Chapter 3
Comparing the Size of the Market in Potential High Speed Rail Corridors of the Midwest: A Gravity Model Approach

Joseph P. Schwieterman
DePaul University, USA

ABSTRACT

Transportation planners in the Midwest are advancing an agenda for high-speed rail while simultaneously investing in numerous corridors that have different strengths and weaknesses. To assist in establishing priorities, this paper compares the size of the travel markets in seven of these Midwestern corridors. Using a technique known as the gravity model, it demonstrates that the corridors linking Chicago to Cincinnati and Detroit likely exceed the others on the basis of total passenger traffic, and, along with the Chicago – Twin Cities route, rank at the top with respect to the passenger-miles of travel. The routes to Cleveland, St. Louis, and other locales compare less favorably. The top corridors, while shown to be only a fraction of the size of the California and Northeast Corridor routes, are found to be appreciably larger than most of the country’s proposed high speed rail corridors, suggesting they have considerable potential for rail-passenger development.

DOI: 10.4018/978-1-5225-0102-2.ch003
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INTRODUCTION

A fundamental issue affecting the development of high-speed rail service throughout the Midwestern states is a dispersion of efforts across numerous corridors. Resources have been spread out over a variety of routes on account of political boundaries, differing goals of government agencies, challenges of each corridor, and a lack of consensus on which route deserves to be the top priority. Although lengthy segments of the Chicago – St. Louis and Chicago – Detroit routes have been upgraded for 110 mph service—the standard used in this chapter for a service to be considered “high speed”—it remains unclear when these routes will become fully functioning high-speed corridors, due to remaining obstacles.

This dispersal of resources across various corridors has not been nearly as significant in the development of high-speed service in most other parts of the world. In France and Japan, for example, a consensus emerged early in the planning process that the Paris – Lyon and Tokyo – Osaka routes, respectively, were the highest priorities. In Spain, resources initially focused on completing the Madrid– Seville route before significant resources were devoted to other routes. A similar consensus has emerged about which corridors in California and the Northeast states are most suitable for new or improved high-speed trains. Due to the reasons listed above, such a consensus does not exist in the Midwest.

This study seeks to evaluate the size of corridors potentially served by the Midwest Regional Rail System (MWRRS), the multi-state system envisioned to promote faster and more frequent rail service in the region, using a technique known as the “gravity model.” This approach considers the populations of the metropolitan regions served by various corridors, the distances between them, and the rate at which the volume of travel diminishes as distances rise. This gravity model approach is based loosely on the Newtonian law of gravity, which dictates that any two bodies attract each other with a force that is directly proportional to the product of their masses and inversely proportional to the square of the distance between them.

This report’s primary goal is to provide a fresh perspective on the traffic potential of Midwestern corridors due to the growing obsolescence of past efforts to compare them as well as foster greater understanding of the tradeoffs the region faces. In the following sections, the analysis explores seven corridors, originating from Chicago, including: Chicago – Cincinnati, Cleveland, Detroit, Lansing/Port Huron, St. Louis, Minneapolis/St. Paul, and Omaha. Results from the gravity model are compared with estimates used in a 2004 study of the MWRRS. The final section compares Midwestern corridors with those in other parts of the United States, including the Cascade, California, and Northeast corridors.
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