Rail Investment

Chapter 10

Chapter 10: Rail Investment

A good working relationship between the railroad and agricultural industries in the United States depends on the ability of the railroads to provide adequate service to agricultural shippers at a reasonable price. DOT has predicted that total freight transportation could increase over 90 percent from 2002 to 2035.[191] AAR states that "if railroads don't have the money to expand their infrastructure, by 2035 some 16,000 miles—one-third of the nations' primary rail corridors—will be severely congested."[192] They further state "freight railroads are key to solving the freight capacity challenge and keeping more trucks off our highways (as) railroads, on average, move one ton of freight 436 miles on just one gallon of fuel."

Continually increasing rail rates, however, could undermine projected future rail demand and reduce the level of investment needed. Although rail rates decreased from the 1980 Staggers Rail Act until 2005, they have been increasing rapidly for the past four years and, for many agricultural products, since 1988. As discussed in Chapter 9, a recent study showed the amount of rail freight originated during 2007 decreased markedly from the trend of real GDP, showing railroads lost market share in 2007 rather than gained it, as was expected.[193]

Railroads are a capital-intensive industry. In an attempt to meet rising demand, railroads spent around $420 billion on infrastructure between 1980 and 2007.[194] Freight railroads have invested almost 18 percent of their revenue on capital expenditures,[195] including maintenance of way.* Perhaps 15 to 20 percent of this investment went to expanding rail capacity; the balance was simply to maintain existing capacity.[196]

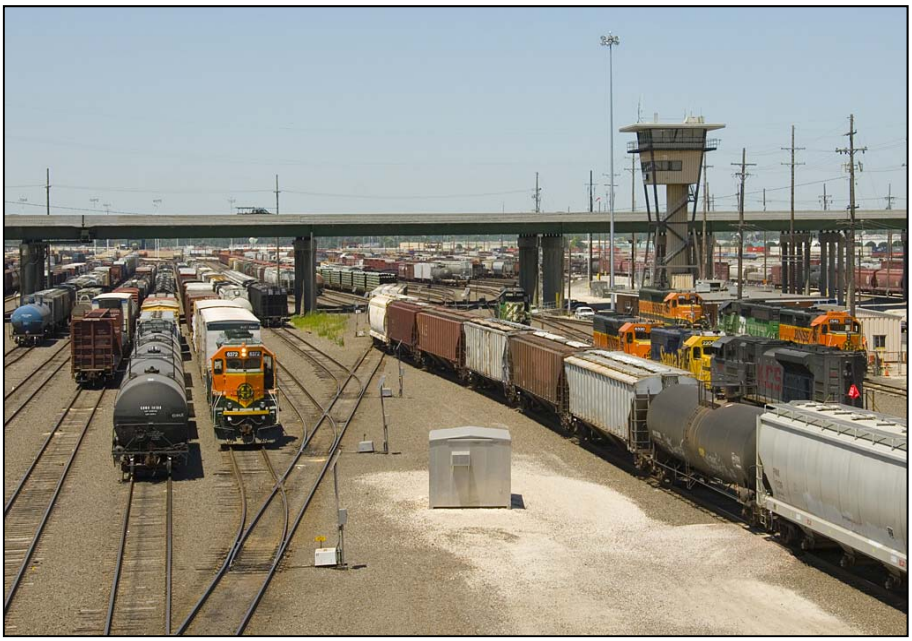


Figure 10-1: Railroads must invest in infrastructure to keep up with increasing transportation demand.

Source: Chris Groeling

* Maintenance of way is the normal maintenance required to keep track at the same level of performance.

Due to the recent decline in the economy, investment by the railroad industry in new capacity may fall behind in meeting future railroad transportation demand, especially for agricultural commodities. This potential shortfall in investment could come at the time when competing nations, such as Brazil, are making strategic investments in the transportation systems serving their export grain markets.[197] The lack of investment in rail capacity for agricultural products can impair the United States' position as the deliverer of the lowest cost, highest quality grain and grain products in the world.

While several recent studies predicted a future shortage of rail capacity, a review of these studies by Christensen Associates for the Surface Transportation Board indicated that forecasts of future growth in rail traffic—especially the movement of coal and municipal solid waste—appeared to be substantially overstated. Nevertheless, the investment of public funds in the expansion of rail capacity may be justified by the savings in pollution, congestion, and maintenance of highways. Public investment in railroads has until recently been directed largely to the preservation of branch line rail service to rural areas. However, the time may now have arrived when public investment in main lines and intermodal facilities is economically justified.

Demand for Rail Freight Movements

Many recent studies have pointed to a continual increase in the demand for rail freight service. Although the magnitude and timing is debated, the fact that demand will increase is not.

Changes in economic activity are the basis for forecasts of increases in overall freight transportation, and especially freight rail. The GAO, in an October 2006 report, examined the economic health of the freight railroad industry. It found that economic health had improved, but that concerns about competition and capacity should be addressed.[198] The study reviewed several major studies dealing with transportation demand, especially rail transportation demand. GAO concluded that "…forecasts of freight and freight rail demand are useful as one plausible scenario for the future. As the CBO observed in a January 2006 report 'forecasts of demand are best viewed as illustrative rather than quantitatively accurate.'"[199]

First DOT Study

The Freight Analysis Framework (FAF) is a comprehensive database and policy analysis tool maintained by DOT to help identify needed freight capacity investments. Using FAF in 2002, DOT projected that overall domestic freight demand would increase by more than 65 percent and international demand by 84 percent from 1998 to 2020.[200]

AASHTO Study

The American Association of State Highway and Transportation Officials (AASHTO) released *Freight Rail Bottom Line Report*, which described the rail industry and its benefits to the nation. In this report the industry's investment needs and its ability to meet those needs was estimated, and the consequences of underinvestment were quantified.[201] It developed baseline freight forecasts using TRANSEARCH data for the year 2000 and interim growth rates developed by DOT under the FAF project.[202] The study concluded that, with moderate economic growth, total freight tonnage would grow from 15.2 billion tons in 2000 to 24.5 billion tons in 2020, an increase of 67 percent. Domestic tonnage would rise from 12.6 to 21.7 billion tons, an increase of 57 percent, and import-export tonnage was projected to grow from 1.4 to 2.8 billion tons, an increase of 99 percent.

It found that not all regions of the United States would experience the same growth in demand. Growth was forecast to be 76 percent in the West, 71 percent the South, 63 percent in the Central region and 58 percent in the Northeast. The largest volumes (rather than percentage increases) were predicted for the Northeast and Central regions.

Modal volumes and growth were also predicted, driven by the growth in the commodities traditionally handled by the modes. Barring any change in modal shares or logistical constraints, the study projected that rail would grow from 2,009 million tons in 2000 to 2,891 million tons in 2020, an increase of 62 percent. Ton-miles were projected to grow to 1,821 billion in 2020, up from 1,239 billion ton-miles in 2000, an average increase of 47 percent for all rail markets.

U.S. Growth, by the Numbers

Congressman James Oberstar, discussed meeting our infrastructure needs in *Transportation Builder*, March 2009, mentions changes in the country since 1956:

- Between 1950 and 2007, the U.S. population doubled from 150 million to 300 million.
- The gross national product has exploded from $345 billion to $13 trillion.
- Imports have tripled and exports have doubled since 1970.
- Land use, economic development, and migration patterns have changed significantly, leading to an increased dependence on our transportation infrastructure for daily travel.
- U.S. exports of goods and services grew by 12 percent in 2008 to $1.84 trillion; imports increased by 7.4 percent to $2.54 trillion.
- Exports accounted for 13.1 percent of U.S. GDP in 2008, up from 9.5 percent in 2003 and 5.3 percent forty years earlier.*

*Transportation Builder, March 2009

Both the FAF and AASHTO studies predicted that freight rail tonnage, while increasing 44–55 percent, would lose some market share to truck carriage by 2020. The AASHTO study based its projections on the assumption that up to about $4 billion in annual railroad investments would be required to meet future demand.

ATA Report

In 2005, the American Trucking Association's (ATA) report, *U.S. Freight Transportation Forecast to 2016,* projected overall freight volume to increase by about 32 percent between 2004 and 2016.[203]

Booz/Allen Study

A 2006 survey by Booz/Allen, in conjunction with *Traffic World*, collected data from rail and intermodal shippers and potential rail freight users about the capacity of the rail freight network and its impact on customers.* Rail is attractive to shippers for its efficiency; 42 percent of respondents said they would increase their rail shipments up to 40 percent if there were no capacity issues. In analyzing demand, Booz/Allen found that rail demand had increased for the ninth consecutive year in 2006 and the network can be expected to carry 500 billion ton-miles of new traffic, with an over 20 percent increase in rail freight demand in the next ten years.[204]

FHWA Study

In a similar study, DOT's Federal Highway Administration (FHWA) also has examined growth trends and made projections on U.S. freight tonnage in their *Freight Facts and Figures*. Using assumptions similar to the earlier DOT report, they estimated that freight tonnage would grow by slightly over 70 percent between 2006 and 2035.[205]

* The survey was sent to 6,000 current and former *Traffic World* subscribers who ship a range of goods. Fifteen percent of the respondents spent at least $500 million each year on freight transportation, two-thirds spent at least $10 million, and 15 percent spent less than $1 million to ship goods.

Summary of Various Study Findings

Study	Year Conducted	Findings
DOT/FAF	2002	Domestic freight demand projected to increase by 65%; international by 84%
AASHTO	undated	Total freight expected to grow from 15.2 billion tons in 2000 to 24.5 billion tons 2020 (67% increase) Domestic up 57% International up 99%
ATA	2005	Overall freight volume up 32% from 2004 to 2016
Booz/Allen (for *Traffic World*)	2006	Rail network expected to carry 500 billion ton-miles of new traffic; 20 percent increase in next 10 years
FHWA	2006	Freight tonnage expected to grow 70% between 2006 and 2035
DOT/FAF Version 2.2	2007	Total freight projected to increase by 93% from 2007 to 2035
Cambridge Systematics (for AAR)	2007	Uses USDOT/FAF Version 2.2 projections.

Second DOT Study

A second FAF study by DOT, *FAF Version 2.2*, estimated that the demand for total freight transportation will grow from 19.3 billion tons in 2007 to 37.2 billion tons in 2035, an increase of about 93 percent.[206] An annual increase of 1.9 percent in rail shipments is assumed. The data from FHWA used in this study estimates that population growth, economic development and trade will drive this increase in demand for transportation services.*

Cambridge Systematics Study

A substantial study was commissioned by AAR in 2007. It was called *National Rail Infrastructure Capacity and Investment Study* and was conducted by Cambridge Systematics. It assessed the long-term capacity expansion needs of the continental U.S. freight railroads.[207] The study agrees with the projected demand figures by the FHWA of an increase of 88 percent in tonnage by 2035. The Cambridge Systematics study will be used later in this chapter to examine shortfalls in capacity and resultant investment needs in the future.

Christensen Study

A study conducted by Laurits R. Christensen Associates in March 2009 titled *Supplemental Report to the U.S. Surface Transportation Board on Capacity and Infrastructure Investment* is the most recent study done on rail capacity and related issues.[208] This was a follow-up study to the original report to STB titled *A Study of Competition in the U.S Freight Railroad Industry and Analysis of Proposals that Might Enhance Competition*, in November 2008, by the same firm.[209]

In the supplemental report Christensen Associates was tasked with analyzing the long-term forecasts of freight rail demand as a precursor to projecting rail investment needs. The report describes efforts to review FAF and to augment it as much as possible to permit "greater incentive-based responses by economic agents and to test sensitivity of FAF to key inputs such as fuel prices and rates." The following paragraphs in this section are drawn from that study.

The demand for railroad services is based on the need to move products from production points to (in the case of agriculture) the tables of consumers. The FAF projections have been frequently used as the future picture of that demand. However, comparison of FAF to alternative forecasts illustrates some uncertainty.

This study showed how forecasts of real GDP used by the Trustees of Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds (OASDI) vary significantly from low-cost to high-cost scenarios.† Estimates of increases in real GDP range from 80 percent to 151 percent growth between 2002 and 2035 for the high-cost and low-cost scenarios, respectively.[210] Comparison of macroeconomic forecasts made by the CBO in January 2007 versus those made in January 2009 revealed that the projected growth in real GDP from 2002 to 2035 ranged from 131 percent using the January 2007 assumptions to only 115 percent using

* Estimates obtained in FAF Version 2.2 are not directly comparable to those in the original FAF. Version 2.2 uses a different set of data, relying much more on Commodity Flow Statistics to generate estimates.

† Real GDP is often used to forecast freight demand.

the January 2009 assumptions, indicating that the current recession has had significant effects on projections.[211]

The Christensen study also analyzed sources of uncertainty by looking at major commodities in the rail shipment mix. They said, "Overall, we find that the FAF model forecasts very high rail demand growth compared to current forecasts from the Department of Energy for coal and for petroleum products (excluding gasoline and fuel oils) and from the Department of Agriculture (USDA) for grains." Specifically, the FAF models forecast coal tonnage that was more than the growth in total coal production projected by the Department of Energy's Energy Information Administration (EIA). FAF forecast growth of 78 percent from 2002 to 2035; the EIA scenarios forecast increases of only 24 percent to 50 percent.

The grains category, the second largest in the FAF tonnage growth, was projected by FAF to nearly double between 2002 and 2035. USDA's production expectations are substantially less than the FAF traffic projections for the first ten years of the period, under the assumption of constant modal shares.

In total, the Christensen study found the FAF projections to be substantially higher than alternative forecasts and commodity projections. Thus, the top end of required investments of $148 billion identified in the Cambridge Systematics study may be overstated. However, there seems to be consensus that substantial investment, even if an unknown amount, is required to provide shippers the capacity and service they desire.

Regardless of magnitude, the direction of growth in transportation demand seems clear. Significant and sustained growth is expected, possibly almost doubling by 2035. The following section examines past investment performance, current investment ability, and long term investment needs of the railroad industry to meet the demand for capacity and service in the future.

Railroad Investments and Service

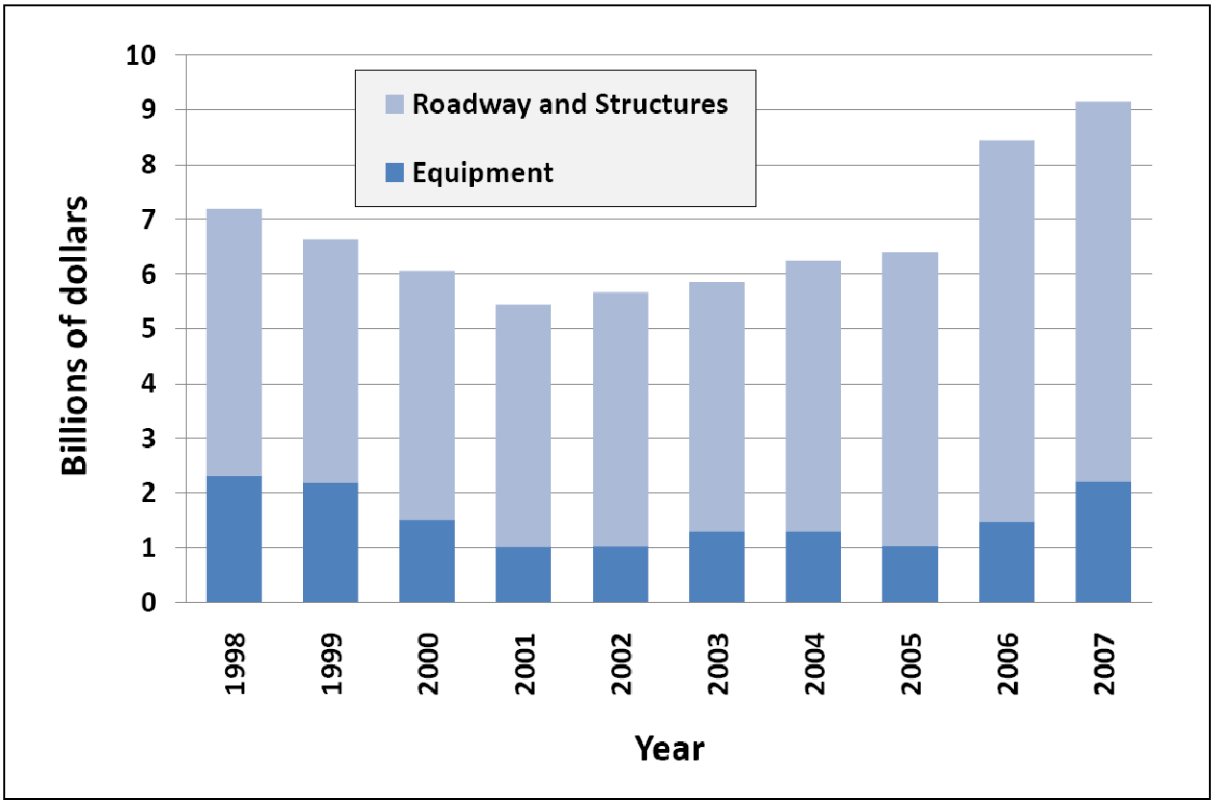
Recent years have seen, after many depressed years, a surge in railroad revenue to the point where revenue adequacy has been achieved (for a fuller discussion, see Chapter 7**:** Rail Rates). The question now is whether that revenue will be translated into investments in infrastructure and how much of it will be invested.

There is no question that railroad capacity has been strained, especially for bulky agricultural commodities, and could be more strained in the future based on the demand projections summarized above. Total tons hauled and ton-miles per route mile have steadily increased for Class I railroads. This increased traffic density (up 118 percent since 1990 according to the AAR) on the tracks, while increasing efficiency overall, has been accompanied by congestion on some rail corridors and the rise of many chokepoints.[212] AAR also reports that from 1980 to 2007 a total of about $420 billion of capital expenditure and maintenance expenses have been spent on infrastructure and equipment.[213]

Capital Expenditures

Figure 10-2 below shows Class I railroad capital expenditures for roadways and equipment. It shows that expenditures on equipment decreased steadily in the first four years of the period examined. Equipment expenditures increased slightly in the middle of the period, decreased in 2005, then increased again during the last two years. Roadway expenditures have increased significantly since 2003, with 2003 being the last year of fairly constant expenditures. Railroads are responding both to the increased demand and to the availability of capital associated with being revenue adequate. After reaching a low of about $5.5 billion in 2001, railroad industry annual capital expenditures on roadway and equipment have increased steadily to over $9 billion in 2007.

Figure 10-2: Class I Railroad capital expenditures



Source: AAR, Analysis of Class I Railroads

The two tables below from the AAR disaggregate the investment pattern and present a comparison of western and eastern railroads. Tables 10-1 and 10-2 show that total road and equipment investments by the western railroads during 2007 were $5.9 billion compared to $3.2 billion for the eastern railroads. The western railroads, however, operate many more track miles than the eastern railroads**:** 70,828 miles in the West compared to 48,794 miles in the East in 2007. Even so, western railroads spent about 26 percent more per mile than eastern railroads—$83,700 compared to about $66,200.

The regions vary in communications system investments; western railroads have invested from 50 to 100 percent more than eastern railroads. In total road investments, the western railroads usually invest about double that of the eastern railroads, with the west investing $4.68 billion in 2007 and the east investing $2.26 billion in the same year. Both areas have investment patterns showing lower levels around the middle of the period but with significant increases in later years. For example, from 2002 to 2007, investments in roadways increased 66 percent for the Eastern railroads and 42 percent in the West.

Both East and West have increased their expenditures on equipment in the last two years, but the East is still below its expenditures during the 1990's. Because of the substantial investment in locomotives and freight cars during 2007, the Western railroads have reached almost the highest level during the period; only 1998 is comparable. Overall, western railroads have worked to meet the increased demand by investing almost $6 billion in 2007, a 57 percent increase over 2002. Eastern railroads also have increased their overall investment by over 72 percent from 2002 to 2007.

Table 10-1: Eastern railroads, capital expenditures ($1,000)

Road					Equipment				
Year	Communications Systems	Signals	All Other	Total Road	Locomotives	Freight Cars	Other Equipment	Total Equipment	Total Road and Equipment
1996	36,676	129,905	1,082,403	1,248,984	543,943	440,342	94,495	1,078,780	2,327,764
1997	n/a								
1998	68,687	222,361	1,519,823	1,810,871	455,660	445,287	151,879	1,052,826	2,863,697
1999	59,426	174,255	1,233,435	1,467,116	582,297	449,305	197,454	1,229,056	2,696,172
2000	47,686	247,433	1,462,579	1,757,698	341,699	510,665	70,057	922,421	2,680,119
2001	27,358	128,370	1,234,765	1,390,493	315,916	155,413	60,664	531,993	1,922,486
2002	21,390	129,610	1,215,148	1,366,148	347,068	64,910	104,593	516,571	1,882,719
2003	29,609	107,941	1,278,074	1,415,624	281,954	82,364	70,043	434,361	1,849,985
2004	36,562	134,418	1,404,123	1,575,103	599,761	140,683	97,150	837,594	2,412,697
2005	19,164	121,536	1,344,112	1,484,812	415,602	114,426	69,375	599,403	2,084,215
2006	51,224	185,661	2,286,810	2,523,695	549,468	242,070	133,369	924,907	3,448,602
2007	45,699	170,899	2,047,594	2,264,192	600,578	252,158	112,558	965,294	3,229,486

Source: AAR, Analysis of Class I Railroads

Table 10-2: Western railroads, capital expenditures ($1,000)

Road					Equipment				
Year	Communications Systems	Signals	All Other	Total Road	Locomotives	Freight Cars	Other Equipment	Total Equipment	Total Road and Equipment
1996	88,452	197,507	2,364,380	2,650,339	718,513	202,862	201,518	1,122,893	3,773,232
1997	n/a								
1998	97,141	314,992	2,652,086	3,064,219	984,998	155,313	127,667	1,267,978	4,332,197
1999	127,343	252,658	2,598,408	2,978,409	694,738	158,678	100,976	954,392	3,932,801
2000	129,706	225,344	2,436,425	2,791,475	353,568	112,699	119,003	585,270	3,376,745
2001	98,360	269,320	2,663,233	3,030,913	291,323	77,583	112,040	480,946	3,511,859
2002	123,604	292,154	2,863,460	3,279,218	349,648	56,076	98,726	504,450	3,783,668
2003	67,685	265,792	2,812,173	3,145,650	672,205	47,262	145,796	865,263	4,010,913
2004	119,511	319,078	2,927,384	3,365,973	188,184	38,665	236,842	463,691	3,829,664
2005	97,373	364,213	3,417,501	3,879,087	155,918	82,215	188,697	426,830	4,305,917
2006	87,833	411,104	3,959,252	4,458,189	239,025	82,907	223,478	545,410	5,003,599
2007	70,006	341,386	4,268,732	4,680,124	696,980	292,538	257,859	1,247,377	5,927,501

Source: AAR, Analysis of Class I Railroads

Levels of Service

Given the forecast increase in demand and the efforts of the railroads to invest in infrastructure, just what is the current situation? AAR points out that the Class I freight railroads have, after many years of decreasing labor numbers, recently hired and trained thousands of employees. The railroads had 11,000 more employees in December 2007 than they had in December 2003.[*]

As rolling stock numbers suggest, railroads also have added thousands of new, more-powerful locomotives. The aggregate horsepower of the locomotives owned and operated by the railroads increased nearly 23 percent from 2002 to 2007.[214] Railroads further stress that they have been incorporating new technologies to take advantage of these investments, including using "trip planning" systems to consider many variables such as crew and locomotive availability, track conditions, and weather to optimize how and when freight cars are assembled in rail yards and when those trains depart.

[*] Due to the current recession, though, some of these new employees have since been laid off.

Figure 10-3: A Norfolk Southern dispatch center. Railroads have been investing in new technology to increase efficiency.

Source: Norfolk Southern

As the Class I railroads build large new intermodal facilities in urban areas, many smaller intermodal terminals in rural areas have been closed or had their service discontinued. This has resulted in greatly increased costs to agricultural shippers who use intermodal services. Although western railroads are investing in capacity, rural agricultural shippers are concerned that the direction of their investments is increasing shippers' transportation costs and road maintenance costs to rural society.

Since the Staggers Act, railroads have been slowly increasing their share of freight ton-miles by introducing innovations. Significant reductions in inflation-adjusted freight expenses per revenue ton-mile have been achieved. Decreases in such costs have been made by abandonment and spinoff of rail lines, reduction of redundant labor, reduction of routes, longer hauls, heavier rail cars and, most notably, increased density on remaining lines by longer and heavier trains. Some of these efficiencies are the source of concerns by shippers when service is evaluated and concern about "cost shifting" is expressed.

Shippers worry that the railroads have focused internally on their own needs to reduce costs rather than trying to improve the price or service offered to customers. Eliminating the excess capacity of their network has increased the probability of railroad congestion, considering the expected surges in rail freight demand.

Until the current recession began, this was the situation that faced the nation, with new demands poised to appear in the marketplace. Once the economy more fully rebounds, these concerns will resurface. The issues then become the sufficiency of future investment, additional investments needed, and the source of those investment dollars. The needs of other sectors in the supply chain, such as ports, terminals, roadways, and waterways will compete for available public investment funds.

Investment Needs

In August 2006, *Traffic World* examined the 5-year investment needs for U. S. infrastructure.[215] It estimated that over $1.6 trillion would be needed to improve the Nation's infrastructure. The report, very broad in approach, included many items, ranging from roads and bridges to schools to dams to hazardous waste. The estimated five-year needs for transportation-related items were $628 billion for roads and bridges, $219.5 billion for transit, and $50 billion for navigable waterways. Investments needed for rail transportation were $61 billion over the five-year period, or an average of about $12 billion per year.

The magnitude of growth in transportation demand is projected to be as much as 80 percent over the next 20 to 30 years. The recent review of FAF projections by Christensen suggested these estimates may be high, but if most of the increased traffic appears, the level of service provided by the current freight rail system could decrease significantly without substantial infrastructure investments.

Other investment need estimates are available from recent studies. The National Surface Transportation Policy and Revenue Study Commission, in a December 2007 report, found that if increases in capacity or changes in rail market share were to occur now, the percentage of primary rail corridors operating below their theoretical capacity would decrease from a current level of 88 percent to 44 percent.[216] The percentage of corridors operating near capacity would rise slightly from 9 percent to 10 percent. The number of corridors operating above their theoretical capacity would increase from 3 percent to 30 percent. Such a result would be characterized by unstable flows and service breakdowns.

This estimate of shortfall in capacity and service is based on the Cambridge Systematics study reviewed earlier, done by the AAR upon a request by the Commission. Required investments were analyzed based on railroads maintaining their current market share, and then under conditions of increasing market share through 2035.

An average annual investment of $5.3 billion would be needed to accommodate the rail demand identified in the Cambridge Systematics study. This $5.3 billion annual investment is the equivalent of $148 billion over the 2007-2035 time period. The Commission report suggests that the Class I railroad share would be $135 billion, and the share of the smaller

railroads would be $13 billion. However, the Cambridge Systematics study assumes the Class I railroads would only be capable of generating and investing $96 billion of the $135 billion with the rest ($39 billion, or $1.4 billion per year) to be provided from other sources.

The Commission reported on a sensitivity analysis with market shares ranging from a reduction of 20 percent market share to an increase of 20 percent. The lowest estimate for annual investment needs was $3.9 billion; with an increase of 20 percent, the annual investment required would be $7.1 billion. The impact of not meeting the required investment of $148 billion would be, according to the Commission, the rail infrastructure being able to carry only 2.46 billion rail ton-miles on primary rail corridors in 2035, rather than the 2.75 annual ton miles consistent with maintaining railroad market share, an 11 percent shortfall. These estimates reflect only the cost of system expansion and not the anticipated costs of system rehabilitation. Cambridge Systematics suggest that the balance for the Class I freight railroads of $39 billion, or about $1.4 billion per year, be funded from railroad investment tax incentives, public-private partnerships, or other sources.

Estimates based on the alternative growth rates presented by Christensen rather than the FAF projections used by Cambridge required reduced investments. Overall for the four major commodities of coal, cereal grains, petroleum and coal products excluding fuel, and waste and scrap, use of the alternative projections resulted in a decrease of slightly over 900 million tons of rail traffic, about a 40 percent decrease in tonnage. Reductions for specific commodities were 38 percent for coal and 30 percent for cereal grains. If the percentage for total traffic is simply assigned to the earlier estimates of the $148 billion required investment, the new estimate becomes around $89 billion, or $3.18 billion per year, down from $5.3 billion. Even though the estimated investment need is decreased, substantial need for capital investments still remains to handle the increased traffic demand that is expected.

Investment Sources

The above discussion indicates the range of investment needed to maintain the current level of service. The examination of roadway investment suggests that the western railroads, which move many agricultural products and depend on the revenue from these movements, have been making far more investments in roadway than have the eastern railroads, suggesting that agricultural interests might be receiving attention. However, it is not certain how much of this investment is going for the bulk commodities, such as the grains that are so important to agriculture, and how much is going to enhance intermodal container shipments from overseas to inland centers.

Railroad investments in capacity require adequate rail revenue. The recent surge in investments by the railroads has occurred at the same time as increased rail revenues. Railroads have raised their rates over the past four years overall, and over the past eight years for many agricultural products. Increased revenues offer investment dollars and expectations for future revenue streams. From the railroads' viewpoint, a decrease in rates without an accompanying decrease in costs of operation means a decrease in available investment dollars. Officials of the major railroads serving agricultural markets have continued to speak positively about the revenue picture and the possibility of continued investment increases.

One source of investment for rail capacity has been the shippers that use the rail system. Their private investments in terminals to handle trainload shipping, in ports to provide capacity to move freight, and in freight rail cars to provide capacity are now part of the rail transportation landscape. These private investments are based on private benefits to the shippers.

Public-private funding of rail infrastructure projects, to the extent that it benefits the public, also has become an accepted practice. The Alameda Corridor that has eliminated many rail/highway crossings in the Los Angeles/Long Beach region is a good example. The public has benefitted from the elimination of waiting time at highway/rail crossings and the increased safety; the railroads have benefitted from the increased speed in the movement of freight. For more detail on the Alameda Corridor, see Chapter 14**:** Ocean Transportation. Other examples are public investments to preserve railroad branch lines to avoid the additional costs of highway maintenance and highway accidents that would occur if the lines are abandoned.

Figure 10-4: The Alameda Corridor moves freight quickly through Los Angeles to the Port of LA.

Source: ©2010 Alameda Corridor Transportation Authority

Yet another source of public funding is the use of tax credits for investment in railroad infrastructure that expands capacity. Similar tax credits have been used to assist smaller railroads in upgrading their lines to handle the larger 286,000-pound railcars that are now common in the railroad industry. Some interested observers have suggested that tax credits could be available to all businesses making capacity-enhancing rail investments, not just railroads.

Finally, railroad capacity investments can be financed through the use of low-interest government loans. The Railroad Rehabilitation and Improvement Financing (RRIF) loan program is an example. The RRIF program currently is limited to $35 billion, with a limit of $3.5 billion for each firm. The program has assisted railroads in making capacity and rehabilitation improvements and no loan has been in default.

Public benefits come in many forms, magnitudes, and in many places. Safety and security can be enhanced, environmental air quality can be improved, highway congestion decreased and mobility increased, network efficiency on the railroads can be improved, among other benefits. Lower transportation costs lower the costs of inputs to producers in rural areas, increase farm gate prices, increase competitiveness of U.S. producers in international markets, and improve local job and tax base opportunities. These benefits exist whether the mode is waterway locks and dams, dredging, highways, or ports, whether marine or air.

These public benefits have driven the public—Port Authorities, States, the Federal government, and other entities—to provide funds for private/public partnerships in the railroad system. Short line railroads, many of them serving agricultural and rural interests, have received financial support from States. Rail projects receive local and State investments, rail bridge investments to decrease rail transit times are mutually funded, and freight train track and terminal relocations have been and are under consideration.

The railroad industry argues that governments should fund railroad improvements because it funded infrastructure for water and truck transportation. They note that public funding of infrastructure for water and truck transportation has put rail at a competitive disadvantage. They further suggest that governmental funding of rail infrastructure would help eliminate the inequity of governmental support of competing transportation modes.

Government investment in railroads had, until recently, been limited mostly to passenger rail projects of various kinds and to the preservation of railroad branch line service in rural areas. Often this involved the purchase of branch lines from Class I railroads to prevent their abandonment, with the State contracting with a short line rail carrier to provide rail service. Increasingly, public money has flowed to investments in main line railroads, usually for capacity increases or terminal improvements. In these cases, investment is usually shared between the railroad and public sources, with the public funding justified by public external benefits that will not accrue to the railroad or its shareholders. Such an arrangement can be difficult to manage, however, because access to the rail system is controlled by the owner of the track, who is able in some instances to charge bottleneck rates for the use of that track and restrict rail-to-rail competition in other ways, which could result in benefits weighted toward railroad

shareholders. The use of public funds for transportation infrastructure, whether for rail, highway, or waterway, should be developed in such as way as to ensure that the benefits of public financing flow to the public commensurate with the level of investment.

Existing data did not allow specific investigation of the investment needs of agriculture for this study. The practice of differential pricing by railroads means that, in some markets, agricultural shippers are contributing to both railroad variable costs as well as covering a large share of fixed costs. However, in areas where transportation alternatives exist—especially alternatives such as waterways, made possible by large public investments—railroad rates have been restrained. The extent to which railroads will be able to generate sufficient investment to accommodate the future growth in the demand for agricultural transportation remains an open question. A greater level of public investment in rail capacity may be required.

Conclusions

The steady and significant growth in demand for freight transportation is unquestionable, but studies provide differing predictions of the rate of growth. Investment in the railroad industry may not keep up with future demand for rail services, especially for agricultural commodities, which are located in rural areas. Insufficient investment in rail capacity for agricultural products could impair the United States' position as the deliverer of the lowest cost, highest quality grain and grain products in the world.

Railroad capacity has been strained recently, especially for bulky agricultural commodities, and could become even more strained in the future. Total tons hauled and the number of Class I railroad ton-miles per route-mile owned have been steadily increasing, resulting in congestion in some rail corridors and the rise of chokepoints in the system.

Railroads are a capital intensive industry. To meet rising demand, railroads, according to AAR, spent around $420 billion on infrastructure between 1980 and 2007. For freight railroads, this represents an investment of almost 18 percent of their revenue on capital expenditures, which includes maintenance of way.

Railroad industry profitability has surged in recent years, quite often reaching revenue adequacy. They are responding by increasing capital investment. After reaching a low of about $5.5 billion in 2001, annual railroad industry capital expenditures on roadway and equipment have increased steadily to over $9 billion in 2007. During 2007, the western railroads invested $5.9 billion, compared to $3.2 billion for the eastern railroads. Western railroads, however, operate more track miles than the eastern railroads, 70,828 miles in 2007 compared to 48,794 miles, so they spent about 26 percent more per mile operated than the eastern railroads, $83,700 compared to about $66,200. Western railroads have met increased demand by investing almost $6 billion in 2007, a 57 percent increase over 2002. The eastern railroads have also increased their investment—over 72 percent from 2002 to 2007.

A 2007 study by Cambridge Systematics (which, in view of the current recession, may overstate the investment needed) estimated as much as $148 billion would need to be invested in rail infrastructure by 2035. Class I railroads will need an investment of $135 billion, with the balance needed by smaller railroads. Other evaluations of the growth in the economy and in coal and grain movements suggest a somewhat lower estimate of $89 billion being needed. Following the Cambridge study, Class I railroads estimated they would be able to invest as much as $96 billion for increased capacity. Should only $89 billion in rail investment be needed, public funding might still be needed because in a slower economy railroads expect to have less revenue available for improving future rail capacity.

The availability of public investments typically depends on the benefits to the public. Public benefits often vary in form, magnitude, and location. Safety and security can be enhanced, environmental air quality can be improved, highway congestion can be decreased and mobility increased, and the network efficiency of the railroads can be improved by focused public investment.