# Passenger Rail Ridership Projection, Demand Modeling, and Impact Analysis

## *Staff Experience*

AGENCIES AND PROJECT CONTACTS:

Illinois Department of Transportation
*220mph High Speed Rail Feasibility Study*
Kazuya Kawamura / (312)413-1269

University of Illinois at Chicago
*220mph Midwest High Speed Rail: Market Conditions Assessment*
Kazuya Kawamura / (312)413-1269

Metra Commuter Rail
*RTA Regional Fare Model Project*
Chris Wilson / (773)274-7663

Transportation Research Board 2017 Annual Meeting
*Current Trends in Highway/Rail Grade Crossing Research (Session 583)*

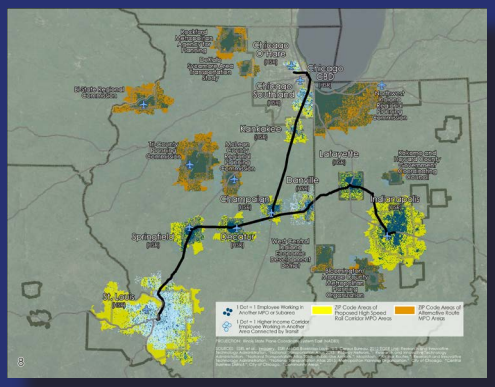
PROJECT PURPOSES:

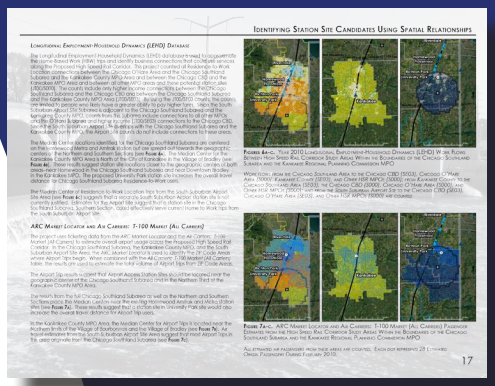
- Identify and Apply Methods to Estimate Ridership Demand
- Estimate Future Capacity and Operational Requirements
- Project Ridership Responses to Fare and Service Changes
- Assess At-Grade Crossing Changes and Roadway Impacts

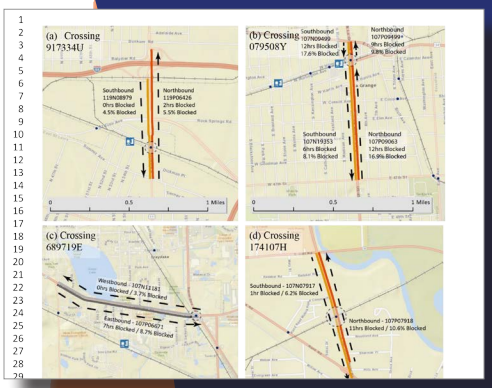
The professional staff of DAMA Consultants, Inc., have developed, applied, and evaluated passenger rail ridership projection methodologies and modeled future market demand to develop plans for capital and operational needs. These methodologies evaluated regional travel demand models and applied these models to intercity demand; applied estimates of demographic, employment, and land use changes to regional transit demand; and assessed existing demand potential using airline, intercity home-work connections, spatial relationships, and economic and retail market estimates. DAMA staff assessed modeling practices, price and demand elasticity estimations, and route modeling and evaluated the results of multiple scenarios.

DAMA staff members have applied these methodologies to estimate future operational requirements and their relation to existing infrastructure and equipment capacities, future state economic opportunities, alternative routing, and alternative scenarios. These projects have used data from the U.S. Census Bureau Longitudinal Employer-Household Dynamics (LEHD) Database and the the Airlines Reporting Corporation (ARC) to identify intercity demand and the National Performance Management Research Data Set (NPMRDS) to quickly estimate delays at multiple at-grade crossing locations and assess hourly delay impacts along intersecting roadways.

DAMA's experience in the use and application of multiple data sets provided broad insights into how transportation corridors are used and how changes in one area can affect demands for limited capacity across different types of networks.







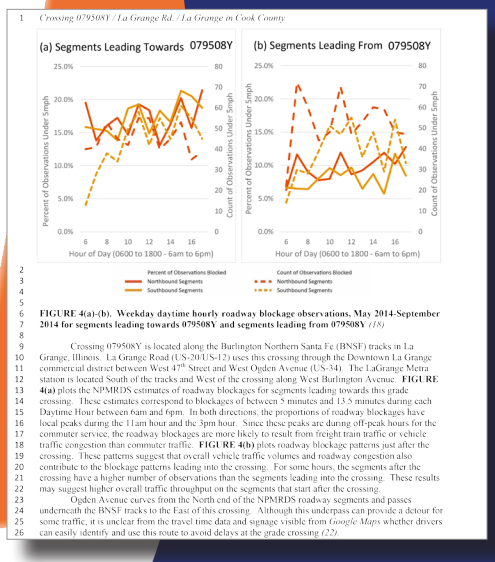




**FIGURE 4(a)-(b). Weekday daytime hourly roadway blockage observations, May 2014-September 2014 for segments leading towards 079508Y and segments leading from 079508Y** *(18)*

Crossing 079508Y is located along the Burlington Northern Santa Fe (BNSF) tracks in La Grange, Illinois. La Grange Road (US-20/US-12) uses this crossing through the Downtown La Grange commercial district between West 47th Street and West Ogden Avenue (US-34). The LaGrange Metra station is located South of the tracks and West of the crossing along West Burlington Avenue. **FIGURE 4(a)** plots the NPMRDS estimates of roadway blockages for segments leading towards this grade crossing. These estimates correspond to blockages of between 5 minutes and 13.5 minutes during each Daytime Hour between 6am and 6pm. In both directions, the proportions of roadway blockages have local peaks during the 11am hour and the 3pm hour. Since these peaks are during off-peak hours for the commuter service, the roadway blockages are more likely to result from freight train traffic or vehicle traffic congestion than commuter traffic. **FIGURE 4(b)** plots roadway blockage patterns just after the crossing. These patterns suggest that overall vehicle traffic volumes and roadway congestion also contribute to the blockage patterns leading into the crossing. For some hours, the segments after the crossing have a higher number of observations than the segments leading into the crossing. These results may suggest higher overall traffic throughput on the segments that start after the crossing.

Ogden Avenue curves from the North end of the NPMRDS roadway segments and passes underneath the BNSF tracks to the East of this crossing. Although this underpass can provide a detour for some traffic, it is unclear from the travel time data and signage visible from *Google Maps* whether drivers can easily identify and use this route to avoid delays at the grade crossing *(22)*.