

Shipper's View

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The stated objective of this Conference on Railroad Freight Transportation Research Needs is to set priorities for research needs for the next 10 to 15 years. The underlying implication of this objective is to identify things that should be changed. Change is a curious thing: who resists change? Few will admit to defending the status quo, and many will claim to favor change. General Motors is finally serious about change. Change was brought about not by a 10-point market share loss, but by a management shake-up. Results are now being seen.

Three things are needed to effect change: identification of what should change, a plan to change (internal to an organization), and the resolve and skill to make the change. The focus here is what should change. Here is an example of what I am leading up to: the average distance a vehicle is shipped is 1,000 mi. The average transit time is 10 days, which equals 100 mi a day. Assuming 24-hr days are available for shipments to move, General Motors Corporation (GM) is delivering vehicles to dealers at 4 mi an hour—walking speed.

Here is another example: in 1980, a shipment from Michigan to California averaged 10 days transit time with a 10 percent chance of transportation damage. In 1993, a similar shipment from Michigan to California averaged 9.5 days transit time, but with a less than 1 percent chance of transportation damage. During this time, the quality of service was improved significantly, but little improvement in transit time occurred.

LINK AMONG QUALITY, COST, AND TIME

GM used to equate high quality products with high cost and low quality products with low cost. Then the Japanese came to the United States with low-cost, high-quality products and took our market share. GM had to learn a new formula; it has, and has virtually closed the quality gap with Japan. If the 1980s was the decade of quality, then the 1990s is the decade of time. GM needs to rethink formulas about time, such as fast (e.g., a Concorde) is expensive, and slow (e.g., a barge) is cheap; or trucks are fast, but cost per ton-mile is high, and railroads are slow, but cost per ton-mile is low. The Japanese changed the rules of manufacturing when they examined the economic run quantity formula (used by GM to determine the exact number to be produced) and worked on reducing the setup time to zero. GM needs to change the rules of transportation so that fast transit time can equal low cost.

TRANSIT TIME

Transit time is the total elapsed time from when a product is ready for shipment until it is delivered to its intended customer. Transit time has two major components: speed (the velocity that a conveyance moves when in motion) and idle time (the period when a shipment is not in motion).

All of the major research topics being addressed at this conference can affect transit time in some way. Improvements to infrastructure primarily affect speed and can reduce transit times. Improvements to command, control, and communication systems and to service management can also result in reduced transit times. Energy consumption and the environment can be positively influenced by a lean, low-transit-time rail transportation system, just as lean manufacturing results in lower resource requirements in the automobile business.

Transit time is a topic worthy of further discussion. Transit time is reviewed at the highest levels of GM management. Someday GM will have the manufacturing and order management capability to produce a "3-day car." We do not want to wait 10 days for delivery.

In closing, GM does not believe that transit time is the responsibility of the railroads only, but recognizes that its own business practices need to be changed as well. GM and the railroads must jointly identify those factors that need to be changed.

Discussion Group Summary: Future Trends and Visions

Participants at the Conference on Railroad Freight Transportation Research Needs identified the following as characteristics of the railroad of the future:

- Seamless service,
- Customer driven,
- Transparent physical plant,
- Competitive necessities faced,
- Commitment to time compression,
- Global competition understood,
- Quality improvement embraced, and
- Focus on safety.

VISION FOR RAILROAD RESEARCH

Research is a foundation for the railroad of tomorrow—dedicated to creating breakthroughs in safety, profitability, and growth as part of a global distribution network.

Research must be comprehensive, encompassing people, economics, hardware, software, and processes. Achieving its potential requires basic and results-oriented research. Railroads, suppliers, labor organizations, customers, universities, and governments must join together to support this effort adequately.

Effective railroad research will provide increased industry vitality; safer, more fulfilling work for employees; reliable, timely, cost-effective service for customers; and environmentally sound safe transportation of people and goods.

MAJOR THEMES DRIVING RESEARCH NEEDS

The following are the major themes that should drive railroad transportation research needs for the next 10 to 15 years.

Improved Short Line Relationships

- Improve relations between Class I and short line railroads,
- Assess future condition of short line railroad physical plant, and
- Strengthen relations with states and labor.

Improved Vehicle and Track Performance

- Accelerate incremental change to provide innovation;
- Create a fault-free railway transportation operating system for freight and passengers (e.g., infrastructure, rolling stock);
- Develop distributed power alternatives;
- Provide systematic technology transfer;
- Develop economic, reliable rolling stock with zero failures;
- Develop low-cost, short-life capital equipment;
- Conduct research to develop technology to support rapid growth;
- Conduct research to develop ways to reduce false train stops by 50 percent; and
- Eliminate slack action damage.

Development, Improvement, and Integration of Information and Control Systems

- Implement advanced train control systems—the electronic railroad,
- Develop intelligent railway transportation systems,
- Maintain electronic data interchange to support throughput,
- Develop expert systems for infrastructure and rolling stock, and
- Develop division support systems for operations management.

Improved Safety

- Research and develop ways to reduce train derailments by 50 percent,
- Eliminate accidents at highway rail crossings,
- Improve the safety of hazardous materials transportation, and
- Eliminate job-related worker injuries.

Understanding and Development of New Markets

- Develop and promote the entire concept of seamless transportation;
- Offer acknowledged environmentally friendly services;
- Communicate benefits of rail transportation;
- Create a unique trilateral system from the customer point of view;
- Develop effective short-haul services (bulk, heavy manufactured, and intermodal);
- Investigate ways to reduce shippers logistics costs;
- Increase volume of bulk commodities, which form traffic base;
- Bring back the value added of transportation to the railroad (more retail, less wholesale);
- Count trucking companies as customers instead of competitors;
- Strive to be more market oriented and more market connected and earn higher returns as a result;
- Review continually the defense need for rail transport, and conduct research as warranted;
- Make recyclables an attractive market;
- Research how to extract more value added (including antitrust);

- Research innovative contracting practices and customer needs;
- Understand cost variability with severe induced fixed cost;
- Develop measures of revenue sensitivity to time variance;
- Compete successfully for the less-than-500-mi merchandise market;
- Develop total logistics capability;
- Define what it takes to compete profitably in 2003; and
- Provide seamless single-point contact.

Focus on Customers

- Reengineer management structure to streamline decision process,
- Change culture to become sensitive to customer, and
- Develop seamless operating-marketing interface.

Capital Formation Issues

- Use profit center accounting.

Real Estate Opportunities

- Conserve real property and use land intensively, and
- Establish real property needs for the future (and bank that land).

Passenger Transportation as a Business

- Improve efficiency of commuter trains,
- Conduct sensible research on integrating passenger services, and
- Look at passenger traffic as a new market.

Managing Research and Development

- Develop supplier railroad technology,
- Perform a competent benefit-cost analysis for each research project at an appropriate point after completion,
 - Identify source of research dollars,
 - Identify research projects in which the public interest is such as to justify public support,
 - Increase research expenditures,
 - Conduct research on methods to reduce transit time, and
 - Conduct research to promote reliance on performance (instead of design) specifications.

Global Focus

- Globalize railroad technology,
- Invest substantially in foreign railroads,
- Exploit railroads' generally attractive clearances in pursuing unit-load transport as part of the vision for the future,
 - Conduct research on processes through which railroad innovations develop and are diffused,
 - Leverage research as a national strategic advantage, and
 - Internationalize and leverage research.

Human Resource Development

- Develop a constructive labor organization environment,
- Achieve employee buy-in to technology,
- Continue to improve labor productivity,
- Develop human factors research program,
- Accommodate, manage, and profit from diversity in the workplace,
- Eliminate department boundaries,
- Learn to manage employment growth,
- Create a work paradigm that allows employees the opportunity to contribute when they are on duty,
 - Provide decision aids for operations personnel,
 - Provide employee training and retraining, and
 - Conduct rail employee surveys.

Service Improvement

- Explore passenger train service for containers,
- Handle nonbulk merchandise traffic like intermodal traffic,
- Explore new intermodal combinations (e.g., air-rail shipments),
- Duplicate the Florida East Coast Railway service,
- Recognize container transport as the emerging mode,
- Conduct research to determine ways to best penetrate the truck market,
- Reduce capital cost and time in container terminals,
- Reduce nontransit time by 50 percent,
- Improve shipment tracking and tracing,
- Investigate methods of improving equipment use,
- Determine ways to expand terminal and line haul capacity at minimal cost, and
- Determine ways to overcome intermodal interchange barriers.

Shaping Public Policy

- Reconsider and revamp industry-government relationship for partnership in research, including adoption of new technology, creation of level playing field, and passage of legislation favorable to railroads;
 - Conduct joint railroad-government research;
 - Develop methods for participating in transportation planning processes with metropolitan planning organizations;
 - Determine changes required in current legislation and regulation to enhance rail transport; and
 - Assess impact of legislation on future transportation of coal.

Environment

- Develop environmental-related business opportunities,
- Increase environmental awareness,
- Undertake risk analysis of transportation and cleanup of environmentally unsafe materials, and
 - Become involved in regulatory process as it pertains to the environment.