



CANADIAN NATIONAL RAILWAY COMPANY

Enabling a Service-Led Railway with SAP® ERP

SAP BUSINESS TRANSFORMATION STUDY



Canadian National Railway Company, partnering with SAP, created a platform for business transformation and efficient, long-term growth for its best-run business.





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CANADIAN NATIONAL RAILWAY COMPANY

AT A GLANCE

Industry	Logistics service providers
Revenue	CAD 7.7 billion in 2006
Employees	22,250
Location	Montreal, Canada
Web Site	www.cn.ca
SAP® Solutions & Services	SAP® ERP and SAP Product Lifecycle Management applications
Implementation Partners	Accenture, BearingPoint, SAP

Established in 1832, Canadian National Railway Company (CN) is 1 of the oldest freight railroads in the world and a leader in the North American rail industry with a network that spans Canada, mid-America, and Mexico. In 1995, CN transitioned from a government Crown corporation to a very successful public company. Between 1999 and 2004, CN acquired 3 railroads and partnered with a 4th. CN now provides shippers with unmatched transportation options and greater reach in the rapidly expanding market for north-south trade. CN has achieved the lowest operating ratio (operating expenses as a percentage of revenue) in the industry.

Key Challenges

- Solidify the focus on customers and profitability
- Create a culture of agility and innovation
- Merge the organizational structure and systems of 4 railways
- Improve analytics for financial management, asset productivity, and operational efficiency
- Manage a diverse workforce
- Adequately deal with regulatory reporting

Why SAP Was Selected

- Comprehensive functionality
- SAP® ERP focus on process excellence and innovation
- Enterprise-wide platform
- Future functional innovation for rail transportation and logistics
- Integrated functionality
- Commitment to partnership

Implementation Best Practices

- Senior management sponsorship
- Business ownership of the project
- Solid project management
- Rigorous change management
- Careful partner selection and management
- Rapid realization of business benefits with a phased implementation plan
- Early planning for new technologies

Low Total Cost of Ownership

- SAP software used everywhere that made sense
- Simplified Canadian National Railway Company (CN) IT architecture
- Leveraged the value of hardware, licences, and skill sets
- Assisted in the migration to a midrange platform
- Retired more than 100 legacy systems

Financial and Strategic Benefits

- Improved management of financial, material, human, mechanical, and engineering assets
- Faster, smoother integration of mergers with 4 railways, extending CN's reach across the continent
- Contributed to the improvement of the operating ratio: from 72% in 1999 to 61% in 2006

Operational Benefits

- Over CAD 400 million in hard benefits
- CAD 84 million in one-time inventory and financial savings
- Over CAD 100 million annual savings in asset, procurement, labor, and technology





“When you improve service, you lower the cost of doing business. Each time we improve the service and lower the cost, we open up markets to handle freight that we couldn’t haul before.”

E. Hunter Harrison
President and CEO
Canadian National Railway Company

KEY CHALLENGES

Over the years, Canadian National Railway Company (CN) has worked to create an extensive railway network and a culture that encourages change to make the most of its opportunities. Many new opportunities were created when senior management changed the framework of operations from the railway principle of scheduling trains to a more customer-focused strategy. Now, CN emphasizes improving transit reliability through more effective scheduling of shipments, rather than just scheduling trains. This cultural shift created opportunities in the following areas.

Solidifying the Focus on Customers and Profitability

To scale for strong and efficient growth, CN reoriented its railroad culture toward one of generating profits through efficient asset management and superior customer service.

Creating a Culture of Agility and Innovation

Faster growth required CN to emphasize flexibility, agility, and innovation. The transformation moved the company toward precision railroading, with precise scheduling and execution of service for customer shipments.

Merging the Organizations and Systems of Four Railroads

The CN merger with Illinois Central (January 2001), Wisconsin Central (June 2003), Great Lakes Transportation (January 2005), and British Columbia Rail (April 2005) expanded CN's rail services throughout North America. But the mergers also added IT systems

whose data was necessary for decision making.

Increasing the Flexibility of Enterprise Systems

CN's legacy applications and architecture did not support the flexibility and global access required by North American and overseas business growth.

Improving Analytics for Financial Management, Asset Productivity, and Operational Efficiency

To analyze and improve process effectiveness and asset utilization, CN management needed better information – not just data, but flexible analytical tools to ensure the right assets are in the right place at the right time.

Increasing the Efficiency of IT Assets

CN's software, hardware, and network license and maintenance fees continued to climb. Succession issues with the mainframe computer environments put pressure on costs.

“Something at CN is different – there is a willingness to change that sets us apart from other railroads. That willingness to change is what will take us to the next level.”

Claude Mongeau
Executive Vice-President
and Chief Financial Officer
Canadian National Railway
Company



FIVE GUIDING PRINCIPLES FOR BUSINESS SUCCESS

Business success depends on motivated people managing valuable assets to deliver safe and reliable customer-focused service while conscientiously controlling costs. Canadian National Railway Company's five guiding principles are:

- Service
- Cost control
- Asset utilization
- Safety
- People

Managing a Diverse Workforce

CN's 22,250 employees are widely dispersed across North America, many working in the field far from offices and connectivity. Information sharing with all employees is critical to business success.

Adequately Dealing with Regulatory Reporting

As CN's railroad footprint expanded, so did the amount and complexity of compliance with the reporting requirements of numerous regulatory agencies. CN management must access the right data and information to accurately satisfy these requirements.

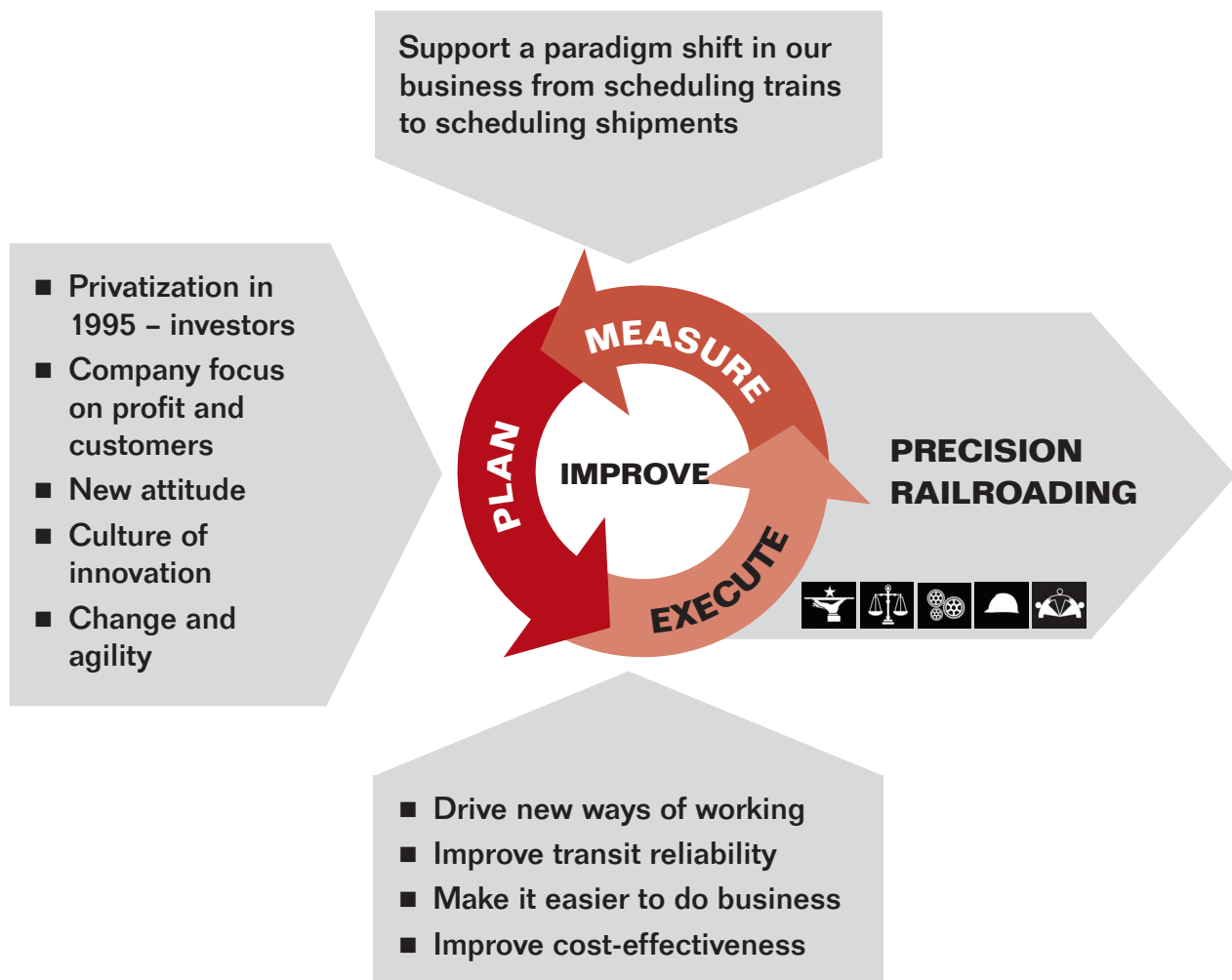


Figure 1: Precision Railroading at Canadian National

WHY SAP WAS SELECTED

From the outset, CN's senior executives appreciated SAP's commitment to developing the right SAP implementation plan to transform business processes and achieve business goals. CN recognized that SAP had the ability to integrate with the hundreds of legacy applications and provided the comprehensive functionality CN needed for more efficient growth. Even more important, CN management counted on the SAP organizational pledge to continue to develop innovative functionality that would heighten CN's transformation to precision railroading. The CN four-phase program was based on the following SAP elements.

Comprehensive Functionality

CN fully leveraged the depth of SAP® software functionality in financials, supply management, information access, human resources, real estate, safety and risk management, and the mechanical and engineering areas, as well as maintenance.

SAP ERP Focus on Process Excellence and Innovation

CN recognized the business value in adopting the business process best practices embodied in SAP solutions. SAP brought to CN a commitment to and market momentum for ongoing growth, improvement, and innovation of processes.

Enterprise-Wide Platform

CN management wanted a partner whose enterprise-wide platform could pull together all of the legacy systems while positioning CN to benefit from future innovations. SAP would help CN plug holes in its processes and information as it retired legacy applications.

Future Functional Innovation for Rail Transportation and Logistics

CN appreciated SAP's commitment to continuing innovation in both enterprise asset management and transportation. CN will benefit from SAP solutions based on best practices to improve railway business processes.

Integrated Functionality

CN counted on the ability of SAP software to replace or integrate legacy applications that impeded operational efficiency. SAP solutions reduced the time to integrate the acquisitions of Illinois Central, Wisconsin Central, Great Lakes Transportation, and British Columbia Rail, and they helped increase the speed to value realization.

Commitment to Partnership

The SAP commitment to the concept of partnership convinced CN to move ahead with an innovative enterprise partnership agreement in 2005. SAP helped CN achieve goals in all five areas for success.

"We are extremely pleased that CN and SAP work together to further leverage our SAP investment and meet the accelerating needs of our business and our customers, while allowing SAP to expand its reach and add value across the rail industry."

Fred Grigsby
Senior Vice-President and
Chief Information Officer
Canadian National Railway
Company

IMPLEMENTATION BEST PRACTICES

CN worked with SAP and the system integrators in a step-by-step fashion, focusing on enterprise asset management, starting with core administration and business applications. The teams developed a plan based on four distinct phases beginning in 1999 and ending in 2006. Working in parallel with CN's existing operations management systems, CN's implementation success was driven by best practices.

Senior Management Sponsorship

CN executives actively participated in the steering committee, led by the CFO, weekly or monthly during each of the phases. The committee was accessible, decisive, and ensured alignment with the company's objectives. The executives also drove support for the project throughout the organization.

	October 1999	January 2001	April 2002	2003–2006
AREA	PHASE 1	PHASE 2	PHASE 3	PHASE 4
Supply Management	Warehouse inventory Requisitioning Bar coding Purchasing	Intranet requisitioning Field inventory	Procurement cards Travel expenses Rail production shop Inventory optimization	End-user invoice entry Fuel management system
Finance	General ledger Financial reporting Accounts payable	Projects system Asset accounting Recoverable billing	Business warehouse Financials Budget planning	Budget planning Functional location integration Payroll consolidations Real estate
Human Resources	CN management Employee information Compensation and succession Time and gross payroll	U.S. payroll rollout to all unionized employees Time reporting	Employee qualifications Employee self-service Net payroll Canadian and U.S. benefits	Voice and time interface Compensation management Pension and benefit integration Employee performance
Safety and Risk Management			Employee health and safety Incident and accident log Canadian medical solution	Law pack replacement Police optimization U.S. medical solution
Mechanical			Mobile assets (locomotives and railcars) Work equipment shops Main shops	Facility maintenance Locomotive optimization Wheel wear management Archiving
Engineering			Network assets Signal equipment management	Bridge condition system Bridge management

INTEGRATIONS

- Illinois Central – 2001
- Wisconsin Central – 2003
- Great Lakes Transportation – 2005
- British Columbia Rail – 2005

Figure 2: Release of Functionality by Phase

Business Ownership

CN dedicated some of its most talented railway people to leadership of the program. They were charged with maintaining a full-time focus on ensuring the project's success and developing a solution that met the business requirements.

Dedication to Hands-On Project Management

The various project teams overseeing each of the initiatives were structured to ensure results. Through each of the phases of the SAP software implementation, the teams built on the success of one another and transferred knowledge of implementation best practices.

Leveraging a Proven Methodology for Change Management

CN senior management developed its own approach to change management. Project teams ensured business benefits were achieved by preparing the business – and its employees – to accept, leverage, and own the initiative. SAP enabled this methodology as a key aspect of the implementation for each of its solutions.

Careful Partner Selection and Management

Senior executives carefully managed relationships with the implementation partners: Accenture, BearingPoint, and SAP. Implementation partners integrated their knowledge and methodologies with CN's culture. They also agreed to abide by creative partnership agreements, which relied on performance-based incentives to hold the line on costs, increase efficiencies, and guarantee business-based results.

Realize Business Benefits Quickly

CN prioritized project opportunities based on business value, size, and time to deliver. Project releases were scoped into 12-month cycles and staggered to level the workload and to realize an ongoing stream of benefits.

Plan for New Technologies Early

The lead time on new technologies is often the critical path to solution delivery – both in technical landscape to support the development team and with the deployment of field technology to end users. Technology acquisition and deployment were begun early on in the project.

“To date, CN has integrated and consolidated the functionality and data from over 100 computer applications into one seamless SAP platform. In addition to improving numerous key business processes, this consolidation has enhanced management decision making by providing CN managers with quick, efficient access to integrated, real-time data.”

Fred Grigsby
Senior Vice-President and
Chief Information Officer
Canadian National Railway
Company

PROJECT MANAGEMENT BEST PRACTICES

CN senior management understood the importance of changing the organizational mind-set to ensure user acceptance of the new platform. The CN approach to change management used a structured, proven methodology to manage the people side of projects. CN followed best practices in governance and project management, including the following.

Strong Project Management Leadership

The project leaders were business leaders in their respective areas. They were teamed up with IT and partner experts. These leaders were chosen to be the future process owners. CN was acutely aware of just how painful it was to move them off their jobs onto the project.

Rigorous Scope Management

To minimize costly customization and to ensure SAP best practices were utilized to the fullest, CN senior management required business users to present a business case for any modification. As a result, the few modifications that were allowed added real business value.

Obsession with Successful Delivery

Once a project plan was approved, project teams (composed of business people, IT, and partners) were motivated to deliver on time and on budget, building a culture of innovation and pride in the credibility that comes from successful implementations.

In-House Skill Building and Knowledge Transfer

One key aspect of delivering a successful project is the training and support of project teams and end users. CN set specific targets of knowledge transfer of new functionality to decrease dependency on third-party consultants.

BUSINESS PROCESS TRANSFORMATION AND VALUE REALIZED

Despite the enormity of the process transformation, CN began to see real business returns on the SAP software investment as early as 2001. By the end of 2002, the annual tally of business benefits was as much as four times the SAP software investment. In 2006 alone, CN's profits rose 34% to CAD 2 billion, market capitalization climbed to CAD 27 billion, and CN generated CAD 1.3 billion in free cash flow. Its 61% operating ratio compared favorably to the 83% average of its main competitors.

“The ‘precision railroad’ creates an environment where the only question is, ‘Can I do better?’”

Claude Mongeau
Executive Vice-President
and Chief Financial Officer
Canadian National Railway
Company

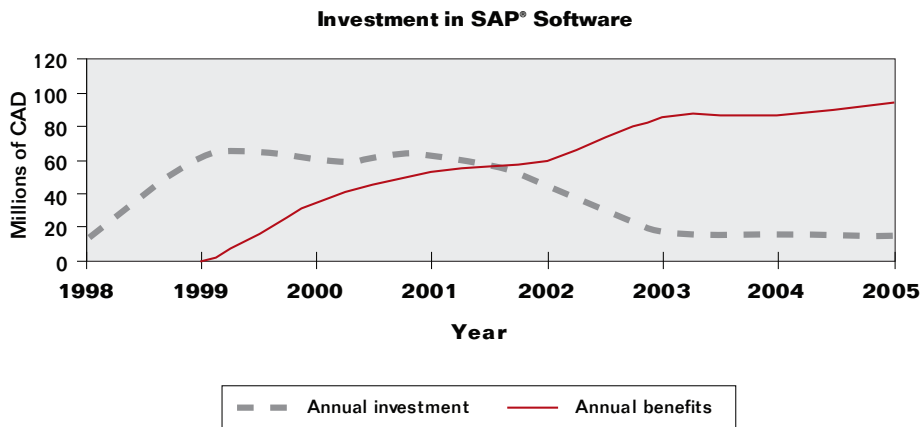


Figure 3: Value Realized to Date



THE HARD BENEFITS REALIZED

Canadian National Railway Company realized significant financial benefits, including the following:

- Over CAD 400 million in hard benefits on a CAD 200 million investment
- CAD 84 million in one-time inventory and financial savings
- Over CAD 100 million savings per year in asset, procurement, labor, and technology

CN has achieved significant benefits through continuous improvement over the course of its SAP project. The company generates annual benefits in the areas of technology, procurement, asset maintenance, and employee productivity. It has become the largest scheduling railway in the world, and it has maintained that position. Among the most important benefits are the following.

Improved Management of Financial, Material, Human, Mechanical, and Engineering Assets

A key to CN’s continuing successful performance has been the improved management of key financial, material, human, mechanical, and engineering assets. Precision railroading demands smoothly functioning processes that flawlessly manage the basic assets of the corporation.

Reducing Costs While Improving Effectiveness

CN must hold down costs and increase customer satisfaction by more effectively utilizing its assets. SAP software not only holds down costs, but also integrates the various legacy systems to more effectively leverage their functionality.

Integrating All Systems into a Network Whole

The integrated network of SAP and legacy applications provides the foundation for CN’s transformation to a culture of innovation and adaptability. Rather than losing the data and insights from legacy applications, SAP has enhanced their functionality and integrated the data to the benefit of the entire CN network.

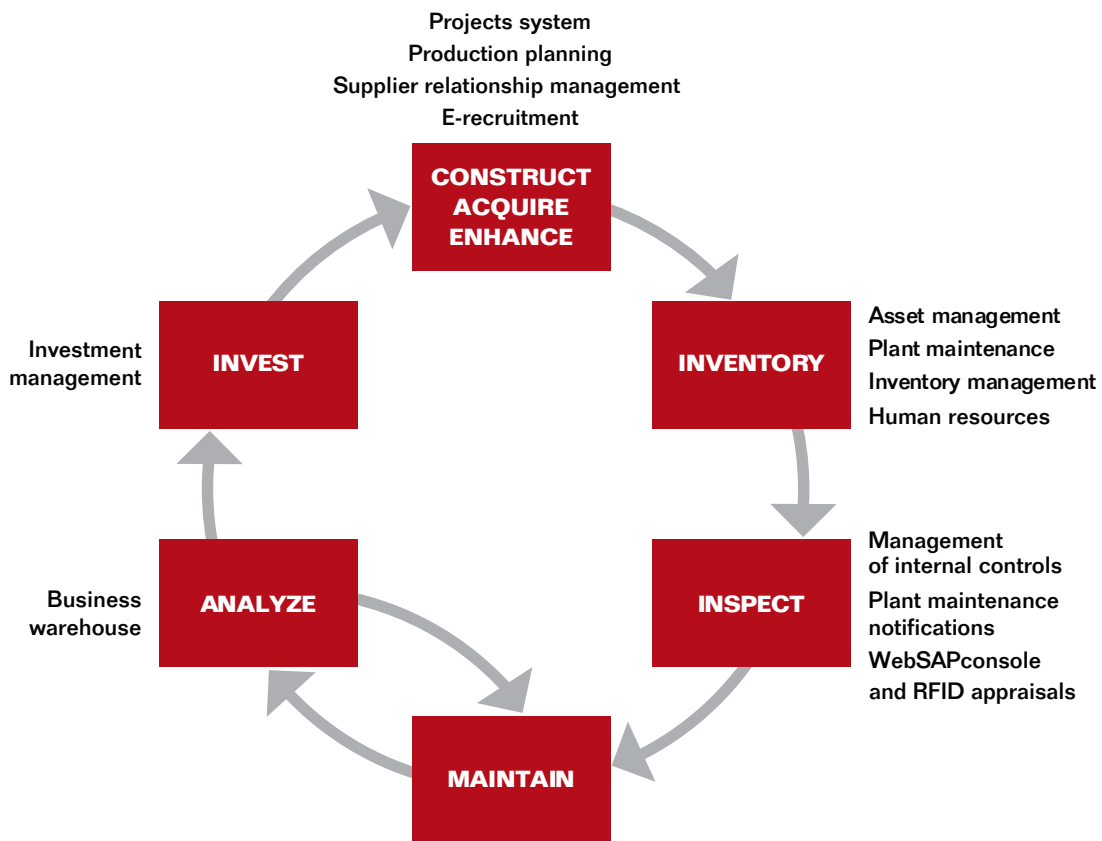


Figure 4: The CN Network

FUTURE ROAD MAP

CN is driving toward achieving its Vision 2010 where the company seeks to:

- Generate top-line growth exceeding CAD 9 billion
- Close in on an operating ratio of 60%
- Grow earnings per share by more than 10%
- Free cash flow with a steady CAD 1 billion

In support of these corporate goals, CN and SAP signed an innovative enterprise agreement in 2005 under which CN will continue to leverage SAP applications and technologies and intensify its efforts to realize more value from its SAP software investments.

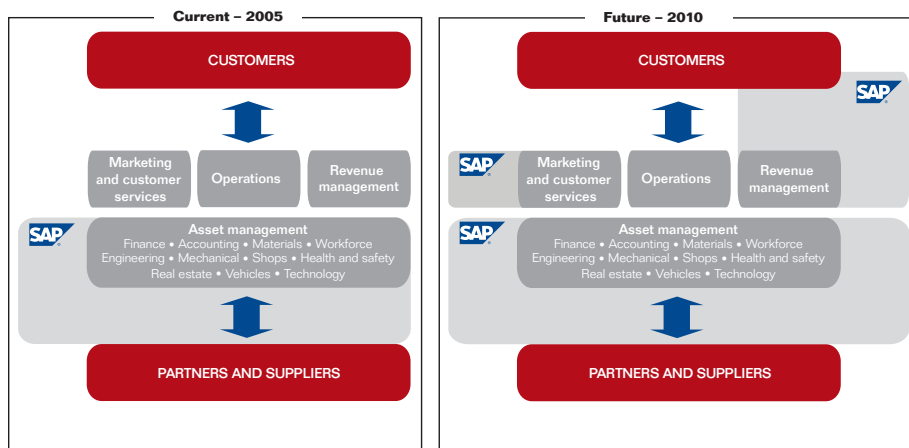


Figure 5: Vision of SAP® Software at CN

CN's SAP road map already has eight projects underway. Over the next five years it will:

- Expand the existing SAP footprint to include more of areas of enterprise asset management and workforce management
- Extend the SAP footprint into new areas of the business, particularly revenue management, marketing, and logistics
- Leverage the SAP NetWeaver® platform, including the SAP NetWeaver Mobile component and the SAP xApp™ Mobile Asset Management and the SAP xApp Mobile Time and Travel composite applications for field use, as well as the SAP NetWeaver Portal, SAP NetWeaver Exchange Infrastructure, and SAP NetWeaver Master Data Management components
- Continue to retire isolated legacy applications, using SAP software to plug holes in process and information
- Jointly develop solutions for transportation management in the SAP Supply Chain Management application

“My vision is to make CN not just the best-performing railroad in North America, but the continent’s best-performing transportation company.”

E. Hunter Harrison
President and CEO
Canadian National Railway
Company

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