2011 THOMAS B. DEEN DISTINGUISHED LECTURE

TRR Paper Number 11-0001

Railroads and the New Normal

Impact of Lean and Green on Their Future

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Railroading faced a bleak future in the 1960s. At the heart of the decline were several core problems. Freight and passenger traffic was shifting to highways, with the rapidly developing Interstate highway system, and to airlines, with the growing use of commercial jet aircraft. There were an overabundance of railroads and of rail capacity for the diminishing rail traffic. Unproductive labor agreements limited productivity, and economic regulations restricted flexibility. A series of changes over the course of more than two decades produced a more efficient, environmentally-friendly—or lean and green—railroading industry. The size and the number of railroads diminished, regulations were eliminated, and more flexible staffing and work rules were instituted with nonunion labor. Better technology also improved productivity. Railroads are now the most financially successful of all transportation modes, although immense challenges still lie ahead.

Good evening. It is an honor and a pleasure to be here.

The theme for this lecture was taken from an editorial in *Fortune Magazine* written in the depths of the recession. The thesis was that in the coming years the firms that would prosper had to be efficient—lean, if you will—and environmentally friendly, or green. That got me to thinking about the implications of lean and green for the railroad industry. The easy answer was that railroads were both lean and green already so they were ahead of the game. But on reflection, it is clear—to me at least—that the industry will face some immense challenges as well as some great opportunities.

Before delving into the future, which is always subjective, I would like to spend some time outlining just how far the railroads have come since the 1960s, when bankruptcies and declining market share led many to believe that railroads were doomed to go the way of the horse and buggy.

"FROM RAGS TO RICHES" OR "THE COMEBACK KID"

When I started in the business in the early 1960s, the Interstate highway system was expanding rapidly, producing huge improvements in automobile and truck transportation. Jet aircraft were coming into service and would proceed to turn airlines from a mode for the elite to transportation for the masses. Railroads were being hammered by the loss of freight and passenger traffic and the future seemed bleak, especially for railroads in the Northeast and the Midwest.

But things did not work out exactly as expected. Airlines stumbled and then stumbled again, and they continued to seek the holy grail of sustained profitability. Autos are the core of our passenger transportation network but they too are less shiny than they were in the 1960s. Their success has brought sprawl, pollution, and often massive congestion. Trucking is the dominant freight mode but, as with the airlines, profitability has been elusive and congestion and pollution are a by-product of their success. More controversial is the impact of large trucks on pavement conditions, throughput capacity, and safety.

Railroads are now solidly profitable and are the most financially successful of all transportation modes. It is certainly the transportation comeback story of the past two decades. After all, Warren Buffet owns a major railroad, the Burlington Northern Santa Fe (BNSF), but has no major investments in either the airline or the trucking industry, though he did flirt with U.S. Airways some years ago.

So how did this turnaround occur and is there anything we might learn from it?

The simplistic notion of the rail revival was that Congress passed a law, in this case the Staggers Rail Act of 1980, and all was right in the world again. Railroads, that story line goes, were overregulated and when the dead hand of regulation was lifted by the Staggers Act, life was good once more. The story fits a fairy tale notion that complex problems can be fixed if Congress just passes the right law—instant gratification through legislation, if you will.

But the simple story centered on the Staggers Act misses most of the story. The Staggers Act dealt with some, but by no means all, of the railroads' difficulties. It took well over two decades to implement all the pieces needed for the rail recovery. And while a lot of smart decisions were made, a lot of luck was involved as well.

The decline of the railroads started early in the 20th century. Railroads are highly efficient but they are also inconvenient. Automobiles and trucks are far more flexible and user-friendly, so as the road system expanded rail traffic suffered. World War II provided a respite

from traffic losses as both auto and truck transportation was discouraged by fuel and rubber rationing. But as soon as the war ended, the decline of the railroads continued apace and at an accelerating rate.

By the early 1960s, a full-blown railroad crisis existed, at least in many parts of the nation; some railroads, mostly in the West and South, were never in dire financial straits. Still, the railroad problem, which was focused first in the Northeast and Midwest, ultimately spread from coast to coast as railroads such as the Rock Island and the Milwaukee Road failed and the Chicago and North Western Railway and the Southern Pacific Railroad nearly did. As losses soared, so did deferred maintenance, and with that service deteriorated. And service deterioration caused more traffic losses, setting up a potential death spiral.

At the time, railroads were prone to blame their ills on government subsidies to other transportation modes as well as rigid, heavy-handed regulation. That was true but was not the core issue. The hard fact was that autos and trucks were a better mousetrap for much of the transportation market—again, convenience trumped efficiency for the users. Government invested in other modes not as a plot against railroads but because people demanded better roads, or in the case of inland waterways because Congress knew that low-cost barge service would help American farmers and grain dealers. That investment, most notably the Interstate highway system, certainly sped up the shift in traffic to auto and truck but was ancillary to the railroads' decline.

CORE RAILROAD PROBLEMS

The following core issues affected railroad viability:

- Loss of traffic—There was a substantial shift of freight and passenger traffic to the highways and of passenger traffic to the airlines. But some traffic simply stopped moving altogether as industries, especially in the Northeast, closed. Railroads in the West and South fared better; while their share was also declining, the underlying economies were expanding.
- Overcapacity—Too much railroad was chasing too little traffic. Management had been slow to adjust capacity to lower levels of demand. While regulation made the exiting of markets difficult, management was often reluctant to admit that traditional markets were gone and were not coming back. Recently, similar evidence of management denial has been observed, most notably in the domestic automobile business.
- Unproductive labor agreements—As rail was a heavily unionized industry, wages and benefits were high and work rules limited productivity. Much of the trucking industry (especially the full truckload business most competitive with railroads) was free of such restrictions. The loss of market share from domestic auto producers to foreign-owned transplants with lower labor costs is a similar phenomenon.
- Huge and rapidly escalating passenger train deficits—Passenger trains had been a money-losing business for decades, but with the rapid post–World War II decline in passenger volumes, followed by the loss of most mail contracts in the late 1960s, losses ballooned. By the end of the 1960s, passenger deficits threatened even the financially strongest carriers. Regulators eventually allowed many abandonments; the process was both slow and uncertain.
- Too many railroads—In a world where trucks could serve any market directly, railroads were balkanized into regional entities. Through service took a lot of coordination of both

services and pricing. Different railroads had different goals and objectives; working together was difficult at best and often impossible, at least in a timely fashion.

- Economic regulation—Railroads could not raise or lower rates without regulatory approval. Entry and exit also required regulatory approval, as did rail mergers and transfer of lines. Changes in pricing or in the network could take years; one merger—the Rock Island case—dragged on for more than a decade until the whole plan was moot. Almost anyone—customers, employees, unions, competitors, communities—could file objections to a proposed action. The railroad where I started my career spent 3 years and millions of dollars implementing lower grain rates offered in large new covered hopper cars replacing antiquated, inefficient box cars; the Interstate Commerce Commission (hearing objections from some customers as well as other railroads and barge lines) decided against the Southern twice, until it was finally overruled by the Supreme Court.

SOLVING THE RAILROAD PROBLEM

Each of these core issues was dealt with and all had to be addressed to put railroading on a viable footing. The process took more than two decades. Here is a quick review of some critical actions taken by both the private and the public sector.

Passenger Deficit

The passenger deficit was tackled first. The free market choice of simply letting the trains die was rejected and the only way to save even a core system was for intercity trains to be subsidized by the government. It was not a great answer; the system shrank by 50% and has cost billions in subsidies. The myth was that it would operate at a profit at some point; even those of us on the inside knew that was impossible. But we reasoned that it was better to have a skeletal system than none at all and it was certainly good public policy to free freight railroads from most, though not all, of the losses. Decades after it started, Amtrak still relies on below-cost, statutorily guaranteed access to freight tracks. Again, the amount of the subsidy is controversial, but consider just this one caveat: if Amtrak decides to run more service on the BNSF transcontinental mainline to California, it pays nothing for the “opportunity cost” to BNSF of using that capacity for its own intermodal traffic.

This means that future public policy “green initiative” actions intended, for example, to divert significant numbers of trucks from the highways runs smack up against competing green initiatives to add passenger service.

Intercity passenger trains were only part of the passenger problem. Commuter systems in Boston, Massachusetts; New York; Philadelphia, Pennsylvania; Baltimore, Maryland; Washington, D.C.; Chicago, Illinois; and San Francisco, California, lost millions of dollars annually. Shifting those losses to the public sector was a slow and costly process that took more than a decade.

Overcapacity

Overcapacity was tackled first by the U.S. Department of Transportation (DOT) in its efforts to deal with the bankrupt railroads in the Northeast. First, DOT issued a report and focused on the fact too many railroads and too much railroad capacity were chasing after too little traffic. DOT suggested that 25% of the entire northeastern rail network, operated by both solvent and bankrupt carriers, was potentially surplus—a politically correct way of saying "tear it up." The howls from all constituents were huge and Congress created a new entity to address the issue, the U.S. Railway Association (USRA). But USRA, in its final system plan excluded thousands of route miles from the new Consolidated Rail Corporation (Conrail) system, leaving that mileage to be abandoned or operated with government subsidies. Congress had no ability to tweak the plan, only the ability to reject it and seek a new approach. Critics of the plan lacked the votes to force such an outcome.

Over the next 15 years, line rationalization became a major corporate initiative on all major railroads. In the Midwest, which followed the Northeast with a series of bankruptcies and "sick" railroad problems, DOT and FRA played a critical role in stimulating rationalization, in part by tying many low-cost loans and grants to line rationalization efforts but perhaps more importantly by supporting the Milwaukee Road trustees in their efforts to shrink to a core operation, thus avoiding a "Conrail-West" solution. DOT urged the Rock Island trustees to do the same, with less success. Even the solvent railroads, taking a cue from the success of Conrail and others, undertook programs of their own. In the 1980s, I led the effort at Norfolk Southern that shrank the system by 6,000 mi, a third of its system, through transfers to short-line carriers and by outright abandonment.

Too Many Railroads

The problem of too many railroads was already being addressed when the railroad crisis hit. Mergers were a business strategy from the early days of railroading but the modern merger movement began in the 1950s with the merger of the Norfolk and Western Railway and the Virginian Railway. The merger of the Pennsylvania Railroad and the New York Central Railroad and its later failure put a pall over the effort. But with the creation of the Burlington Northern in 1970 and Conrail in 1976, mergers were considered a necessary part of the perpetual (or so it seemed by then) "railroad problem." The Staggers Act played a major role in the post-Conrail mergers. The Act made viability of the industry an important goal and tilted the playing field toward protecting competition, not competitors. The result was an Interstate Commerce Commission that was far more willing to allow mergers. CSX started the ball rolling despite efforts by Norfolk and Western and Southern to extract punitive conditions. The dominos continued to fall until the industry settled on a six-carrier structure: two major carriers in the East, two in the West, and two based in Canada (each of which has substantial U.S. operations).

The final big event in the merger puzzle, the split of Conrail between CSX and Norfolk Southern, came more than 20 years after Conrail was created as a monopoly and 40 years after the Norfolk and Western–Virginian merger. The Conrail split is especially noteworthy; the merger of the Pennsylvania and the New York Central Railroads created a competitive imbalance in the Northeast. USRA tried but failed to resolve the issue and "Big Conrail" was created, making a bad imbalance even worse. The split, a private sector–funded solution, restored the competitive balance that had been lost more than 30 years earlier.

Economic Regulation

Economic regulation was substantially changed by the Staggers Act. Railroad technology and economic advantage favor large, point-to-point movements: the less intermediate handling, the lower the costs; the heavier the load per car and per train, the lower the costs; and the longer the haul, the lower the costs per mile. Railroad "economics of scale and density"—elusive before the Staggers Act—finally became meaningful.

The flexibility provided by the Staggers Act—in particular its legalization of pricing and service contracts between railroads and their customers—made it possible to quote lower prices for volume movements or for long-term commitments of traffic. It became easier to close unprofitable routes and junctions, thus improving lane density and reducing switching costs. Some prices were raised but mainly railroads reduced prices to give incentives to customers to load heavier and ship on direct routes. Increasingly, prices began to reflect the economics of the business.

Deregulation did not come easily or even quickly. Some railroads opposed the Staggers Act and many were slow to implement changes.

The Staggers Act did not change everything. For example, abandonments were still regulated under the old rules, but transfers of lines to new railroads were liberalized. Still, the declared purpose of the Staggers Act was to maintain and enhance the viability of carriers and not just to provide a level playing field for all competitors and all customers. Arguments involving the right balance between viability and efficiency and competitive access for customers continue to rage to this day.

As an important footnote, Conrail gave the greatest impetus to passage of the Staggers Act. Launched in 1976, Conrail continued to lose money and required annual operating subsidies. Congress grew tired of the payments and Conrail argued that the deficit could be eliminated if it could restructure its operations and pricing.

Unproductive Labor Agreements

Dealing with unproductive labor agreements was another area where change came slowly. USRA essentially ducked the problem when Conrail was formed; it was too hot a political issue. But later, government played an important role in introducing change. When the unions went on strike against the Rock Island Railroad in 1978, the Carter Administration allowed the railroad to be liquidated—much to the surprise of the unions, which had expected a Conrail-type bailout. Next, the new Reagan Administration, having already fired the air traffic controllers, threatened to liquidate Conrail unless its costs were brought into line. Conrail used that threat to reduce its train crews from four or five to three.

The Interstate Commerce Commission finally took a liberal position on transfer of rail lines to short-line and regional carriers under Staggers Act principles. One divestiture after another was approved and all were made to low cost, generally nonunion companies with flexible work rules. The threat of more transfers put pressure on the unions to adopt more flexible work rules and the major carriers continued to push for change.

A major fork in the road came with Presidential Emergency Board 219. In an arbitration dispute over crew size, the Board sided with the Chicago and Northwestern and found that a two-person crew on through freight trains was reasonable. The union planned to strike and that would have shut down much of the Chicago commuter network. Congress, about to leave for summer

recess, simply forced adoption of the Presidential Emergency Board decision on the Chicago and Northwestern unions. After that, the other major carriers were able to negotiate more flexible staffing and work rules.

Technology

Technology played a huge role in improving productivity. It would take an entire evening to list all the changes—many of them incremental—that made a difference. Higher-quality rail meant a longer time between replacements. Mechanization of track maintenance produced greater productivity as well as less downtime for maintenance. Less downtime meant more time to run trains, further improving the productivity of line-haul crews.

Centralized traffic control makes it possible for trains to take sidings without stopping the train and throwing a switch; thus, trains move faster and crews are more productive. The development of remote control locomotives permitted the use of one-person crews in yards. Trackside monitoring devices have eliminated many en route inspections and have greatly reduced the number and severity of derailments caused by bearing failures or broken wheels or loads that were either too high or too low for clearances of the route. Improved dispatching models are coming into use that will increase the capacity of existing lines.

The productivity numbers are impressive. In 1965, ton miles per employee numbered 1.1 million. By 2006 and before the great recession, ton miles per employee numbered 10.6 million. A somewhat fairer measure is to compare the results from 1990 and 2006; by 1990, passenger service employees had largely been transferred to passenger entities and most of the transfers to short lines had been made. The results were still impressive, ton miles per employee increased from 4.8 million to 10.6 million.

Unlike many manufacturing jobs, the work was not outsourced to another country. Technology and changes in work practices drove the railroad result. As we think about where the jobs have gone, the results for the railroads show just how powerful technology can be. But all the technology came with a massive price tag, which is why many in the railroad industry view efforts by Congress to roll back the clock on railroad regulation with such alarm.

Loss of Rail Traffic

The loss of rail traffic that so devastated the northeastern railroads was halted and even reversed. Two major sources of new traffic ultimately produced an explosion of rail traffic, though the western carriers benefited far more than the eastern carriers. One source, the movement of low-sulfur coal from Wyoming and Montana was the outcome of government action (and once again, government action proved important); the Clean Air Act of 1970 and Clean Air Act Amendments in 1990 mandated a reduction in sulfur emissions from coal-fired power plants. A utility had a choice of installing scrubbers or burning low-sulfur coal. Most opted for the latter and today western coal moves all the way from Wyoming to New Jersey and Georgia.

The 500-mi hauls from Appalachia were replaced with 1,500- or 2,000-mi hauls. Not only that, but the British thermal unit content of western coal was much lower than that of eastern coal, so it took a lot more tons to provide an equal amount of heat. The bottom line was a lot of tonnage moving long distances. It was a perfect commodity for rail technology: heavy loading and usually long hauls in unit trains.

Ton miles exploded, driving rail market share up. But it was not traffic diverted from the highway, which shows how misleading broad market share data can be as a measure of truck versus rail competition. Often a change in "share" data reflects not a shift between modes but rather whole new sources of traffic that simply did not move before.

The other major "engine of growth" was intermodal, especially international intermodal. Some railroads experimented with containers in the 1960s for domestic intermodal. But the game-changing technology was the container ship and the double-stack container car. By going up, a train could carry almost twice the payload in a given length. The double-stack car, which is pretty much the standard for intermodal services today, was designed and built by a consortium of a steamship company, a railroad, and a car builder.

Big ships serving major ports fed trainloads of cargo, which then moved long distances by rail. Hauls of 2,000 mi or more were, and are, common. It was a fast way to rack up ton miles. And intermodal provided another efficiency benefit. Often there was no gathering function at all; traffic was loaded at the port directly to rail cars. And the gathering and distribution that was done used contract dray operators—nonunion labor with flexible work rules and the ability to come into and go out of the labor pool as conditions warranted.

Much of the improved efficiency that railroads achieved came from a change in traffic mix; traffic moving in trainload quantities assumed a greater share of the rail traffic base while the higher-cost, single-car business declined in relative, though not absolute, importance.

Critically, all this growth required massive investments in infrastructure. Tunnels were enlarged and bridge profiles were modified to accommodate double-stack trains. Intermodal terminals were built, often with price tags well in excess of $100 million. New rail lines were built and thousands of miles of existing trackage was upgraded with better signals, additional tracks, and heavier rail and ballast. Now, the Powder River Basin hosts about 120 trains a day, and three or four can often be seen moving at the same time.

Again, give credit to the Staggers Act for much of this increased traffic. Without the ability to make long-term contract rates, railroads could not have raised the capital needed for these massive investments.

Market share, which was at 30.3% in 1989, rose to 43.3% in 2006 and the share of ton miles between rail and trucks has stabilized; the number for 2006 was 43% for rail and 30% for trucks. But ton mile market share, often used by the rail industry for comparative purposes, really understates the importance of trucking, for trucks handled 75% of all freight tonnage. It just does not move as far as rail traffic.

All in all, it has been a great success story. And while the private sector played a critical role, the public sector deserves a lot of credit. Government provided the funds needed to lift passenger train losses off the backs of the freight railroads. Government provided the grants and loans to bankrupt and marginal carriers that helped them rebuild their infrastructure.

The turnaround could not have been accomplished without passage of the Staggers Act and, more importantly, a more enlightened regulatory process that recognized that efficiency and viability were an important part of the equation.

In providing financial resources, government practiced "tough love." Fundamental change was the price of government funding. The railroad story gives us some hope that perhaps the current intervention in the auto industry will have a happy ending.

LESSONS TO BE LEARNED

There are some lessons that can be learned:

- It takes a long time to get deeply in trouble and it takes a long time to fix the problem. Just passing a law does not provide instant gratification. So fixing General Motors or the housing industry or health care is going to be a hard slog and progress will often be erratic—two steps forward and one step back. Patience is not exactly an American virtue, and that will be a problem as we tackle problems far more complicated than failing railroads.
- Ignoring economic realities and market forces is a huge mistake for societies as well as families. Amtrak was created on a political compromise that created the myth that passenger trains could make money. Conrail was created in a more objective process and the upfront capital to rebuild the system was recognized and allocated.
- Restructuring is a painful process. Essentially, the railroads had to reduce costs to compete. In the process, hundreds of thousands of employees lost well-paying jobs and thousands of communities lost rail service.
- Government can be a powerful catalyst for positive action but that may be achieved only when there is a crisis.
- In the end, economics trumped politics. There were many arguments in favor of keeping the status quo. But government, it turned out, was unwilling to pay for the long-term costs of maintaining the status quo. (Reregulation, of course, is the reverse, politics trumping economics.)
- Congress ought to be written out of any detailed solution. The tough love of the final system plan was sustained because Congress had no ability to tinker with the plan.

GOOD NEWS FROM THE GREAT RECESSION

Just how far the railroads have come was underscored by their performance in the great recession. Traffic levels began to get a bit soft for both railroads and truckers in 2007 and most of 2008. Then, in the fourth quarter of 2008, the bottom fell out of the economy. Rail traffic collapsed, down 20% or more on most railroads. Based on historical precedent, a supposedly high-fixed-cost industry should have been crippled by such a huge and rapid loss of traffic.

But it did not happen. Railroads adjusted and they adjusted quickly. Earnings declined but did not disappear as operations were rapidly brought into line with diminished traffic levels. There was a crisis in the auto sector, a crisis in the construction sector, and a crisis in the domestic auto sector.

But there was no railroad crisis.

Railroad performance in the great recession was in marked contrast to the 1960s when financial collapse was imminent for many companies and the merest dip in revenue led to disaster. In my view, these are the factors that made a difference.

- Now, there are six major, cohesive networks. Train operations can be changed over large networks on almost a real-time basis. In the 1960s, negotiating service changes with a dozen or so connecting carriers made any rapid response to changes in volume almost impossible, at least on a timely basis.

- Now, powerful network models allow railroads to reprogram their networks rapidly and with confidence in the outcome. In earlier days, changes were made by the seat of the pants; changes were made and then observed to see how they turned out. Often, they turned out badly and it was back to the drawing board.
- Now, railroads have moved a lot of assets and people to other parties. A substantial portion of the car fleet is owned by customers. Much of the gathering function is provided by short-line carriers or, more importantly given the importance of intermodal services, by third-party draymen. As volumes plummeted, so did equipment rents and payments to draymen and short lines.
- Current managements are simply more aggressive now than those in the past. Railroading used to have a semi-public-utility attitude and decision making was slow and bureaucratic. That is no longer the case.

This year, as traffic is increasing, railroads have added a few employees but generally handle more business with fewer resources than prerecession. Trains are longer, older power remains stored, and marginal facilities closed. Recent numbers show that rail traffic is up by 28% but the number of train and engine crew starts is up only 6%. This performance, which has been repeated throughout much of the private sector, is a reason why unemployment remains so high. As an aside, just think about all those marginal auto plants that were closed as production was concentrated at the newest and more automated facilities. Lots of jobs disappeared and will not come back.

In short, railroads have been reinvented and their performance in this great recession proves that the transformation can produce solid results in good times and bad.

WHERE DO WE GO FROM HERE: THE IMPACT OF "LEAN"

Now I will turn to the future. Looking into the future is certainly a daunting task, and there are about as many forecasts of the future as there are economists, pundits, and politicians making them. So what follows is speculation, though informed speculation, I think. I worked on restructuring railroads for much of my career—expanding into markets where it made sense and exiting markets that looked weak. By necessity, I spent a lot of time thinking about the future: how much would be moving, where it would be moving, and so on. One tough thing about railroading is that you cannot pick up the tracks and move them if a market shifts.

As I write this, the economic landscape is fairly bleak. Outright disaster has been avoided but most economists now predict a long, slow recovery. The net worth of households is about where it was a decade ago. Consumers drove the "old" economy but it turned out they did it with easy credit; it was a false prosperity funded with unsustainable debt. It is difficult to see where consumers, facing stagnant wages at best and unemployment at worst, are going to find the bucks to create a surge in demand. In short, the country has become far leaner, though the choice was not voluntary.

Of course, an enforced lean economy has some real consequences for transportation. Transportation exists to move things—"stuff," if you will. When people buy less there is less to move. In fact, the great recession has already wiped out about 10 years of growth in the rail carload business. Nor have truckers escaped; they need a number of good years to return to the traffic levels of 2006.

For the transportation professional, the great recession and its aftermath will be felt for years, if not decades, to come. A slow, uneven recovery seems the most likely scenario—two steps forward and one step back. As I write this, the mortgage documentation debacle and all it portends on the recovery dominate the news—one step backward, if you will.

Of course, things might be a lot better than they look right now. It is always a bit dangerous to forecast from either the top of an economic cycle or the bottom. We all hope so. But, assuming we will have a slow recovery, certainly a plausible thesis, there are implications for transportation. We, as transportation professionals, may be forced to rethink some of our basic beliefs, including the following.

Growth Rates

A leaner future means that transportation volumes may not grow at the rates that we saw in the recent past. There will be growth as the population expands, and people do have to eat and will continue to consume. But the hyperconsumption that characterized the period before the great recession is likely a thing of the past. Think about a leaner future. The population is going to increase, but the amount of freight "consumed" per capita is likely to decline.

We should rethink capacity needs whether for highways, airports, railways, or ports. "Build it and they will come" just may not be true anymore; it does not seem prudent to most business people and probably no longer works for a public sector that is stressed for funding. Just look at the unprecedented decline in housing and the huge inventory of unsold housing that will slow suburban sprawl in coming years, and thus the need for more roads.

Availability of Government Funding

A leaner future will put a lot of pressure on transportation funding. Transportation professionals tend to get caught in their own silos. Thus, we argue that the transportation infrastructure "needs" are ever mounting and must be funded. Those in education, health care, and the military are also caught in their own silos and are certain that their needs "must be funded." And we all know that government, at all levels, is fundamentally out of money. Further, government has limited means to raise revenues in a depressed economy; people might have accepted increased sales taxes or gasoline taxes when times were good but are unlikely to do so in today's environment.

Caught somewhere between "meds for Grandma" and "retirement for Grandpa" and "schools for Sammy" and "no new taxes" and covering all the public sector unfunded pension plans means that public sector finances are going to be a mess even when the economy rebounds. The recent (as I write this) cancelation of the trans-Hudson rail tunnel by the governor of New Jersey is not the last of the bad news for transportation.

Tilt Toward Efficiency

If this scenario plays out, the transportation industry will have to find ways to do more with less, which means making better use of the infrastructure that we have. Transportation decisions have been driven by convenience, not efficiency—and that is the "inconvenient truth." Convenience will still be important, but the future world is likely to tilt more toward efficiency. We are seeing this borne out by the rapid growth of domestic rail intermodal, where major truckload carriers

have embraced intermodal as a way to move traffic at less cost than going over roads. In the process, tens of thousands of truck drivers have been displaced, which does nothing to solve the unemployment problem.

Tilt Toward More Private Sector Financing

If the public sector no longer has the wherewithal to fund necessary transportation improvements, it is possible that the private sector (which has a far more robust balance sheet at this point in time) will step in. Public–private partnerships are going to be a lot more common but the old model of augmenting private capital with a big dose of public funds will shift. The public dose, by necessity, will be far reduced.

Reduced consumption and a stressed public sector are not the only aspects of a lean future. Products are being downsized. Consider houses and motor vehicles. Houses, to the extent any are even being built, have been downsized simply to bring their price in line with what people can actually afford. There will be more multifamily dwellings as renting replaces owning for many people.

Smaller dwellings mean less stuff to move, from construction material to carpeting, and less coal to burn to provide the power for heating and cooling. While these changes will be at the margin, they will limit future growth.

With regard to motor vehicles, they are an important source of freight traffic. Steel and plastic and various parts are moved and the finished vehicle is moved to its destination. Lean means that fewer vehicles will be produced; 2010 looks like it will come in at less than 12 million units, up substantially from the depths of the great recession but well below the peak production years of the recent past.

Not only are fewer units being produced, they are on average smaller and lighter than was the case just a few years ago. Smaller means less steel, less plastic, and less carpeting and it means that more vehicles can be loaded on a single railcar. It also means less fuel use and lower emissions. But from a ton-mile-generation standpoint, railroads would be better off if everyone bought a really big sports utility vehicle.

Lean does not end there. Walmart, for example, is making a concerted effort to reduce its carbon footprint by forcing its suppliers to redesign packaging so that more goods can fit into a trailer or container.

In short, lean means that economic constraints will reduce the amount of stuff that is bought and that stuff will be smaller and lighter. It is good for society in the long term but still is something that will limit the growth of freight transportation.

THE IMPACT OF “GREEN”

Another mega trend that will affect transportation is concern for the environment—the green part of a lean and green future. The arguments about climate change will ebb and flow and it seems unlikely that we will get any comprehensive energy legislation. Still, concerns will make themselves felt in local and state ordnances and regulations, while any progress at the national level is increasingly problematic. But that will not stop a multitude of state and local initiatives because concern about the environment is not just part of a liberal agenda.

Railroads advertise themselves to be the green mode, and the arguments are fairly compelling. But deeper analysis shows that environmental concerns will create some substantial downside risks for railroads. A few of them are discussed below:

Coal

Coal is first in tonnage and usually first in profitability on most railroads and comes in second in total rail revenues, just behind intermodal. Environmentalists have painted a big bull's eye on coal-fired power plants.

Coal is not going away anytime in the next several decades. There is too much investment in coal-fired generation plants, and wind and solar are more expensive. The poor state of the economy will keep coal in business for longer than it would were the economy stronger. Obtaining higher utility rates in these economic times for costly solutions such as nuclear or solar or wind or coal sequestration is a difficult proposition. Getting public sector subsidies will be tougher as well.

That said, coal is going to be under a lot of pressure. It is difficult to get a new coal-fired generating plant approved. As older coal plants are retired, production will shift not to exotic sources such as wind but to gas-fired plants. First, gas is increasingly plentiful. Second, the carbon dioxide emissions have half the impact of coal. Third, gas is increasingly competitive in cost, which means the environment is improved without everyone's utility bill soaring out of sight and it moves by pipeline, not by rail.

As discussed earlier, western coal was a major "engine of growth" for railroads. Coal will continue to be important but will not provide the growth that it did in the past.

Downsizing

There will be less stuff to move. We have already talked about the downsizing of homes and motor vehicles and the use of more efficient packaging as part of a trend toward a leaner future. Green reinforces that downsizing and even if the economy makes a huge recovery, it is hard to see gas guzzlers coming back in large numbers simply because government mileage standards will keep manufacturers focused on somewhat smaller, fuel-efficient vehicles.

Green, coupled with community concerns, will continue to cause delays and increase costs for new transportation projects. These delays will be a special concern as we try to stretch what may well be scarce transportation dollars. The double whammy of limited funding and environmental and community concerns are likely to prove highly toxic for large-scale highway projects. Railroads, however, will have significant problems as well, as I will discuss in a moment.

Given the twin forces of lean and green, how will the freight railroads evolve? I see the next decade unfolding as follows.

Carload Business

The carload business, including coal, will grow with the economy and will stay below historic levels until the economy rebounds. As I said earlier, I think that is going to be years not months.

Intermodal

Intermodal, more specifically domestic intermodal, will be the engine of future growth. In recent months, intermodal has rebounded to levels that are almost back to the peak year of 2006. International intermodal will come back as the economy recovers but domestic intermodal will be the real story.

Domestic intermodal will be pushed to some extent by continued constraints on highway capacity. Public sector financial woes as well as green resistance to many highway projects will make new highways a tough sell. But this is not altogether good news for rail intermodal as it is very dependent on the urban–suburban highway network, and the same green concerns will make building on new intermodal terminals time-consuming, expensive, and in some cases impossible. As a further caution for those who long to take trucks off the road, most truck movements are less than 300 mi, distances where intermodal technology has been unable to compete.

Capacity

Capacity will not be a serious issue but a number of choke points will remain, especially as the intermodal business ramps up. The decline in traffic during the great recession has given the railroads some breathing room, and slow growth will continue to provide some relief from capacity issues. At the same time, sophisticated dispatching models and improved real-time information on train location, which can improve line capacity, will mitigate some of the capacity issues.

Adding capacity for intermodal growth will be a challenge, especially in major terminal areas where slower speeds, passenger and commuter train operations, and crossing with other railroads cause congestion. Major rail hubs, like major highway hubs, are where congestion is worst. It is at those same locations where adding capacity is both costly and time-consuming and often runs up against community and environmental concerns. Not only is track capacity hard to add in major urban areas, so too is finding places to build intermodal facilities. An intermodal terminal facility operating 24/7 is not anyone’s idea of a good neighbor. It is clear that intermodal will be the “engine of growth” in the future, but it is not clear that adding the needed capacity can be accomplished in an efficient and cost-effective manner.

Finding the funds to build needed capacity will be a challenge, especially in light of the unfunded mandate the railroads face to install positive train control. That unfunded mandate will drain about $15 billion in capital from the industry—funds that could have bought a lot of additional intermodal terminal capacity, among other things.

Railroad Funding

Freight railroads will continue to tap public funding for some projects, but the availability of such funding is uncertain at best. One thing I learned when dealing with the northeastern railroad crisis of the 1970s is that freight transportation in general and railroads specifically are not high on a politician’s wish list.

But if the public money dries up, it is not the end of the world. Compared with overall capital investment, it is not a significant number. Railroads will be able to raise funds in the private sector for any project that makes economic sense. Looking at the demands on public

sector budgets, I would certainly rather be trying to add railroad capacity than highway capacity. Simply stated, railroads are solvent and the government is not.

I have not dealt with the future of rail passenger services. That subject deserves a complete lecture in its own right. But I do have a warm spot in my heart for passenger trains; I was present at the creation of Amtrak and was one of its first employees. I think there is a role for passenger trains in selected markets and certainly they have proven their worth in the Northeast Corridor and in California. Unfortunately, this country has never shown any inclination to provide long-term funding for intercity passenger trains. The recent passenger rail initiatives are more of the same in that regard and, given the state of public sector balance sheets, especially in the states where passenger rail makes the most sense, where are states going to find the reliable, long-term funding needed to provide the ongoing operating subsidies required? I see no clear way forward for rail passenger service, no matter how passionate its supporters might be. Again, the pressures of “meds for Grandma” will trump public sector budgets.

SUMMING UP

The nation now faces an extraordinary set of challenges. It sometimes seems that there is no end to bad news. That, on a much smaller scale, was what railroading looked like in 1960. Traffic was often declining, trains were coming off, maintenance was being deferred, and deficits were mounting. The then current government regulatory mechanism was dysfunctional and at odds with the existing market and economic reality of railroading.

Still, the problems were addressed, though long after they had become a crisis. Solutions were found and for the most part those solutions worked. The key to that success was to deal with the world as it was and not the world as we wished it to be. And transportation professionals in both the private and the public sector guided the effort.

Going forward, the railroads are well positioned for success. The physical plant is in the best condition of my long career. The people running the business are smart and more importantly have learned how to deal with a rapidly changing marketplace. The key will be fact-based decision making and not responses based on “would have been, could have been, should have been.”

I am confident that the railroads will get it right.

Finally, there is a message in all of this for the broader transportation community. Resources are going to be scarce. Transportation, and especially freight transportation, is simply going to have to compete with all sorts of other priorities. It will be up to us, as the professionals, to define what needs to be done and what, realistically, is likely to be funded. The entire transportation community is faced with the same sort of hard economic choices that the railroads faced for more than three decades.

We live in interesting, and demanding, times.

Thank you for your time and attention.