

RESEARCH SUMMARY

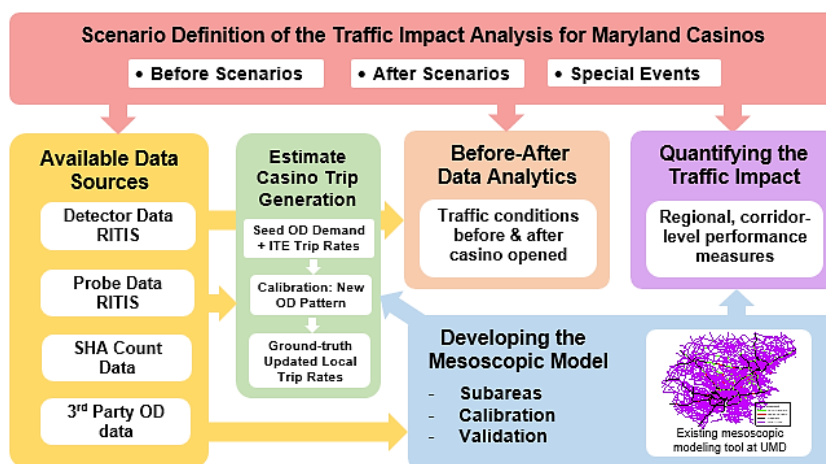
Advanced Data Analytics and Mesoscopic Models for Special Event Impact Study at Maryland Casinos

WHAT WAS THE NEED?

Three casinos recently opened in Maryland: Maryland Live! at the Arundel Mills Mall, Horseshoe in Downtown Baltimore, and MGM at the National Harbor. While these new gaming resorts brought new jobs, economic development opportunities, and tax revenue to Maryland, they also created new travel demand patterns which could produce traffic impacts on residents and businesses. Therefore, an in-depth analysis of both before- and after-scenario traffic conditions at the regional and local level was performed.

WHAT WAS THE GOAL?

Quantify the traffic impact of each of the three casinos using reliable data and advanced modeling tools and explore improved trip generation rate estimation methods for traffic impact studies.



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WHAT DID THE RESEARCH TEAM DO?

The comprehensive analysis was a three-pronged effort that included before/after-scenario probe data analytics, mesoscopic simulation-based modeling, and the exploration of new methods for estimating the trip generation rates for full-scale casino complexes in Maryland. First, historical travel time and speed data were utilized to analyze and visualize observed traffic impact for selected months before and after each casino became operational. Second, an open-source mesoscopic dynamic traffic assignment simulator named DTALite was employed to model the traffic patterns for before/after scenarios, including reoccurring special event scenarios (e.g. Baltimore Raven's football game, Black Friday, concert). Lastly, alternative trip generation rate estimation methods were explored: trip estimates from mobile device big data and the Origin Demand Matrix Estimation (ODME) statistical procedure in DTALite.

WHAT WAS THE OUTCOME?

Based on historical data, traffic impacts at about one-third of all studied corridors were insignificant. At other corridors, the negative traffic impacts, measured by changes in travel time and speed, were mostly within 10% of the before-casino values.

Before/After Changes		
Casino	Avg. TT	Avg. Speed
Horseshoe	No Significant Impact	
Live!	+14%	-12%
MGM	+6%	-6%

The DTALite modeling analysis showed that the Live! Casino exhibited the greatest regional mobility impact and the Horseshoe Casino had no significant impact.

The alternative trip generation rate estimation methods revealed that ITE-based rates based on national data significantly overestimated trip generation at Maryland casinos. The ODME method out-performed both the ITE-based and mobile device-based trip estimates.

HOW WILL SHA USE THE RESULTS?

With results from the before-after study and DTALite analysis, MDOT SHA will have a better understanding and be able to better communicate the traffic impact on the nearby roadway network from casinos under various scenarios. Trip generation rates estimated with alternative methods will help MDOT SHA forecast travel demand for future Maryland casinos, as well as potentially other specialized land uses, with higher accuracy and reliability.

LEARN MORE

To view the complete report, click [here](#).

After-scenario + Nearby Special Event		
Special Event	Avg. TT	Avg. Speed
Weeknight Raven's NFL Game	+30%	-26%
Black Friday	+66%	-40%
Sold-out Concert at MGM	+6%	-6%

For more information on research at MDOT SHA, please visit [our website](#).
