

MEMO

PRP 139 Report

Background & Objectives

This memo describes the recommended post 2021 Regional Plan (RP) model improvements, input changes, and impact on model results. ABM2+ version 14.3.0 is in the pipeline for post 2021 RP modeling in Service Bureau projects. Data Science staff seek guidance and approval from you both on what improvements and input changes to be included in ABM2+ 14.3.0

For your reference, the SANDAG Board adopted the 2021 RP in December 2021. The model versions used and to be used for recent and upcoming key agency initiatives are:

- 2021 RP: ABM2+ version 14.2.2 (released September 2021)
- Post 2021 RP Service Bureau Application: ABM2+ version 14.3.0 (June 2022)

Modeling and planning staff met on 2/23/22 and 3/28/22 to discuss the changes and potential impacts described in the next section. Subsequently, the modeling and the forecast teams met on 4/25/22 and 4/26/22 to discuss what triggered job allocation correction, the correction methodology, and why the correction affected VMT and GHG.

Improvements & Model Input Changes Tested

1. Employment Inputs: Population and employment data are important ABM inputs, and changes to these inputs can significantly alter model results. For the 2021 RTP modeling effort, SANDAG's EDAM team produced two Series 14 Regional Growth Forecast scenarios, referred to as data source ID 35 (DS_35) and 38 (DS_38). These forecast scenarios represent the baseline and SCS scenarios, respectively. After the development of DS_35 and DS_38, TAM team members discovered some anomalies in traffic counts and employment at some large employment location sites and TAZs. EDAM subsequently made corrections to some of the base year employment allocation inputs for MGRA-based job allocations and produced data source ID 41 (an update of DS_35) and data source ID 42 (an update of DS_38). The employment inputs in these two newer scenarios resulted in a regional VMT increase. The employment

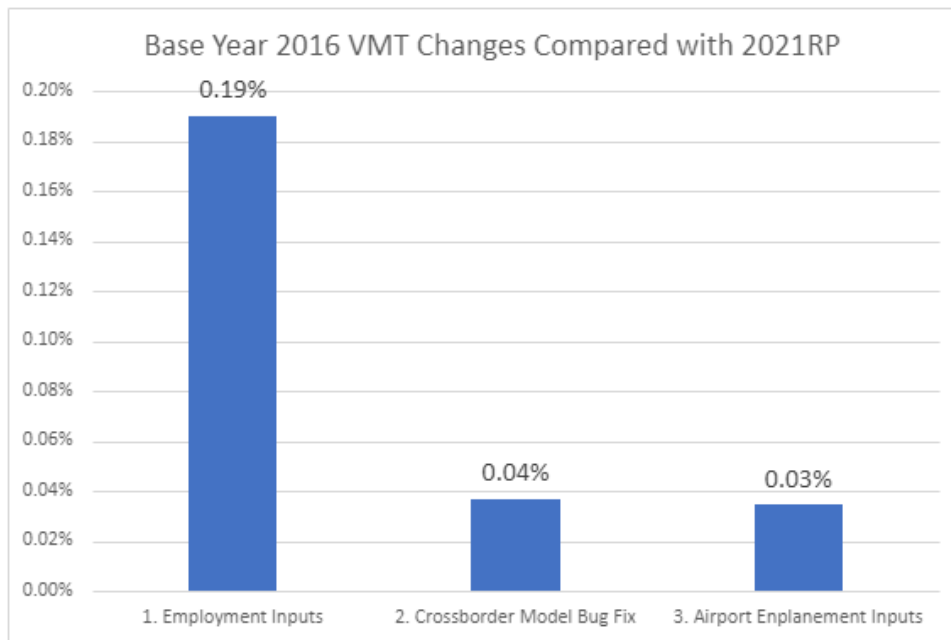
allocation algorithm is based on observed base year employment counts, and individual jobs by sector are allocated stochastically (commonly referred to as Monte Carlo assignment). This method iteratively generates random numbers and allocates individual jobs based on the cumulative distribution of employment observed at employment establishment sites. As such, sites with substantial sector-specific employment capacity are more likely to be assigned employment than sites with little capacity (e.g., it is more likely the algorithm will assign additional employment to the Wells Fargo building than a single-story office building). The result of the revised scenarios is that significantly more employment across a handful of sectors is more concentrated in a handful of locations, whereas that employment in DS_35 and DS_38 was more dispersed.

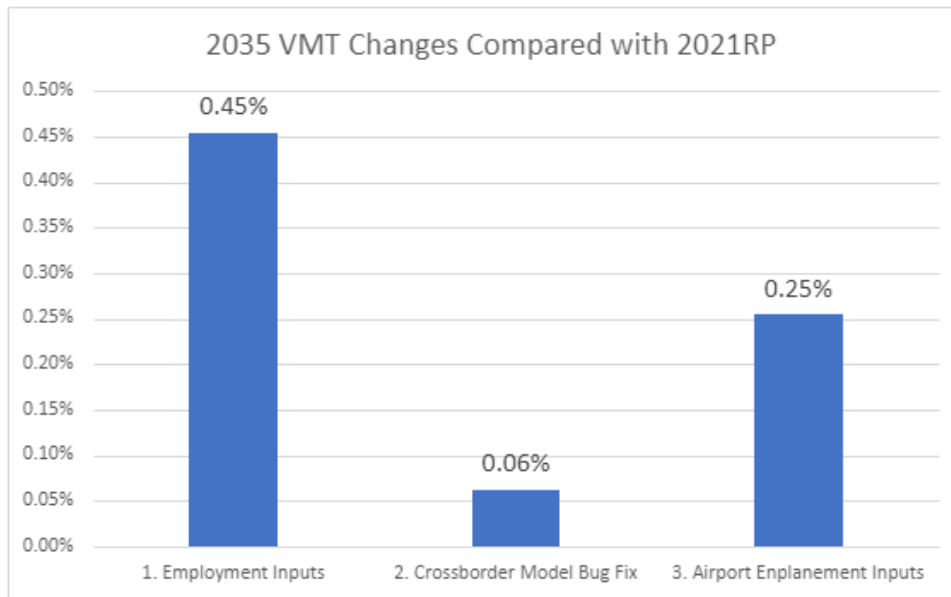
2. A Cross-Border Model Software Bug Fix: Staff discovered a software bug that affects the number of crossings via Otay Mesa East (OME) which affects SR 11 traffic volumes. After confirming and discussing with RSG, the ABM software developer, the bug was fixed. This bug fix improves traffic volume on SR 11 and had minor impact on regional VMT.
3. Airport Enplanement Inputs: Airport enplanement is an input to the airport model, a model component in ABM. ABM2+ 14.2.2 uses enplanement inputs from a 2013 Aviation Activity Forecast from the San Diego International Airport. The forecast was updated in 2019, with larger projected enplanements, which resulted in more traffic from the airport in out years and increased regional VMT. The updated 2019 forecast was not available when SANDAG developed ABM2+ for the 2021 RP.
4. Airport Model Update: To make the airport model suitable for modeling key agency priority projects such as the Central Mobility Hub (CMH), the airport model update work is currently underway with consultant support. The updated airport model will also reflect the impact of TNC growth in the past few years. Initial results show minimal impact on base year VMT. Out year VMT changes are also expected to be minor, as the traffic to/from the airport is largely driven by the projected enplanement.
5. Land Use Customization Procedure: To make ABM2+ suitable for Service Bureau applications and internal small area projects with modified land use scenarios, custom procedures need to be developed. This work is currently underway with consultant support. A critical step in this task is to allocate employment by land use code by MGRA in the Series 14 forecast. A significant internal work effort was needed because the Series 14 forecast system doesn't have a mechanism for allocation. Staff have developed a workable approach starting from the Series 13 land use code distribution for employment allocation purposes. The procedural changes will have minimal impact on model results, including regional VMT.

- Update of Projected Border Crossings: The total number of north bound crossing is an input to the cross-border model, a model component in ABM. ABM2+ 14.2.2 used projected crossings from a draft 2018 Traffic and Revenue Study (T&R) by WSP. In early 2022, staff was informed that an updated crossing forecast was available from a new draft T&R Study. Model calibration and testing of the impact of updated forecast is still underway. The initial finding is that the updated crossing forecast resulted in larger border crossing traffic and regional VMT. QA and a PRP are needed before finalizing the VMT impact conclusions. The staff assigned to this task is on family leave, so inclusion of this change is on hold at this time but we wanted you to know this was also pending.

Model Results

This section describes model results compared against those from 2021 RP model runs (ABM 14.2.2). Although staff analyzed comprehensive output metrics such as VMT, mode shares, trip length etc., only VMT results are discussed in this memo because VMT is a directly related to GHG emission. Because work on items 4, 5 and 6 are still underway, result analysis on items 4, 5 and 6 are not included and will be discussed in the future. The more detailed analysis is available in a separate technical [memo](#).





Decisions from the Meeting

Staff agreed at some MGRAs need to be corrected to add missing employment from DS_35 and DS_38. This was resolved in DS_41 and DS_42, where sector-specific employment was allocated by incremental, year-over-year change by sector, and the size of employment and marginal capacity by sector at each parcel. The PRP team recommend including items 1) employment inputs, 2) a cross-border model bug fix, 4) airport model update, and 5) land use customization procedures in ABM2+ version 14.3.0 for project level modeling. For Item 3) airport enplanement input update, although the updated aviation forecast was not available when ABM2+ development started, it was brought to our attention during the 2021RP comment period. Staff's response to the comment was SANDAG will incorporate the new forecast in a post-Regional Plan model version. Both the 2013 and 2019 SDIA aviation forecasts represent pre-pandemic conditions. In ABM3, currently under development for 2025RP, the post-pandemic aviation forecast will be included when it is available. Because of the unavailability of the 2019 aviation forecast when ABM2+ development started and the possible post-pandemic aviation forecast update, the PRP team don't recommend including item 3) in version 14.3.0. For item 6) update of projected border crossing, because the work is still underway and the updated border crossing projection was not available when ABM2+ development started, the RPR team don't recommend including item 6.

The discussed changes also have impact on the ABM2+ version for the potential 2021RP Update. For 2021RP Update modeling, if it is done, staff recommend including items 1 and 2 because they are corrections to the 2021RP model. Items 4 and 5 are procedural and airport model structural changes for project level modeling, to be consistent with 2021RP model version, the PRP team don't recommend include them in 2021RP Update. The PRP team don't recommend including items 3 and 6 for the same reasons as described above.