



Homeland
Security

Southwest Border Migrant Encounter Projections

October 2023

*Office of Homeland Security Statistics/Migration Analysis Center
Science and Technology Directorate/MMI*

OHSS SWB ENCOUNTER PROJECTIONS

- The Office of Homeland Security Statistics (OHSS) runs the enterprise-wide Southwest border migrant encounter projections for DHS. A monthly interagency working group meets to discuss these projections.
- Projections inform operational, budgetary, and policy planning. They are also used in downstream modelling of other indicators of interest.
- I will present:
 - Overview of Methodology
 - Example Results
 - Example Evaluations of Forecast Accuracy

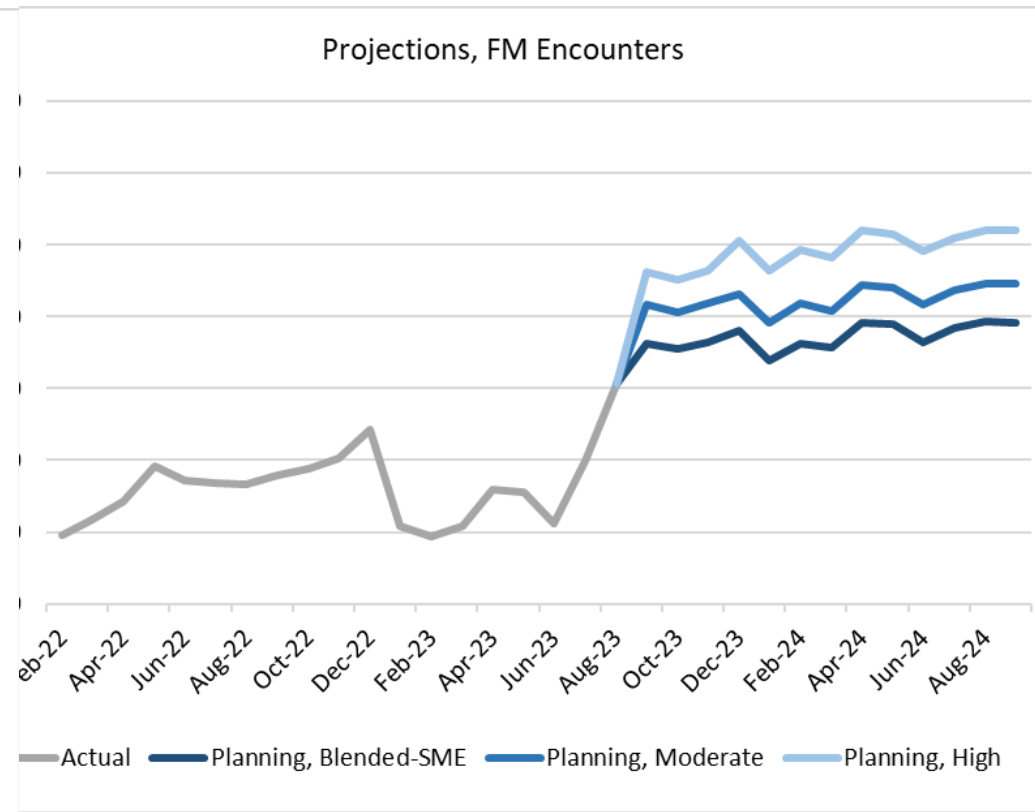
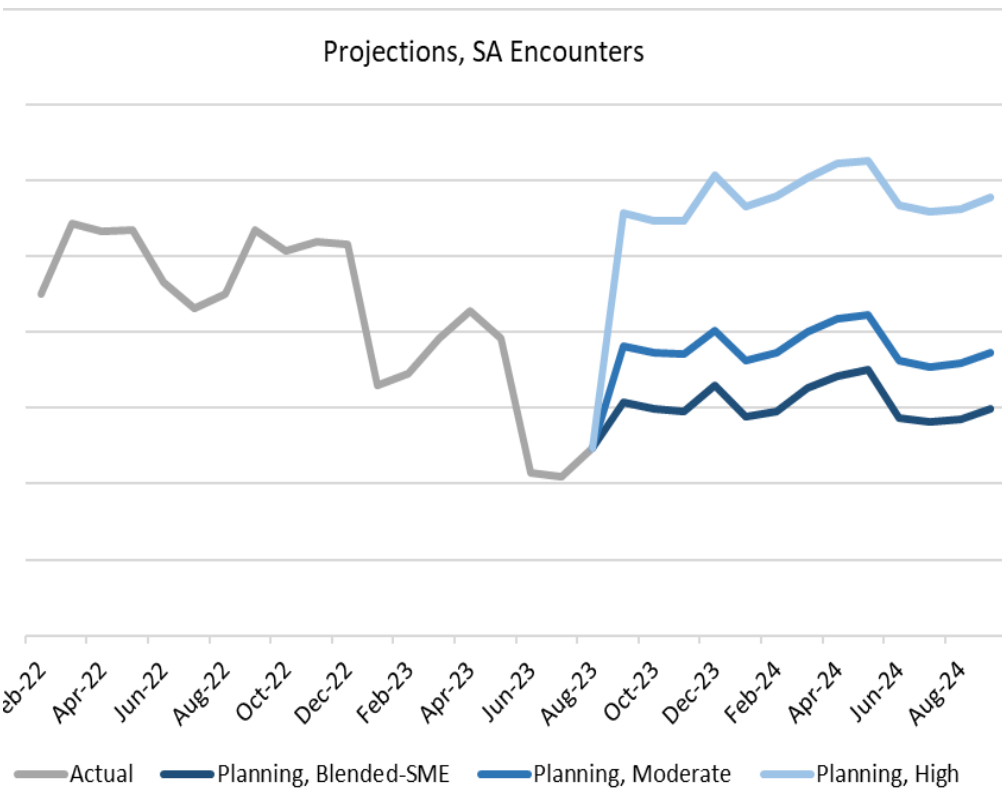
OVERVIEW OF METHODOLOGY

- Bayesian Structural Time Series (BSTS) model
 - Separate simultaneous estimates of:
 - Semi-local linear trend
 - Autoregressive (AR) terms
 - Seasonality (monthly dummy variables)
 - Underlying drivers of migration, based on data-driven regression results, reviewing existing research, and discussions with DHS components
 - Government of Mexico Apprehensions
 - USA Unemployment
 - Removals as share of T8 encounters
 - Separate runs for each citizenship (top 14 plus all other) and family status group (Single Adult, Family Unit member, or Unaccompanied Child).
 - Subject Matter Expert (SME) survey provides input on results. Additional assumptions are used to create planning lines.
 - Diagnostic statistics (MAPE) calculated in each month.

SME SURVEY

- Distributed each month to SMEs across DHS components, HHS, State, and USAID.
- SMEs react to statistical model results and provide input on whether to adjust the projections higher, lower, or to keep them as is.
- SMEs provide input on expectations for total encounters or by family type (SA, FM, UC).
- As participation in the SME survey has increased, the SME survey has begun to increase the forecast accuracy.
- With monthly meetings to review results and discuss ongoing migration trends, the quality of SME input is improving over time.
- Going forward, we intend to continue expanding the number of respondents and maintaining the engagement of existing respondents.

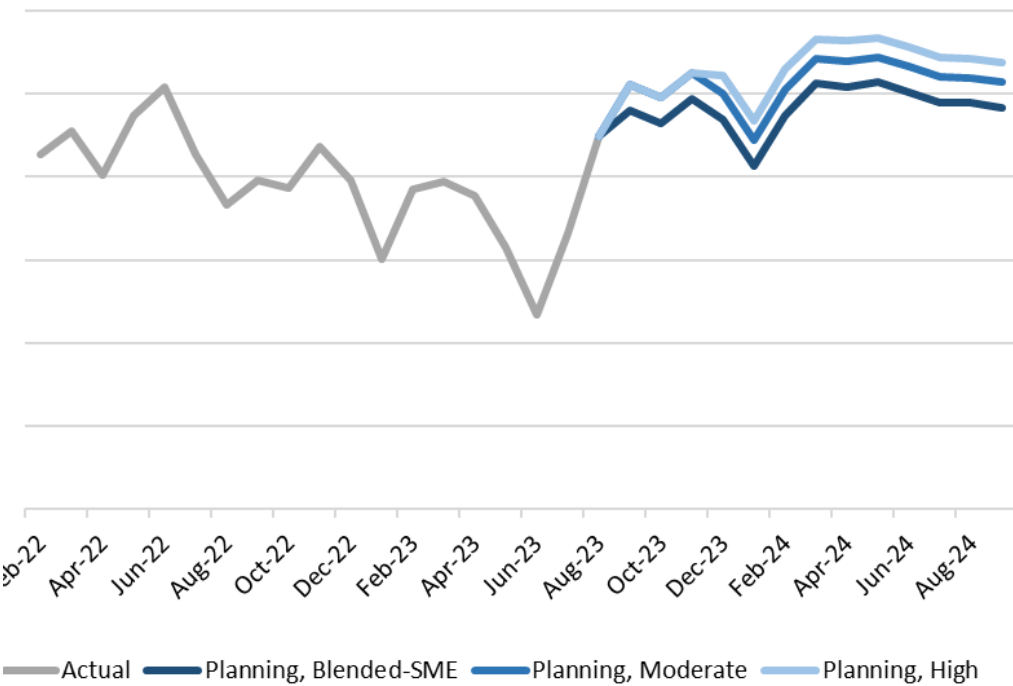
PLANNING MODELS: FM & SA ENCOUNTERS (DAILY AVERAGE)



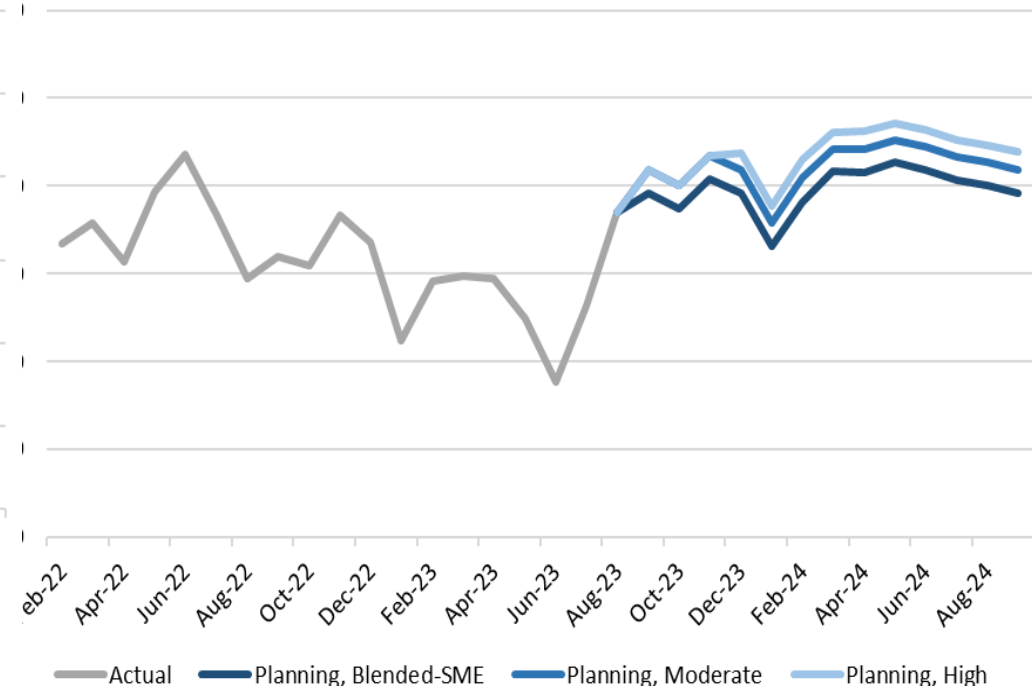
* Encounter projections exclude CBP One arrivals and OFO Paroles.

PLANNING MODELS: UC & UC OTM ENCOUNTERS (DAILY AVERAGE)

Projections, UC Encounters



Projections, HHS Referrals

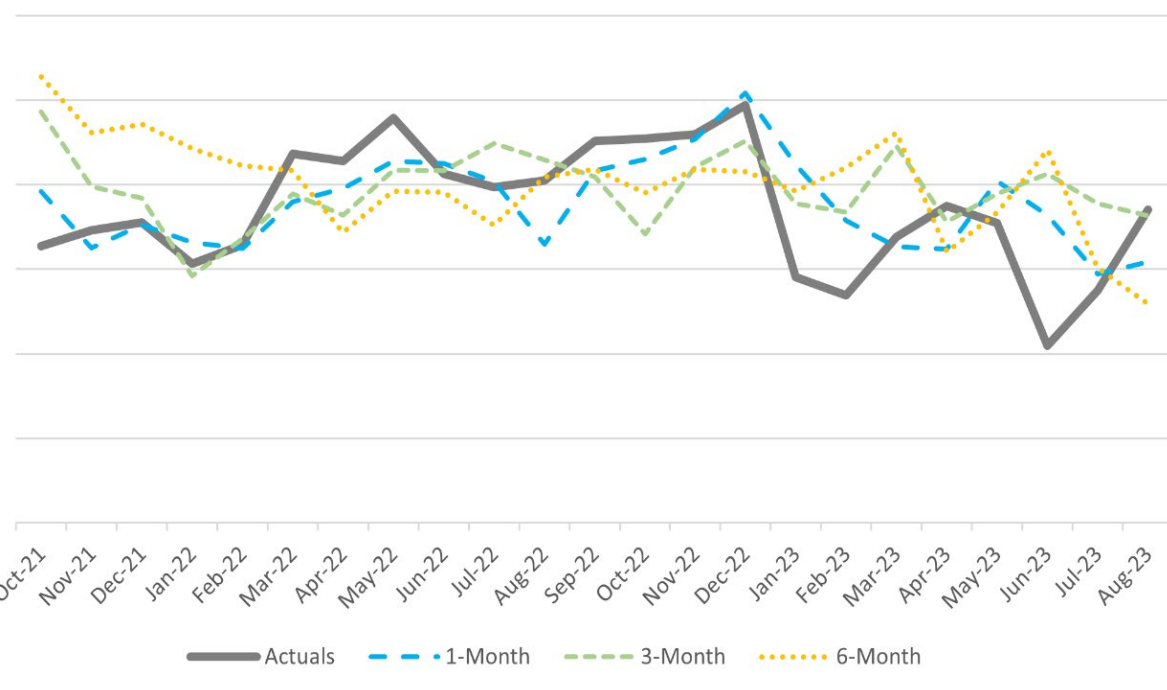


* Encounter projections exclude CBP One arrivals and OFO Paroles.

SHORT-TERM PROJECTIONS: EVALUATION

- Evaluation statistics are calculated on a rolling basis to evaluate model performance
 - Evaluation statistics include: Median Percent Error and Median Absolute Percent Error (Median APE).¹
- Diagnostics allow us to identify sub-groups with the most room for improvement and test model adjustments before making changes.
 - Example: OHSS identified CHNV as countries where models needed improvement. In January, OHSS removed the trend component from the models for these four countries. This has improved forecast accuracy.

Total Encounters, Actuals and Monthly Lookahead Projections



	1-Month	3-Month	6-Month
Median Percent Error, Full 23 Months	-1%	2%	-2%
Median APE, Full 23 Months	8%	11%	18%
Median APE, Last 12 Months	11%	17%	15%

1. Medians instead of means are used because the arithmetic mean of the percent error is not as valid when dealing with evaluations of population forecasts (Moreno et al. 2013; Tayman & Swanson, 1999; Fildes, 1992)

THANK YOU

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Link to OHSS Products:
<https://www.dhs.gov/immigration-statistics>