



BUSINESS INTELLIGENCE PROJECT
The Leading Component of School Expenditures
March 28, 2016
Installment 1

Business Intelligence Defined

According to the on-line Wikipedia encyclopedia: “Business intelligence (BI) can be described as a set of techniques and tools for the acquisition and transformation of raw data into meaningful and useful information for business analysis purposes. ... BI can be used to support a wide range of business decisions ranging from operational to strategic. ... When combined, external and internal data can provide a more complete picture which, in effect, creates an ‘intelligence’ that cannot be derived by any singular set of data.”

The purpose of the Business Intelligence Project is to provide the Board of Education, administration, and community with pertinent financial comparison information for sound decision making. As part of the strategy to become more knowledgeable about costs per pupil, for example, it is often worthwhile to compare costs per pupil among school communities with commonalities. Depending on the cost metric being analyzed, the comparative group may be different. For example, it may be most meaningful to compare administrative salaries among similar districts statewide. Yet, the best corresponding comparison for salaries for certain part-time non-teaching positions may well be among nearby eastern Cuyahoga County districts. Sometimes, multiple comparison groups will be used in order to provide relevant perspective. A guiding principle of the Business Intelligence Project is that there is no single solution or lone correct answer. Rather, many viable options often exist. So, courses of action and desired outcomes can be chosen based on pertinent facts and circumstances.

Comparative Business Intelligence Analytics

Comparative analytics can provide useful insight and information about organizations. Discerning interpretation of this data is vital. In many cases, the most germane comparison group will be Chagrin Falls, Orange and Beachwood. (I have developed the acronym COB for this group). These communities have many similarities including geographic proximity, robust property tax bases, strong resident income levels, high college matriculation rates and similar demographic profiles. Nevertheless, there are important differences even among these three school districts. For example, the minority student population is significantly lower in Chagrin Falls than in Beachwood or Orange. General Fund property tax revenue per student in fiscal year 2014 was \$33 greater per student in Beachwood than Orange. Yet, for the same period, property tax revenue per student for Chagrin Falls was \$7,133 less per student. However, Chagrin Falls has the highest school property tax rate of the three communities. While ranked 15th highest of

Ohio’s more than 600 school districts, Beachwood had the lowest median federal adjusted gross income of its residents of the three districts. Chagrin Falls was ranked 8th and Orange ranked 1st. (The table below breaks out details of these numbers.) So, even among similar districts, discernment about differences is meaningful and necessary.

Chagrin Falls-Orange-Beachwood Selected Analytics			
<u>Analytic</u>	<u>Orange</u>	<u>Beachwood</u>	<u>Chagrin Falls</u>
Enrollment ¹	2,146	1,496	2,021
Tax Revenue Per Student ²	\$17,799	\$17,832	\$10,666
Property Tax Base ³	\$1,054,272,420	\$720,078,250	\$328,892,550
Tax Rate (mills) ⁴	41.41	34.05	48.46
Adjusted Gross Income ⁵	\$84,900	\$67,570	\$73,768
AGI School District Rank ⁵	1 st	15 th	8 th

¹Total District Enrollment (ADM) for Fiscal Year 2014. Source: Ohio Department of Education via Forecast 5.
²General Fund, Property Tax Revenue Per Student Data for Fiscal Year 2014. Source: Ohio Department of Education via Forecast 5.
³General Fund, Total Property Tax Base, Tax Year 2015. Source: Cuyahoga County Auditor.
⁴General Fund, Residential Effective Rate, Tax Year 2015. Source: Cuyahoga County Auditor
⁵Federal Tax Year 2013 Returns. Source: Internal Revenue Service via Ohio Department of Taxation. High-Low Ranking.

Other comparison groups that from time to time will provide useful information include the following: Excel TECC vocational consortium districts, nearby eastern Cuyahoga County districts, statistically similar districts statewide as identified by the Ohio Department of Education, and districts with similar resident incomes.

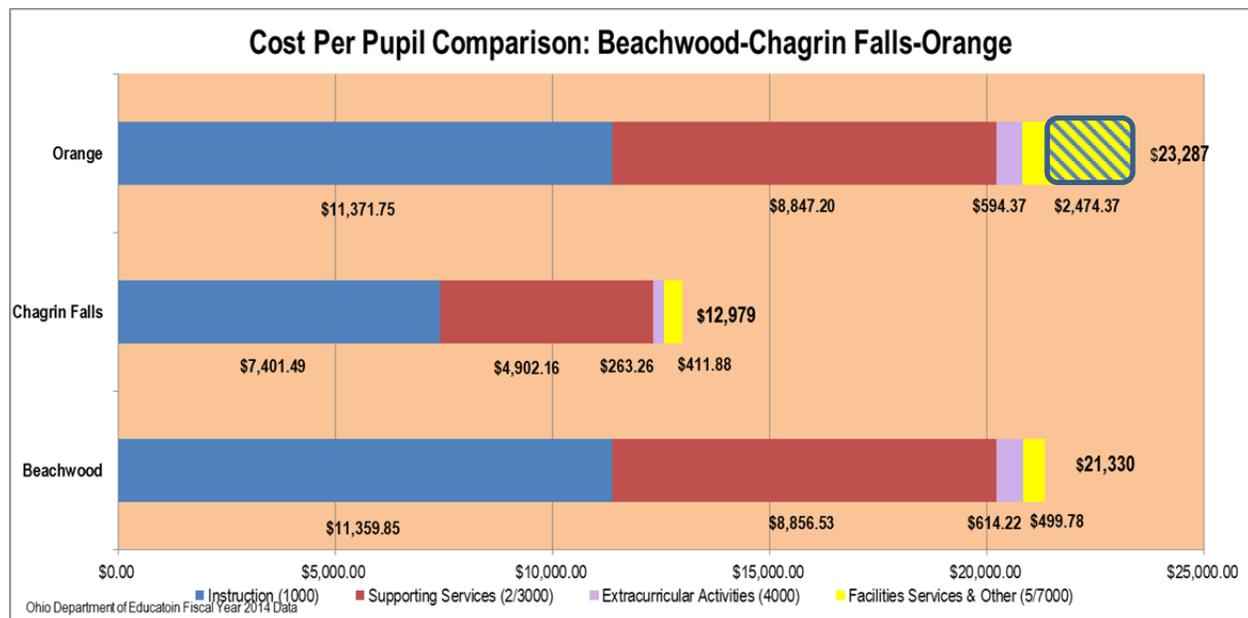
Comparative analysis has limitations. Orange Community Education & Recreation is an example. No other school district in the region offers similar services with significant financial support from a voted tax levy. In many other school communities, those services may receive financial support from the local municipality or may not be available at all. Teacher compensation is another example. While it is easy to contrast average teacher salaries, educational attainment and experience through comparative analysis, determining how well a district’s teachers connect with students is not so easy to compare.

Comparative Total General Fund Cost Per Pupil

A good starting point for this analysis is to compare the operating, or General Fund, cost per pupil. As with any facet of Business Intelligence, an “apples to apple” comparison is essential. As strange as this may seem, there are actually two cost per pupil figures reported by the Ohio Department of Education. One cost per pupil number reports per-pupil spending based on local, state and federal funding and has numerous technical exclusions for capital spending. This number conforms to data used by the federal National Center for Educational Statistics (NCES). While this data could be very valuable for analytical purposes, unfortunately, I have no way to drill down very deeply into this data. So I have to rely on a second set of data that is actually very useful. That is total fund expenditures (and related data) as reported to the Ohio Department of Education. These are robust data sets that can be drilled down into very specific subparts.

From time to time, revenue, taxation, and other available data sets will be incorporated into the analytics as appropriate.

The chart below provides a high-level overview of cost per pupil for our baseline comparative districts—Chagrin Falls-Orange-Beachwood (COB). The table found back on Page 2 provides data that delineates similarities and differences among the three school districts. The broad categories of spending include instruction (blue), support services (red), extracurricular activities (violet) and facilities/other (yellow). Note the crosshatched area of the yellow bar for Orange. That \$1,775 amount represents funds transferred from the General Fund to the Educational Improvement Fund for Fiscal Year 2014 data (the most recent statewide data available). When that is factored out, the total Fiscal Year 2014 cost per pupil for Orange is \$21,512 compared with \$21,330 for Beachwood. This \$182 difference is a variance of less than 1%. It is noteworthy that Chagrin Falls has a significantly lower level of spending than Orange or Beachwood. Yet, as data in the table show, the General Fund tax rate for Chagrin Falls is the highest of the three districts.



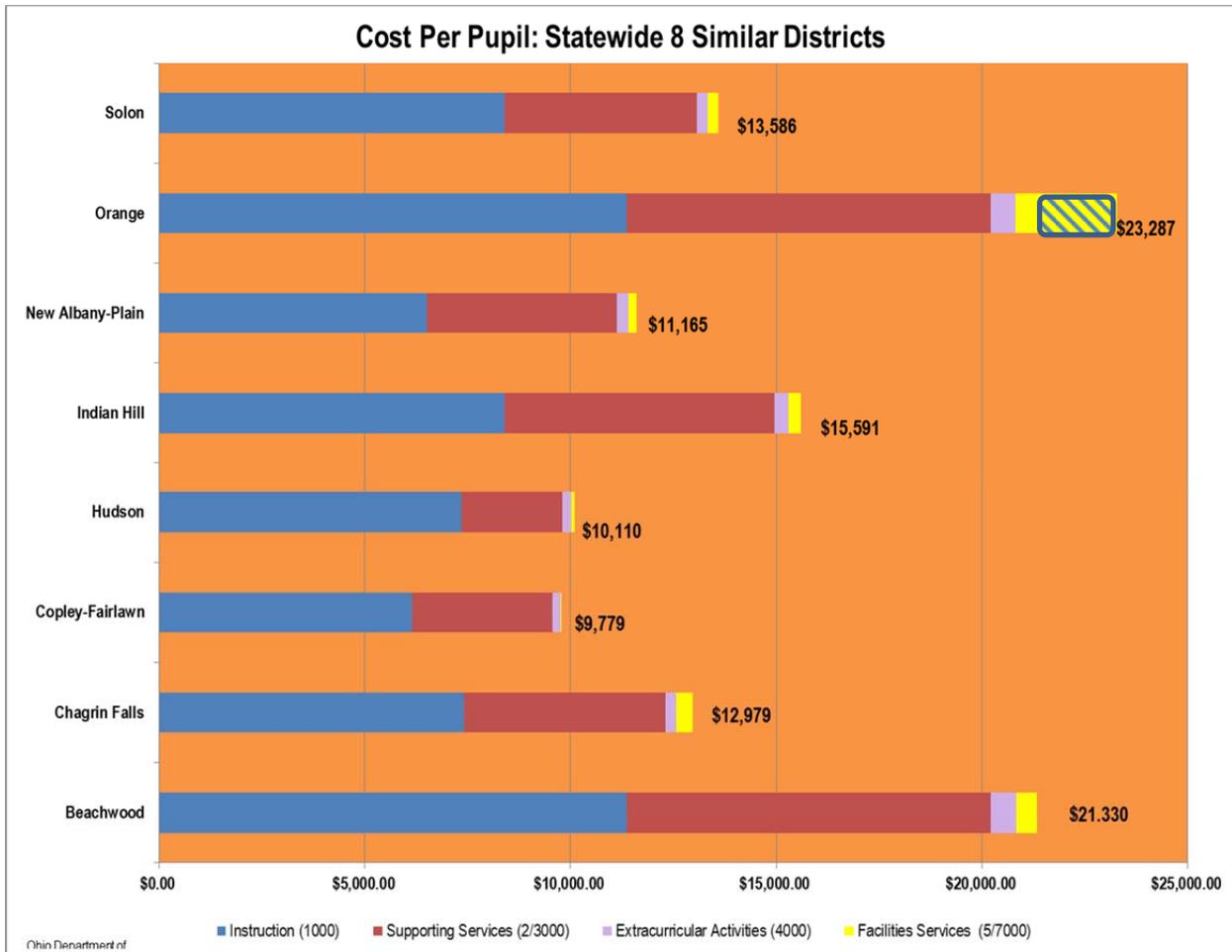
The table below provides the information set forth in the chart above in tabular form.

Chagrin Falls-Orange-Beachwood Costs Per Pupil¹				
District	Instruction	Support Services	Extracurricular	Facilities & Other
Orange	\$11,372	\$8,847	\$594	\$2,474
Chagrin Falls	\$7,401	\$4,902	\$263	\$412
Beachwood	\$11,360	\$8,857	\$614	\$500

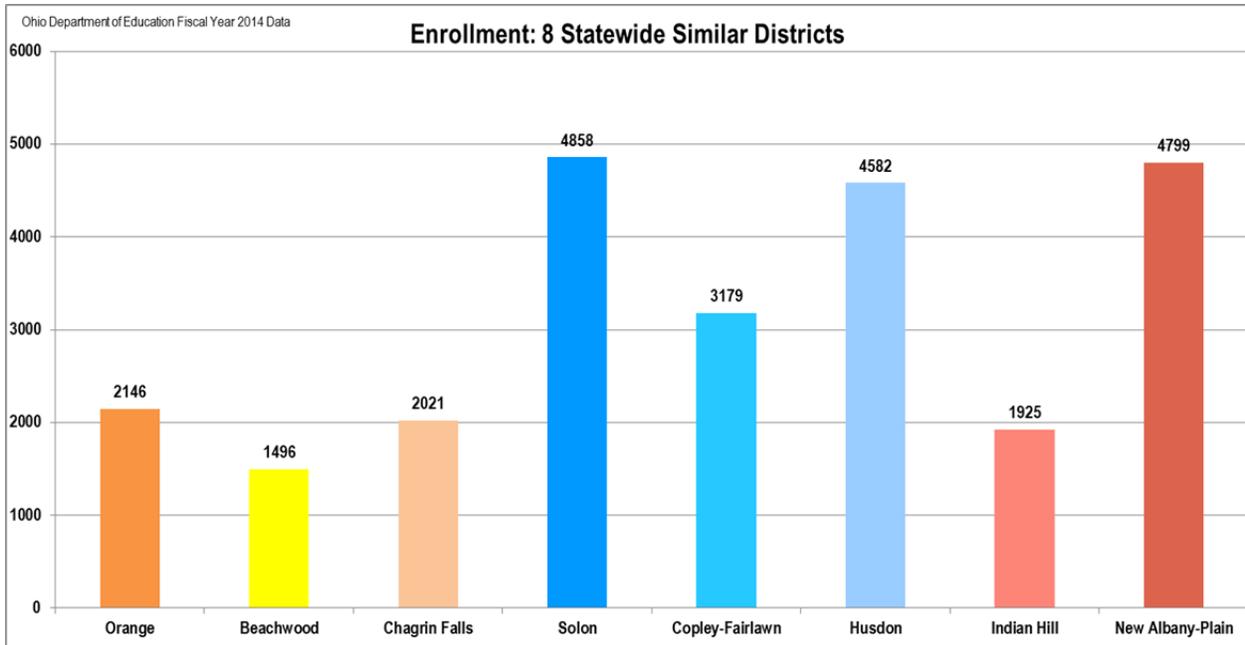
¹General Fund Expenditures for Fiscal Year 2014. Source: Ohio Department of Education via Forecast 5

Our nearby comparable (COB) districts are just one meaningful comparison group. A second insightful comparative perspective can be derived from eight statistically similar districts as

identified by the Ohio Department of Education. Note that the base comparison group (COB) districts are included among these eight similar districts. Costs per pupil high-to-low vary widely as do enrollments. What is similar is that these eight districts aren't widely scattered across the state but serve suburban communities in just four of the 88 Ohio counties—Cuyahoga, Franklin, Hamilton and Summit. Graduation and college matriculation rates are among the highest in Ohio. Yet, there are important tax base and demographic differences. The cost per pupil graph below provides cost per pupil data in the same format as the chart on Page 3 for just the COB districts.



What becomes evident from the addition of these districts is that enrollment is among the relevant factors in analyzing costs per pupil. Districts with greater student enrollment tend to have lower costs per pupil. While this certainly isn't the only factor, and may not be the primary driver of costs per pupil, it certainly is one factor. Indeed, the districts with larger student enrollment may enjoy certain economies of scale. For example, if a district with 2,000 students has the same number of administrative personnel serving students as a district with 4,000 pupils, personnel costs per pupil will trend toward being double that of the 4,000-student district. The bar chart on Page 5 contrasts the total district enrollment of the eight comparison districts. Note that Solon has a student enrollment approximately three times greater than Beachwood.



The table below page provides the information set forth in the chart on Page 4 in tabular form.

8 Statewide Similar Districts Costs Per Pupil¹				
<u>District</u>	<u>Instruction</u>	<u>Support Services</u>	<u>Extracurricular</u>	<u>Facilities & Other</u>
Orange	\$11,372	\$8,847	\$594	\$2,474
Chagrin Falls	\$7,401	\$4,902	\$263	\$412
Beachwood	\$11,360	\$8,857	\$614	\$500
Solon	\$8,392	\$4,684	\$261	\$249
Copley-Fairlawn	\$6,155	\$3,412	\$193	\$18
Hudson	\$7,360	\$2,439	\$212	\$98
Indian Hill	\$8,402	\$6,555	\$340	\$294
New Albany-Plain	\$6,502	\$4,630	\$279	\$204

¹General Fund Expenditures for Fiscal Year 2014. Source: Ohio Department of Education via Forecast 5

Drilling Down Into Instructional Costs

Direct instructional expenditures constitute approximately one half of the School District's spending--\$11,372 per pupil of the total Fiscal Year 2014 cost per pupil of \$23,287. (Fiscal Year 2014 is the most recent fiscal year for which statewide comparison data is available.) This is the largest broad category of spending for the school district. Instructional expenditures include teacher salaries and benefits, textbooks, instructional supplies and classroom equipment. During Fiscal Year 2014, instructional expenditures totaled \$24,385,804. In the aggregate, Orange City Schools' instructional expenditures have changed little during the past five years. Indeed, those expenditures actually decreased by more than \$750,000 during Fiscal Year 2013 compared with Fiscal Year 2012. Spending for the regular instructional program and for vocational education was essentially flat or actually decreased in several of the past five years. Only spending for special education consistently increased year-over-year during each of the past five years.

However, even special education spending decreased in 2015 compared with 2014. The table on Page 6 breaks down Orange instructional spending for the past five years by major category.

Orange City Schools Instructional Expenditures¹						
<u>Fiscal Year</u>	<u>General Instruction</u>	<u>Special Education</u>	<u>Vocational Education</u>	<u>Other Education</u>	<u>Total Instruction</u>	<u>Total Annual Change</u>
2015	\$18,332,272	\$6,268,938	\$246,319	\$0	\$24,848,529	+1.9%
2014	\$17,634,788	\$6,492,430	\$248,350	\$10,235	\$24,385,804	+1.9%
2013	\$17,493,695	\$6,071,600	\$353,004	\$15,784	\$23,934,084	-3.1%
2012	\$18,256,039	\$5,955,819	\$418,238	\$41,055	\$24,711,151	+0.4%
2011	\$18,203,774	\$5,916,207	\$343,283	\$162,243	\$24,625,507	

¹General Fund Expenditures Only. Source: District Accounting Records.

Drilling Down Into General Instructional Costs

General Instructional Costs Per Pupil refers to those costs associated with the regular classroom instructional program of a school district. At the elementary level, this delineates the costs of employing teachers who instruct a so-called typical classroom of 25 first graders, for instance. At the middle and high school levels, this refers to those teachers who teach mathematics, social studies or foreign language, among others. General Instruction, sometimes called regular instruction, includes accelerated or advanced placement courses. Among excluded costs from the general instructional program are educational offerings for preschool, gifted, special needs and vocational education.

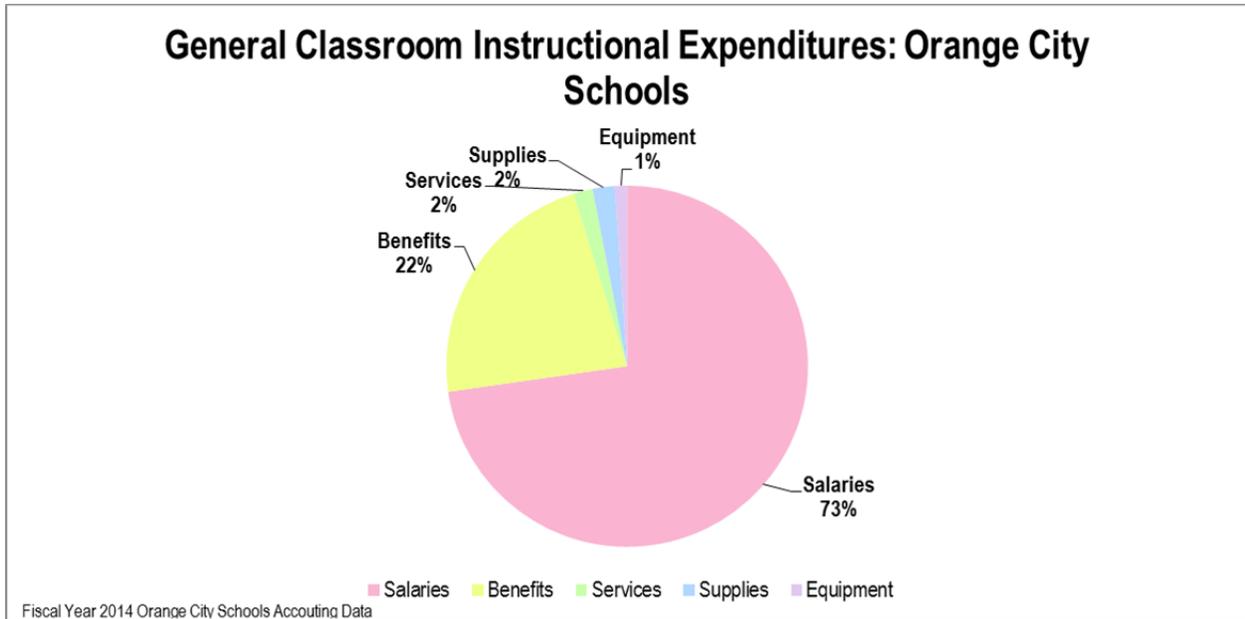
The Uniform School Accounting System (USAS) manual for Ohio sets forth six broad categories for subdividing school district expenditures: salaries, benefits, purchased services, supplies, equipment, and fees plus miscellaneous expenses. (A seventh category of advances and transfers isn't relevant to this discussion.)

Orange City Schools General Instructional Expenditures¹							
<u>Fiscal Year</u>	<u>Salaries</u>	<u>Benefits</u>	<u>Purchased Services</u>	<u>Supplies & Materials</u>	<u>Equipment</u>	<u>Other</u>	<u>Annual Total</u>
2015	\$13,026,179	\$4,055,283	\$810,508	\$302,388	\$138,914	\$0	\$18,333,272
2014	\$12,826,229	\$3,964,506	\$302,096	\$350,707	\$191,249	\$0	\$17,634,788
2013	\$12,798,153	\$3,979,565	\$311,652	\$173,377	\$230,948	\$0	\$17,493,695
2012	\$13,369,030	\$4,172,229	\$260,268	\$216,979	\$237,533	\$0	\$18,256,039
2011	\$13,337,143	\$4,042,071	\$237,423	\$281,003	\$306,135	\$0	\$18,203,773

¹General Fund Expenditures Only. Source: District Accounting Records.

For the most part, Orange City Schools' total annual general instructional expenditures have fluctuated in a relatively narrow range during the past five years. Indeed for the five-year period from 2011 to 2015, the cost of general instructional salaries decreased by \$310,964 (2.3%), which is an annualized rate of less than 0.5%. The cost of benefits increased for the same period by just \$13,213 (0.3%). The one noteworthy area of increase is for purchased services. The single largest driver of the increase in purchased services is attributable to subcontracting teaching and some classified substitute services starting in Fiscal Year 2015. In prior years, the

District directly paid the salary and benefits costs of these substitutes. The Fiscal Year 2015 cost of these services was approximately \$408,000. It represents a shifting of costs to the purchased services line item from the salaries and benefits line items. The subcontracting of substitute services was done to avoid administrative obligations associated with the Affordable Care Act and the Fair Labor Standards Act, to expand the pool of available substitutes, and to ease other administrative burdens to the District. The pie graph below displays how money is spent for general classroom instruction. Note that about 95% goes toward employee salaries and benefits. This is consistent with the labor-intensive nature of teaching.



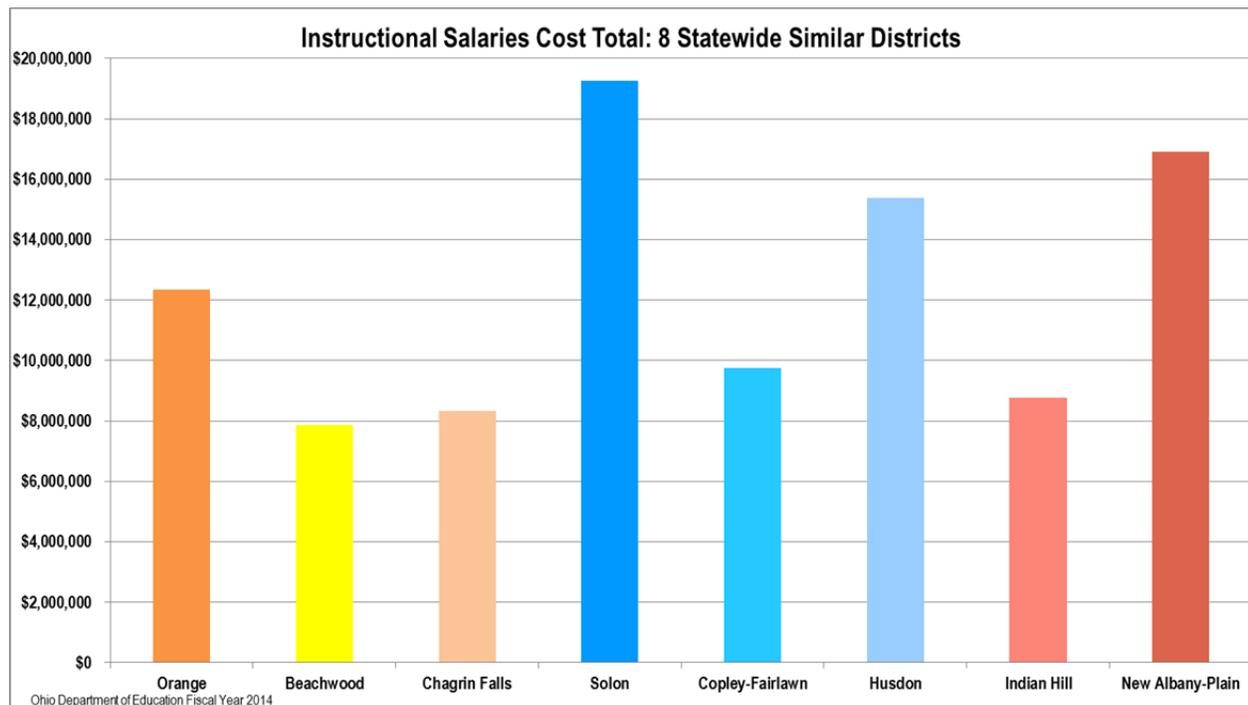
The proportionate share of salaries and benefits as the primary driving force of general instructional expenditures appears fairly consistent for the eight similar statewide districts. Salaries and benefits costs are highest for Orange and second highest for Beachwood. This not only is a reflection of teacher compensation levels but also comparatively low pupil-teacher ratios. Once again, there is some level of correlation between total district wide student enrollment and general instructional costs per pupil. The table on Page 8 breaks general instructional costs per pupil for all eight statewide similar school districts.

8 Similar Statewide Districts General Instructional Costs Per Pupil¹						
<u>District</u>	<u>Salaries</u>	<u>Benefits</u>	<u>Purchased Services</u>	<u>Supplies</u>	<u>Equipment</u>	<u>Other</u>
Orange	\$5,977	\$1,847	\$141	\$172	\$89	\$0
Chagrin Falls	\$4,257	\$1,521	\$103	\$167	\$115	\$4
Beachwood	\$5,392	\$1,593	\$143	\$126	\$176	\$0
Solon	\$4,768	\$1,312	\$356	\$140	\$77	\$1
Copley-Fairlawn	\$3,256	\$1,004	\$430	\$187	\$55	\$6
Hudson	\$3,902	\$1,204	\$61	\$162	\$28	\$0
Indian Hill	\$4,899	\$1,656	\$127	\$144	\$20	\$0
New Albany-Plain	\$3,610	\$1,142	\$231	\$62	\$7	\$4

¹General Fund Expenditures for Fiscal Year 2014. Source: Ohio Department of Education via Forecast 5

Drilling Down Into General Instructional Salaries Costs

The final drill down for this initial installment of the Business Intelligence Project will address instructional salaries. A broad definition of instructional salaries costs includes not only the cost of that teacher who teaches first grade or high school mathematics, but also it includes the cost of certain supplemental contracts, long-term substitutes and severance pay. There is a specific salary object code (111) that is used for the salaries of certified employees—in this case teachers. In the aggregate, it may not be surprising that total teacher salary expenditures for the general educational program are greatest at the school district with the largest student enrollment. The table below shows the total annual salary expenditure for the eight similar school districts compared throughout this review.



Conversely, on a per-pupil basis, teacher salaries trend toward being highest in school districts with small enrollments. This appears consistent with the concept that academically high-performing districts, whether small or large, offer college preparatory coursework deemed necessary whether 10 students or 20 students are enrolled. This is not unusual for third or fourth year coursework in foreign language and upper-level science courses. Orange High School will

sometimes combine sections of specialized upper-level coursework or offer those courses on an every-other year basis. The table below provides salary cost per pupil data for the eight statewide similar school districts.

8 Similar Statewide Districts General Teacher Salary Costs¹			
District	General Teacher Salaries Total	Salaries Per Pupil	Per Pupil Difference to Orange
Orange	\$12,343,290	\$5,752	\$0
Chagrin Falls	\$8,320,391	\$4,117	\$1,635
Beachwood	\$7,853,469	\$5,250	\$502
Solon	\$19,258,192	\$3,960	\$1,792
Copley-Fairlawn	\$9,739,434	\$3,064	\$2,688
Hudson	\$15,370,797	\$3,355	\$2,397
Indian Hill	\$8,761,697	\$4,549	\$1,203
New Albany-Plain	\$16,918,571	\$3,548	\$2,204

¹General Fund Expenditures for Fiscal Year 2014. Source: Ohio Department of Education via Forecast 5

The Bounds of Business Intelligence

An important outcome of the Business Intelligence Project is to provide meaningful cost per pupil data on topics of interest to the Orange school community. Inevitably, this data lens is largely focused on quantitative data. Quantitative information certainly provides insight, meaning and context, especially for analytical and comparative purposes. However, it is essential not to discard or to overlook the relevance of qualitative data. Qualitative data provides essential context and meaning. This also is essential for determining the worthiness of offering a program or service. Understanding both data sets is vital to determining the efficacy, efficiency and effectiveness of the educational programs of the Orange City Schools. Future Business Intelligence Project reports will be guided by this principle.