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# CASE ANALYSIS 1.1

## BURLINGTON NORTHERN RAILROAD AND THE ARES DECISION

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## **Overview**

Burlington Northern (BN), an established railroad company in the United States, is considering whether or not to invest in a new railroad control system ARES which would implement technology that would improve fuel efficiency, reduce labor costs, reduce the chance of collision, and improve delivery times, among other advantages. The railroad shareholders must assess whether these advantages justify the high cost of implementation.

## **The Problem**

In order to stay competitive against other railroads and transportation alternatives such as trucking, Burlington Northern must assess its current position in the industry and determine what steps the company can take to continue being profitable. Deregulation of the trucking industry has lowered its cost, thus heightened the threat of poaching customers away from BN's consumer base. The company's main competitor is already implementing newly available technology in order to improve operations and increase capacity, raising the same threat. Because BN is operating at or near its current capacity, some analysis must be done to determine how to make the company more efficient so that it may expand operations and justify raising prices if service levels are improved significantly.

Current issues in inefficiency include trains running off-schedule, time-costly meet and passes, and the operations of maintenance crews. Much of the current technology used to dispatch trains was developed in the 1920's and is out of date, and dispatchers could only monitor a handful of trains at any given time. Thousands of meet and passes occurred daily, costing time in routing. Because of the outdated technology in use, data about operations was difficult to

obtain. Locations of trains was difficult to accurately approximate, which in turn effected the efficiency in scheduling.

Moreover, since the implementation of the ARES test, the management of the company had significantly changed. Many of the champions of the project were no longer in those important decision-making roles, resulting in the decision to implement the system company-wide being made by those who had not authorized its development in the first place. Many of those in management roles were skeptical on whether the benefits of the ARES system were realistic, and if they would allow the company to become more profitable fast enough to offset its accrued debt.

## **The Proposed System**

The Advanced Railroad Electronics System (ARES) was proposed to be used by the Burlington Northern Railroad in order to change how the company's operations were planned and controlled. The application of this system would lead to improved fuel and operating efficiencies, such as labor, by using GPS to track trains en route. Communications about the location of a train would lead to more efficient routing, meets and passes, and Maintenance-of-Way (MOW) operations.

The ARES system was installed in 1987 for use on 17 locomotives in BN's Minnesota Iron Range as a preliminary test. The system was able to generate efficient traffic plans for the locomotives in use, which resulted in better instructions for MOW operations, regulations control such as operating procedures, and fuel efficiencies. Additionally, the Locomotive Analysis and Reporting System (LARS) feature of ARES was used to monitor the health and efficiency of the trains,

allowing for intervention in the event of a potential locomotive failure. Monitoring the health status of locomotives and their locations could ostensibly eliminate accidents and collisions. These improvements would allow for BN to run its current operations with smaller staff and capital investments than the current system in use.

Burlington Northern had invested about \$15 million on the ARES project by 1989, and the information gathered from the Iron Range lead to the conclusion that implementing ARES would enable the railroad to improve service and asset utilization, while also reducing cost. Installing the system on the entirety of the railroad would further result in about \$350 million in cost. An analysis of this implementation by the Strategic Decisions Group (SDG) concluded that the potential benefits of ARES were large, but not guaranteed. Estimates of the gross benefits fell within the range of \$400 million to \$900 million, which would be greatly dependent on the success of the implementation. Benefits of the system would be measured in fuel efficiency, lower costs of equipment and labor, and damage prevention.

## **Industry/Competitive Analysis**

### **Burlington Northern**

As a result of the merge of four separate railroads in 1970, Burlington Northern Railroad was formed. By 1989, the railroad was employing the use of up to 800 trains per day on its extensive rail system spanning 23,356 miles of track, generating net income of \$242 million, and operating out of three cities in mid-continental United States. Revenues for the rail came from mainly coal, agriculture, industrial products, intermodal goods, forest products, food and

consumer goods, and automotive products. The railroad is determined to be running at or near capacity, limiting its potential for revenue if unchanged.

### **Threat of New Entrants**

The threat of new entrants in the railroad industry is low. The current railroad networks that serve the country are already in use by established railroad companies like BN. Significant capital would be required to build new rail, acquire trains, and establish a customer base, which puts several substantial hurdles before potential new rail companies. Government regulations also play a role in the barriers to entry in this industry.

### **Bargaining Power of Buyers**

The bargaining power of buyers (customers) is medium. Customers may choose the competitor Union Pacific to transport their goods by rail, or may choose to opt for the more expensive option of trucking companies if it suits their needs better. The bargaining power differs by industry – the food and consumer goods industry may find more success if the switch is made to trucking transportation, but the coal industry – BN’s largest business segment – may not be able to make the same justifications on cost. This difference in consumer power lies in how perishable the consumer good is, its weight, its cost, and its specific transportation needs. Coal customers generally are under long-term contracts, but agricultural customers may be more flexible in choosing their shipping method, as they generally had a more varied schedule depending on harvest and demand.

### **Bargaining Power of Suppliers**

The bargaining power of suppliers is high, as the main businesses in the industry consist of Burlington Northern and its main competitor, Union Pacific (UP). The companies compete with each other over cost, but territory is established. Union Pacific is known to have made investments in new technology to improve its shipping business.

### **Threat of Substitutes**

Threat of substitutes is high, as there are alternative modes of transportation for the types of goods the railroad transports. Though the type of goods that BN transports are generally time insensitive, heavy, and inexpensive, customers can alternatively choose a trucking company to transport their goods. Trucking has the advantage of offering deliveries, and though the transportation is more expensive than by rail, customers may be willing to pay a premium for the convenience of delivery. Deregulation of the trucking industry has increased the trucking industry's competition with railroads by reducing their rates.

### **Competitive Rivalry**

Competitive rivalry is low; Burlington Northern's main competition is Union Pacific, which has already made efforts to invest in their infrastructure and technology used. The main focus on this threat is that UP is believed to have excess capacity, whereas BN is close to capacity on its coal lines, which could lead to a loss of potential business.

## **Stakeholders**

### **Burlington Northern Company**

The Burlington Northern Railroad as a company represents the largest stakeholder in considering this decision. The ARES system could help BN increase its capacity, allowing for more business potential. The system could also lead to improved service, justifying a cost increase for customers. If the system is not implemented, BN may not be competitive enough in its industry where other businesses are making technological improvements. However, with the implementation of ARES coming at such a steep price tag, the business would need to ensure that improvements would indeed lead to higher efficiency, lower cost, higher capacity, and ultimately more revenue in order to justify rolling out the system company-wide.

### **Employees**

Employees of BN are another stakeholder as their livelihood is dependent on the success or failure of the company. Though implementing ARES could result in a lessened need for labor, if it also allowed the company to expand, employees positions with the company may not be threatened, and could be a boon for employees. ARES could result in a more well-run business, resulting in higher employee satisfaction with their jobs. Alternatively, by not adopting the ARES system, BN could be threatened by competitors, which would result in waning business and reductions in employment.

### **Consumers**

Customers of BN are a stakeholder in that they rely on the services of BN to complete their business transactions. Improved service from BN would benefit consumers, and potentially grow the pool of consumers that use BN's services. BN's failure would put stress on current consumers who may face additional costs when looking for a new delivery method.

## **Potential Solutions**

### **Implement ARES**

In this scenario, Burlington Northern implements ARES and rolls it out across the organization at cost to the tune of \$350 million. Safety and efficiency are improved by this system being in place, and BN is able to use its increased quality of service to leverage higher fees from customers. Increased service levels could result in business moving from competitor Union Pacific to BN. The company would need to increase profits in order to justify the cost of implementation.

### **Reduce Scope of ARES**

Using the Iron Range as the model, Burlington Northern could roll out a partial implementation of ARES, reducing the scope and therefore reducing the stress on capital expenditures.

Reducing the cost of implementation would be an attractive point for management, which could make decisions to expand the system down the road if proven to be beneficial financially.

By implementing ARES in an initial few phases, the business could assess whether they get the return on investment they expect from the system. Improved performance in certain areas the



railroad services with ARES would allow the company to determine the extent to which the system serves the railroad's needs and if it does lead to more business and revenue.

### **Do Nothing**

By staying the course and not implementing the ARES system, Burlington Northern would continue to see similar levels of revenue for the short-term. The railroad could focus instead on paying down its debt load. The business would indeed avoid having to invest a large amount of capital on the system, but at the expense of potentially hamstringing their growth. In the long run, by not taking advantage of the same technological improvements as their competitors, BN may lose business.

### **Selected Option**

I would recommend Burlington Northern commit to investing the \$350 million in implementing the ARES system for use throughout its railroad network, but do so in a phased implementation strategy in order to reduce the chance of creeping timelines for implementation. In this way, the business could roll out the system in iterations, allowing for proper testing and ensuring that problems that arise might be handled before the next phase begins. If the cost is broken up over several years of rollout, the effects will be less stressful on the finances of the organization.

The advantages offered by ARES I believe justify the price tag in the long run. Improving safety and efficiency throughout the rail system would benefit the company enough that it could expand its operations, resulting in more revenue, and thus justifying the investment. The

system would improve the company as a whole – the workers union supports the implementation, and believe that the system would result in a higher quality of life for employees.

The ARES system technology was already years ahead of the technology being developed by the Advanced Train Control System (ATCS), which only controlled trains, not the entire rail system as ARES did. By being a frontrunner in the industry in regards to technology, BN would find itself with a unique competitive advantage that could allow it to outperform competition in the long run.

I believe this option is better than a partial implementation, because it allows the company to use ARES to its full potential. Having more accurate data about their operations could be a very powerful tool moving forward, and the business can build on this data to determine information that could make operations even more profitable in the future.

Implementing the system is more advantageous than doing nothing to change the current system, because without being able to stay competitive with other railroads and forms of transportation, Burlington Northern will fall behind and become obsolete. Because of the fast changing terrain of technology, failing to seize an opportunity with such benefits is a misstep.

## Resources

Hertenstein, Julie H., and Robert S. Kaplan. "Burlington Northern: The ARES Decision (A)."  
"Burlington Northern: The ARES Decision (B)." Harvard Business School Case 191-122; 191-123.  
1991.