, seek to configure the visibility application so that it "serves up" the appropriate information and helps them work in an exception management fashion. *Role-based views and personalized task lists and exception reports are vital to achieving high user adoption of the visibility system across multiple departments.* For instance, at Liz Claiborne more than 100 people across the company access visibility information on a daily basis from an on-demand visibility system. Also investigate how web services can be used to deliver visibility information directly into users' current application environments.

External stakeholders can also benefit from access to the visibility system. For instance, Germany-based Tchibo, which operates over 1,000 coffee shops, lets its trucking company access its visibility system to accurately assess what equipment and resources it will need for each incoming vessel from Asia.

"Spend time and money on training resources and training materials," advises one respondent. "You need to teach people how to use the system to get value." Another respondent also reminds that updated policies and procedures must be rolled out to internal and external stakeholders: "Technology alone will not create improvement."

Avoiding the Alert Trap

A trap into which many companies fall is becoming alert crazy – that is, setting alerts on all sorts of milestones and events. In the initial rollout phase, using alerts is even more dangerous because many will be false alarms caused by poor data quality. Users will start ignoring the alerts and real supply chain disruptions will go unnoticed amidst all the alert noise.

Many companies that gain the most value from visibility solutions work hard to minimize the number of e-mail alerts used in order to prevent alert overload, which can drive staff away from using the system. Instead, they become masters at using exception reports and on-line task sheets to manage activity. For instance, a user may configure the system to deliver a daily report of orders in which the advance shipment notice does not match the purchase order line-item quantities or a report that identifies containers approaching the end of their free storage time at a deconsolidator. *In general, small and midsize companies find they can effectively use exception alerts, while large organizations with huge shipping volumes find they work more productively by using exception reports.*

4. Improving Disruption Management

Pitfall to Avoid: *Using the visibility system as a problem detector but not using it as a way to enforce corporate resolution policies*

Leaders are evolving their visibility systems from tactical status and exception identifiers to systems that provide resolution insight and support. Many commercial visibility systems now include functionality for recalculated estimated times of arrival based on status updates and inventory pipeline visibility. These features help companies decide what actions, if any, should be taken if order or shipment status deviate from plans.

A number of systems contain rules-based escalation functionality (e.g., automatically alerting a manager if an alert is unresolved for more than a day). Some systems also pro-

vide resolution workflow and advice. For instance, if there is a shipment delay, the work-flow might automatically check the inventory system for an out-of-stock condition at a store or a safety stock violation at a distribution center. Based on this information, the system can identify where else in its network that inventory is available. The user can then decide to transfer stock from another warehouse or issue an expedited order to a different supplier.

Resolution functionality can help companies enforce corporate policies for expediting, rerouting, reallocating inventory and so on to help meet customer service level targets and profitability goals. *Capacity-smart (e.g., understanding dock, warehouse, or equipment capacity) and profit-sensitive resolutions will be the next wave of innovation in resolution management.*

5. Driving Supply Chain Improvement

Pitfall to Avoid: *Expecting a visibility system to automatically reduce lead times and inventory levels*

Using a visibility system to track and alert against shipments will help improve customer service capabilities and on-time delivery performance, as well as help distribution centers, retail operations, and manufacturing facilities better plan workload. However, using a visibility system to make lasting, structural improvements to the supply chain requires analytical discipline.

One quick opportunity area is to use visibility data to measure actual lead times across your network and update your inventory and customer service system with these times. Many companies find that their systems contain "worst case" lead times rather than accurate lead time averages. Updating the lead time values can result in quick reductions in safety stock levels, the ability to shorten order promise dates for customers, and the ability to better schedule when to drop sales orders from your ERP system to your warehouse system. One consumer goods company, for instance, found that inaccurate lead time data in its SAP system was causing some orders to be delivered five days early, while others were being delivered 20 days late.

Companies achieving the highest value from visibility technology apply statistical process control and Six Sigma analysis methods to identify recurring points of variability and delays, research their underlying causes, and take corrective action. Actions can include changing the routing of goods to avoid bottlenecks, closer collaboration with a supplier or logistics partner to prevent recurring problems, or changing inventory policies. This will result in continual improvements in lead times and process reliability. For instance, the European pharmaceutical company that was able to reduce inventory by $55 million in its first year of running a global visibility system through resetting its lead times found that disciplined analysis of its visibility data in its second year let it take additional days of lead time out here and there across its supply chain, resulting in an additional $45 million in inventory savings.

Using visibility data to feed supplier and logistics partner scorecards is another fruitful process. Common supply chain performance metrics include supplier adherence to target shipment dates, container utilization, container rollovers (i.e., the number of containers not making it onto the booked vessel due to capacity limitations), detention/demurrage charges, arrival date adherence, and transit time adherence.

Chapter Four:
Recommendations for Action

Key Takeaways

- Visibility technology drives working capital, productivity, and customer service benefits.
- **Visibility novices** should gain access to supply chain visibility technology and roll out basic tracking and alerting capabilities; **visibility best practice seekers** should add escalation policies, inventory pipeline visibility, and root cause analysis; **visibility innovators** should focus on variability analysis, resolution workflow, and gross margin management.

L everaging visibility technology is becoming a necessity for supply chain excellence because of elongating supply chains and tighter, more time-definite delivery requirements by customers. A myriad of technology options are available to gain order, inventory, and shipment visibility (see Table 4). Better visibility is proving to deliver tangible business benefits, including:

Working Capital Benefits
- Reduced safety stocks and inventory investment
- Ability to use in-transit inventory as "available inventory" for order allocation decisions and inventory calculations
- Better fleet and mobile asset utilization

Customer Service Benefits
- Faster order fulfillment (and cash-to-cash cycle) times from eliminating bottlenecks and operating off of "true lead times"
- Fewer late deliveries, resulting in decreased chargebacks and other customer invoice deductions and penalties, as well as fewer stock outs and lost sales
- Enhanced customer service via proactive issue notification and more accurate ETAs

Productivity Benefits
- Better workload balancing and productivity at manufacturing and distribution sites
- Enhanced expediting decisions and better transportation planning and scheduling (resulting in lower freight costs)

Following are recommendations for action based on a company's current visibility capabilities, whether a company is a *visibility novice* and has yet to deploy technology, a *visibility best practice seeker* looking for ways to gain more value from a visibility solution, or a *visibility innovator* striving to gain market advantage from the technology.

Steps to Success for Visibility Novices

1. Gain access to supply chain visibility technology
The ability to monitor shipment status is becoming mandatory for customer retention and in-house productivity. If you don't have the internal resources to purchase or support a visibility system, then turn to an on-demand solution that you can pay for on a subscrip-

tion basis or look to leverage the shipment tracking technology of your transportation carriers or third-party logistics providers. To track international ocean shipments, consider using a cargo portal. Look to web services to help integrate shipment information into your back-end systems

2. Roll out basic tracking and alerting capabilities

Set up milestones for the handful of the most critical work-in-progress or shipment events and configure exception reports or alerts to identify impending problems. Avoid data overload and false alerts by focusing on events in which you can access timely, high-quality data. Push this information via the Web to other departments and even to customers so they can "self-serve" select information versus having to place phone calls to determine order or shipment status.

Steps to Success for Visibility Best Practice Seekers

1. Extend supply chain visibility

Move to exception-based management of supply chain activities and slowly increase the number of milestones you monitor, such as intermediate transportation events and dwell time alerts. Start executing against a longer-term roadmap that adds escalation policies, inventory pipeline visibility, mobile asset management, etc.

2. Apply analytics to improve business decisions

Start using visibility data for more than just improving ad hoc expediting and re-routing decisions. Move to detailed performance scorecarding and root cause analysis. Mine the data to investigate recurring bottlenecks, supplier performance issues, fleet utilization and backhaul opportunities, etc. As the amount of data increases, mapping and visualizations combined with data analytics become increasingly powerful in identifying problem areas and improvement opportunities.

Steps to Success for Visibility Innovators

1. Evolve to advanced visibility with variability analysis and resolution workflow

Link visibility programs to Six Sigma or similar initiatives to identify and mitigate bottlenecks and recurring variability. Early adopters report this is proving instrumental for using visibility systems to reduce lead times and lower inventories. Start to codify resolution strategies and provide on-line resolution suggestions to users to ensure that business goals around cost and customer service are being followed. Seek ways to use visibility to protect gross margins by tracking how costs builds as a transactions progresses across the supply chain; if costs are higher than targeted, take action such as changing pricing, promotions, or shipment routing.

2. Invest in advanced information management

Refine your ability to deliver "just in time" information to users across the enterprise. Start rolling out rich "cockpit" displays that allow real-time supply chain monitoring and support drill-downs into problem areas. Look to create role-based views that incorporate key performance indicators to provide true supply chain process visibility to executives, supply chain managers, warehouse directors, purchasing departments, sales and marketing organizations, customer service agents, inventory managers, and finance.

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Prior to joining Aberdeen*Group*, Enslow was senior vice president of strategic development for Descartes Systems Group, a global supply chain software company. At Descartes, she led initiatives in such areas as RFID, wireless-enabled delivery, and inventory performance management. Before that, Enslow was research director at Gartner, Inc., where she ran its supply chain planning and logistics advisory practice on a global basis. She has worked for a number of other research and consulting organizations, including the Conference Board, a leading business think tank and economic forecasting organization. Enslow is also a lecturer on supply chain technology at the Center for Supply Chain and Logistics Management at York University's Schulich School of Business in Toronto.

Appendix A:
Research Methodology

I n 2006, Aberdeen Group conducted a number of surveys that evaluated supply chain visibility technology interest and usage. Responding supply chain, logistics, and operations executives completed an online survey that included questions designed to determine the following:

- The priority of visibility technology as compared to other supply chain technology initiatives

- The types of visibility technology in use today and the plans for technology enhancement

- The effectiveness of visibility technology in improving business results

Aberdeen supplemented this online survey effort with telephone interviews with select survey respondents and other organizations, gathering additional information on visibility technology strategies, experiences, and results.

The study aimed to identify emerging best practices for visibility technology usage and provide a roadmap by which readers could plan their own visibility initiatives.

The data used in this report were collected in the following surveys:

- Global Supply Chain Benchmark survey of 150 companies conducted in May and June 2006

- Domestic Visibility mini-survey of 41 companies conducted in July 2006

- Transportation Management Benchmark survey of 173 companies conducted in August 2006

- Inventory Management Benchmark survey of 160 companies conducted in August and September 2006

Respondents included small, midsize, and large companies across consumer goods, industrial manufacturing, distribution, and retail industries. The majority of study respondents were from North America, with the rest primarily from Europe. See the individual benchmark reports for further demographic data.

Appendix B:
Related Aberdeen Research

Related Aberdeen research that forms a companion or reference to this report includes:

- Transportation Management Benchmark Report (September 2006)
- Technology Strategies for Inventory Management Report (September 2006)
- Global Supply Chain Benchmark Report (June 2006)
- The On-Demand Tipping Point in Supply Chain Report; March 2006
- Best Practices in International Logistics (January 2006)

Information on these and any other Aberdeen publications can be found at www.Aberdeen.com.

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