



# **DEMOGRAPHICS & PROJECTIONS**

## Demographics and 10 Year Enrollment Projections

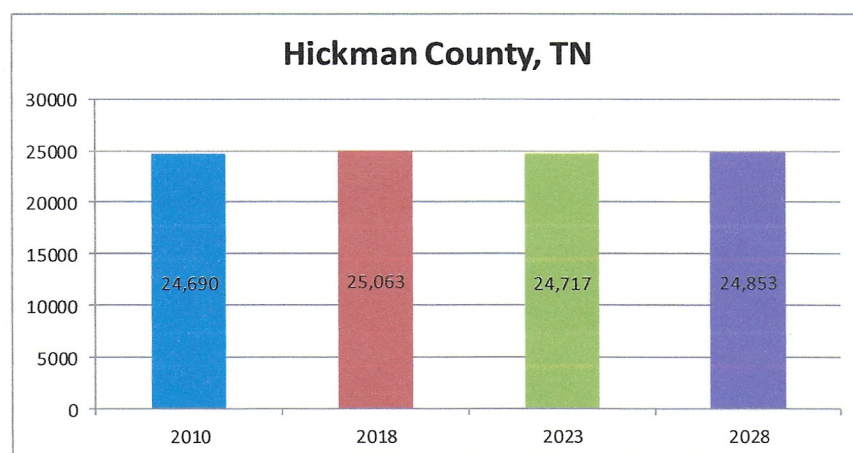
This section presents the demographic analysis and 10 year enrollment projections for Hickman County Public Schools (PCPS). An analysis of both the quantitative and qualitative data formed the basis for these enrollment projections. Quantitative data from the district, county, US Census, Boyd Center for Business and Economic Research and ESRI Demographic Data were analyzed and provide the foundation for understating the growth trends that are taking place within the district. The qualitative data was gathered from conversations with district employees and other city and county officials and provides the “why” behind the numbers.

### Historical Data and Population Trends

It is important to understand the context in which enrollment trends occur in HCPS. In 2010 Hickman County had a population of 24,690 people and the US Census estimated population in 2018 was 25,063, an increase of 1.5%. This higher than the projections provided by the Boyd Center for Business and Economic Research, University of Tennessee, that projected a 2018 population for Hickman County at 24,439 and a 2028 projection of 24,853. In either case these institutions are not forecasting much growth.

A review of the population of school aged children between 5 and 19 years old declined by 375 people from 2010 to 2018 and is projected to decline by another 245 people by 2018 (Exhibit 2). The segment of the population in their prime child bearing years (25 – 44) is also going to be flat and will have an impact on long term student enrollment. The section of population showing the most growth is 65 years and older. A declining live birth rate and an aging population are trends that are common throughout Tennessee.

### Exhibit 1 – Hickman County Population



Source: U.S. Census Bureau, Census 2010 Summary File 1.

Source: Boyd Center for Business and Economic Research, University of Tennessee, Knoxville - September 2017

### Exhibit 2 – Hickman County Population

Population by Age	2010	2018	2023	2028
Age 0 - 4	1,389 0.06%	1,340 0.05%	1,205 0.05%	1,158 0.05%
Age 5 - 9	1,491 0.06%	1,441 0.06%	1,371 0.06%	1,294 0.05%
Age 10 - 14	1,623 0.07%	1,471 0.06%	1,477 0.06%	1,425 0.06%
Age 15 - 19	1,667 0.07%	1,494 0.06%	1,467 0.06%	1,442 0.06%
Age 20 - 24	1,481 0.06%	1,485 0.06%	1,524 0.06%	1,522 0.06%
Age 25 - 34	2,960 0.12%	3,099 0.13%	3,185 0.13%	3,232 0.13%
Age 35 - 44	3,551 0.14%	3,046 0.12%	3,118 0.13%	3,215 0.13%
Age 45 - 54	3,893 0.16%	3,398 0.14%	3,208 0.13%	3,150 0.13%
Age 55 - 64	3,195 0.13%	3,420 0.14%	3,361 0.14%	3,219 0.13%
Age 65 - 74	2,063 0.08%	2,529 0.10%	2,752 0.11%	2,842 0.11%
Age 75 - 84	1,026 0.04%	1,321 0.05%	1,553 0.06%	1,751 0.07%
Age 85+	351 0.01%	395 0.02%	496 0.02%	606 0.02%
Total Population	24,690	24,439	24,717	24,856

Source: U.S. Census Bureau, Census 2010 Summary File 1.

Source: Boyd Center for Business and Economic Research, University of Tennessee, Knoxville - September 2017

A further quantitative analysis of historical enrollment data provided by HCPS shows that between 2013 and 2018 the district's enrollment declined by approximately 236 students for an annual growth rate of -1.38%. During this time all tier levels have seen declining enrollment (Exhibit 3 & 4).

### Exhibit 3 - Growth by Tier Level

	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	Growth
K-2	791	788	747	731	732	730	-7.71%
3-5	763	755	729	757	752	733	-3.93%
6-8	792	771	761	763	762	767	-3.16%
9-12	1123	1102	1061	1008	1001	991	-11.75%

Source: Hickman County Public Schools

#### Exhibit 4 – Enrollment 2013-2018

Grade	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
KG	263	251	228	249	247	240
1	275	261	258	235	259	248
2	253	276	261	247	226	242
3	234	247	250	258	247	225
4	266	240	246	247	258	247
5	263	268	233	252	247	261
6	236	261	260	239	251	270
7	277	239	262	261	240	252
8	279	271	239	263	271	245
9	289	283	275	239	262	269
10	293	276	265	270	235	256
11	284	277	260	242	267	221
12	257	266	261	257	237	245
N	40	52	48	41	47	52
Total	3509	3468	3346	3300	3294	3273

#### Projection Model and 10 Year Projections

This section describes the methodology used in 10 year enrollment projections and goes over their findings. Historical Enrollment trends form the basis for the 10 year projections and impact the trend line used. The projection model used has four parts: Live birth and Cohort Survival, Annual Increase, linear Regression and students generated from new residential construction.

**Live Births** in Hickman County and their “Capture Rate” in Hickman County Public Schools play a key role in Kindergarten enrollment. The model compares the number live births 5 years prior to a child being enrolled in Kindergarten. For example, in 2013 there were 284 live births and this year’s Kindergarten enrollment was 240 students a 85% capture rate. On average HCPS has a 92% capture rate, but the capture rates has been declining since 2014 with a 98% capture to 2018 with only a 85% capture rate. Live births in Hickman County have gradually been increasing since 2009 with 256 live births to 281 live births in 2019. If live births continue to increase, larger Kindergarten classes can be expected in the future.

**Cohort Survival** calculates the growth or decline of enrollment by grade at each school within HCPS over a 5 year period beginning in 2013 thru 2018. The “Survival Rate” is the number of students from the previous year that went on to the school in the next grade and these ratios



are then applied to incoming classes to calculate trends in that class as it moves on through the school system. For example, if history has shown that between fifth and six grades, the classes have grown by an average of 2.6% then the size of the incoming classes would be calculated by multiplying them by 102.6%. If the growth rate were negative it would be multiplied by 100% minus the declining growth rate.

**Average Annual Increase** calculates future enrollment based on the historical growth or decline from year to year enrollment at each school by grade. For example if 6<sup>th</sup> grade enrollment increased by 5% from 2013 to 2014 and it increased by 7% from 2014 to 2015, then the average percentage change would be a 6% increase in enrollment and would be factored into the projections for future years.

**Linear Regression** is a standard statistical model used to calculate an unknown future value of a variable by performing calculations on known historical values. These values can then be plotted to form a “regression line.”

The model developed for HCPS projections used the live birth calculations to determine Kindergarten enrollment and feeder school enrollment to determine transition grades, 3<sup>th</sup> and 6<sup>th</sup> and 9<sup>th</sup> grade. The other grade levels were calculated by a weighted model consisting of Cohort Survival (50%), Average Annual Increase (25%) and Linear Regression (25%). The weights were reviewed at each school and were adjusted as needed if one of the weights appeared to be skewing the model.

**Student Generation Rates** is another common tool used in school districts to project future enrollment. The student generation rate is simply dividing the number of housing units in a district by the number of students and then multiplying this value times the number of new residential units. Based on US Census data there were 10,490 housing units in Hickman County in 2018 and there were 3,294 students, which gives a student generation rate of .31. If a 100 unit development were proposed we anticipate the development to generate 31 new students.

For this analysis a detailed review of historical building permits (2009-2018) was performed and this projected growth was added into the projections. New residential permits have been increasing in Hickman County since 2011 where there was a low of 68 permits to a high of 123 permits in 2017. If this higher rate of building permits continues it will impact enrollment in HCPS. Based on this analysis 469 students were added into the 10 year projections.

In summary HCPS has seen declining enrollment since 2009 when the district had 3,803 students and has a current enrollment of 3,273 students. A review of US Census data and projections provided by the Boyd Center do not show much growth in K-12 enrollment. The projections models used in this analysis also do not show growth, but rather that the rate of enrollment decline will slow from the current average of -1.38% a year to -.42%. On the

positive side birth rates and new residential building permits have been generally increasing and if these trends continue or accelerate the district could begin to see enrollment increase.

#### Exhibit 7 – Projected Growth by Tier Level

Year	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	Growth
K-2	735	751	756	744	737	742	751	749	747	746	1.47%
3-5	720	720	729	725	727	723	716	710	708	707	-1.77%
6-8	775	784	769	763	758	756	748	743	738	729	-5.94%
9-12	980	999	986	974	961	939	924	908	891	880	-10.24%
N	53	54	60	62	65	67	70	72	74	77	45.99%
<b>Total</b>	<b>3263</b>	<b>3308</b>	<b>3300</b>	<b>3268</b>	<b>3248</b>	<b>3227</b>	<b>3208</b>	<b>3182</b>	<b>3158</b>	<b>3139</b>	<b>-3.81%</b>

#### Exhibit 8 – Projections 2019-2028

Grade	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
KG	248	250	242	238	245	244	244	244	243	242
1	248	261	264	253	248	256	257	256	254	254
2	239	240	251	253	244	241	250	249	249	249
3	235	232	231	231	232	225	223	226	224	222
4	235	245	243	243	244	244	239	236	238	236
5	250	242	254	251	250	254	254	247	246	249
6	267	268	262	273	271	267	269	268	265	263
7	258	256	249	241	249	243	239	240	237	232
8	251	260	258	249	239	246	240	235	236	234
9	263	272	272	271	265	258	259	254	250	248
10	251	249	251	247	245	239	232	233	227	222
11	236	234	228	227	222	221	214	207	208	202
12	229	245	236	228	229	222	219	214	205	207
N	53	54	60	62	65	67	70	72	74	77
<b>Total</b>	<b>3263</b>	<b>3308</b>	<b>3300</b>	<b>3268</b>	<b>3248</b>	<b>3227</b>	<b>3208</b>	<b>3182</b>	<b>3158</b>	<b>3139</b>

### Exhibit 9 – School Projections 2019-2028

School	2014	2015	2016	2017	2018	Proj 2023	Proj 2028
Centerville ES	378	367	336	339	341	347	359
Centerville Intermediate	350	339	379	374	363	342	339
Hickman County MS	378	364	362	353	367	370	363
Hickman County HS	526	515	512	513	494	475	429
East Hickman ES	423	392	401	403	410	409	411
East Hickman Intermediate	420	406	391	392	382	407	397
East Hickmand Middle	402	404	409	419	411	398	376
East Hickman HS	591	559	510	501	505	500	465
Total	3468	3346	3300	3294	3273	3248	3139