

## ESTIMATING TRIP GENERATION

This week focused on estimating the household-level trip production model for home-based work (HBW), home-based other (HBO), and non-home based trips (NHB). We first estimated a household-level regression model for each type of production type, then choosing the most significant variable alone, to see if a reduced model would be preferred. These results are shown here.

	Full model		Reduced model	
(Intercept)	1.28 ***	(p = 0.00)	1.63 ***	(p = 0.00)
zero_veh_TRUE	0.06	(p = 0.83)		
size_two	0.26	(p = 0.22)		
inc_levels_low	-1.01 **	(p = 0.01)	-0.97 **	(p = 0.01)
inc_levels_mid	-0.69 *	(p = 0.03)	-0.60	(p = 0.08)
N	185		251	
R2	0.11		0.05	

\*\*\* p < 0.001; \*\* p < 0.01; \* p < 0.05.

Figure 29: Home Based Work (HBW) Model Summary

The regression model for home-based work trips indicates that trip counts are most affected by low income households. We chose income levels for the reduced model, though because our R<sup>2</sup> then drops but the low income level coefficient changes only slightly, we are choosing the full model to move forward.

	Full model		Reduced model	
(Intercept)	2.21 **	(p = 0.00)	2.11 ***	(p = 0.00)
zero_veh_TRUE	0.16	(p = 0.84)		
size_two	1.89 ***	(p = 0.00)	2.02 ***	(p = 0.00)
inc_levels_low	-0.49	(p = 0.63)		
inc_levels_mid	0.14	(p = 0.84)		
N	185		188	
R2	0.13		0.13	

\*\*\* p < 0.001; \*\* p < 0.01; \* p < 0.05.

Figure 30: Home Based Other (HBO) Model Summary

The regression model for home-based other trips indicates that trip counts are most affected by household size. We chose household size for the reduced model, and this is a better fit, with our R<sup>2</sup> staying constant and our two person household coefficient increasing.

	Full model		Reduced model	
(Intercept)	1.97 ***	(p = 0.00)	3.09 ***	(p = 0.00)
zero_veh_TRUE	0.18	(p = 0.71)		
size_two	0.41	(p = 0.29)		
inc_levels_low	-1.41 *	(p = 0.01)	-2.07 ***	(p = 0.00)
inc_levels_mid	-0.06	(p = 0.91)	0.11	(p = 0.88)
N	185		251	
R2	0.09		0.04	

\*\*\* p < 0.001; \*\* p < 0.01; \* p < 0.05.

Figure 31: Non-Home Based (NHB) Model Summary

The regression model for non home-based trips indicates that trip counts are most affected by low income households. We chose income levels for the reduced model, though because our R<sup>2</sup> then drops but the low income level coefficient drops less significantly, we are choosing the full model to move forward.

After determining our preferred models and balancing our number of trip productions and trip attractions, we are left with a distribution of trip counts by tract across our study area. These are visualized below.



Figure 32: Home Based Work (HBW) Trips by Census Tract

The figure above shows home-based work trip productions - we see that there are a handful of tracts that have a significant number of household trips. We see a peak in some downtown census tracts, maybe those who travel back and forth to their homes more frequently during the day.

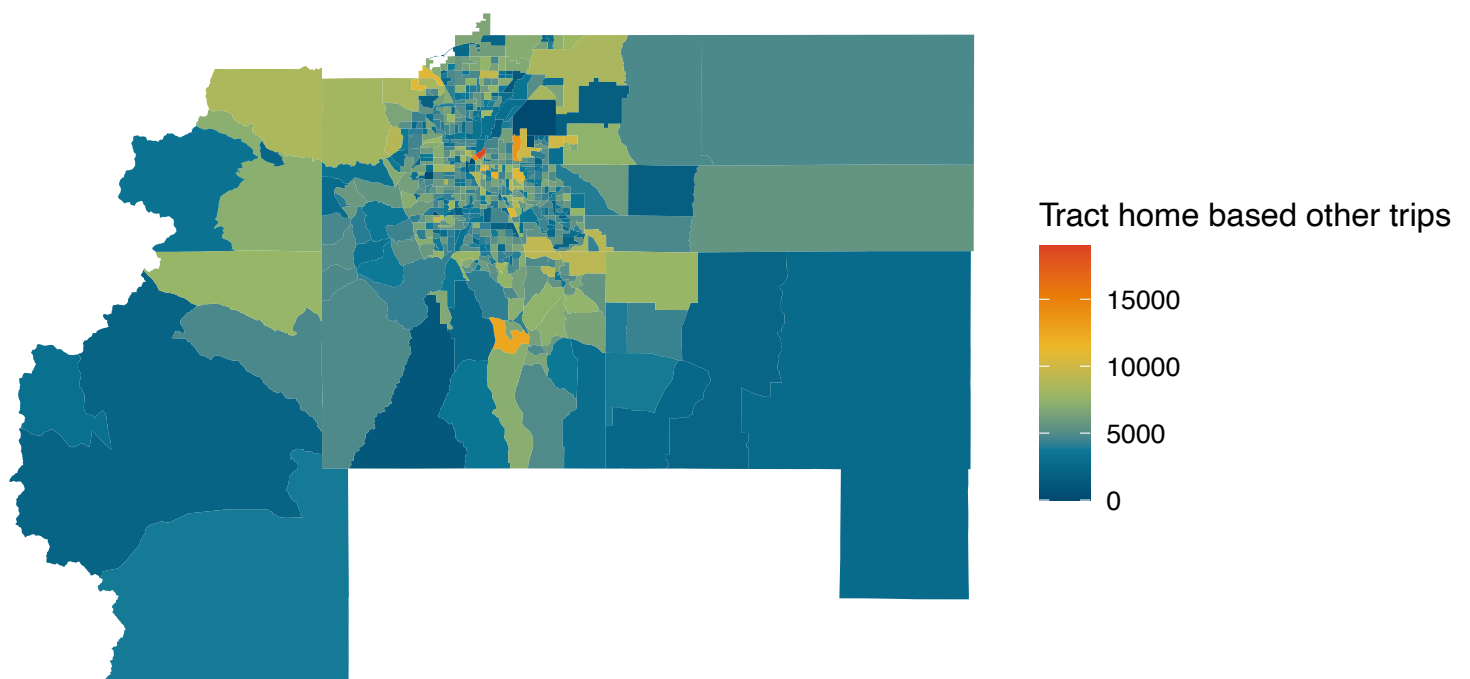


Figure 33: Home Base Other (HBO) Trips by Census Tract

Home-based other trip productions are show above - we see similar relationships between tracts here but with higher total counts.



Figure 34: Non-Home Based (NHB) Trips by Census Tract

Non-Home Based trips have a similar relationship to the others as well. Red and orange tracts must have high levels of residential and non-residential productions.



Figure 35: Home-Based Other (HBO) Trip Attractions

Finally, we looked at trip attractions. Red and orange tracts here indicate areas where there are a lot of opportunities that draw households outside of work commitments. The bright orange tract on the west, for example, is almost entirely state park.