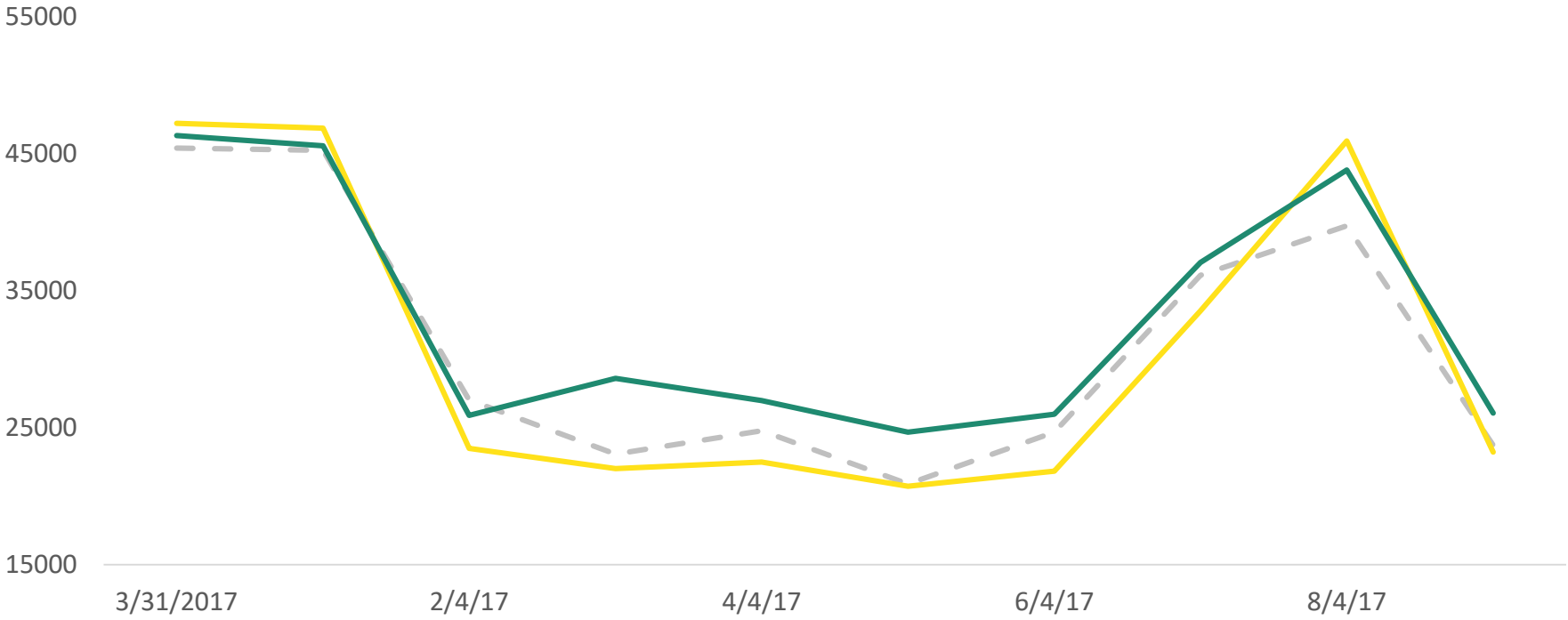
Two diverse models gave us the best results

XGBoost
(Extreme Gradient Boosting)

LSTM
(Recursive Neural Network Deep Learning)

Predicted number of ridership from different models



	MAE
Actual	*3477 (baseline)*
LSTM	*2906*
XGBoost	*2936*

** Calculated based on MAE (Mean absolute error) - average of difference between prediction and actual*
Note: all the performance and impact are calculated based on static (one year) model

Stacking boosts the prediction by reducing MAE by ~150

XGBoost
(Extreme Gradient Boosting)

LSTM
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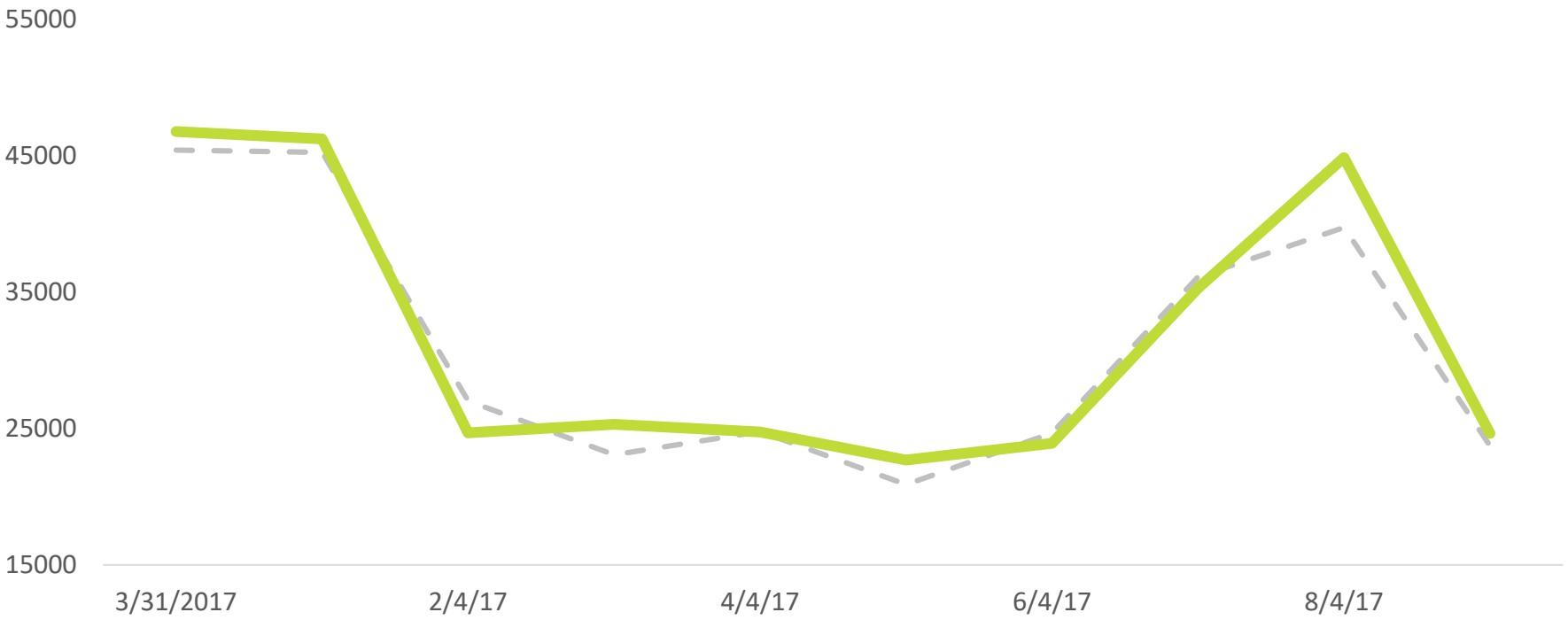
Predicted number of ridership from different models



MAE
3477 (baseline)
2754

Leveraging existing data with external data is key to achieving better prediction performance…

Historical ridership

School

Weather

Population Data

Additional features retrieved online

…with the most important features identified from each category

- Average ridership in same day/ week/ month in past years, adjusted for holiday
- Lag values

- Total number of students in school
- Flag for summer holiday

- Highest Temperature
- Extra weather data including humidity, wind, dew point

- Young population (aged 6 - 18) in Minnesota