

New Economy, New Vision for Transportation

Prominent Role for Intermodal Freight?

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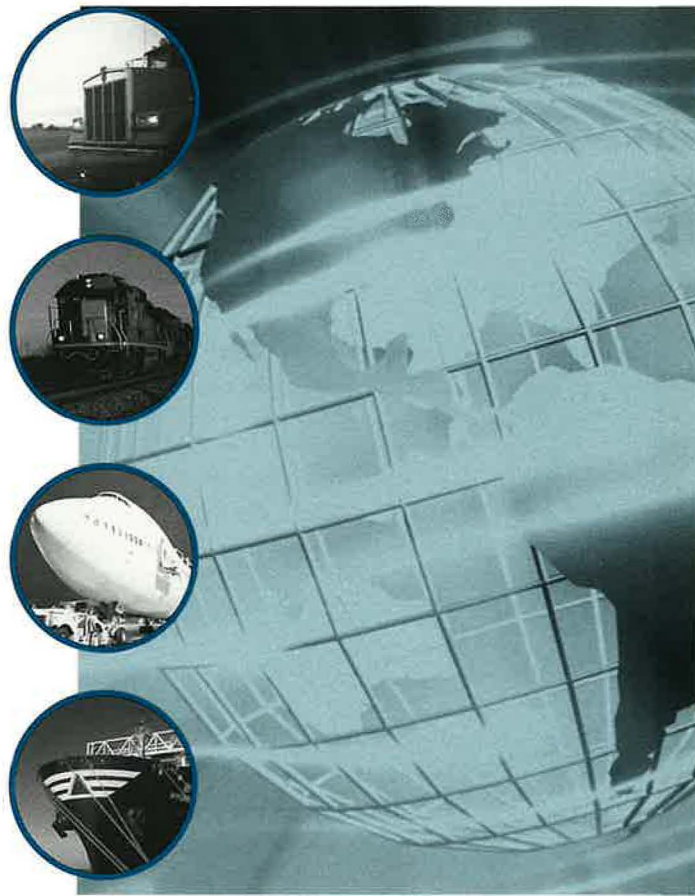
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The year 2000 concluded an economic expansion unprecedented in the United States in half a century. Industry translated productivity gains into profits, and consumer confidence reached an all-time high. Information technology was at the center of this economic surge, transforming business practices; e-commerce was the most visible transformation.

E-commerce is a business process improvement on an economic function, the trade of goods. The new technology still requires the transportation system to move goods from the point of origin to a place of higher value. Historically, transportation policy has reflected and supported market trends and community ambitions.

The most recent market changes, however, caught transportation officials by surprise. Preoccupied with addressing commuter needs for additional capacity, transportation policy makers were not sure how to deal with the demands and implications of e-commerce.

The reach of the Internet for the exchange of commodities has meant new markets, new suppliers, new labor opportunities, improved internal efficiencies, and more transportation. The e-commerce market was expected to pass \$2 trillion by 2004—comprising 20 percent of the U.S. economy. By 2003, 25 percent of all business-to-business transactions worldwide were expected to occur online and reach more than \$2.8 trillion in value. Although e-commerce was available to anyone with access to the Internet, the



forecasts suggested that business-to-consumer e-commerce revenue—12 percent of worldwide totals—would be dwarfed by the volume of business-to-business transactions.

By all standards, the forecasts signaled that the implications of e-commerce for transportation should be examined. With glacial speed, policy makers began collecting data, listening to shippers and carriers, and assessing trends.

Mixed Conclusions

To understand the transportation implications of this new business dynamic, several meetings for policy

makers, researchers, shippers, and carriers were held during the summer of 2000 and spring of 2001:

- ◆ The Executive Committee of the Transportation Research Board (TRB) sponsored the first session in June 2000;

- ◆ Two of TRB's freight committees sponsored the second session at the midyear meeting in San Diego the following month;

- ◆ A workshop convened in September 2000, cosponsored by Oak Ridge National Laboratory and TRB (see article, page 4);

- ◆ The TRB 80th Annual Meeting in January 2001 included a two-part session on e-commerce; and

- ◆ The Federal Highway Administration, the Environmental Protection Agency, the Foundation for Intermodal Research and Education, and the Port of Portland sponsored a roundtable discussion in Portland, Oregon, in March 2001.

The following are key points from the sessions.

1. Business has new expectations for transportation system performance, which affects the bottom line.

- ◆ The declining cost of access to information has led to gains in productivity. Information technology has stimulated worldwide gains from trade.

- ◆ Competition applies pressure to cut costs. Transportation is an external cost that must be managed. The supply chain requires improved efficiencies; in many markets, congestion and a lack of reliability in the transportation system will have an adverse impact.

- ◆ Consumers exert increased influence on products and delivery. The business-to-consumer model assumes transportation access to all consumers.

- ◆ Institutional decision making that does not keep up with the rate of change in the economy risks making inefficient or erroneous investments.

- ◆ Competition among regions for transportation service availability and capacity may have effects contrary to such community goals as economic growth and livability.

2. Shippers and carriers are still a long way from embracing e-commerce.

- ◆ Face-to-face interaction remains the hallmark of many shipper and carrier relationships.

- ◆ Executives see e-commerce as a comparative capability—that is, carriers with e-commerce capabilities that allow collaborative planning with shippers have an advantage over those that do not. However, most e-commerce initiatives planned by carriers for the next several years focus on improving transactional functions, not on e-commerce initiatives for collaborative efforts with shippers (1, p. 15).

- ◆ Manual transactions are expected to decline from 67 percent to 31 percent of total transactions over the next two years (2), yet many carriers and shippers are building technology solutions that function independently, not interdependently.

- ◆ Shippers are looking for carriers to reduce the cost of the supply chain, but carriers lag behind in Internet implementation and in the technology to support supply chain evaluation and management (1, p. 16).

- ◆ Shippers view transportation and distribution in terms of networks instead of carriers or modes.

- ◆ Independent decisions by shippers, carriers, and logistics providers to optimize the use of transportation may overburden some parts of the system.

The Times Are A-Changin'

In 2001, the fall of the dotcom companies sent tremors through the new economy. E-commerce, the rallying cry for the next phase of economic vitality, was being stifled as quickly as it emerged. The development of a new transportation vision incorporating e-commerce was shelved prematurely.

But e-commerce is simply a business practice improvement using technology and the Internet that has spotlighted some less visible aspects of freight transportation dynamics. Trade and commerce continue, and transportation continues to play a fundamental role. Trade is growing at twice the rate of the economy (3). Current federal projections forecast a doubling of freight volumes by 2020.

Freight transportation needs have changed dramatically in the past 30 years. Some of the reasons involve market dynamics and business dynamics.

Market Dynamics

- ◆ Markets, suppliers, and labor now are located all over the world. Products and components are moving longer distances—for example, during production, some Intel computer chips travel around the world three times before reaching the final destination. Businesses must manage international supply chains.

- ◆ Information technology has improved the efficiency of business operations through automation and consistency. The Internet has introduced new market opportunities, new suppliers, and a means for assessing market demand to develop the right product in the right volume at the right time.

- ◆ The reduction in inventory translates into productivity gains but also makes the transportation system part of the production process, changing the competitive focus of business. Expectations are for system reliability to match technological developments and advances.

- ◆ Consumer incomes are rising, but personal time is limited. Consumers know the products they

want and when; the expectation is that if a product is available for ordering via the Internet, delivery should be comparably instantaneous.

Business Dynamics

◆ Logistics is a current focus of business competitiveness. In the 1800s, industry competed on production, managing the costs for the production of each unit. By the 1900s, as products caught up with demand, the focus changed to sales. By the late 1900s, the sophistication of product offerings had increased, global markets developed, and customers increased expectations (see Figure 1). Competitive businesses now must focus on managing external costs and must compete on the efficiency of the logistics system.

◆ Smaller shipments moving greater distances reflect the increased complexity of production—for example, parts arriving from all over the world for final assembly—as well as the decreased life cycle of products.

◆ Decreased on-site inventory and less production capacity means that business productivity must realize gains through just-in-time assembly.

◆ The outsourcing of logistics raises expectations for system reliability, including product tracking and time forecasting.

◆ Warehousing must be able to trade off between the availability of transportation service and capacity and the need to meet customer expectations for next-day delivery. Warehousing has a new role, serving as a point for consolidation, distribution, and sometimes assembly.

New Vision for Transportation

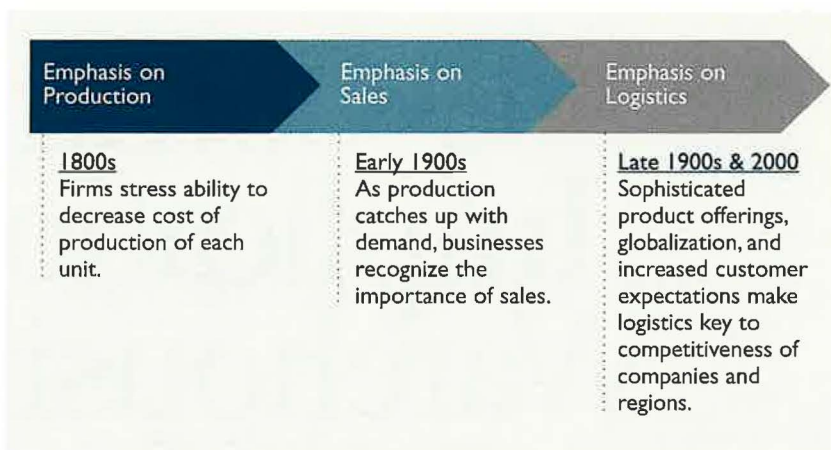
These freight dynamics add up to increased dependence on transportation services and systems. Transportation and logistics can account for 40 percent of some product costs. As a result, many businesses searching for improvements in productivity and profitability will scrutinize the management of handling and shipping first. E-commerce only accelerates this scrutiny.

Critical to the shifts in the U.S. economy are

◆ An efficient, modally competitive transportation system, and

◆ Logistically strategic distribution and intermodal facilities.

The far-flung intermodal supply chains linked to this economy demand a prominent role for truck, air, and rail freight. Transportation constraints that affect a region's trade also affect success in e-commerce.



The U.S. transportation vision for the 21st century appears fuzzy at best, at worst irrelevant to the future economy. Not aligning the transportation vision with the developing trends puts the U.S. economy at risk. Without a strategy for the transportation system to support the changes in technology and business operations, the United States will lose vital economic opportunities.

FIGURE 1 Three phases in the history of industrial competitiveness.

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