Interactive Model Notes

The interactive model uses data about the number of high school graduates, higher education enrollees and completers, and central Ohio residents and migrators to allow users to model potential future regional attainment levels, including the year central Ohio might reach the Lumina 60% higher education attainment goal.

Creating the Model

The interactive model is linear, and when it first appears on the page, educational attainment percentage values for 2007 and 2014 are used to derive the line (its slope and intercept). This initial line models the potential percent of the population with at least an associate's degree for years following 2014 assuming that the rate of change continues into the future at the same pace as between 2007 and 2014.

The model allows you to manipulate values (graduation numbers, college enrollment numbers, college completion numbers, and migration numbers) to see how they may impact future central Ohio attainment levels. The default values in the center of the sliders are set at the 2014 value for each variable.

The model is built such that changing the number of high school graduates changes the number of college enrollees. Similarly, changes in the number of college enrollees changes the number of college graduates. In this model, we assume that the migration numbers are independent of the other variables.

Estimates of Variable Initial Values

Post-Secondary Attainment - We used data from the United States Census Bureau's American FactFinder tool to determine the total number of individuals between the ages of 25 and 64 residing in each of the 11 central Ohio counties with at least an associate's degree, as well as the total working-age population.

High School Graduates - We calculated the number of high school graduates using the Ohio Department of Education's Bireports. We aggregated the total number of diplomas awarded to districts within the Central Ohio Region.

Post-Secondary Enrollment - We calculated the number of undergraduate enrollees at colleges within the Central Ohio Region using the National Center for Education Statistics Integrated Postsecondary Education Data System (IPEDS). We aggregated enrollees at all institutions (public and private; for profit and nonprofit; 4-year, 2-year, and less-than-2-year) in the Central Ohio Region.

Post-Secondary Completers - We calculated the number of college or certificate completers in the Central Ohio Region again using IPEDS. We defined college completers by aggregating the number of individuals receiving sub-bachelor's-level certificates, associate's degrees, and bachelor's degrees.

Post-Secondary Graduate Migration (Net) - The US Census Bureau provided data about the number of residents moving into and out of the Central Ohio Region for 2011; the Census Bureau used data collected between 2007 and 2011 to estimate these migration numbers.

Estimates of Variable Interactions

High School Graduates who Enroll in Central Ohio Post-Secondary - We used data from IPEDS and the Ohio Department of Higher Education (HEI) to determine the percent of Central Ohio Region high school graduates who attended (private and public, respectively) post-secondary institutions within the Central Ohio Region. We combined these percentages to calculate the total of 52%.

Students Enrolled in Central Ohio Post-Secondary who Graduate - Using the dashboard calculations for The Central Ohio Region using HEI data for students who earned a degree within six years (see "The Region" tab), we estimate approximately 45% of enrollees will become graduates.

Adjusting the Sliders and Re-Drawing the Line

Using the estimates of variable interactions described above, a new line is drawn using the existing 2014 point and the modeled 2020 point when a user adjusts one or more of the sliders. The initial line, prior to transformation, modeled 45 percent of the population with an associate's degrees in 2020. In addition, assuming a linear increase in population, we estimate the population in 2020 using the yearly Census report detailing the total population within the Central Ohio Region between 2007 and 2014.

We use the number of initially predicted 2020 degree completers, derived by calculating 45 percent of the estimated 2020 population, and add the new number of degree completers, allowing one to determine a new percentage of attainment within the Central Ohio Region by increasing the total number of adults with a post-secondary degree (numerator) while leaving the total population the same (denominator). When the Post-Secondary Graduate Migration number is adjusted, both the number of individuals with a degree is changed (numerator), as well as the total population (denominator).

How it Works

Assume that the number of high school graduates increases from 23,000 (the default value) to 27,000, yielding a 4,000 person increase in the number of high school graduates. We know from our data that about 52 percent of high school graduates in Ohio go on to attend colleges within Ohio (and thus assume that this number is the same for the Central Ohio Region). Therefore, the number of college enrollees increases by 52 percent of the 4,000 person increase in high school graduates (meaning .52*4000 persons=2,080), changing the number of college enrollees from the 2014 value of 115,000 to 117,080 (1,500+2,080). If you slide the High School Graduates slider up to 27,000, you will notice the Post-Secondary Enrollment slider will slide up by 2,080.

Because the number of college enrollees has increased, the number of college graduates will also increase. We know from the data collected that approximately 45 percent of higher education students that first enroll as an undergraduate obtain a degree or certificate in 6 years. Therefore, because the number of enrollees has increased by 2,080, then the number of those earning a degree or certificate increases by .45*2,080, or 936. Therefore, if you slide the High School Graduates slider up to 27,000, you will notice the Post-Secondary Graduates slider will slide up by 936.

Changing the number of Post-Secondary graduates (by itself, or by virtue of changing High School Graduates or Post-Secondary Enrollment) changes the future population attainment rate within the Central Ohio Region. In particular, if we have 1,000 new post-secondary graduates, then in 2020 we assume that we have 1,000 more members of the population with higher education degrees. The time lag in the model is based on the assumption that a post-secondary graduate will generally be younger than the 25-64 "working age" population.

As a result, the rate of change of college attainment in the population, or the slope of the line in our model, changes. The new line is calculated by using the educational attainment percentage for 2014 that we obtained from the data and our new point: the year 2020 and our new percentage of postsecondary graduates.

Although post-secondary graduates are moving into and out of Central Ohio, these movements are captured by the migration slider. The Post-Secondary Graduate Migration slider is centered on the net migration for those with post-secondary degrees in 2014; if you believe it will be larger or smaller, that assumption can be adjusted using the interactive tool.