



## Simulation Analysis of Runway Reconstruction Options



*Animation with Closed Runway 4R/22L at Detroit Metro Wayne County International Airport*

**Client Name:** Jacobsen Daniels Associates, sub to Kimley-Horn – prime contractor for Wayne County Airport Authority

**Date Started:** July 2009

**Date Completed:** January 2010

At 12,000 feet, Runway 4R/22L is the longest runway at Detroit Metro Wayne County International Airport (DTW). Its pavement conditions are worsening, such that the runway must be reconstructed entirely. DTW is a major connecting hub for Delta Air Lines serving both domestic and international markets, thus the airline is most concerned about the operational impacts of not having the runway available. The Airport contracted with Michigan Aviation Partners (led by Kimley-Horn Associates) to plan the runway reconstruction and consider various phasing options.

The project team formed a Planning and Airspace Committee (PAC) consisting of Airport, FAA, and airline personnel as well as the consultant team. Several PAC meetings were held throughout the planning phase to understand the operational issues and to review the planning considerations (construction costs, days out of service, etc). To quantify the operational impacts, TransSolutions simulated five alternative runway phasing options and analyzed the aircraft delays in each option.

TransSolutions developed a model of the airfield in *Simmod PLUS!* and calibrated the model to south-flow visual conditions, DTW's primary wind/weather scenario. The model was then modified to represent south-flow instrument conditions, north-flow visual conditions, and north-flow instrument conditions. Using the existing flight schedule, TransSolutions grew the schedule to represent a 2012 traffic demand.

For each phasing option, TransSolutions analyzed average delays for all traffic as well as for the Delta family of carriers. Using the delay data in conjunction with the construction costs and FAA funding, the Airport was able to determine a preferred phasing option for the runway reconstruction.