Equity Analyses of the 2015-2017 Indiana School Funding Formula

Report Prepared for the Indiana State Board of Education

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Report Prepared By

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Executive Summary

Primary Findings

- ADM is projected to decline modestly in the state's school corporations in 2017, compared to 2009, with larger declines in traditional school corporations.
- Findings from the analyses of Indiana's school funding formula indicate that the state's public school corporations experienced substantial changes in state funding between 2009 and 2017.
- Total Tuition Support and Basic Funding are projected to increase through the end of the 2015-2017 biennium; however, the increases in funding are not sufficient to fully restore funding to pre-2009 levels in terms of constant dollars (inflation adjusted).
- Regression analyses suggest that current funding formula policy improved horizontal and vertical equity throughout the study period, and projections indicated high levels of equity will be achieved in 2017.

Report Overview and Analytic Approaches

This report describes analyses of publicly available enrollment data. These analyses were conducted to assess changes in student enrollment in Indiana's public school corporations, including charter schools. The report also presents analyses of changes in Total Tuition Support and Basic Funding provided by the state's school funding formula, as well as related impacts on horizontal and vertical equity. Horizontal equity refers to the degree to which similar districts receive comparable funding; vertical equity refers to the degree that districts with greater need (as judged by the mix of students and communities served) receive additional support. A particular focus of the report is on state funding for public education that is provided to school corporations through the state's school funding formula. This entails consideration of changes in state funding and how these actions affect horizontal and vertical equity.

The Indiana Department of Education (IDOE) provided the data used for this work; the data span the years 2008/09 to 2016/17. Data for 2016/17 was based on projections prepared by IDOE and the authors (because projections are used some findings are presented in future tense). Center for Evaluation & Education Policy (CEEP) staff acknowledge that the information presented in this report may differ from other analyses given the date this information was retrieved. The results of this work should therefore be viewed in concert with other analyses that may reflect more recent information.

The State Board of Education (SBOE) retained CEEP to complete these analyses. The approach used here was modeled after previous research conducted by CEEP staff (Lochmiller & Sugimoto, 2014; Toutkoushian & Michael, 2008).

Additional Details about Enrollment and Funding in Indiana's Public School Corporations

- Public school corporations, both traditional and charter, experienced a modest decline in average daily membership (ADM). Between the 2009 and 2017 school year, ADM is projected to decline 1.7%, or 16,915 ADM. Traditional school corporations are projected to decline by 4.1% or 40,259 ADM. Of traditional school corporations, 37.8% are projected to experience ADM declines greater than 10% in 2017 compared to 2009 levels. Virtual charter schools are projected to make up 29.9% of the charter school sector, with 11,685 ADM.
- The proportion of students receiving free or reduced price lunch (FRL) has increased, which had significant implications for complexity grant funding through 2014. Between 2009 and 2014, the percentage of FRL students increased from 41.7% to 49.0%. Since then, the proportion has stabilized at 48.0% in 2016.
- After declining from 2009 to 2011, Total Tuition Support per-pupil increased each year. In 2017 it is projected to reach $6,863 in current dollars. In constant 2016 dollars, Total Tuition Support per-pupil is projected to be 4.2% lower than in 2009, when it was $7,162. These reductions partially correspond with statewide reductions imposed during the 2009 recession and the expiration of American Recovery & Reinvestment Act (ARRA) funds that were allocated through the funding formula.
- Basic Funding per-pupil in Indiana's public school corporations also declined. In 2009, school corporations received $6,402 per-pupil in Basic Funding in constant dollars, compared with $6,181 per-pupil in 2017.
- In current dollars, 48.6% of traditional school corporations are projected to receive less Total Tuition Support in 2017 than in 2009. For these school corporations, the main cause was declining ADMs. In 92.1% of cases, ADM is projected to decline by at least 5%.

School Formula Impacts on Horizontal and Vertical Equity

Our analyses indicate horizontal and vertical equity continued to improve across the state's school corporations during both periods of reductions and increases in Basic Funding and Total Tuition Support. Horizontal equity generally improved throughout the study period. These improvements reflect reduced shifts in funding attributed to the state's Transition to Foundation funding program. Vertical equity also improved between 2009 and 2016, and is projected to improve through 2017. The Complexity index in the school funding formula addresses vertical equity, which increases

funding to school corporations serving proportionally more students from low-income families.

Conclusion

The results of this analysis indicates that state funding continues to increase on a per-pupil basis from the nadir in 2011 and 2012. However, shifting ADM presents potential challenges in a large number of traditional school corporations that resulted in lower total state revenue in 2017, compared to 2009, even in current dollar terms. Higher current dollar funding per-pupil should ameliorate unintended effects that might occur from variable costs. Studies on local school corporation revenue, which pay for fixed costs like debt service and capital expenses, are needed to understand the full effect on school finances. Additionally, it is important to keep in mind that the methods used to assess intended equity cannot answer questions related to overall adequacy of funding. An adequacy study to determine if funding is sufficient to provide an adequate education is therefore warranted.

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Introduction

The State of Indiana will spend more than $6.8 billion in each year of the 2015-2017 biennium to fund K-12 public education through State Tuition Support (Indiana Department of Education [IDOE], 2015). State funding for public education is derived from various state taxes and other revenue sources. These funds are appropriated by the Indiana General Assembly each biennium and allocated to public school corporations through the state's school funding formula. The funding formula determines how much funding each school corporation will receive based on the number of students who attend as well as students' characteristics. The IDOE is responsible for overseeing the allocation of state funds for public education.

This report focuses on the distribution of State Tuition Support to K-12 public school corporations (districts). This is a critical focus because while other forms of state funding for K-12 public education exist (e.g., alternative education grant, National School Lunch Program), State Tuition Support makes up more than 95% of state support. Note that, in Indiana, local revenue sources are used to pay for non-operational expenses (e.g., capital expenses, transportation, debt service); these revenue sources are excluded from this analysis. The analyses also exclude local revenue from referenda, which may be used for operational expenses. Federal funds (e.g., Title I funds) are also not considered, with the exception of funding from the American Recovery and Reinvestment Act (ARRA) in 2009 and 2010. These funds were included in Tuition Support amounts provided by IDOE. This is because, in

2009, ARRA funds replaced state funding intended by the legislature in 2007 (P.L. 234-2007), rather than supplemented amounts above what the state intended.

The research presented in this report emerges from persistent concerns about the equity of school funding in the state. The Indiana General Assembly therefore appropriated grants to provide research support to the Indiana State Board of Education. This particular study examines the impact of recent changes to the school funding formula on Indiana's public school corporations, traditional and charter schools. The analyses focus on equity concerns and whether recent changes to the school funding formula impacted horizontal and vertical equity. The analyses presented in this report updates previous research conducted by CEEP (Lochmiller & Sugimoto, 2014; Toutkoushian & Michael, 2003; 2006; 2007; 2008) using data through the 2015-2017 biennium (2017 values are projected). Key terms used throughout the report are defined below:

Key Terms

Average Daily Membership (ADM) – A count of students enrolled in kindergarten through Grade 12 in Indiana public school corporations and all charter schools on a particular day in the Fall (September) and Spring (February). Full-day kindergarten students are counted as one (1) ADM, while half-day kindergarten students are counted as one-half (1/2) ADM. School corporation ADM is the sum of resident enrollment, transfers out, cash transfers, state obligations, placements in, and dual enrollment.

Basic Tuition Support - The amount of state funding for each traditional school corporation, charter school, and virtual charter school. Basic Tuition Support is calculated by multiplying the foundation funding amount set by the Indiana General Assembly (adjusted for Transition to Foundation) with student ADM in the school corporation, charter school, or virtual charter school. Prior to 2014, Basic Tuition Support was adjusted for the Complexity Index. Virtual charter schools receive 90% of Basic Tuition Support.

Basic Funding - The sum of Basic Tuition Support and the Complexity Grant. This is used to make comparisons in Basic Tuition Support from before 2014 comparable with amounts since then.

Charter School - A public school that operates under a contract, or charter, entered into between the school's organizer and a charter school authorizer (sometimes referred to as a charter school "sponsor").

Complexity Index - A weight used to adjust school corporation funding based on the number of low-income students. Low-income students are defined as students who received free-or-reduced price lunch for 2009 to 2014, received textbook assistance for 2015, or received SNAP, TANF, or foster care assistance for 2016 and 2017. There was a planned three-year transition period for the Complexity Index to change, as well as an adjustment for school corporations where more than 25% of students are enrolled in English Language Learner programs. The Complexity Index is designed to address vertical equity concerns in Indiana's school funding formula and was previously part of the Basic Tuition Support calculation before 2014.

Complexity Grant – Beginning in 2014, Complexity Index funding was separated from the Basic Tuition Support and is now treated as categorical funding. The Complexity Grant is based on the Complexity Index for each school corporation. The Complexity Grant is designed to address vertical equity concerns in Indiana's school funding formula. In 2015, the Complexity Grant reflected the percentage of students who receive assistance under I.C. 20-33-5 (textbook assistance). In 2016 and 2017, the Complexity Grant reflected the percentage of students who receive SNAP, TANF, or foster care assistance.

Foundation Funding Amount – The per-pupil amount set by the Indiana General Assembly to fund general educational operations in each school corporation. For FY 2016, the amount is $4,967 per ADM. For FY 2017, the amount is $5,088 per ADM. This addresses horizontal equity.

Locale – The National Center for Education Statistics (NCES) categorizes the types of communities that schools and districts serve (e.g., urban, suburban, rural or town). See Appendix A for further details on NCES urban-centric locales.

SNAP, TANF, or foster care assistance (SNAP) – Student participation in any of these programs is used in calculating the Complexity Index in 2016 and 2017. In this report, we will abbreviate inclusion in any of these programs as SNAP. Formally, SNAP refers to the Supplemental Nutrition Assistance Program ("Food Stamps") funded by the U.S.D.A. TANF refers to the Temporary Assistance for Needy Families ("Welfare") funded by the state and

U.S. Department of Health and Human Services. The eligibility criteria for SNAP (generally the least stringent eligibility criteria of the three) are a household gross income at or below 130% of the federal poverty guidelines and an asset/resource limit of $2,250 for most households. Students who receive foster care assistance are also included in this percentage for calculating the Complexity Index.

Textbook Assistance Program – As defined by I.C. 20-33-5, this is a state program that reimburses school corporations for the cost to provide assistance to low-income students to purchase or rent textbooks. The eligibility criteria are similar to the National School Lunch Program's reduced price lunch eligibility (household income must be 185% or less than the federal poverty guidelines).

Total Tuition Support - The sum of Basic Tuition Support plus each of the state's categorical grants (e.g., Honors Grant). This term is equivalent to State Tuition Support. Unless otherwise specified, it will be presented in per-pupil amounts in this report.

Transition to Foundation – Funding provided to Indiana school corporations that mitigate year-to-year differences in Basic Tuition Support that are attributable to the implementation of the state's foundation funding program. This provision was eliminated in 2017.

Virtual Charter School – A public school operating under a charter that delivers instruction through online technology.

An Overview of How the School Funding Formula Works

Funding for Indiana's public schools is primarily provided through the state's Tuition Support program with additional funding provided by referenda levy and other miscellaneous sources. In Indiana, these Tuition Support funds are allocated to each school corporation using a foundation funding formula. Under a foundation funding formula, the state guarantees school corporations, including charter schools, a specific amount of per-pupil funding for education operations (Duncombe & Yinger, 1998). In this report, the term school corporation will refer to both traditional public school corporations as well as public charter schools, as defined by state law. In the

current funding formula, State Tuition Support represents the total of Basic Tuition Support (which provides foundation funds) and four categorical grants. The Indiana General Assembly establishes the funding formula each biennium. Changes to the funding formula in 2013 and 2015 improved transparency in the funding process.

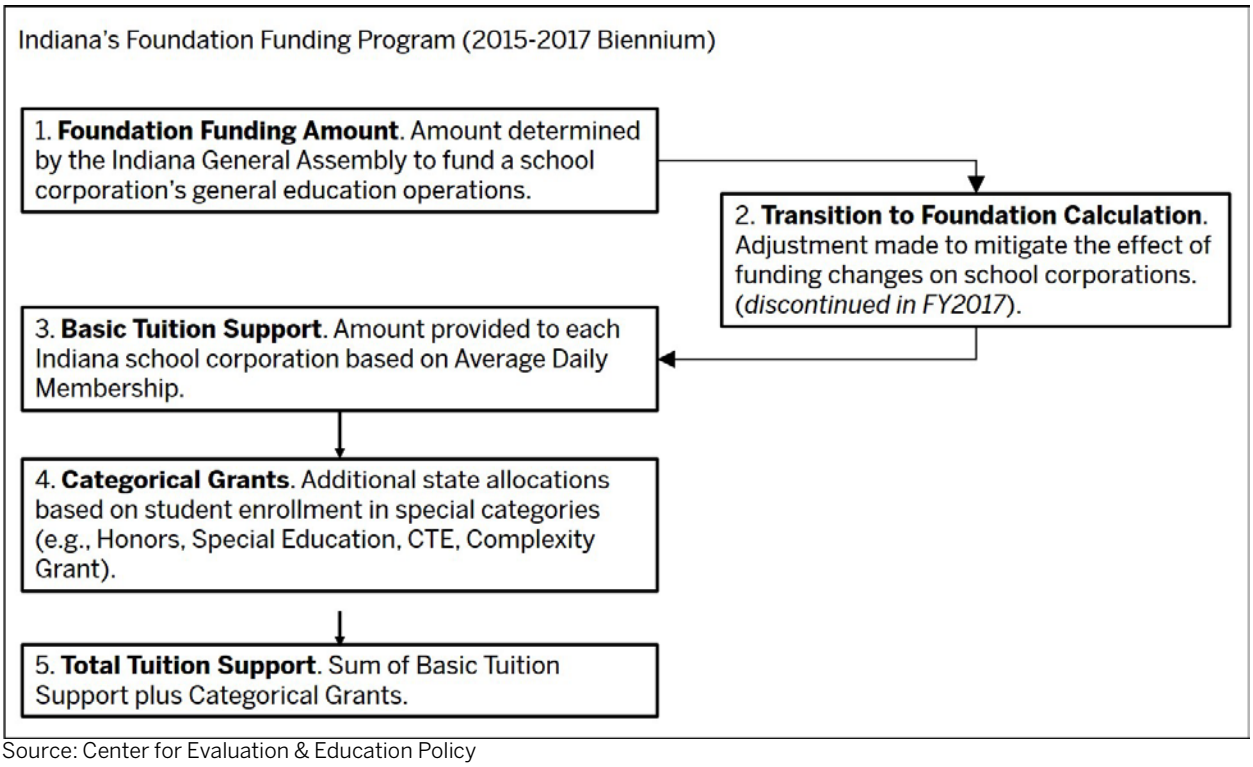
The base amount of per-pupil funding set by the Indiana General Assembly is referred to as *Foundation Funding Amount*. This amount reflects the funding provided by the state to educate each student enrolled in the state's public school corporations. This funding covers the cost to provide general education services. For 2016 and 2017, the respective Foundation Funding Amount is $4,967 and $5,088 per ADM, respectively. Until 2017, the amount of funding provided to each public school corporation varied slightly from the amount stipulated by the legislature because of the *Transition to Foundation* provision in the funding formula. This provision buffered school corporations from significant year-to-year differences in funding as the state moved toward full implementation of the foundation funding formula. The base amount of funding a school corporation receives reflects the Foundation Funding Amount (adjusted for the Transition to Foundation) multiplied by ADM (derived from the number of students) attending the school corporation. This amount is referred to as *Basic Tuition Support*. Basic Tuition Support amounts are reported on a per-pupil basis, unless otherwise noted.

When the amount of Basic Tuition Support is added to the state's current categorical grants, this amount is referred to as *State Tuition Support.* The state's categorical grants include the *Honors Grant*, *Special Education Grant*, *Career & Technical Education Grant*, and *Complexity Grant*. This value represents total state

funding provided for educational purposes. In this report, we refer to State Tuition Support as *Total Tuition Support* in order to better distinguish it from Basic Tuition Support. Total Tuition Support amounts are reported on a per-pupil basis, unless otherwise noted.

The funding process is represented in Figure 1. It bears noting that the figure simplifies the funding process for explanatory purposes. For a more detailed discussion of the funding formula, the reader should consult the *Digest of Public School Finance in Indiana, 2015-2017 Biennium* (IDOE, 2015).

Figure 1. Indiana's Foundation Funding Program



Source: Center for Evaluation & Education Policy

Finally, note that changes in the school funding formula lead to changes in the definition of Basic Tuition Support. Therefore, the term *Basic Funding* is used to refer to Basic Tuition Support plus the Complexity Grant. This makes possible

comparisons prior to 2014 when funding related to the Complexity Index was incorporated into the Basic Tuition Support calculation. Basic Funding amounts are reported on a per-pupil basis unless otherwise noted.

Overview of the funding formula in the 2016-2017 biennium. For the 2015-17 biennium, Total Tuition Support for each school corporation and charter school is the sum of the following:

- Basic Tuition Support. School corporations receive $4,967 per ADM in 2016 and $5,088 per ADM in 2017.
- Honors Grant. School corporations receive $1,000 for each student who received an Academic Honors diploma or a Core 40 diploma with Technical Honors in the prior year. An additional $400 is received for each of these graduates who received assistance through the Supplemental Nutrition Assistance Program (SNAP), Temporary Assistance for Needy Families (TANF) program, or Foster Care Assistance.
- Special Education Grant. School corporations receive an amount based on the count of students enrolled in special education programs and the disability category. Values for the Special Education Grant in 2016 and 2017 are listed in Table 1.

Table 1. Special Education Grant Amounts

	FY 2016	FY 2017
Severe Disabilities	$8,800	$8,800
Mild and Moderate Disabilities	$2,300	$2,300
Communication Disorders	$500	$500
Homebound programs	$500	$500
Special preschool education program	$2,750	$2,750

Source: IDOE, 2015

- Career and Technical Education (CTE) Grant. School corporations receive an amount based on enrollment of students in career and technical education programs. Amounts vary depending on the labor market demand and wages associated with CTE programs. Values for the Career and Technical Education Grant in 2016 and 2017 are listed in Table 2.

Table 2. CTE Grant Amounts

	FY 2016	FY 2017
More than Moderate Need and High Wages	$500	$500
More than Moderate Need and Moderate Wages	$450	$450
More than Moderate Need and Less than Moderate Wages	$300	$300
Moderate Need and High Wages	$450	$450
Moderate Need and Moderate Wages	$300	$300
Moderate Need and Less than moderate Wages	$225	$225
Less than Moderate Need and High Wages	$300	$300
Less than Moderate Need and Moderate Wages	$225	$225
Less than Moderate Need and Less than Moderate Wages	$150	$150
Area Vocational School Participation	$150	$150
Other Introductory Courses	$300	$300
Other Foundational Courses	$150	$150
Apprenticeships, Cooperative Education Programs, Work Based Learning Courses	$300	$300

Source: IDOE, 2015

- Complexity Grant. As of 2014, funding associated with the Complexity Index is calculated as a separate Complexity Grant, rather than included in Basic Tuition Support. For 2016 and 2017, the school corporation's percentage of students who received SNAP, TANF, or Foster Care assistance in October 2014 is used for the Complexity Index. A transition is also made between the calculated amount and the prior year Complexity Index. A second tier calculation was replaced based on the percentage of students who were English language learners and the difference in the 2015 and 2016 Complexity Index.

Recent Changes to the Funding Formula

The state biennial budget in 2015 (PL 213-2015) included two significant changes to the school funding formula, which has implications in making comparisons between 2009 and 2017. First, the Indiana General Assembly fully funded kindergarten through Basic Tuition Support, rather than using a categorical grant. Previously, full-day kindergarten students were counted as 0.5 ADM. Therefore, school corporations only received half the Foundation Amount in Basic Tuition Support calculations. In 2014 and 2015 the other half was provided through the Full-Day Kindergarten Grant[1]. Starting in 2016, full-day kindergarten students count as a full (1.0) ADM, and receive the full Foundation Amount in the Basic Tuition Support calculation. This affects funding per ADM calculations and requires adjustments to make it comparable to prior years. In this report, we report a modified ADM for 2016 and 2017 by treating full day kindergarten students as 0.5 ADM as in prior years. ADM refers to this modified ADM throughout the report unless otherwise specified. See Technical Appendix A for details on estimating the modified ADM.

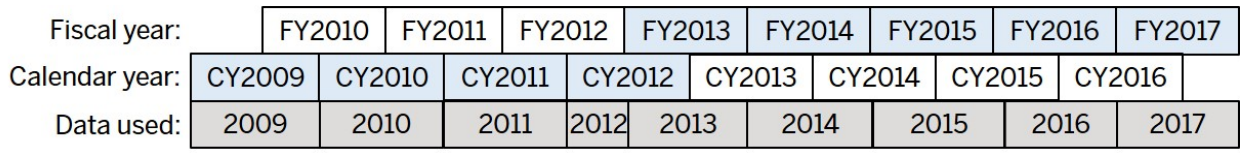
The second substantial change regards the Complexity Index. While the basis for the Complexity Index changed from free or reduced price lunch to textbook assistance in 2015, the programs had the same eligibility criteria. In 2016 and 2017 the Complexity Index is based on the percent of students in the Supplemental Nutrition Assistance Program (SNAP), Temporary Assistance for Needy Families

[1] Prior to 2014, the Full Day Kindergarten Grant was provided for funding outside of the state's Tuition Support program. However, the appropriation was generally insufficient to fully fund kindergarten students at the foundation amount. These amounts are excluded from the analysis.

program (TANF), or receiving foster care assistance. This report will collectively refer to all three programs as SNAP. SNAP eligibility is substantially more stringent than free or reduced price lunch or textbook assistance programs. Equity analyses will use both percentages to compare funding with the law as intended as well as to make comparisons over time.

The state biennial budget in 2013 (PL 205-2013) made two changes to the school funding formula that affect comparisons in the study period. First, the Indiana General Assembly changed the financial reporting periods for Indiana's school corporations starting in FY 2014. This change shifted reporting from a calendar year basis (i.e., January 1 to December 31) to a fiscal year basis (i.e., July 1 through June 30). This change is reflected in the current analyses. School finance data for 2009-2012 were received for calendar years, while data for 2013-2015 were received for fiscal years (shaded in light blue). Fiscal year 2013 data was divided between July to December 2012 and January to June 2013. For the remainder of the report, amounts from 2009-2012 reflect calendar year amounts. The amount for 2013 reflects funding from January through June, which was annualized for comparability purposes. Amounts from 2014-2017 reflect fiscal year amounts as reported from IDOE (see Figure 2). In this way, years refer to the ending year for fiscal years.

Figure 2. Aligning Calendar Year and Fiscal Year Data



Second, the General Assembly changed the way in which funding from the Complexity Index is provided to school corporations. Prior to FY 2014, funds from the Complexity Index were included as part of the Basic Tuition Support calculation. Since then, funding from the Complexity Index is provided as a separate categorical grant, the Complexity Grant. To permit year-to-year comparisons, the amount of the Complexity Grant in 2014 to 2017 was added to the school corporation's Basic Tuition Support and is referred to as Basic Funding, to distinguish it from Total Tuition Support.

Data Used in the Analyses

CEEP obtained state data for these analyses from two sources. The IDOE, specifically the Office of School Finance, provided ADM counts, student enrollment information, and funding by grant source (e.g., Foundation, Honors, CTE, etc.) for each school corporation for 2009 through 2016. ADM estimates from the September 2016 count day[2] and estimates of foundation and complexity grant per ADM were provided for 2017. The data from IDOE for 2009 to 2016 represents actual amounts of Total Tuition Support received by each school corporation. Data for Basic Funding (Foundation and Complexity Grant) for 2017 were based on IDOE estimates. The authors estimated other categorical grants in the following subsection.

In addition to state data sources, CEEP obtained school district locale information from the National Center for Education Statistics, Common Core of Data.

[2] ADM estimates from FY2014 to the present are based on a count of students in September and February of each school year.

This information was merged with state data sources to create a single dataset. The analysis was completed using IBM SPSS Statistics 24. Charts and tables were developed using Microsoft Excel.

FY 2017 estimates. As noted previously, estimates for ADM, foundation amount per ADM, and complexity grant per ADM were obtained from IDOE. The foundation per ADM and complexity grant per ADM amounts were current estimates as of August 2016. The ADM estimates were current as of October 4, 2016. Because the Spring ADM count tends to be lower than the Fall ADM count, we estimated a Spring ADM count for each school corporation using the average Spring to Fall ADM ratio from 2014 to 2016. The average of the Fall ADM and the estimated Spring ADM was used as the 2017 ADM estimate.

Basic Tuition Support (i.e., Foundation) and Complexity Grant funding was calculated as the product between ADM and each amount per ADM. For school corporations that existed in 2016, the Honors, Special Education and CTE Grant amounts were calculated as the 2016 grant amount divided by 2016 ADM and multiplied by 2017 ADM for each school corporation. Appendix B provides further details on estimating 2017 funding.

The Special Education Grant amounts for new physical charter schools (not virtual) that opened in 2017 are based on the average charter school 2016 grant amounts per ADM multiplied by the new charter school's 2017 ADM. The CTE and Honors Grant amounts were found to be inapplicable and estimated as $0. For new virtual charter schools, a similar procedure to estimate the Special Education Grant was employed except that the weighted average was based on other virtual charter

schools in 2016. For similar reasons, Honors and CTE grants were estimated at $0 for these schools.

Average Daily Membership in Public School Corporations

ADM in Indiana's school corporations (traditional and charter) is projected to decline by 16,915, or 1.7%, between calendar year 2009 and fiscal year 2017 (Table 3). As noted previously, we estimated a modified ADM in 2016 and 2017 throughout the report that treated kindergarteners as 0.5 ADM in order to make it comparable across years[3]. Traditional and charter school corporations show different changes in ADM. Whereas traditional school corporation ADM is projected to decline by 40,259, charter school ADM is projected to increase by 23,344. Half of the charter increase is expected in virtual charter schools. By 2017, virtual charter schools are projected to make up 29.9% of all charter school ADM. Despite the relatively large ADM increase in the charter sector, traditional school corporations will still be projected to serve more than 96% of state public school students.

Table 3. Changes in Statewide ADM: 2009-2017

	2009	2017	Difference	Percent Change	Average Annual Change
State	998,570	981,655	-16,915	-1.7	-0.2%
Traditional	982,777	942,517	-40,259	-4.1	-0.6%
Charter	15,794	39,138	23,344	147.8	12.9%
Physical	15,794	27,453	11,659	73.8	7.7%
Virtual	0	11,685	11,685	---	---

The degree to which the decline in ADM may be attributed to private schools is unclear. Data from the American Community Survey suggests that the number of private school students in Indiana in 2015 was 2,486 higher than in 2009, although this is well within a 90% margin of error (U.S. Census Bureau, n.d.). Based on the

[3] See Technical Appendix A for estimation methods.

number of children in Kindergarten through grade 12 that were enrolled in either public or private schools, there were 11,150 more students in 2015 than in 2009, which is slightly larger than the 90% margin of error. This would suggest increased private school enrollment, given declining ADM from IDOE figures.

Comparing the number of Choice Scholarship students (recipients of vouchers for private school tuition authorized under IC 20-51-4), there were 28,775 more Choice Scholarship students in 2016 than in 2012 (IDOE, 2016). Including non-Choice private school students, the increase is 11,986, although this only includes private schools that report to IDOE. American Community Survey estimates of the number of private school students was 65% higher than the IDOE private school count in 2015. Again, differences in the estimates of the number of public and private school students make it difficult to draw conclusions about whether private schools contributed to declining ADM.

Table 4 shows changes in ADM patterns based on the school corporation's National Center for Education Statistics locale code (e.g., urban, suburban, town, or rural) in the most recent year available (2014). The "virtual" locale corresponds with virtual charter schools, as students may reside in any locale type. ADM is projected to decline in school corporations serving urban, town, and rural locales. ADM is projected to increase in school corporations serving suburban communities. Part of these changes reflect locale code changes as community populations changed. For example, it is possible rural growth near prior suburban would increase suburban ADM as the school corporation's locale classification would change from rural to suburban. Towns with declining populations would change to rural areas.

However, regardless of whether locales were assigned based on 2014, 2009, allowing the locale code to match the assigned year, or limiting the analysis to school corporations whose locales never change, the pattern remains (see Appendix Tables B1 to B3 for how reclassification affects the number of school corporations in each locale). In all analyses, there were relatively moderate ADM declines in urban and rural areas, larger declines in town areas, and increases in suburban areas. Results for these specifications may be found in Appendix Tables B4 to B6. For the remainder of the report, locales will refer to the locale assigned in the most recent year available, unless otherwise noted.

Table 4. Change in ADM by Locale

	CY2009	FY2017	Difference	Percent Change	Average Annual Change
Total	998,570	981,655	-16,915	-1.7	-0.2%
Urban	321,559	310,578	-10,981	-3.4	-0.5%
Suburban	280,807	291,624	10,817	3.9	0.5%
Town	148,720	137,614	-11,107	-7.5	-1.0%
Rural	247,484	230,155	-17,329	-7.0	-1.0%
Virtual	0	11,685	11,685	---	---

Table 5 shows the percent of ADM served by each type of community based on the locale codes assigned in 2009 and 2017. This shows some of the effects of the shifting locale classifications can be seen when basing locales on the relevant year locale. Urban school corporations served approximately 31% of the state in 2009 as well as 2017. Suburban school corporations are projected to serve 29.7% of the state in 2017, a 4.6 point increase. Town and rural school corporations are projected to serve 14.0 and 23.4 percent of the state respectively, approximately a three-point decrease for each.

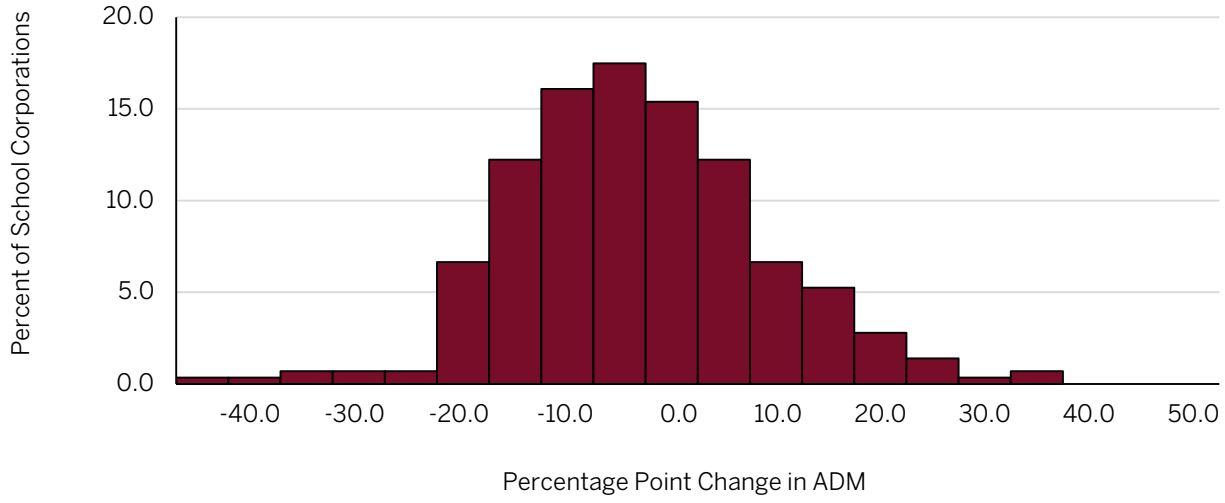
Table 5. Change in Percent of ADM by Relevant Year Locale

	CY2009	FY2017	Percentage Point Difference
Urban	31.2	31.7	0.6*
Suburban	25.1	29.7	4.6
Town	17.2	14.0	-3.2
Rural	26.5	23.4	-3.1
Virtual	--	1.2	1.2

Note: Differs due to rounding.

Figure 3 depicts the projected variation in ADM change between 2009 and 2017 for traditional school corporations not involved in consolidations. Patterns of ADM changes differ between traditional school corporations, varying from a 48.7% decrease to a 34.6% increase. Of the traditional school corporations, 70.6% are projected to lose ADM between 2009 and 2017, with 37.8% of traditional corporations projected to experience more than 10% decreases in ADM. Results indicate that 17.1% of traditional corporations will experience ADM growth of at least 5%.

Figure 3. Percentage Point Change in ADM: Traditional School Corporations



Changes in Student Enrollment by Race/Ethnicity[4]

Enrollment data was obtained from IDOE corporation reports for 2009 to 2016. Years refer to the ending school year (e.g., 2016 refers to the 2015/16 school year). Enrollment data shows a small decline in student enrollment between 2009 and 2016, as seen in Table 6. While White students remained the majority of students (69.6%) in the state in 2016, their enrollment declined by an average of 1.1% annually. Overall, Non-White student enrollment increased from 25.0% of state enrollment to 30.4%. Black students remained the second largest racial/ethnic group in the state, with little change between years. Hispanic student enrollment increased at the fastest rate, averaging 6.8% annual increases. Hispanic student enrollment has nearly reached the level of Black student enrollment. Asian/Pacific Islander student enrollment and Multiracial student enrollment continued to grow. American Indian student enrollment declined during this time.

Table 6. Enrollment by Race/Ethnicity: 2009-2016

	2009	2016	Change	Percent Change	Average Annual Change
Total	1,041,957	1,039,123	-2,834	-0.3	0.0%
American Indian	2,876	2,242	-634	-22.0	-3.5%
Asian/Pac. Isl.	15,192	22,993	7,801	51.3	6.1%
Black	126,194	126,798	604	0.5	0.1%
Hispanic	73,112	115,591	42,479	58.1	6.8%
Multiracial	43,375	48,702	5,327	12.3	1.7%
White	781,208	722,797	-58,411	-7.5	-1.1%

Figure 4 shows that the percent of enrollment by Non-White students was substantially higher at charter schools than traditional school corporations. In 2016,

[4] The names of racial/ethnic categories are the same used in IDOE, with the exception of Asian/Pacific Islander. While IDOE currently uses two categories (Asian and Native Hawaiian or Other Pacific Islander), they were combined for comparability with 2009.

the percent of students at charter schools who are Non-White was 58.9% compared to 29.4% at traditional school corporations. Over time, the gaps decreased as relatively more White students enrolled at charter schools between school years ending in 2010 and 2013. Since then, enrollment changes by race/ethnicity were similar between charter schools and traditional school corporations.

Figure 4. Percent of Students Who are Non-White in Traditional vs. Charter Schools: 2009-2016

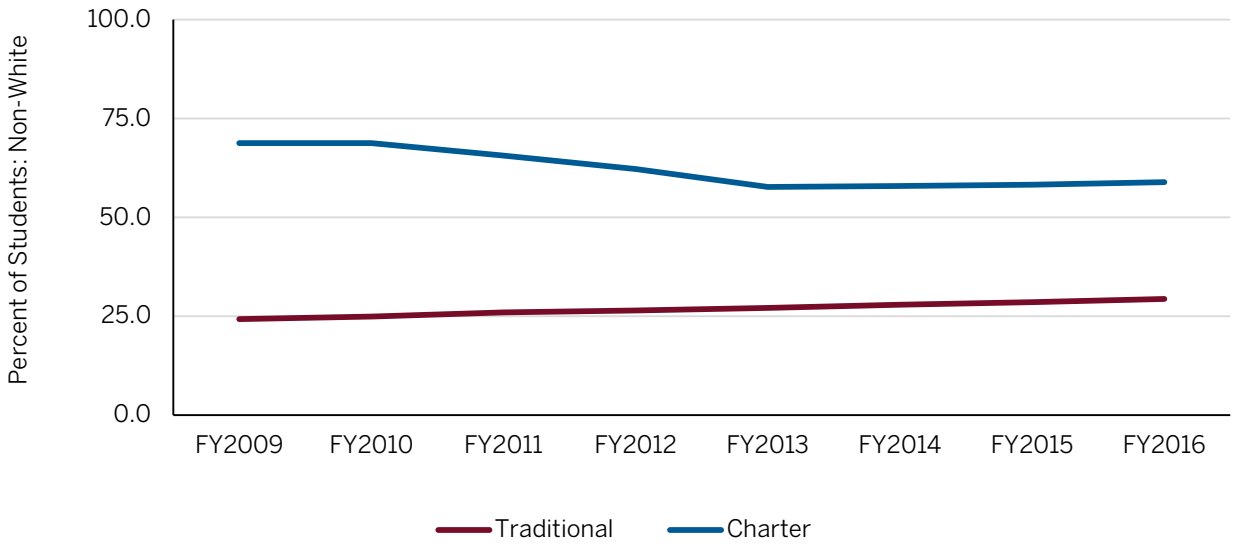


Table 7 indicates that school corporations serving urban communities experienced the largest percentage point increase in students who are Non-White, where they made up 52.1% of student enrollment. Town and Rural communities continue to serve relatively fewer Non-White students, where they made up 15.4 and 9.1 percent of enrollment in the school year ending in 2016. The percentage of enrollment by students who are Non-White at virtual charter schools in 2016 is 22.9, which is somewhat lower than the state as a whole, but higher than Town or Rural communities.

Table 7. Percent of Students Who are Non-White by Locale

Locale	2009	2016	Percentage Point Change
All	25	30.4	5.4
Urban	45.3	52.1	6.8
Suburban	26	31.6	5.6
Town	10.7	15.4	4.7
Rural	6.1	9.1	3
Virtual	---	22.9	---

Table 8 specifically shows that Non-White students are unevenly distributed across school corporations in the state, when focusing on traditional school corporations (which have defined geographic areas). Non-White students made up 30.4% of students in the state in 2016 (Table 7). However, Non-White students constituted less than 10% of enrollment in over half of traditional corporations in 2016 (56.4%). The percentage of traditional school corporations where Non-White students made up less than 5% of enrollment declined from 44.2% to 21.1%.

Table 8. Traditional School Corporations Classified by the Percentages of Students Who are Non-White: 2009-2016

Percent of Students that are Non-White	2009 (%)	2016 (%)	Percentage Point Change
0-4%	44.2	21.1	-23.1
5-9%	22.6	35.3	12.7
10-19%	17.5	19.7	2.3
20-49%	11.6	16.6	5
50-100%	4.1	7.3	3.2

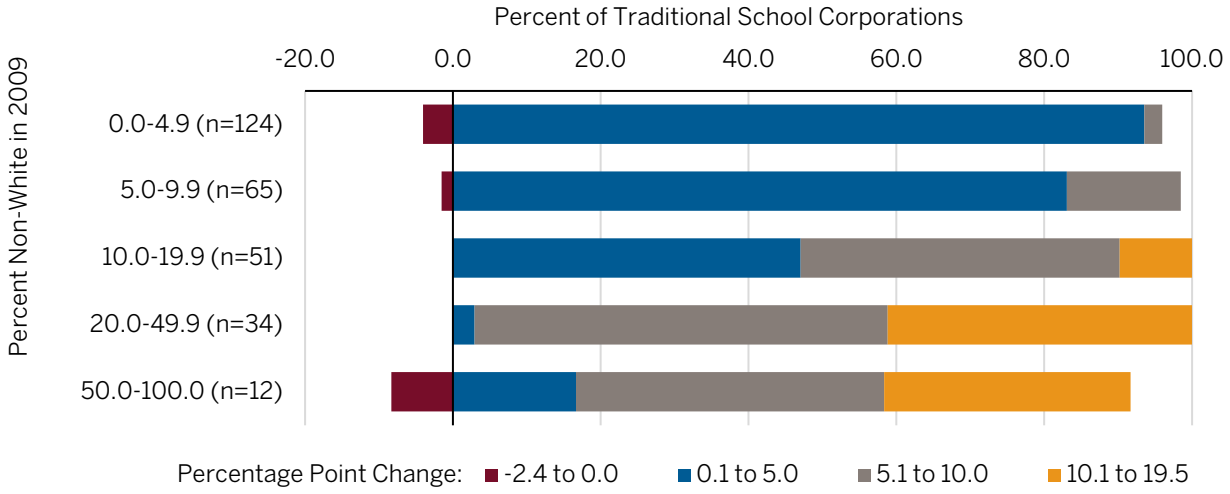
Limiting the analysis to traditional school corporations that were not involved in consolidations, all but seven (2.4%) experienced an increase in the percentage of students who are Non-White (Table 9). However, 68.9% experienced less than a five-point increase, compared to the 5.4 point change for the state as a whole (Table 7). Only 28.7% of school corporations experienced more than a five-point increase. This further suggests an uneven increase in Non-White enrollment.

Table 9. Traditional School Corporation Change in Percent of Students Who are Non-White: 2009-2016

Percentage Point Change Non-White	n	Percent
-2.4 to 0	7	2.4
0.1 to 5.0	197	68.9
5.1 to 10.0	59	20.6
10.1 to 19.5	23	8

During this time period, the percentage of students who are Non-White tended to increase more in school corporations that were already more diverse. More than 90% of the traditional corporations where Non-White enrollment was less than 5% of total enrollment experienced a five-point increase or less (Figure 5). Most traditional corporations where at least 20% of enrollment was Non-White in 2009 experienced more than a five point increase between 2009 and 2016.[5]

Figure 5. Percentage Point Change in Percent of Students that Were Non-White by 2009 Percentage



[5] The one decrease was in a school corporation where more than 90% of students were Non-White in 2009.

Changes in Free or Reduced Price Lunch (FRL) Student Enrollment

As before, enrollment data was obtained from IDOE corporation reports. Years refer to the ending school year (e.g., 2016 refers to the 2015/16 school year). Figure 6 shows that the percent of students receiving free or reduced price lunch (FRL) increased between 2009 and 2013 from 41.7% to 48.9%. Since then, the percentage of students receiving FRL appears to have stabilized or declined slightly (48.0% in 2016). As a comparison, Figure 6 also shows the percentage of students receiving textbook assistance in 2014 and 2015, as well as the percent of students in SNAP in 2015. Textbook assistance was relevant to the Complexity Index for 2015, and was very similar to the percent of students who received FRL, as expected given similar eligibility criteria. The percent of students receiving SNAP is substantially lower than the percent receiving free lunch, which have ostensibly similar income eligibility criteria (24.0% compared to 41.1%). This suggests differences in assets, propensity to enroll in the programs, and/or over-enrollment in the free lunch program.

Figure 6. Percent of Students Receiving Free or Reduced Price Lunch: 2009-2016

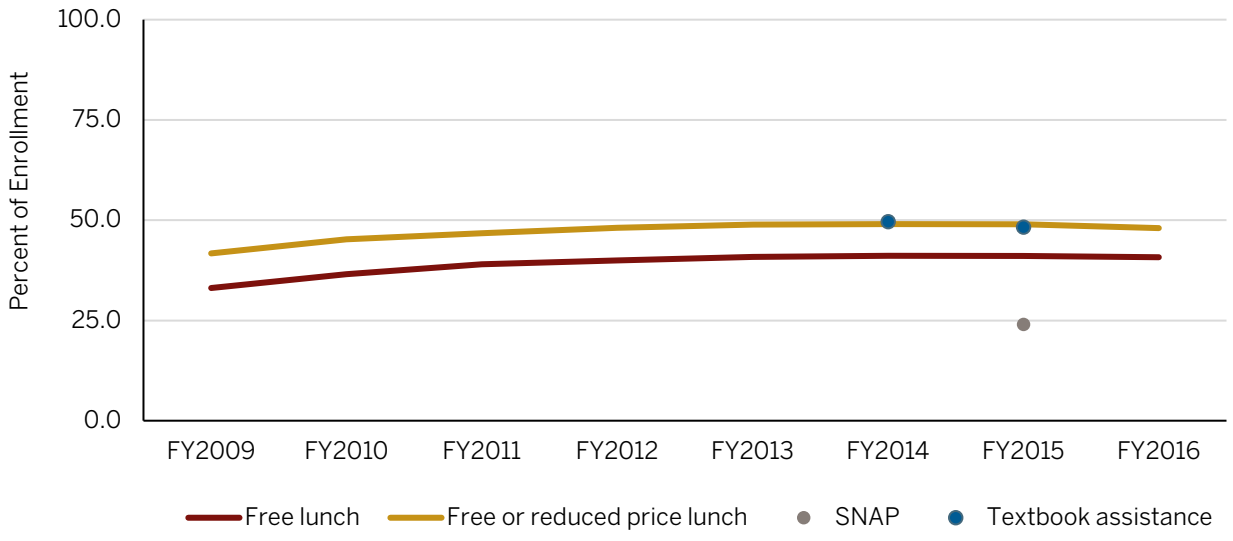


Table 10 displays the number of students in each lunch price category. The percent of students receiving free or reduced price lunch increased because of both an increase in the number of students receiving free lunch, as well as a decrease in the number of students paying full price[6]. During this time, the number of students receiving free lunch increased by 22.9% and the number of students paying full price declined by 11.0%. The number of students receiving reduced price lunch declined by 16.7% over the period.

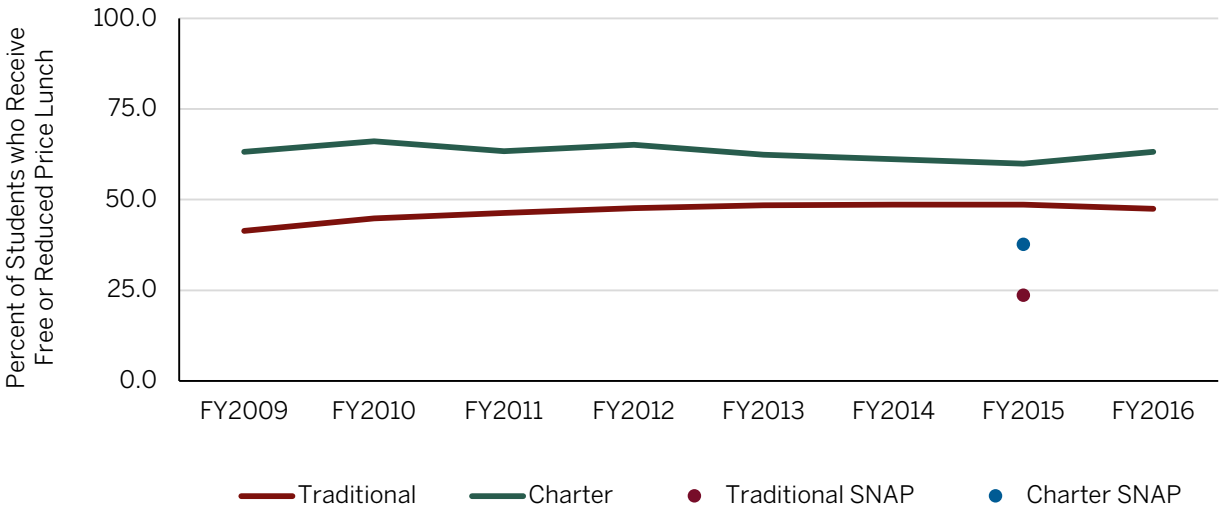
Table 10. Number of Students in Each Lunch Price Category: 2009 and 2016

	2009	2016	Difference	Percent Change	Average Annual Change
Total enrollment	1,041,957	1,039,123	-2,834	-0.3	0.0%
Free lunch	344,743	423,776	79,033	22.9	3.0%
Reduced price lunch	89,937	74,953	-14,984	-16.7	-2.6%
Paid Lunch	607,277	540,394	-66,883	-11.0	-1.7%

Figure 7 demonstrates that charter schools tend to serve relatively more students who receive FRL. Nearly two-thirds (63.0%) of charter school students received FRL over the years, compared to 47.0% at traditional schools in 2016. The percent of students receiving SNAP was also higher at charter schools compared to traditional schools as indicated by the circle marks with the corresponding colors.

[6] Technically all lunches at school corporations in the National School Lunch Program are subsidized. "Paid" lunches are subsidized at $0.25 per meal.

Figure 7. Percent of Students Who Receive FRL: Traditional Corporations vs. Charter Schools 2009-2016



The percentage of students receiving FRL generally increased at school corporations serving all locales (Table 11). Urban school corporations continue to have the highest concentration of FRL students, at 61.2%. Suburban and rural school corporations continue to have the lowest concentration of FRL students at 38.1% and 40.3%. Town and rural school corporations experienced the largest relative percentage point increases at 8.2 and 7.6.

Table 11. Percent of Students Who Receive Free or Reduced Price Lunch by Locale

Locale	2009	2016	Percentage Point Change
All	41.7	48	6.3
Urban	56	61.2	5.1
Suburban	32.1	38.1	6
Town	43.8	51.9	8.2
Rural	32.7	40.3	7.6
Virtual	---	42.5	---

All but nine of the traditional school corporations that did not undergo consolidations experienced an increase in the percentage of students that receive FRL (Table 12). Of these, 34.6% experienced more than a ten-point change in the

percent of students receiving FRL. Fifty-three (18.5%) experienced an increase less than or equal to five points, compared to the state increase of 6.3 percentage points.

Table 12. Traditional School Corporation Percentage Point Change in FRL

Change in % Free or Reduced Price Lunch (2009-2016)	n	Percent
Decrease in % free or reduced price lunch	9	3.1
0.1-5.0 point increase in % free or reduced price lunch	53	18.5
5.1-10.0 point increase in % free or reduced price lunch	125	43.7
10.1-15.0 point increase in % free or reduced price lunch	81	28.3
More than 15.0 point increase in % free or reduced price lunch	18	6.3

Changes in English Language Learner (ELL) Student Enrollment

The percentage of students that are ELL increased from 4.4% of enrollment in 2009 to 5.5% of enrollment in 2015, before declining to 4.8% of enrollment in 2016 (Figure 8). As traditional school corporations make up most enrollment in the state, overall percentages are similar to traditional school corporation percentages. The reason for the sharp decline from 2015 to 2016 is unclear. Charter schools had lower relative ELL enrollments in 2009 and 2010 than traditional school corporations, but had similar percentages of students who are ELL by 2016.

Figure 8. Percent of Students Who are ELL: Traditional Corporations vs. Charter Schools: 2009-2016

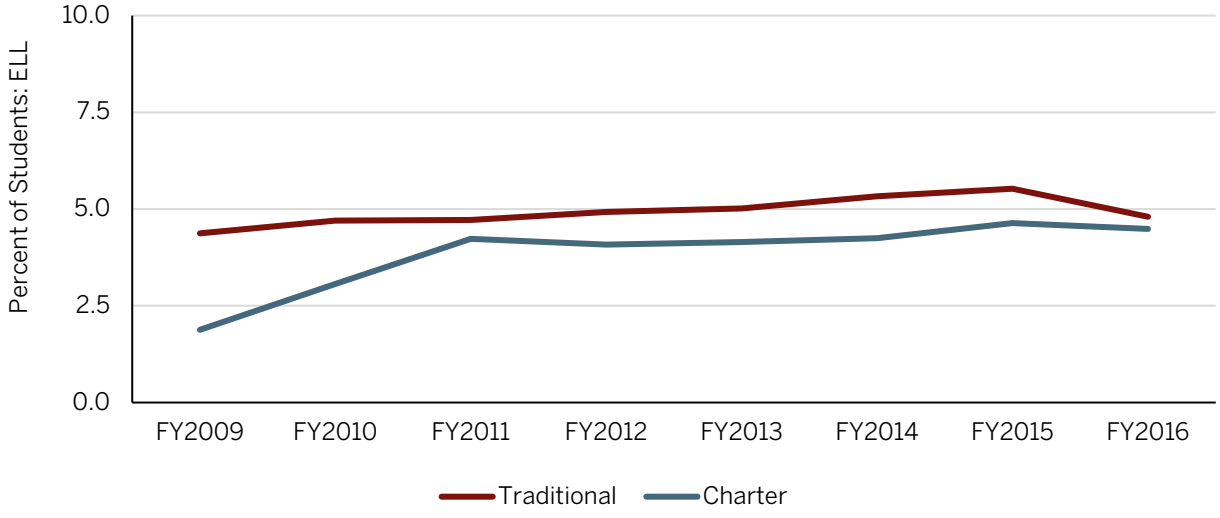


Figure 9 shows that urban communities had the largest concentration of ELL students from 2009 to 2016, where 8.2% of students were ELL in 2016. School corporations in urban areas experienced the largest increase in the percentage students who were ELL from 2009 to 2015, jumping from 6.8% to 9.4%, before declining to 8.2% in 2016. Rural school corporations had the lowest percent of students that were ELL at 2.0% in 2016. The percentage of students that were ELL did not change appreciably in school corporations serving suburban, town, and rural communities.

Figure 9. Percent of Students Who are ELL by Locale

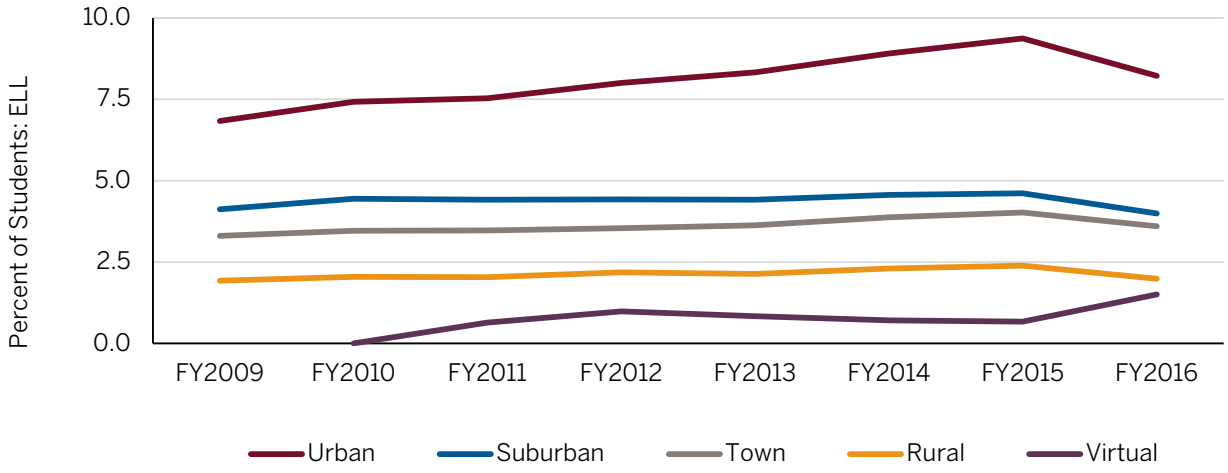


Table 13 shows that while most school corporations have a lower percent of students who are ELL than the state average, some have much larger percentages. Looking at the traditional school corporations that did not experience consolidations, the percentage of students who are ELL is no more than 5.0%. Only 8% (23 corporations) had more than 10% of enrollment as ELL.

Table 13. Number of Traditional School Corporations by Percent of Students Who are ELL

Percent ELL	2009 (n=293)	2016 (n=289)	Percentage Point Difference
0.0-5.0	83.6%	84.6%	1.0
5.1-10.0	8.4%	7.3%	-1.0
10.1-15.0	4.5%	4.9%	0.3
15.1-31.0	3.5%	3.1%	-0.3

Between 2009 and 2016, few school corporations experienced substantial growth in the percentage of their students who were ELL. Table 14 shows that 42.3% experienced no change or declining relative enrollment of ELL students. Another 46.9% experienced a one percentage point or lower increase. Fourteen (4.9%) school corporations experienced more than a two-point increase in the percent of English language learners.

Table 14. Traditional School Corporations – Percentage Point Change in ELL Students

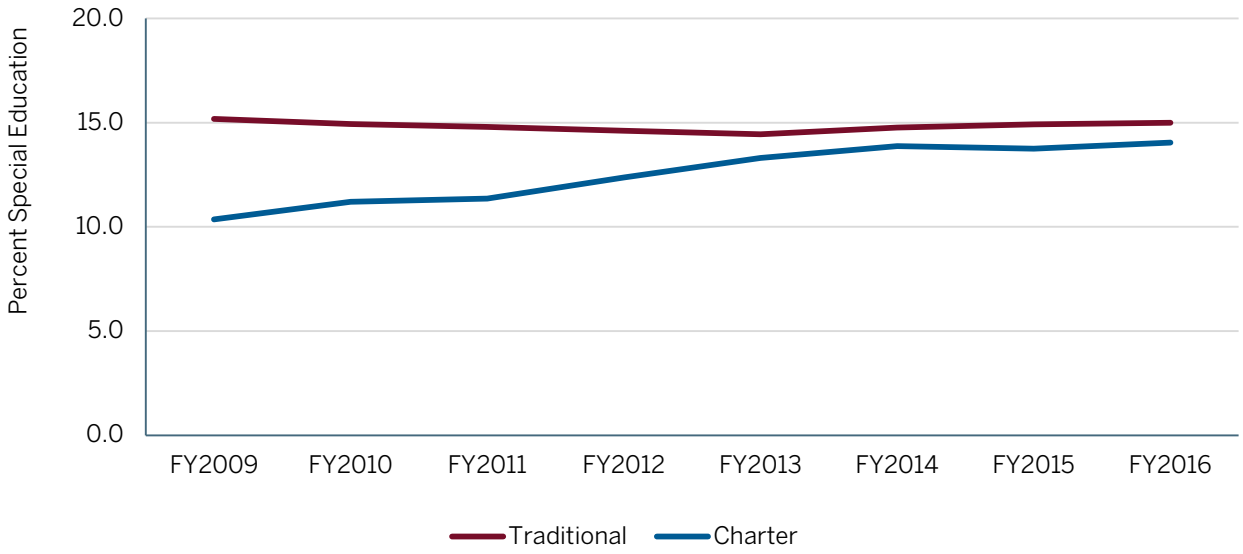
ELL Percentage Point Change	n	Percent
-9.7-0.0	121	42.3
0.1-1.0	134	46.9
1.1-2.0	17	5.9
2.1-10.6	14	4.9

Changes in Special Education Enrollment

Figure 10 displays the percentage of students receiving special education services in traditional school corporations and charter schools. Since traditional school corporations make up more than 95% of student enrollment, the state percentage resembles that for the traditional sector. The percent of students receiving special education services in the state was between 14.4 and 15.1% of students each year from 2009 to 2016. The percent of students that charter schools serve that received special education services increased from 10.4% to 14.0%, which

was only slightly lower than traditional public schools in 2016. Prior to 2011, charter schools served proportionally fewer special education students than traditional school corporations.

Figure 10. Percent of Students Receiving Special Education: Traditional Corporations vs. Charter Schools: 2009-2016



Total Tuition Support per-Pupil

As noted in the introduction, Total Tuition Support is made up of the sum of the Foundation funding plus other categorical grants. The Foundation Funding Amount serve as the base amount per-pupil in each year. Categorical grants are based on student enrollment in special categories (e.g., special education, SNAP).

Figure 11 shows the relative contribution of each form of tuition support between 2009 and 2017. Because contributions from the Complexity Index were included in foundation funding before fiscal year 2014, Complexity amounts were imputed for 2009 to 2013 based on Foundation Amounts and the Complexity Index. Full-day kindergarten grant funding was added into foundation funding for 2014 and 2015, as it was effectively absorbed into foundation funding starting in 2016.

In each year, the vast majority of state Tuition Support is provided through foundation funding. This was followed by the Complexity Grant and Special Education Grant. The funding formula shifted some funding from the Complexity Grant to Foundation funding in 2016, where it increased from 72.6% of total tuition support to 76.4% of Total Tuition Support.

Figure 11. State Support by Grant Source: 2009-2017

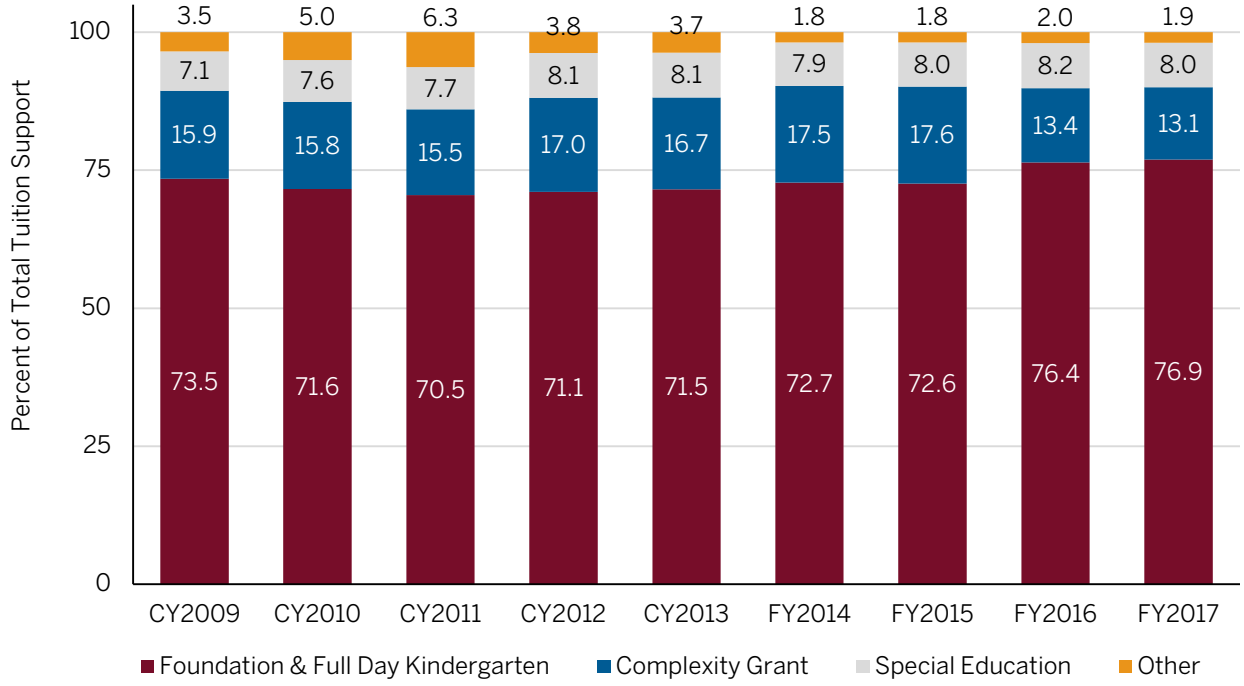
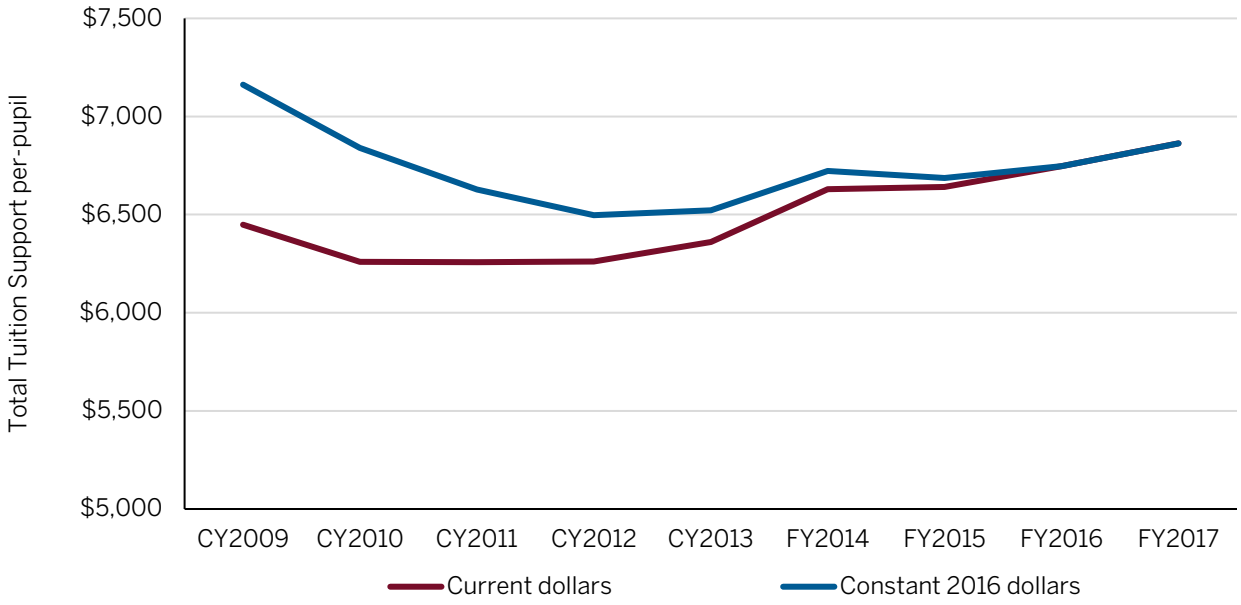


Figure 12 displays Total Tuition Support per-pupil, or ADM, from 2009 to 2017 in current as well as constant year 2016 dollars. Constant 2016 dollars were calculated using the Bureau of Labor Statistic's Consumer Price Index for all Urban Consumers (CPI-U). We assumed no inflation in 2017, relative to 2016. Total Tuition Support per-pupil declined from 2009 to 2011 in the aftermath of the Great Recession, from $6,449 per-pupil to $6,258. Since then, Total Tuition Support per-pupil increased each year and is projected to reach $6,863 per-pupil in fiscal year 2017. Funding in 2017 is projected to be $414 higher, or 6.4%, than 2009 levels. However, in inflation-adjusted constant 2016 dollars, Total Tuition Support per-pupil was $7,162 in calendar year 2009. In constant dollar terms, funding is projected to be $299, or 4.2% lower than 2009. For the remainder of this section, analyses will be in constant 2016 dollars unless otherwise indicated.

Figure 12. Total Tuition Support per-Pupil: 2009-2017



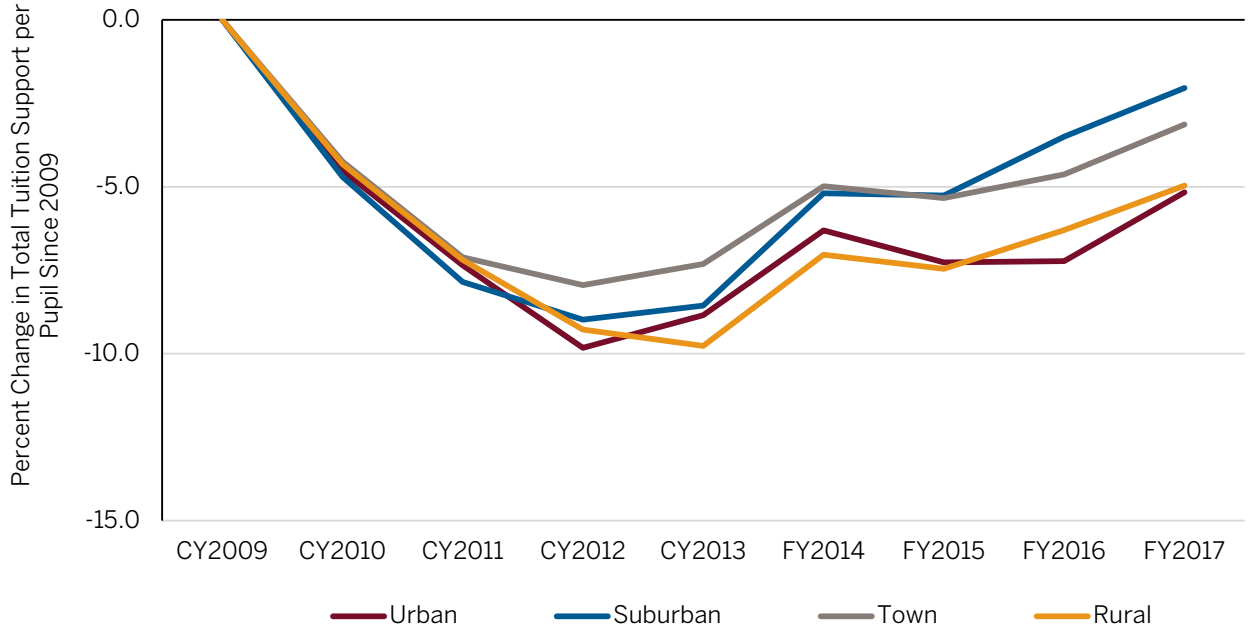
Funding from the American Recovery and Reinvestment Act (ARRA) was allocated through the school funding formula in 2009 and 2010, and included in the amounts shown in Figure 12. ARRA funds increased Total Tuition Support per-pupil by $415 and $115 in 2009 and 2010 in constant 2016 dollars[7]. If ARRA funds are excluded from the analysis, Total Tuition Support per-pupil increased by $116 per-pupil over this time period.

Figure 13 shows changes in funding relative to 2009 in constant 2016 dollars by locale-type. Declines in Total Tuition Support per-pupil were similar in all locale-types through 2012. In 2017, Total Tuition Support per-pupil in suburban and town school corporations are projected to be 2.0% and 3.1% lower than 2009 levels.

[7] Total ARRA funding was $536,365,651 in fiscal year 2009 and $209,141,313 in fiscal year 2010. We applied half of fiscal year 2009 amounts and half of fiscal year 2010 amounts to calendar year 2009. Half of fiscal year 2010 amounts were applied to 2010.

Urban and rural school corporations are projected to be 5.2% and 5.0% lower than 2009 levels.

Figure 13. Change in Total Tuition Support per-Pupil by Locale: 2009-2017



Overall, most traditional school corporations are projected to receive lower Total Tuition Support per-pupil in 2017 than 2009. Table 15 shows the difference in Total Tuition Support per-pupil for the traditional school corporations that did not experience consolidations. Forty-two (14.7%) corporations are projected to receive at least $50 more per-pupil in 2017 than in 2009. Another 13.3% are projected to receive similar per-pupil amounts, within $50. The remaining 72.0% are projected to receive reductions larger than $50 per-pupil in real terms, which shows that there are still residual effects of the recession on school funding. Seventy-six (26.6%) school corporations are projected to receive reductions larger than $500 per-pupil in real terms.

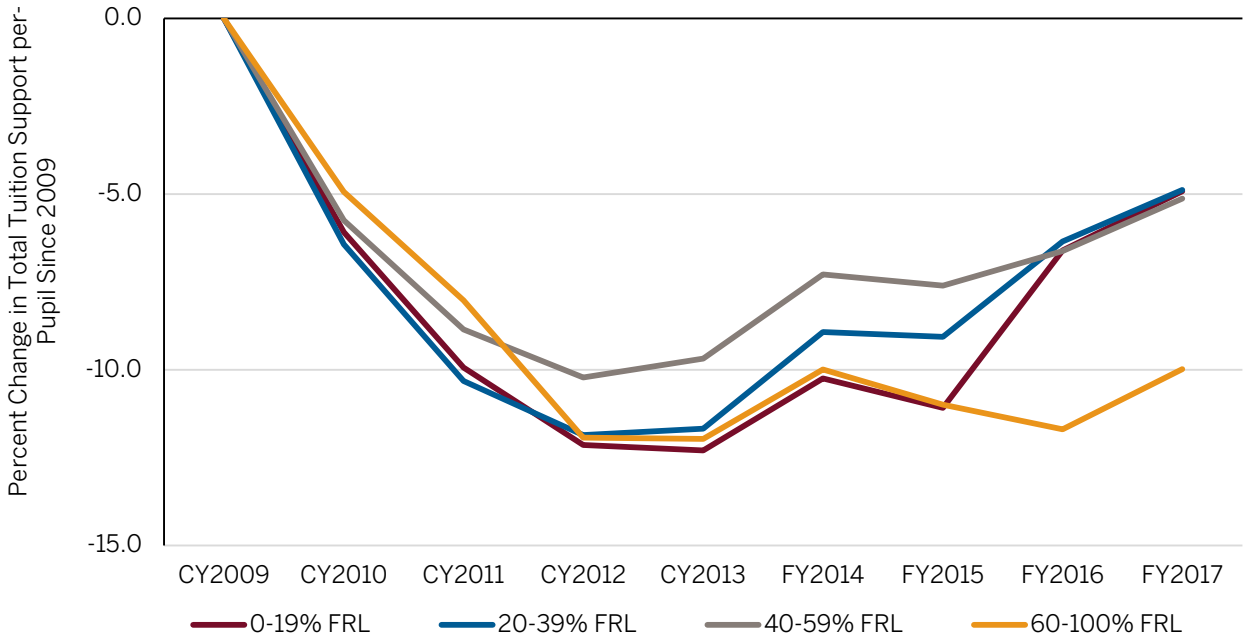
Table 15. Traditional School Corporations: Change in Total Tuition Support per-Pupil, Constant $2016 (N=286)

	n	Percent
-$2,526 to -$501	76	26.6
-$500 to -$251	57	19.9
-$250 to -$51	73	25.5
-$50 to $49	38	13.3
$50 to $250	39	13.6
$250 to $466	3	1

Total Tuition Support per-Pupil by Free or Reduced Price Lunch (FRL) Status

Figure 14 examines Total Tuition Support per-pupil by the percent of students who received FRL in the school corporation. In each year, school corporations were categorized into four groups by the percent of students who received FRL. The groups are: (a) 0.0-19.9% FRL; (b) 20.0-39.9% FRL; (c) 40.0-59.9% FRL, and (d) at least 60.9% FRL. FRL percentages from fiscal year 2016 were carried over to fiscal year 2017. From 2010 to 2012, all groups experienced lower per-pupil funding compared to 2009 levels, as Foundation funding declined during this period. All groups experienced relative increases through 2014. Substantial differences occurred in 2016, where school corporations with at least 60.0% FRL students experienced less funding than school corporations with relatively fewer FRL students. In 2017, these school corporations are expected to receive 10.0% lower funding than 2009 levels on average, compared to approximately 5.0% lower funding for other school corporations serving relatively fewer FRL students. See Appendix C for a further discussion on changes to the Complexity Index related to these differences.

Figure 14. Changes in Total Tuition Support per-Pupil by %FRL: 2009-2017



Note: Percentage of students that received FRL in 2017 was carried forward from 2016.

Despite the relatively larger declines for school corporations serving the largest proportion of FRL students, Total Tuition Support per-pupil remains higher for school corporations serving relatively more FRL students (Table 16). In 2017 school corporations with at least 60% FRL students are projected to receive $7,465 per-pupil on average, compared to $6,076 for school corporations with less than 20% FRL students. Higher cuts to school corporations serving needier students corresponds with compression in funding between high needs and low needs schools.

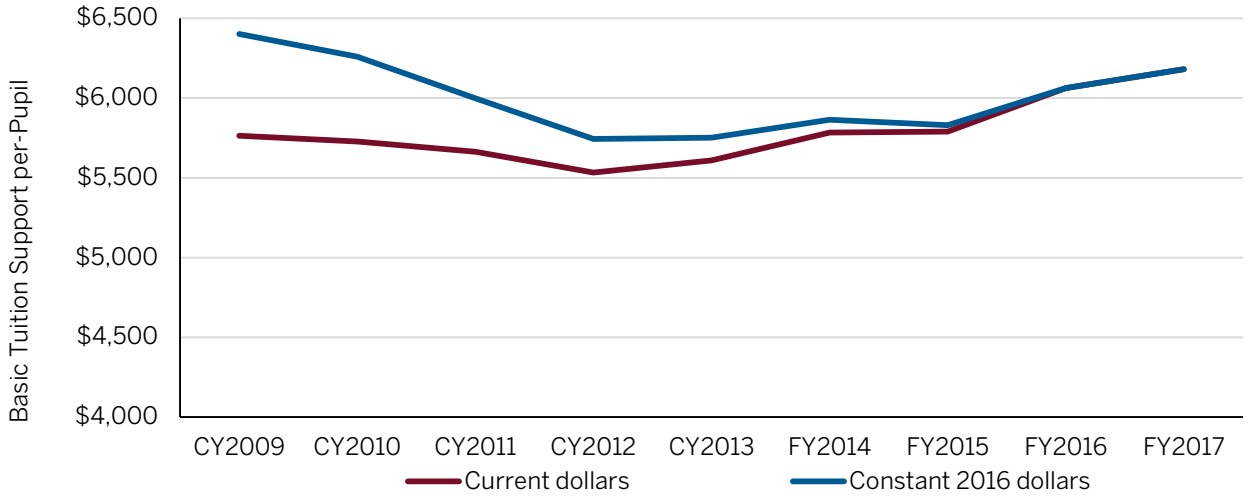
Table 16. Total Tuition Support per-Pupil by %FRL

	CY2009	FY2017	Difference	Percent Change
0-19% FRL	$6,390	$6,076	-$314	-4.9
20-39% FRL	$6,771	$6,448	-$323	-4.8
40-59% FRL	$7,240	$6,869	-$371	-5.1
60-100% FRL	$8,294	$7,465	-$828	-10.0

Basic Funding per-Pupil

Basic Funding includes Basic Tuition Support (Foundation Funding with Transition-to-Foundation provisions) and Complexity Grant funding. These were combined to make comparisons across years due to changes in Basic Tuition Support. Funding reductions from budget cuts were not included in calendar year 2010 or 2011, although they were reflected in the Total Tuition Support section. As Basic Funding includes funding due to the Complexity Index, this portion of funding is responsible for vertical equity. As noted in Figure 11, it accounts for most of State Tuition Support (Total Tuition Support). Figure 15, in contrast, displays Basic Funding per-pupil in current and constant 2016 dollars. In current year dollars, Basic Funding declined from $5,764 per-pupil in 2009 to $5,534 per-pupil in 2012. From there, it is projected to increase to $6,181 per-pupil in 2017. From 2009 to 2017 this is a $417, or 7.2% increase. In constant 2016 dollars, Basic Funding per-pupil was $6,402 in 2009. From 2009 to 2017 this is a $221, or 3.5%, decrease in constant dollars. As before, per-pupil amounts will be in constant dollars for the remainder of the section unless otherwise indicated.

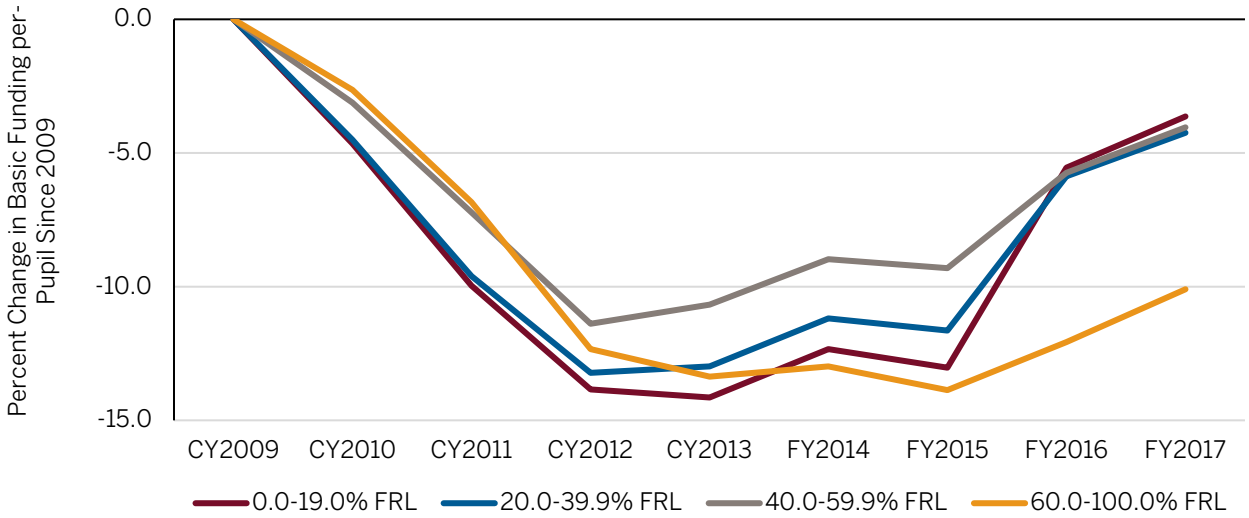
Figure 15. Basic Funding per-Pupil



As in the earlier section, Figure 16 examines changes in Basic Funding per-pupil by the percent of students who received FRL in the school corporation. In constant terms, Basic Funding per-pupil declined on average from 2009 to 2012 for school corporations in each FRL category, with somewhat smaller declines for school corporations serving FRL to at least 40.0% of students. With changes to the new biennium starting in fiscal year 2016, school corporations serving fewer than 60.0% FRL students received substantially larger increases to Basic Funding than those where at least 60.0% of students received FRL. School corporations serving less than 60.0% FRL students are projected to receive approximately 4% less than in 2009. This compares to 10% less for those where 60% or more students receive free or reduced price lunch. Similar to the Total Tuition Support discussion, school corporations serving relatively more low-income students still receive more funding per-pupil on average than school corporations serving relatively fewer do. Relatively

larger cuts for higher needs school corporations correspond with a compression in funding differences.

Figure 16. Change in Basic Funding per-Pupil, Constant 2016 Dollars



Note: Percentage of students that received FRL in 2017 was carried forward from 2016.

Total Tuition Support

Although most of the analyses focuses on per-pupil revenue, the absolute amounts provided to school corporations have potentially important ramifications. While Total Tuition Support (i.e., state support) should cover all general fund expenses (e.g., variable costs), some of these expenses may be difficult to adjust in the short run, whether for political, contractual, or other reasons. This means that absolute losses of revenue in current terms may increase the chances of financial distress in those school corporations. Table 17 presents the change in Total Tuition Support between 2009 and 2017 for traditional school corporations not involved in consolidations. Changes reflect current dollar amounts (not adjusted for inflation). Almost half (48.6%) are projected to receive less Total Tuition Support in 2017 than in 2009 and 36.0% are projected to see declines greater than 5.0%.

Table 17. Change in Total Tuition Support from 2009 to 2017: Traditional School Corporations (Current Dollars)

Change in Total Tuition Support	n	Percent
Decreased by more than 5.0%	103	36
Decreased by 5.0% or less	36	12.6
Increased by less than 5.0%	44	15.4
Increased at least 5.0%	103	36

Table 18 displays the percentage of school corporations receiving less Total Tuition Support to assess the degree to which declines resulted from declining ADM or from lower Total Tuition Support per-pupil. Similar Total Tuition Support per-pupil was defined as 2017 levels within 1% of 2009 levels. ADM declined by at least 5.0% in 92.1% of these school corporations. Tuition Support per-pupil increased in 64.0% of these. Absolute revenue losses appear more related to ADM losses than declining Total Tuition Support per-pupil.

Table 18. Traditional School Corporations with Lower Total Tuition Support (Current Dollars)

	Decreased $Total/ADM	Similar $Total/ADM	Higher $Total/ADM
ADM decreased at least 5%	21.6%	6.5%	64.0%
Similar ADM (within 5%)	6.5%	1.4%	0.0%
ADM increased at least 5%	0.0%	0.0%	0.0%

Assessing the Equity of Indiana's School Funding Formula

This section examines the equity of Indiana's school funding formula between 2009 and 2017. Horizontal equity refers to the extent to which school corporations with similar characteristics (in terms of socioeconomic status of the students they serve and size) should receive similar funding per-pupil. Vertical equity refers to the extent to which school corporations with different characteristics receive proportionately different funding. That is, do school corporations with greater needs (e.g., serve more children from low-income families) receive appropriately more funding support? Defining equity is both a political as well as technical question. Following the work of Toutkoushian and Michael (2007), this analysis used the state school funding formula as the basis for defining horizontal and vertical equity. Since the school funding formula is changed each year, and comparisons are made within each of these years, year-specific, nominal funding amounts and ADMs are used.

Horizontal Equity Indicators

To assess horizontal equity, we calculated the percent of explained variation in per-pupil funding amounts that is attributed to factors used in Basic Funding calculations (related to Foundation funding and the Complexity Grant). Following the work of Toutkoushian and Michael (2007), we regressed per-pupil basic tuition support dollars on factors related to the Complexity Index (percent of students receiving FRL, textbook assistance, or SNAP depending on year). For 2009-2015, the model adjusts for high needs schools (the second tier Complexity Index calculation). For 2012 and 2013, the model also includes adjustments for school corporations with

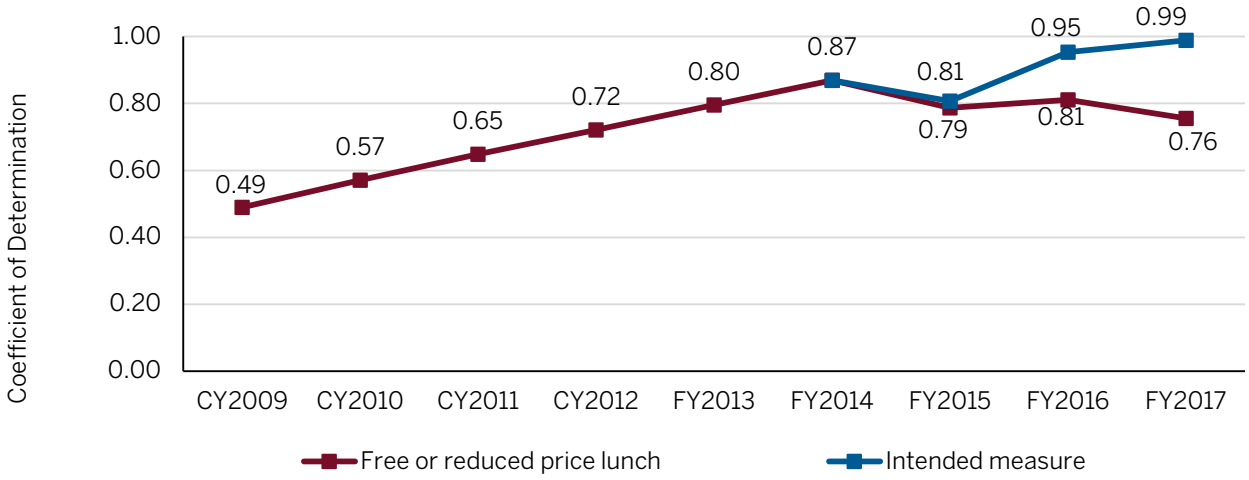
ADM between 500 and 1,000 and those with ADM greater than 1,000. For 2010-2017 it adjusts for virtual charter schools, and in 2016 and 2017 it adjusts for school corporations where at least 25% of students were ELL. Technical Appendix A provides the full regression specifications and results (Table A2). The R^2 statistic, or coefficient of determination, describes the percentage of variation in Basic Funding per-pupil that can be explained by factors in the school funding formula, as modeled in the regression. This statistic shows the amount of variation in funding explained by the intended school funding formula factors, which provides a measure of horizontal equity. Larger measures of explained variation indicate more horizontal equity (presumably as intended by funding formula policymakers), while lower amounts of explained variance show less horizontal equity.

Figure 17 shows that horizontal equity generally improved since 2009 (R^2 values have increased). Because of the changes in measures used to calculate the Complexity Index in fiscal years 2015 and 2016, the regressions were run once for all years using the percentage of students who received FRL to facilitate long-term comparisons. They were run a second time using the relevant measures (e.g., percent receiving textbook assistance or SNAP), shown in blue in Figure 17.

In 2009, approximately half the variability in per-pupil basic tuition support was explained by the foundation amount or complexity calculations. This improved to 87% being explained in 2014 as more school corporations reached foundation funding. During 2015, horizontal equity decreased. This coincides with the change to textbook assistance in calculating the Complexity Index and may reflect "noise" in the data. Alternatively, textbook assistance may be a more volatile measure than FRL,

having more variability between years (e.g. for 2014, which was used for the calculation and the percent from 2015). With the change to SNAP in 2016, which has substantially different eligibility criteria, differences in horizontal equity measures using SNAP and FRL are much larger. Using SNAP, horizontal equity continues to improve with increasing explained variation. It is worth noting that SNAP percentages are based on fiscal year 2015, as current year data were not available. The 2017 measurement is also based on funding projections.

Figure 17. Horizontal Equity as Measured by the Coefficient of Determination

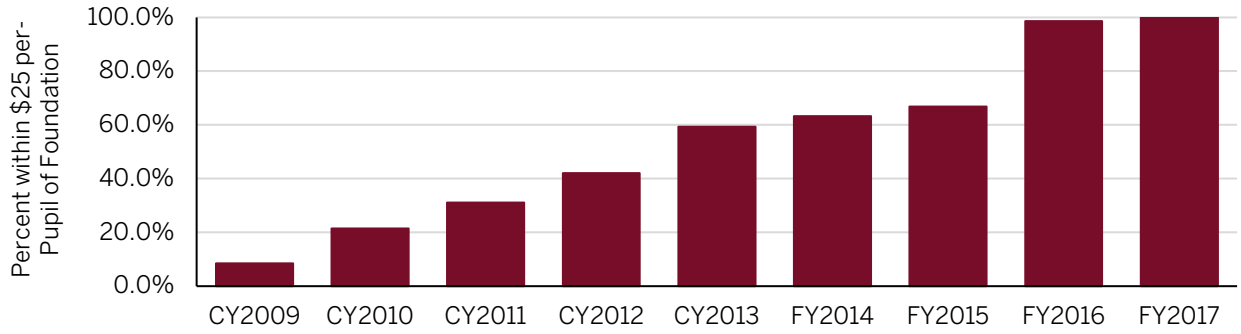


Note: Percentage of students that received FRL in 2017 was carried forward from 2016.

One of the larger sources of funding inequities resulted from the Transition to Foundation provisions. These provisions buffered school corporations from large changes in funding between years caused by differences in year-to-year Basic Funding per-pupil before 2017, as well as ADM prior to 2012. Examining the percentage of traditional school corporations near Foundation amounts shows that more school corporations reached foundation levels each year (Figure 18). This

provision was eliminated in 2017. Calculations for 2012 and 2013 also included the provisions for having ADM of at least 500.

Figure 18. Traditional School Corporations: Percent Within $25 of Foundation (per-Pupil)



The primary form of buffering in 2016 and 2017 were in transitions in the Complexity Index. For most school corporations, the switch from using free or reduced price lunch to SNAP reduced the intended Complexity Index. This change was phased in during fiscal years 2016 and 2017. In sum, current funding approaches appear to achieve intended horizontal equity goals.

Vertical Equity Indicators

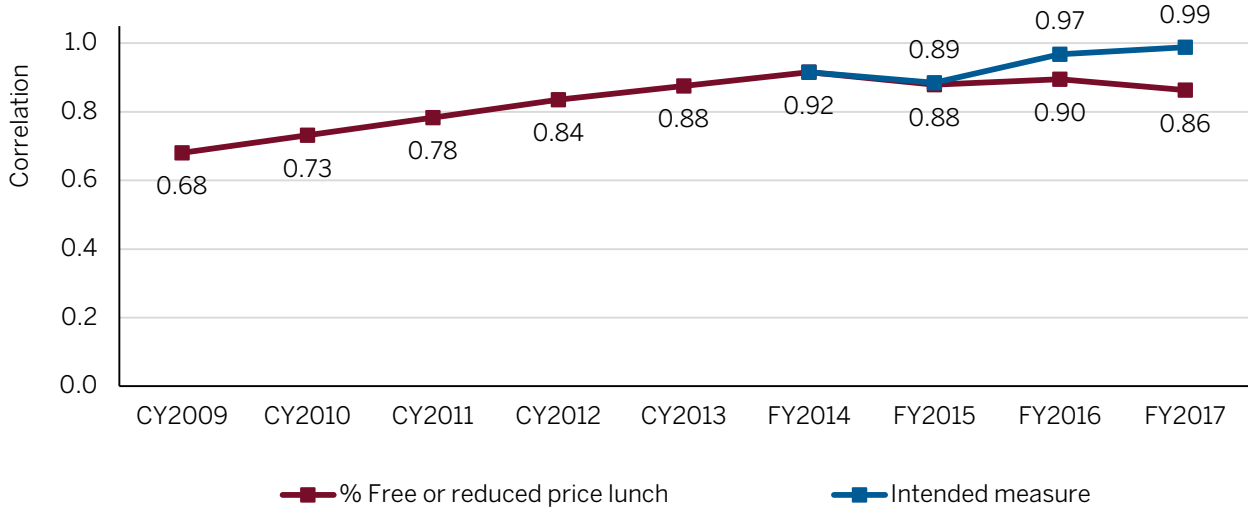
Vertical equity refers to the need for more funding to be allocated to different school corporations in order to educate students who tend to have higher educational costs. The Indiana school funding formula addresses vertical equity through the Complexity Index; this index allows school corporations serving less affluent students to receive additional funding. Vertical equity improves when the relationship between per-pupil Basic Funding and school corporation characteristics (e.g., percent of students who received FRL) strengthens and matches the intended relationship (Toutkoushian & Michael, 2007).

The school funding formula provides additional funding for school corporations that serve a larger proportion of students who are from low-income families. In 2009 to 2014, low income was approximated by the percentage of students that received FRL. In 2015 the formula was changed to account for the percentage of students receiving textbook assistance (which had same income eligibility criteria). In 2016 and 2017 the formula includes the percentage of students in the Supplemental Nutrition Assistance Program, Temporary Assistance for Needy Families program, or foster assistance (SNAP), which has more stringent eligibility criteria.

Correlations between the percentage of students who receive FRL and Basic Funding per-pupil provide one measure of vertical equity. As the percent of students who received FRL was a relevant factor related to vertical equity in most years, this strategy can be used to estimate trends in vertical equity over time. Correlations that are closer to 1.0 indicate greater vertical equity while correlations closer to 0.0 indicate less vertical equity.

Figure 19 shows the Pearson correlation between Basic Funding per-pupil and the percentage of students who receive FRL. For comparison, the blue line shows the correlation between Basic Funding per-pupil and textbook assistance (in 2015) or SNAP (in 2016 and 2017). The correlation increased from 0.68 in calendar year 2009 to 0.92 in 2014, showing an improvement in vertical equity. Since then it has slightly declined, as expected from the changing measures. Nevertheless, using the intended measure shows that vertical equity remains comparatively high in recent years. As noted before however, SNAP percentages are based on 2015, as current year data were not available, and the 2017 measurement is based on projections.

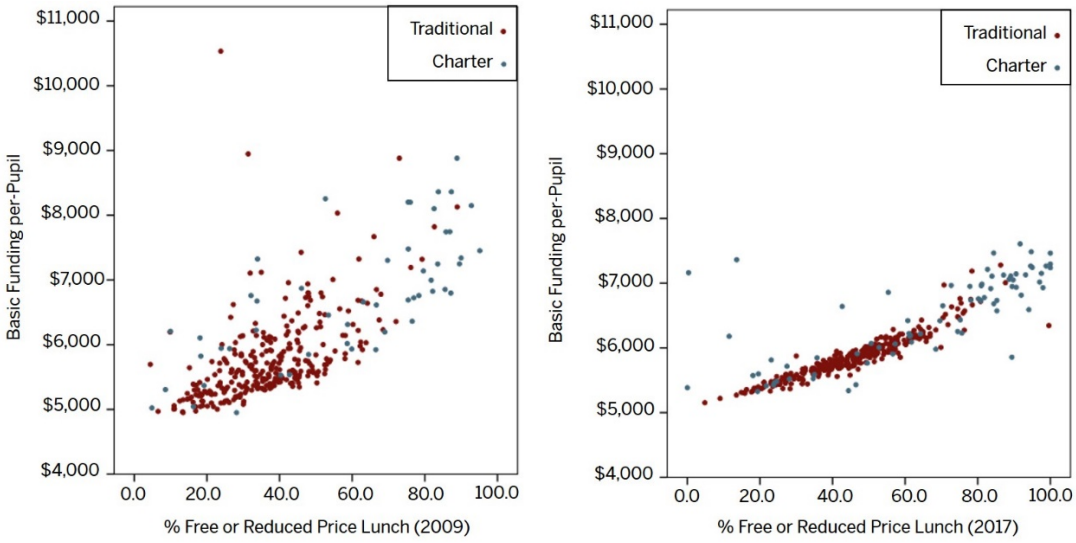
Figure 19. Vertical Equity as Correlation Between Basic Funding per-Pupil and Percent FRL



Note: Percentage of students that received FRL in 2017 was carried forward from 2016.

The tighter relationship may be more clearly seen in Figure 20, which plots Basic Funding per-pupil over the percent of students who received FRL for each school corporation in 2009 and 2017. The larger vertical spread for any percent FRL in 2009 shows a lower correlation, compared to 2017. It also shows improved Horizontal equity.

Figure 20. Basic Funding per-Pupil Compared to Percent Free or Reduced Price Lunch (2009 and 2017)



Note: Percentage of students that received FRL in 2017 was carried forward from 2016.

Regression estimates of vertical equity. Regression estimates expand upon correlational analyses and provide another way to measure vertical equity. In addition to providing a correlational measure of the relative relationship between the percent of students from low-income families and Basic Funding per-pupil, regression approaches also permit assessment of vertical equity on a standardized (i.e., absolute) scale. That is, the regression approaches presented here estimate the additional Basic Funding per-pupil as the percent of low-income students changes across each year. This allows comparisons with funding changes intended by the school funding formula. These estimates also permit a broader discussion of vertical equity, rather than assuming the legislature provided sufficient additional resources to high needs schools. That is, should more or less funds be associated with low-income students?

Table 19 presents the intended additional per-pupil amount provided to a school corporation for each percentage point change in low-income students. These amounts were derived from the Complexity Index calculations and Foundation Amounts or Complexity Grant amounts in each respective year. These values represent the "target amount" for vertical equity as intended by the state legislature in the funding formula. For example, in 2014 school corporations should have received an additional $22.85 per-pupil for each one percentage point increase in the percentage of students enrolled in the FRL program.

Prior to 2016, school corporations serving a high proportion of students who were from low-income families received an additional amount of funding. This was reflected in the "second tier" calculation of the complexity index. In 2014, the school corporation would receive $45.70[8] per-pupil ($22.85 + $22.85 for being a "high FRL" school corporation) for each percentage point change. This amount and low-income threshold for second tier calculations changed by year (see Table A1).

Table 19. Intended Effect of One Percentage Point Change in % Low-Income Measurement Based on the School Funding Formula

	CY2009	CY2010	CY2011	CY2012	CY2013	FY2014	FY2015	FY2016	FY2017
% low-income	$24.00	$22.63	$22.41	$21.29	$21.91	$22.85	$22.94	$34.89	$35.39
High % low-income	$24.00	$22.63	$22.41	$21.29	$21.91	$22.85	$22.94		

Table 20 displays the parameter estimates from the regression results. All results were statistically significant at the 0.05 critical level, with the exception of the

[8] Technically $45.69 since the amounts should be $22.845 + $22.845

ADM500-1,000 indicators in 2012 and 2013. This can be interpreted to mean that funding varied between school corporations based on the percentage of low-income students, as intended by the legislature. Of particular interest are the first two rows, which estimate the effects of a one percentage point change in low-income students, and should correspond with amounts shown in Table 19. To take 2014 as an example in reading the results, a school corporation in which 40% of the students were enrolled in the FRL program (FRL enrolled) received $24.46 more per-pupil than a school corporation in which 39% of the students were FRL enrolled. A school corporation in which 80% of the students were FRL enrolled received $48.33 ($24.46 + $23.87 for "high %low- income") more per-pupil than a school corporation in which 79% of the students were FRL enrolled. For 2016, a one percentage-point change in SNAP enrolled students resulted in a $29.92 per-pupil increase in Basic Funding, regardless of whether or not the school corporation had a high percentage of low-income students. Full regression results are available in Table A2 in Appendix A.

Based on the data, the school funding formula has provided additional funding for school corporations serving a large proportion of FRL enrolled students. For the first tier calculation, school corporations received an additional $18.84 to $24.46 for each percentage point change between 2009 and 2015. Each percentage point change in SNAP corresponded to an average of $29.92 and $32.78 per-pupil in 2016 and 2017, respectively. Second tier calculations provide similar amounts of additional funding for 2009, 2010, 2011, and 2014. However, they are much lower than expected in 2012, 2013, and 2015. For 2012 and 2013 it is likely that ADM overlay provisions affect estimates in unobserved ways. The low estimate in 2015 may be the result of

changing low-income measures to textbook assistance. Table A3 provides estimates for 2015 to 2017 if FRL was used as the low-income measure and show results similar to earlier years.

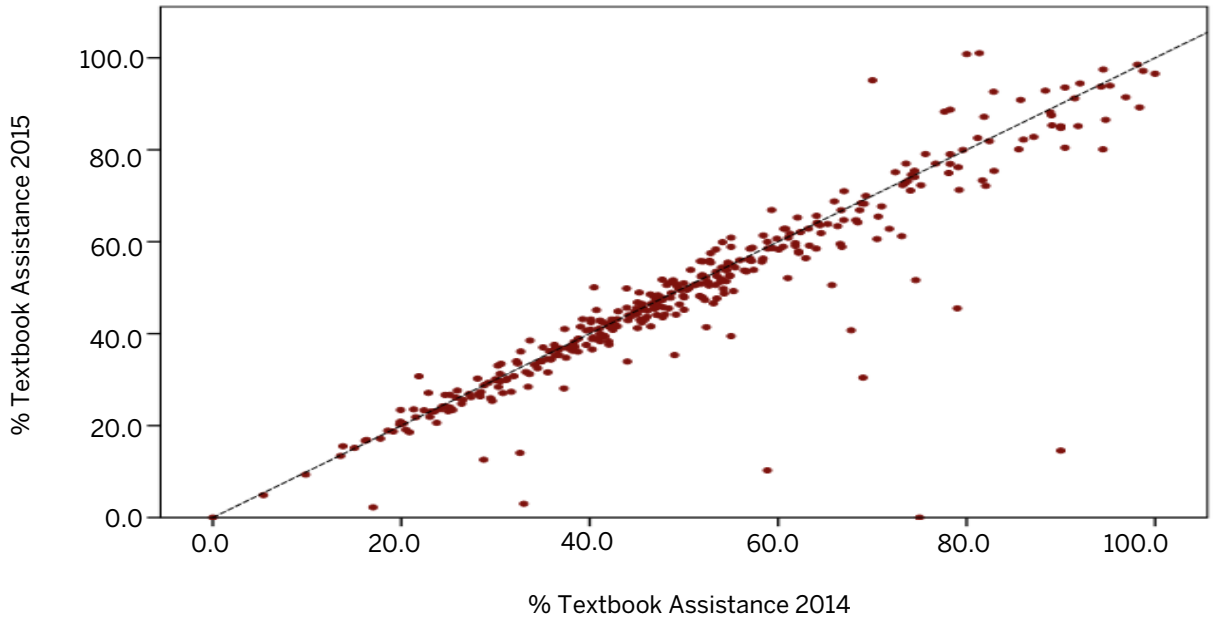
Figure 21 shows large differences between the percent of students receiving textbook assistance in 2014 (used for the 2015 Complexity Index) and the percent in 2015 in some school corporations, which may affect estimates. Second tier calculations are not applicable to 2016 and 2017.

Table 20. Regression Parameter Estimates, Including Estimated Effect of One Percentage Point Change in Percent Low-Income Measurement

	CY2009	CY2010	CY2011	CY2012	CY2013	FY2014	FY2015	FY2016	FY2017
% low-income	$20.04*	$19.86*	$18.84*	$23.50*	$22.46*	$24.46*	$21.42*	$29.92*	$32.78*
High % low-income	$24.96*	$24.21*	$21.49*	$7.31*	$7.23*	$23.87*	$9.66*		
ADM 500-1,000				$76.62	$95.12				
ADM > 1,000				-$236.60*	-$134.28*				
ELL								$270.64*	$214.46*
Adj. R^2	0.485	0.566	0.645	0.751	0.811	0.868	0.805	0.953	0.988
Low-income measure	FRL	FRL	FRL	FRL	FRL	FRL	TBA[a]	SNAP	SNAP

Notes: *p<.05
[a]TBA – Textbook assistance

Figure 21. Relationship Between Percent of Students Receiving Textbook Assistance in 2014 and 2015



In 2012 and 2013, school corporations with an ADM of at least 500 were to receive additional funding. Those with an ADM of 500-1,000 were to receive an additional $150 per-pupil, with the amount tapering off as ADM increased past 1,000. The vertical equity analysis shows that school corporations with ADM of 500-1,000 may have received an additional $76.62 or $95.12 per-pupil on average, in comparison to other school corporations, although the results were not statistically significant. School corporations with an ADM greater than 1,000 received $236.60 and $134.28 less per-pupil on average than school corporations with lower ADM.

As used in Toutkoushian & Michael (2007), the ratio between the measured effects of the Complexity Index funding on per-ADM Basic Funding and the intended effects as defined by the school funding formula can serve as a measure of vertical equity. Table 21 shows the vertical equity measures as the estimates (from Table 20)

divided by the intended amounts (from Table 19). For example, the 2009 ratio of 0.83 is calculated as $20.04 (from Table 20) divided by $24.00 (from Table 19). A measure equal to one implies complete vertical equity and a measure above or below indicates less vertical equity. More specifically, measures greater than 1 indicate school corporations were funded above the intended amount and measures less than 1 indicate school corporations were funded below the intended amount. In most years, the effect of the percent of low-income students was similar to the intended effect for school corporations that were not high need (lower than the high needs percent FRL threshold). School corporations with a high percentage of low-income students may have received somewhat less in 2012 and 2013 and 2015, although some of this may be due to outliers as previously mentioned.

Table 21. Vertical Equity by Year, Basic Funding per-Pupil

	CY2009	CY2010	CY2011	CY2012	CY2013	FY2014	FY2015	FY2016	FY2017
% low-income	0.83	0.88	0.84	1.1	1.03	1.07	0.93	0.86	0.93
High % low-income	1.04	1.07	0.96	0.34	0.33	1.04	0.42		

As noted previously, this analysis cannot determine the appropriate amount of additional funding needed to achieve vertical equity, as equity represent what are fundamentally political and technical questions. The present analysis is based on an assumption that intended state policy, through the school funding formula, achieves vertical equity. Appendix B provides more detailed information about the intended amount of additional funding provided through the school funding formula. While the assumption underlying this work requires that any state comparisons should be treated with caution, Indiana appears to provide a relatively high amount of funding

toward vertical equity (Baker, Farrie, Luhm, & Sciarra, 2016; Parker & Griffith, 2016). However, based on outcomes, differences in achievement (measured by ISTEP, IREAD, or graduation rates) remain between FRL and non-FRL students (IDOE, n.d.a; IDOE, n.d.b; IDOE, n.d.c).

Conclusion

The results of this analysis indicates that state funding continues to increase on a per-pupil basis from the nadir in 2011 and 2012. Current year dollars per-pupil increased each year in 2013 through 2017, and constant dollars per-pupil also generally increased. While the extent of increases differed between school corporations, equity analyses indicate that these differences occurred for intended reasons, and improved both horizontal and vertical equity. However, the present equity analysis cannot answer whether the school funding formula yields the "correct amount" of vertical equity. That is, it cannot answer: what is the correct amount of additional funding for students from low-income families? Additionally, the present equity analysis cannot answer questions related to the adequacy of funding. In other words, is the present level of funding sufficient to provide an adequate education?

Enrollment and ADM trends indicate modest changes at the statewide level, although sharper changes in some school corporations. The number of students receiving free or reduced price lunch increased statewide and in most school corporations. While the number of Non-White and English language learner students increased statewide, most of the changes affected a smaller number of school corporations.

While ADM changes result in small fiscal effects for the state as a whole, certain school corporations face greater challenges as they see declining total state revenue in 2017, compared to 2009. Higher current dollar funding per-pupil should ameliorate the effect on variable costs (e.g., number of teachers). Studies on local

school corporation revenue, which pay for fixed costs like debt service and capital expenses, are needed to understand the full effect on school finances. If declining ADM corresponds with a shrinking local tax base (e.g., broader population declines in the local jurisdiction), those school corporations will face additional pressures paying for fixed costs.

In sum, the key take home points from this work are:

- Findings from the analyses of Indiana's school funding formula indicate that the state's public school corporations experienced substantial changes in state funding between 2009 and 2017.
- ADM is projected to decline modestly in the state's school corporations in 2017, compared to 2009, with larger declines in traditional school corporations.
- Total Tuition Support and Basic Funding are projected to increase through the end of the 2015-2017 biennium; however, the increases in funding are not sufficient to fully restore funding to pre-2009 levels in terms of constant dollars (inflation adjusted).
- Regression analyses suggest that current funding formula policy improved horizontal and vertical equity throughout the study period, and projections indicated high levels of equity will be achieved in 2017.

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Appendix A. Technical Appendix

Estimating Modified ADM for 2016 and 2017

Kindergarten students counted as one-half (0.5) ADM prior to 2015. Beginning in 2016, full-day kindergarten students counted as one (1) ADM. To make ADM counts comparable between years we estimated 2016 and 2017 ADM as if Kindergarten students still counted as one-half (0.5) ADM. To do this, we use fiscal year 2015 and 2016 data to estimate the percent of students in full-day kindergarten. The number of full-day kindergarteners was estimated as below:

$FDK_{t,i} = ADM_{t,i}$*(percent of kindergarteners that attend full day)*(percent of ADM that is kindergarten)

More specifically, this is estimated as:

$FDK_{t,i} = ADM_{t,i}*(FDK_{15,i}/Kindergarten_{15,i})*(Kindergarten_{16,i}/ADM_{16,i})$, for each year (2016 or 2017), t and each school corporation, i.

$FDK_{15,i}$ was estimated as the full-day kindergarten grant amount/$2,472 (the amount for each full-day kindergarten student) for each school corporation. The variables $Kindergarten_{15}$ and $Kindergarten_{16}$ refer to Kindergarten enrollment based on Department of Education enrollment data by grade in the corresponding fiscal years (FY2015 and FY2016). This yields a modified ADM (for FY2016 and FY2017):

$Modified\ ADM_i = ADM_{t,i} - 0.5*FDK_{t,i}$

This assumes the percent of kindergarteners that are full-day kindergarteners in fiscal year 2016 and 2017 is the same as from 2015. It assumes that the percent of ADM made up of kindergarteners is the same as in fiscal year 2016.

For Kankakee Valley School Corporation (3785), which started offering full-day kindergarten in fiscal year 2016, we assumed the percent of kindergarteners that will attend full-day is equal to the minimum traditional school corporation (81%).
For charter schools that opened after fiscal year 2015 and did not serve kindergarten, ADM was not adjusted.

For charter schools that opened after fiscal year 2015 and that serve kindergarten, we assumed the percent of kindergarteners that attend full-day equals the state average (99.5%). For new charter schools in fiscal year 2017, we assumed the percent of ADM that was kindergarten was one divided by the number of grades served.

Funding Estimates for 2017

As noted previously, estimates for ADM, foundation amount per ADM, and complexity grant per ADM were obtained from IDOE. The foundation per ADM and complexity grant per ADM were current estimates as of August 2016. Because the Spring ADM count tends to be lower than the Fall ADM count, we estimated a Spring ADM count for each school corporation using the average Spring to Fall ADM ratio from 2014 to 2016. The average of the Fall ADM and the Spring ADM estimate was used as the 2017 ADM estimate.

The ADM estimates were current as of October 4, 2016. Basic Tuition Support (i.e., Foundation) and Complexity Grant funding was calculated as the product between ADM and each amount per ADM. For school corporations that existed in 2016, the Honors, Special Education and CTE Grant amounts were calculated as the

2016 amount divided by 2016 ADM and multiplied by 2017 ADM for each school corporation.

An exception to the honors grant estimation was for charter schools that opened in 2016 and enrolled students in grade 12. For these schools we used the average charter school graduation rate from fiscal year 2015[9] multiplied by the number of students in grade 12, multiplied by the average charter school ratio of honors graduates to nonwaiver graduates, and the product multiplied by $1,000. This produces a low estimate since it does not account for honors graduates that qualified for SNAP.

The funding amounts for new physical charter schools (not virtual) that opened in 2017 are as calculated as follows. The Special Education Grant amounts were calculated by taking the average 2016 Special Education Grant per ADM for all other physical charter schools and multiplying it by each new charter school's 2017 ADM estimate. For these schools, the CTE Grant amount was estimated as $0 since it was inapplicable to two of the charter schools which served grades under 4 and did not fit with the mission or curricula of the other two. Additionally, most charter schools received $0 CTE funding in 2016. The Honors Grant was estimated at $0 since it was not applicable to new schools. For new virtual charter schools, a similar procedure to estimate the Special Education Grant was employed except the

[9] The most recent year of publicly available data

weighted average was based on other virtual charter schools in 2016. For similar reasons, Honors and CTE grants were estimated at $0 for these schools.

Full Regression Specification and Results

The regressions generally included all school corporations, including charter schools, where data was available. School corporations with missing data were excluded. School corporations during consolidation years were also excluded due to variation in how funding and ADM were assigned between school corporations involved. Charter schools closed during the time period were also excluded, as they did not have a full year of funding data.

The regression equations were as follows:

CY2009-CY2011 and FY2014:

- $\$Basic/ADM_i = \beta_0 + \beta_1 \%FRL_i + \beta_2 \%FRL_i * HighFRL_i + \beta_3 HighFRL_i + \beta_4 Virtual_i$

CY2012 and CY2013:

- $\$Basic/ADM_i = \beta_0 + \beta_1 \%FRL_i + \beta_2 \%FRL_i * HighFRL_i + \beta_3 HighFRL_i + \beta_4 Virtual_i + \beta_5 ADM500_i + \beta_6 ADM1000_i$

FY2015:

- $Basic/ADM_i = \beta_0 + \beta_1 \%TBA_i + \beta_2 \%TBA_i * HighTBA_i + \beta_3 HighTBA_i + \beta_4 Virtual_i$

FY2016 and FY2017:

- $\$Basic/ADM_i = \beta_0 + \beta_1 \%SNAP_{15} + \beta_2 Virtual_i + \beta_3 ELL_i$

Where,

- $\$Basic/ADM_i$ is the basic tuition support per-pupil (from foundation, transition to foundation, and complexity grant)
- $\%FRL_i$ is the percent of students that receive free or reduced price lunch
- $HighFRL_i$ is an indicator equal to 1 if %FRL is greater than or equal to the percentage necessary for second tier calculations (see Table A1); otherwise it is 0
- $Virtual_i$ is an indicator equal to 1 if the charter school is a virtual school; otherwise it is 0
- $ADM500_i$ is an indicator equal to 1 if the ADM is within 500-1,000; otherwise it is 0
- $ADM1000_i$ is an indicator equal to 1 if the ADM is greater than 1,000; otherwise it is 0
- $\%TBA_i$ is the percent of students that receive textbook assistance in FY2015
- $HighTBA_i$ is an indicator equal to 1 if %TBA is greater than or equal to the percentage necessary for second tier calculations (see Table A1); otherwise it is 0
- $\%SNAP_{15}$ is the percentage of students in the Supplemental Nutrition Assistance Program, Temporary Assistance for Needy Families (TANF) program, or foster care assistance from 2015
- ELL is an indicator equal to 1 if the percent of students that are English language learners is at least 25%; otherwise it is 0

Table A1. High Free or Reduced Price Lunch or Textbook Assistance Percentage Threshold as Related to Complexity Index Second Tier Calculation

	CY2009	CY2010	CY2011	CY2012	CY2013	FY2014	FY2015	FY2016	FY2017
%FRL/TBA	50.26	50.26	50.26	56.29	62.32	66.00	70.00		
CI high point	0.25	0.25	0.25	0.28	0.31	0.33	0.35		
factor	0.4974	0.4974	0.4974	0.4974	0.4974	0.5000	0.5000		

Table A2 below provides the full list of regression parameter estimates. Standard errors are in parentheses. Notes below the table show school corporations omitted from the analysis due to consolidation, mid-period closure, or missing data. The percent of students receiving free or reduced price lunch was used as the low-income measure for calendar years 2009 to fiscal year 2014. The percent of students receiving textbook assistance was used as the low-income measure for fiscal year 2015. The percent of students receiving SNAP was used as the low-income measure for fiscal years 2016 and 2017. Of greatest interest are the % low-income row and High % low-income rows, corresponding with β_1 and β_2 in the equations above.

Table A2. Full Regression Parameter Estimates

	CY2009	CY2010	CY2011	CY2012	CY2013	FY2014	FY2015	FY2016	FY2017
n	343	348	353	351	358	358	362	364	362
Constant	5029.82 (115.10)	4840.89 (115.86)	4748.57 (101.11)	4637.15 (85.01)	4623.41 (66.55)	4601.21 (47.36)	4771.02 (50.06)	5132.97 (10.09)	5173.55 (5.38)
% low-income	20.04 (3.39)	19.86 (3.17)	18.84 (2.77)	23.50 (1.88)	22.46 (1.38)	24.46 (1.07)	21.42 (1.11)	29.92 (0.35)	32.78 (0.19)
High % low-income	24.96 (5.98)	24.21 (4.87)	21.49 (4.08)	7.31 (3.44)	7.23 (3.22)	23.87 (3.25)	9.66 (4.25)		
High % low-income indicator	-1308.51 (354.33)	-1226.18 (272.58)	-999.97 (225.35)	-354.24 (219.85)	-314.96 (231.61)	-1611.25 (251.27)	-421.26 (348.99)		
ADM 500-1,000 indicator				76.62 (66.65)	95.12 (53.62)				
ADM > 1,000 indicator				-236.60 (58.05)	-134.28 (46.61)				
Virtual indicator		-875.94 (512.83)	-827.51 (316.10)	-859.91 (241.28)	-806.19 (144.00)	-527.44 (118.99)	57.79 (139.14)	-544.39 (56.23)	-531.70 (29.90)
ELL indicator								270.64 (43.70)	214.46 (23.23)
R^2	0.490	0.571	0.649	0.756	0.814	0.869	0.807	0.954	0.989
Adj. R^2	0.485	0.566	0.645	0.751	0.811	0.868	0.805	0.953	0.988
Low-income measure	FRL	FRL	FRL	FRL	FRL	FRL	TBA[a]	SNAP	SNAP

Notes: Prairie Township omitted in CY2009 and CY2010 due to missing data; Cass Township, Dewey Prairie Consolidated Schools, and Tri-Township Consolidated Schools omitted in CY2011 due to consolidation; MSD North Posey and New Harmony Town and Township Consolidated Schools omitted in CY2012 due to consolidation; Campagna Academy Charter School and Indianapolis Project School omitted in CY2012 due to mid-period closure; Rockville Community Schools, Turkey Run Community Schools, and North Central Parke Consolidated Schools omitted in CY2013 due to consolidation; International School of Columbus omitted in FY2014 due to mid-term closure; new charter schools in FY2017 were omitted due to missing data.
[a]TBA – Textbook assistance

Table A3 presents the parameter estimates for 2016 and 2017 when using FRL as the low-income variable. These alternative specifications follow the same specifications as indicated above, except it uses %FRL instead of %SNAP. This allows for comparisons over time.

Table A3. Parameter Estimates for 2016 and 2017 Using FRL as Low-Income Variable

	FY2015	FY2016	FY2017
n	362	364	365
Constant	4762.78 (53.23)	4888.02 (27.34)	4955.44 (33.87)
% low- income	21.36 (1.18)	19.98 (0.51)	21.00 (0.63)
High % low- income	-1.66 (4.01)		
High % low- income indicator	441.03 (336.47)		
Virtual indicator	39.48 (146.10)	-516.82 (113.53)	-504.60 (141.65)
ELL indicator		-56.28 (88.31)	-141.25 (110.17)
R^2	0.787	0.811	0.755
Adj. R^2	0.784	0.810	0.753
Low-income measure	FRL	FRL	FRL

Notes: New charter schools in FY2017 were omitted due to missing data. Percentage of students that received FRL in 2017 was carried forward from 2016.

Appendix B. School Funding Formula Background and History

ADM and AADM

Average Daily Membership (ADM) serves as the basis of student count for the purposes of corporation funding. From 2009 to 2013 the ADM count occurred on a specific day each fall. Each Kindergartener was counted as one-half (0.5) an ADM.

Prior to 2012, AADM was a rolling average of the current year's ADM and prior years' ADM. When a school corporation's ADM increases from the prior year, the higher ADM count is used as the school corporation's ADM. An adjusted ADM (AADM) was multiplied with tuition support per-pupil to determine a corporation's tuition support funding. In 2009 AADM was the rolling average of the current year's ADM and the prior four years' ADM. In 2010 and 2011, ADM was the rolling average of the current year's ADM and the prior two years' ADM. This served as a mechanism to limit decreases in corporation funding due to declining ADM. Since 2012, only the single year ADM was used for the purposes of calculating Tuition Support.

Starting in 2014, one ADM count occurs in September for funding in the first half of the school year and a second count occurs in February for funding in the second half of the school year. Presented ADM figures correspond to the average of the September and February counts of each fiscal year since 2014.

Transition to Foundation

In order to prevent large changes in corporation funding between school years, the school funding formula included overlay provisions that are designed to assist school corporations in transitioning to the Foundation Funding Amount.

For each year, the Foundation Amount per ADM for the current year is compared to the prior year's Transition to Foundation amount per ADM. The Transition to Foundation provisions changed by year. In 2009, corporations whose prior Transition to Foundation amount per ADM was greater than $50 more than the current year's calculation received $50 less than the prior year. School corporations whose prior year amount (per ADM) was between $50 more than the current year and $99.99 less than the current year calculations received the current year Foundation Amount. Corporations whose prior year amount was $100 less than the current year calculation received at least $100 more than the prior year amount and up to one-third of the difference more than the prior year amount.

Additional flat grant adjustments for school corporations with total revenue losses more than 3.5%, received second tier Complexity Index calculations, and had corporation ADM less than 1,700 also increased funding above transition to foundation amounts.

In 2010, corporations whose prior Transition to Foundation amount per ADM was $150 more than the current year's calculation received one-ninth of the difference less than the prior year or $150 less than the prior year (whichever resulted in an amount closer to the current year foundation calculation). Corporations whose prior year amount (per ADM) was between $150 more than the current year and $49.99 less than the current year calculations received the current year foundation amount. Corporations whose prior year amount was $50 less than the current year calculation received at least $50 more than the prior year amount and up to one-half of the difference more than the prior year amount.

In 2011, corporations whose prior Transition to Foundation amount per ADM was more than $150 more than the current year's calculation received one-eighth of the difference less than the prior year or $150 less than the prior year (whichever resulted in an amount closer to the current year foundation calculation). Corporations whose prior year amount (per ADM) was between $150 more than the current year and $49.99 less than the current year calculations received the current year foundation amount. Corporations whose prior year amount was $50 less than the current year calculation received the current year foundation.

In 2012, the Transition to Foundation compared the current year foundation calculations with the "base" amount. The base amount was the lesser of the prior year amount and 1.2 times the current year calculations. Corporations whose base amount per ADM was more than the current year's calculation received one-seventh of the difference less than the base amount. Corporations whose based amount (per ADM) was less than the current year amount received the current year foundation.

In 2013, the transition to foundation compared the current year foundation calculations with the "base" amount. The base amount was the lesser of the prior year amount and 1.2 times the current year calculations. Corporations whose base amount per ADM was more than the current year's calculation received one-sixth of the difference less than the base amount. Corporations whose based amount (per ADM) was less than the current year amount received the current year Foundation Amount.

Starting in 2014, the amount due to the Complexity Index was removed from the prior year Transition to Foundation amount. In 2014 the Transition to Foundation

compared the current year foundation calculations with the prior year Transition to Foundation amount. Corporations whose prior amount per ADM was more the current year's calculation received one-fifth of the difference less than the base amount. Corporations whose based amount (per ADM) was less than the current year amount received the current year Foundation Amount.

In 2015, the Transition to Foundation compared the current year foundation calculations with the prior year transition to foundation. Corporations whose prior amount per ADM was more than the current year's calculation received one-fourth of the difference less than the base amount. Corporations whose based amount (per ADM) was less than the current year amount received the current year Foundation Amount.

In 2016, new charter schools were funded at Foundation Amount. For continuing school corporations, the current year Foundation Amount was compared to the prior year Basic Grant amount per ADM (fiscal year Basic Tuition Support divided by the average ADM from September and February counts). If the prior year amount was greater than the Foundation Amount ($4,967), the absolute value of the difference was divided by three. This amount was subtracted from the prior year amount and was used for Basic Tuition Support.

No Transition to Foundation was used in fiscal year 2017.

Complexity Index and Complexity Funding

From 2009 to 2013, funding for the Complexity Index was part of Basic Tuition Support. Beginning in 2014, complexity funding was separated from Basic Tuition Support and reported as a categorical grant. For comparability purposes, we use the

term Complexity Grant throughout this report to refer to the portion of tuition support due to the Complexity Index. From 2009 to 2014, the Complexity Index used the percent of FRL students to calculate the Complexity Grant. In 2015 it used the percent of students who receive textbook assistance (which has similar eligibility criteria).

The Complexity Index was calculated by multiplying 0.4974 (set in the funding formula) times the percent of students enrolled in the free or reduced price lunch program in the last year of the previous biennium (e.g., 2010-2011 percent free or reduced price lunch for the 2012-2013 school year)[10,11]. In 2014 and 2015 the percent was multiplied by 0.5 instead of 0.4974. If this is greater than a certain amount set in the funding formula, then the difference between the amount and the product is added back to the first calculation. This specified amount sets a threshold for determining high needs corporations and provides additional funding for these corporations. Higher comparison amounts result in higher thresholds for additional funding.

Calculations for two hypothetical corporations are shown below for 2013:

- Example 1. Corporation where percent free or reduced price lunch = 0.4000; Compare to 0.31
- 0.4000 X 0.4974 = 0.1990
- Since 0.1990 is less than 0.31, the Complexity Index = 0.1990

- Example 2. Corporation where percent free or reduced price lunch = 0.8000; Compare to 0.31
- 0.8000 X 0.4974 = 0.3979

[10] In 2015 it uses the percent of students receiving textbook assistance from the prior year.
[11] Prior to 2014, one was added to the calculation (as well as the comparison amount). We have removed this addition to make it comparable to the 2014 and 2015 Complexity Index calculation

- Since 0.3979 is greater than 0.31 add difference between the product (0.3979) and 0.31
- Complexity Index = 0.3979 + (0.3979-0.31) = 0.4858.

From 2012 to 2015 the amount the product is compared with increased each year. This increased the percent of FRL students required for additional funding (see Table A1).

In 2016 and 2017, the state used the percentage of students in SNAP to calculate the Complexity Index (rather than the percent of students receiving textbook assistance). The change in the Complexity Index will transition over three years. The 2016 complexity index is equal to the 2015 complexity index plus one-third of the difference between %SNAP and FY2015 complexity index (%SNAP – CI_{15}). The 2017 complexity index is equal to the 2016 complexity index plus one-half of the difference between %SNAP and FY2016 complexity index (%SNAP-CI_{16}).

In both years, there is a second tier calculation for traditional school corporations if the complexity index would decrease by more than 0.1 and the percent of students that are ELL is at least 25%. This adds back one-fourth of the absolute value of the difference in %SNAP and the Complexity Index.

Charter Schools

The Indiana school funding formula treats charter school funding in nearly the same manner as public school corporations, with the following exceptions:

- For all years their adjusted ADM was the same as the current year ADM (did not use rolling average prior to 2012).
- If they were outside of Marion County and in their first year of operation, they used the same transition to foundation amount as the corporation that they are physically present in.
- Charter schools in Marion County in their first year of operation use a Transition to Foundation amount based on a weighted average of the school corporations' Transition to Foundation amounts where students resided.
- In 2010 and 2011 charter schools were not eligible for the Small Schools grant.
- In 2016 and 2017 charter schools were not eligible for second tier Complexity Index calculations (based on percent ELL).

Virtual Charter Schools

The school funding formula funds virtual charter schools at a reduced rate compared to other school corporations. The following amounts were used in this analysis:

- 2010 and 2011: 80.0% of regular charter school amounts
- 2012 and 2013: 87.5% of regular charter school amounts
- 2014 through 2017: 90.0% of regular charter school amounts

Urban-Centric Locale Classification

Urban-centric locale classifications (i.e., Urban, Suburban, Town, and Rural) were assigned to school corporations based on their designation in the 2013-2014 school year, the most recent year available. Comparisons between corporation types across school years thus follow the same corporations. Where school corporations did not exist in 2013-4, we used the most recent Urban-centric locale information. Charter schools that formed after 2013-14 were classified based on the classification

of traditional schools nearby or the traditional school corporation in which it resides. For calendar years, the year ending was matched (e.g., 2008-2009 locale data matched with CY2009 ADM data).

Urban-centric locale codes were grouped together by the major classification (e.g., Urban, Suburb, Town, and Rural). The locale code "City" was labeled as Urban in this paper. For example, school corporations coded as "City: Large", "City: Mid-size", and "City: Small" were all coded as Urban.

Table B1 shows the current year classifications for traditional school corporations based on NCES Urban-centric locale information. Most traditional school corporations in Indiana serve rural communities, although as noted in the ADM section, they served approximately 25% of the students over this time period. Overall the number of corporations classified as Town has fallen, while the number classified as Rural is higher than in 2009.

Table B1. Number of Traditional School Corporations in Each Urban-Centric Locale Classification

	2009	2010	2011	2012	2013	2014	2015*	2016*	2017*
All	293	293	292	291	290	289	289	289	289
Urban	25	25	23	24	26	26	26	26	26
Suburban	48	49	49	47	50	50	50	50	50
Town	76	75	72	65	63	64	64	64	64
Rural	144	144	148	155	151	149	149	149	149

Table B2 shows the number of changes in Urban-centric locale classification in each year (from the previous year) and whether they change to a more rural code (e.g., Suburban to Town) or to a less rural code (e.g., Rural to Town). There were changes to classification in 16 traditional corporations in 2012 and 33 in 2013. In other years, there were relatively few changes.

Table B2. Change in Locale Classification from Prior Year Classification, for Traditional School Corporations

	2010	2011	2012	2013	2014
All corporations	293	292	291	290	289
Less rural (more urban)	4	2	4	19	4
No change	285	283	275	257	282
More rural	4	6	12	14	3

Table B3 compares locale classifications in 2009 and 2017 of each traditional school corporation that was not involved in a consolidation during this time period. Most of the changes in classification were between town and rural codes. Most newly classified rural school corporations were previously classified as towns. Looking at the diagonal, most (88.1%) started and ended in the same classification, although an additional 15 traditional corporations (5.2%) experienced multiple changes in years between.

Table B3. Comparing 2009 and 2017 Locale Classification, Traditional School Corporations

		FY 2017 classification				CY2009
		Urban	Suburban	Town	Rural	Total
CY 2009 Classification	Urban	24	0	0	0	24
	Suburban	1	45	0	2	48
	Town	0	1	56	18	75
	Rural	1	4	7	127	139
	FY 2017 Total	26	50	63	147	

As discussed in the main body of this report, the importance of this primarily relates to changes in ADM by locale. The analysis used the most recently available locale classifications. While general trends and differences between locales are similar whether the comparison uses first year locale, last year locale, current year locale, or limits it to school corporations where there were not locale changes, caution should be exercised terms of extrapolating into the future. Of the 147 current rural school corporations, 18 are rural because they lost population, which may not

continue into the future. Despite declining ADM in towns, future extrapolations are likely biased upwards as seven were classified as towns due to population growth.

Tables B4 through B6 show ADM counts by locale when school corporations are assigned to locales based on the matching current year, based on 2009 locale, or only limited to school corporations where the locale does not change. In all cases, suburban school corporations show increasing ADM. Town school corporations show the largest percent declines.

Table B4. Matching to Current Year Locale

	2009	2017	Difference	% Change
Total	998,570	981,655	-16,915	-1.7
Urban	311,341	310,578	-763	-0.2
Suburban	250,848	291,624	40,776	16.3
Town	171,399	137,614	-33,785	-19.7
Rural	264,983	230,155	-34,828	-13.1
Virtual	0	11,685	11,685	---

Table B5. Matching to 2009 Locale

	2009	2017	Difference	% Change
Total	998,570	981,655	-16,915	-1.7%
Urban	311,341	299,133	-12,208	-3.9%
Suburban	250,848	256,149	5,302	2.1%
Town	171,399	157,718	-13,681	-8.0%
Rural	264,983	256,970	-8,013	-3.0%
Virtual	0	11,685	11,685	---

Table B6. Corporations that do Not Change Locales: 2009 to 2017

	2009	2017	Difference	% Change
Total	845,436	826,996	-18,441	-2.2%
Urban	305,123	293,822	-11,301	-3.7%
Suburban	228,279	232,381	4,102	1.8%
Town	115,497	106,211	-9,286	-8.0%
Rural	196,537	182,897	-13,640	-6.9%
Virtual	0	11,685	11,685	---

Appendix C. Changes to the Complexity Index

The Complexity Index is the primary mechanism by which the school funding formula achieves vertical equity, by allocating additional funding to students from low-income families. How much additional funding these students require is a political as well as technical question that cannot be answered by this report. This section will analyze the amount of intended funding provided by the Complexity Index in current year dollars.

Between 2009 and 2015 the second tier Complexity Index calculation was reduced (see Table A1 for further details). The result of this is that school corporations with the highest percent of students from low-income families received relatively less additional funding. Figure C1 shows the additional Complexity funds, relative to Foundation Funding Amounts. Fiscal year 2016 and 2017 levels were approximated using the observed linear trend that the SNAP percentage is 65.0% of the FRL percentage. It also does not account for the Complexity Index transition during this time.

The red line shows the marginal additional funding for school corporations in the first tier (lower percent free or reduced price lunch). This stayed relatively constant for most of the period at approximately 50.0% of Foundation Funding Amounts. In fiscal years 2016 and 2017 it effectively declined to 45.0% of Foundation Funding Amounts, assuming that 65% of FRL students are SNAP eligible. However, the marginal funding for SNAP students is approximately 70.0% of foundation

funding (shown in gold). Additional funding could also reach this point if all FRL students were also SNAP eligible.

Assuming each free or reduced price lunch student should receive the same additional funding and that 100% of the students were FRL, the blue line (High FRL) shows the additional funding for students in schools with second tier calculations each year (high percent free or reduced price lunch). Exact amounts will vary between the red and blue line depending on the exact percentage each year. This declined from a maximum of 74.0% of Foundation Funding Amounts in calendar year 2009 to 65.0% in fiscal year 2015, before being eliminated in 2016.

Figure C1. Complexity Grant Funds per Free or Reduced Price Lunch Student, Relative to Foundation

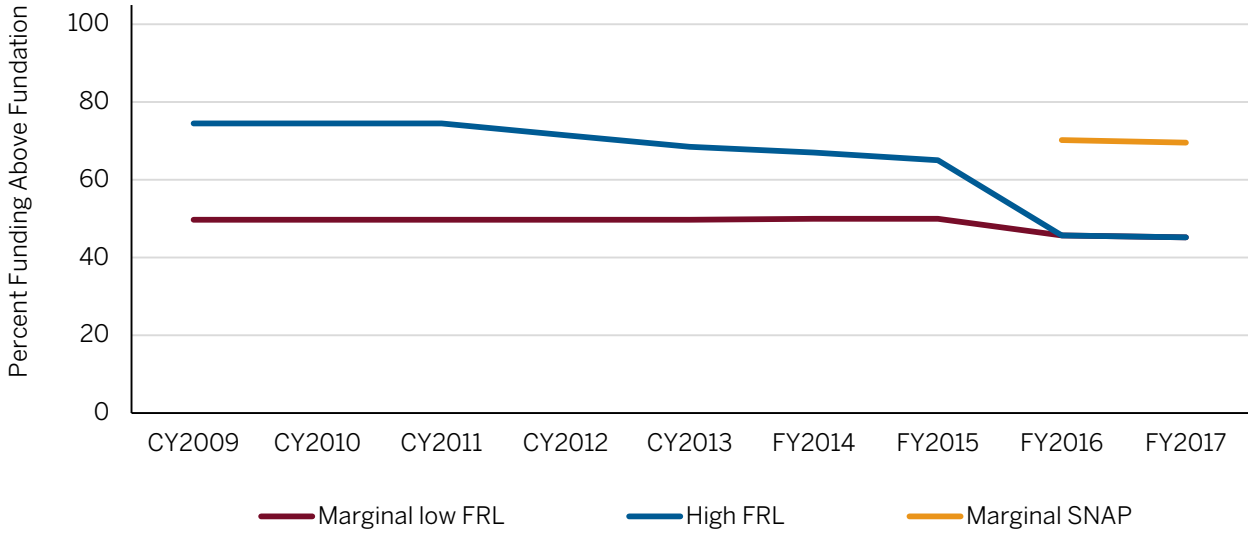

Figure C2 presents complexity funding as current dollar amounts, rather than as a percentage of Foundation Funding Amounts. This figure would be more relevant if it is the absolute amount, rather than relative amount, that is important for vertical equity. Complexity funding per FRL student at low needs schools varied primarily

with the foundation amounts, as the percent relative to foundation was similar. This declined from $2,400 in 2009 to $2,129 in 2012 (with the decline in the Foundation Funding Amounts), before rising to $2,294 in 2015. Starting in 2016, the Foundation Funding Amount was not used in complexity grant calculations. It is projected to be similar in 2017 at $2,300 per FRL student at observed trends. Considering only SNAP students, $3,539 is provided for each SNAP student.

Figure C2. Complexity Grant Funding per Free or Reduced Price Lunch Student, Current Dollars