
TRANSPORTATION

More than Just Running on Time

Precision scheduling could revolutionize rail freight—if it's allowed.

◆ BY IKE BRANNON AND MICHAEL F. GORMAN



In the 1960s, containerization completely transformed how goods are shipped globally and led to dramatically lower shipping costs around the world. In the 21st century, U.S. railroads are introducing a new practice called precision-scheduled railroading (PSR) that could transform their operations in a similar manner.

PSR creates a fixed, predictable timetable for freight shipments. This differs from traditional practice, where rail customers fill cars on their own schedule and then have the railroads move them. PSR would greatly simplify railroad logistics and could dramatically increase how much can be shipped by rail without the need to build more tracks or hire more engineers.

U.S. railroads have been using PSR in limited cases, with good results. But they may not have the chance to expand its usage

IKE BRANNON is a senior fellow at the Jack Kemp Foundation and a contributing writer to *Regulation*. **MICHAEL F. GORMAN** is the Niehaus Chair of Analytics and Operations at the University of Dayton.

because members of Congress, regulators, and rail unions have signaled their unease with it. These officials voice concerns about safety issues from longer trains and busier rail yards, but there also is worry that PSR would reduce railroad employment by improving system efficiency. If the government were to inhibit its further implementation, the few jobs that would be saved would be exceedingly costly, both for railroads and society. Forestalling PSR would make railroads less competitive in the global freight market and push more goods onto trucks, which would increase congestion on U.S. roads as well as tailpipe emissions, increasing smog and greenhouse gases.

THE ECONOMIC BENEFITS OF PSR

In addition to railroads having trains carry more goods, hewing to a fixed, predictable schedule greatly increases the potential capacity of a railroad, so that its tracks carry more freight in a given week or month. The predictability means fewer trains need



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to move to a siding to wait or make way for other trains, so trips generally take less time. PSR also allows for a substantial increase in the length of a train, boosting railroad capacity. One 100-car-length train occupies less track than four 25-car trains because it needs less space on the tracks between other trains than would four shorter trains.

Improving railroad efficiency will shift the transport of goods more toward rail and away from roads, increasing overall U.S. productivity (which economists define as output per worker-hour) in the logistics sector. Because it takes just two locomotives to move what would require 150 trailer trucks, the productivity gains can be significant. PSR improves productivity gains even more by lengthening trains, further reducing labor costs. Larger and more predictable train sizes also allow railroads to more precisely match the locomotive power assigned to each train, which further reduces transport costs as well as greenhouse gas emissions.

Increasing the efficiency of railroads reduces the logistics costs in the supply chain of shippers. If more goods get transported via train instead of trucks, increased efficiency and capacity reduce transport costs across the economy and lower costs for shippers, ultimately reducing prices for consumers. There are also positive externalities to society in boosting rail productivity: Expanding the effective capacity of railroads would result in more goods being transported by rail instead of trucks, which would reduce highway congestion. Because vehicles stalled in traffic emit much more toxic pollutants than cars moving at the speed limit, the environmental gains could be significant.

Reducing the number of trucks on our roads would also reduce the cost of maintaining and expanding U.S. roads, bridges, and highways because fewer trucks would traverse them. By dint of their weight, trucks inflict a disproportionate amount of wear and tear on our roads, so reducing their presence would preserve roads.

OBJECTIONS TO PSR

While PSR holds the potential to boost capacity, reduce transport costs, and increase the reliability of shipping goods by rail, its further implementation faces significant opposition.

The main objection comes from railroad unions, who fear that it will reduce employment and their membership. Longer — and fewer — trains would ultimately mean that railroads would need fewer train crews. The more predictable schedules created by PSR would further reduce the need for crews. Unions also contend that PSR increases the complexity of local rail yard operations, increasing occupational risk. And they say that longer trains are more problematic to maneuver and that staffing on such trains should increase to take that into account.

Some customers also appear wary of precision scheduling, fearing that the reduction in operating costs may not necessarily lead to lower shipping rates. They also worry that the reduction in flexibility such a system imposes would erode some or most of any cost reductions they would receive from PSR-enhanced efficiency.

Some of those opposed to further implementation of PSR have asked Congress to intervene and limit its use. For instance, unions have pushed for the Federal Railroad Administration (FRA) to increase staffing requirements on longer trains. The FRA has also considered implementing some price caps on shipping costs in certain markets where rail has a clear cost advantage over other shipping avenues. Members of Congress have also proposed legislation to curtail its usage.

Railroads do have a modicum of market power with customers who are located in places where barges are not feasible and trucks are clearly cost uncompetitive. It is understandable that rail

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customers might see any attempts to reduce railroads' costs that would require the customers to do something differently — and that costs them more to meet the strict schedules — as being an imposition, especially if there is no guarantee that they will get a sizable share of any cost savings. But in such situations, there should be room for a mutually beneficial transaction when costs fall. It may not be an even split of the savings, but rail shippers can use their power to extract a portion. One way to look at their request for government intervention is as a way to obtain further leverage in this negotiation.

Fewer jobs? / Successful firms constantly strive to improve productivity. PSR is an instance of this. While its expansion may mean a loss of jobs in the short run, companies that are successful at improving productivity can then charge lower prices and increase their business, which would necessitate them hiring more workers.

By shifting more freight to rail, PSR will likely result in more people being employed by railroads in the future. But fewer of those employees will be engineers, and this understandably worries engineers and their unions. However, a union with smaller membership does not necessarily lose bargaining power. Engineers will continue to be, arguably, the most essential workers of a railroad, and the fact that their compensation

constitutes a smaller share of a railroad's costs means the railroad will have less reason to forcefully push back on unions' wage demands. Why risk a shutdown when a wage increase to a small proportion of high-skill workers is such a small share of total expenditures?

Longshoremen unions experienced something similar with containerization. It did reduce their ranks, but the remaining workers are high-skilled, necessitating appropriate compensation. These days, dock workers are paid hundreds of thousands of dollars a year.

PSR also brings benefits to rail crews. For instance, with more predictable operations, train trips can be more easily scheduled to allow crews to ride to an away location and then back home on the same day. Creating more such pairs lessens the need for engineers to spend nights in hotels away from home, seemingly an unalloyed good for both railroads and engineers. Yet, the union laments the reduction of "away pay" that engineers receive for such arrangements.

Are longer trains riskier? / Union leaders and government officials are correct that longer trains are more challenging to operate. The length and weight of long trains require engineers with more precision and care, and the trains come with more risks compared to smaller trains.

However, the slightly higher risk of a longer train having a safety incident is more than offset by the reduced risk from having fewer trains operating on the rail networks overall, as well as fewer trucks on the roads. Fewer trains also result in fewer road crossings and fewer road-crossing safety events. The FRA determines safety limits and it has judged the current PSR train lengths to be well within legal and engineering limits and pose no de facto safety hazards.

Unions have also argued that the larger trains resulting from PSR have made dispatching more challenging. Many sidings are too short to accommodate longer trains, reducing the number of places where one can "pull over" to make way for another. The delicate dance between trains and sidings can lead to fewer options and more delay. Those delays can eventually cause "hours of service" violations in which crews work beyond their legal maximum of 10 hours a day.

This challenge is mitigated by the fact that longer trains mean there will be fewer trains running, which means less congestion. While the time parked in rail sidings can increase in some cases, there are far fewer needs for pulling into a siding. In fact, hours of service violations have fallen as the implementation of PSR has increased.

One large advantage to PSR, which unions overlook, is that more predictable train operations make it easier to give conductors and engineers more regular work schedules, which reduces operator fatigue. Under previous operating schedules, trains were less predictable, necessitating engineers being on call without being on the clock. Because the schedule was often not kept,

engineers could wait several hours to start work, resulting in their beginning a shift already fatigued. More predictable train schedules make it easier for train operators to anticipate work schedules and plan their rest accordingly.

Local yard risk? / A local rail yard is akin to a small regional airport. Under current operations, it aggregates local traffic that then goes to a major hub that redirects the cars toward their final destinations.

Under PSR, there would be more "direct flights," meaning that more traffic sorting would be done at the local yards. As a result, PSR would increase the workload of many local yards, which unions claim increases the risk to local yard workers. That is true, but at the same time, less car handling would need to be done at the major hubs (called "hump yards"), which serves to reduce total car handlings. In short, it is a shift in workload from the big intermediate yards to the smaller origin yards, not an overall increase in total car handlings. That should reduce the workload and risk to yard workers overall but would shift some of the remaining work and risk onto local yard workers.

It would be mistaken to claim that the change in operations results in more handling. An increase in car handling would constitute an unambiguous increase in costs as well as a concomitant reduction in asset utilization, not to mention an increase in total delivery time. The suggestion that PSR causes more work for switchmen looks only at the local operations and not across the entire network. Car handling is dangerous business; reducing it not only reduces rail costs, but also increases crew safety.

PSR BOOSTS PRODUCTIVITY

Logistics — the business of transporting goods across the country — constitutes nearly 10% of our nation's domestic product, and railroads move a large proportion of freight in the United States. If we can improve productivity in that sector — that is, come up with ways to move more goods with lower costs and fewer people — it frees up workers to do other things in our economy, which is the irreducible formula for increasing our standard of living. All modes of transport — planes, trains, trucks, and ships — have seen large productivity improvements over the last few decades, spurred on and abetted first by deregulation and then by the information technology revolution.

In their attempt to remain competitive with the other modes, the railroads have come up with an approach — precision scheduling — that has allowed them to dramatically boost their productivity as well as increase their ability to deliver goods in a timelier manner. PSR would also beget positive economic externalities: replacing trucks with railroad cars serves to reduce congestion on roads along with smog and greenhouse gases.

The justification for government intervention in private markets is to correct for negative market externalities. Nascent government efforts to halt PSR make little sense from either an economic or political perspective. R