Examining the Effects of Precision Scheduled Railroading on Intercity Passenger and High-Speed Rail Service

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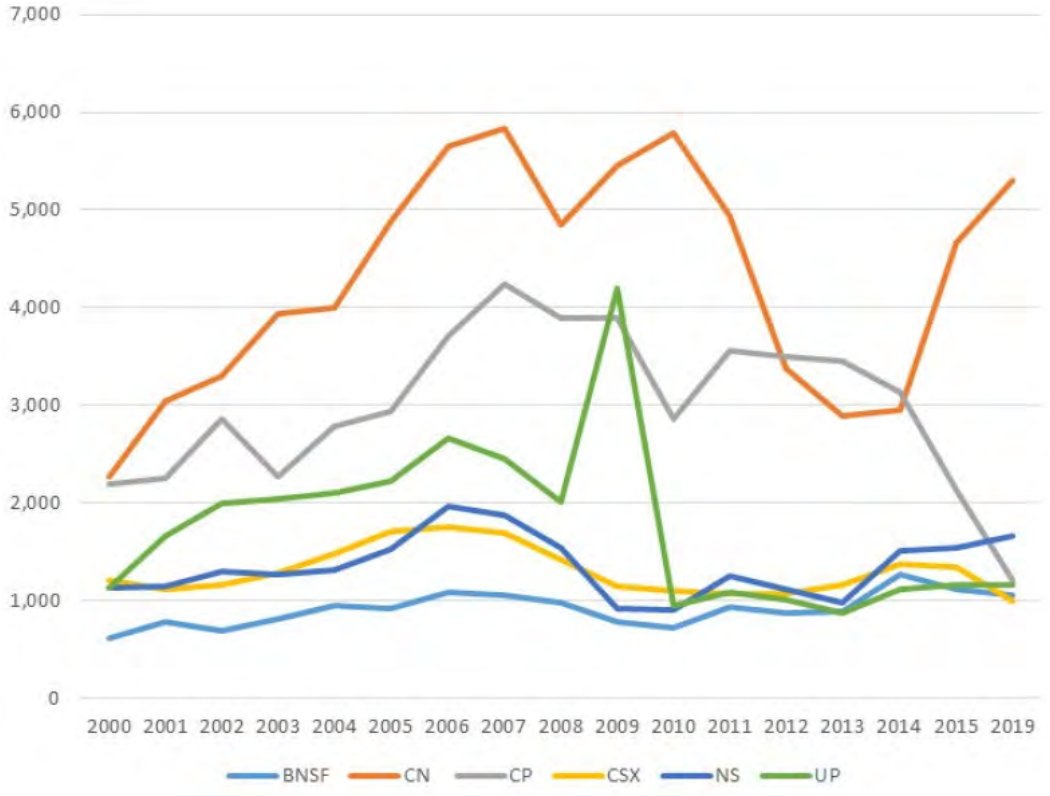

Table 1: Host Railroad Minutes of Delay per 10,000 Train-Miles

The research team began this project because the "Precision Scheduled Railroading" (PSR) has been adopted as a railroad operating strategy by six of the seven Class One (major) freight railroads in the United States in the last five years. PSR strategies strive to make railroads as efficient as possible, and the industry has seen dramatic reductions in personnel, equipment, and trackage. Since PSR was first put into practice, the benefits to shipment arrival reliability and to freight railroads' profitability has been demonstrated by its implementation in several Class One freight railroads. This research focuses on the previously unstudied effects on passenger railway operations in shared freight/passenger corridors.

Study Methods

Amtrak is the nation's sole intercity passenger rail service and its current high-speed rail operator. Therefore, the authors contacted and participated in meetings and discussions with numerous Amtrak staff at various levels within Operations, Engineering, and Maintenance departments to seek input from the railroad's personnel. Amtrak's network consists of tracks owned, maintained, and dispatched by freight railroads who "host" Amtrak trains using their tracks. The major freight railroads control the dispatching and thereby decide on which trains have priority. Federal law requires that Amtrak trains receive preference over freight trains,

but the largest cause of Amtrak delays is due to freight train interference.

To determine the effects of PSR on Amtrak's intercity passenger rail service, the authors collected data from Amtrak for two different measures, viewed over time: (1) the total minutes delay that the host freight railroads cause Amtrak to suffer, and (2) the percentage of Amtrak trains that arrive within 15 minutes of their scheduled arrival time. Also, the authors noted the year when PSR was first implemented at each major freight railroad because it is necessary to understand the effects of PSR on passenger service over time.

The results of the study suggest that if implemented properly, PSR strategies will have no effect on a freight railroad's ability to host Amtrak Intercity and High-Speed Rail passenger railway service, but that if implemented incorrectly, the host railroad can negatively affect Amtrak's train performance.

Findings

The results are mixed. Considering the measure of "Host Railroad Minutes of Delay per 10,000 Train-Miles" suggests that PSR may be able to improve a railroad's ability to reduce delays of the Amtrak passenger trains that it hosts. Of the five railroads that implemented PSR, one has worsened its minutes of delay rate, two railroads have experienced no significant changes, and two have experienced significant improvements. Alternatively, considering "On-Time Performance" measures suggests that PSR strategies have the potential to worsen a host railroad's performance. Setting aside the Canadian National Railway, which began PSR prior to the earliest year of data, of the other five railroads, three showed no significant difference. However, after PSR strategies were initiated at two of the Class One railroads, their on-time performance worsened noticeably.

Policy/Practice Recommendations

If PSR-related track removals are found to have reduced capacity in a section of mainline to the point that on-time performance of passenger trains suffers significantly, restoring track may alleviate the problem. A potential source of funding for such track restorations would be the Federal Railroad Administration's "Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program."

About the Authors

Dr. John G. Green is an Assistant Professor of Civil Engineering and Railroad Engineering in the Civil and Geomatics Engineering Department at California State University, Fresno (Fresno State), with more than 24 years of experience in railway projects. He is a Past President of the Illinois Section of the American Society of Civil Engineers (ASCE) and the current Vice Chairperson of AREMA Committee 24. His current research interests are in high-speed passenger railways, railroad freight transportation, and in the transportation of agricultural products.

Mr. Francis Miller is a licensed Professional Engineer with more than 36 years of experience in the planning, design, construction, inspection and project management of major railway, track, and facility engineering projects and is Vice-President and Director of Track Design for AECOM. He currently serves as Vice-President of AREMA's Passenger & Transit Functional Group.

To Learn More

For more details about the study, download the full report at transweb.sjsu.edu/research/2016

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