RESEARCH BRIEF
School Size – Summary of Research

I - BACKGROUND

Much of the history of discussions of school size has focussed two distinct issues: (i) the relation between school size and economic efficiency, and (ii) the relation between school size and student outcomes. Frequently, discussions offset issues of positive school climate made available in smaller schools with the significantly reduced per-pupil operating costs in larger schools. Discussions of secondary school size also introduce issues of programs and services made available only in larger schools.

Major policy movements in the United States in the 20th Century have led to a slow but steady increase in elementary and secondary school sizes:

- "As a result, during the past seventy-five years in the United States the number of school buildings has decreased from almost 250,000 to approximately 95,000 (Kennedy, 2003). At the same time the K-12 public school enrollment has risen from about 28,000,000 students to over 53,000,000." (Stevenson, 2006)

In Ontario, the trend appears to be somewhat different:

- "In Ontario, the population of school-age children has been declining for more than a decade. The average school size has dropped from 879 students per secondary school in 2001, to 775 this year. In elementary school, the average school size in 1998 was 365 students; this year it is 329." (People for Education, 2013)

The Ontario Ministry of Education School Board Efficiencies and Modernization policy appears to attempt to offset this trend in Ontario.

II – RESEARCH SUMMARY

The issue of ideal school size and the relationship between school size and school effectiveness has been long debated in the research literature. Much of this literature focusses on secondary schools. Research reported by Hattie

(2009) suggests that there is a moderate but significant relation between secondary school size and student outcomes, and that neither too small nor too large secondary schools are most effective. Hattie reports that the ideal size of secondary schools appears to be between 600 and 900 students, allowing schools to provide a more comprehensive curriculum than smaller schools, maintain close personal relationships and an intimate school climate, and yet, taking advantage of economies of scale to reduce per pupil operating costs.

In terms of elementary school size, there is a trend in current policy to favour smaller schools. In terms of research, there are several trends in current elementary school size literature:

(i) research indicating that there is no significant relationship between school size and student achievement,
(ii) research discussing the combined impact of multiple sociological/demographic factors on student achievement, including school size,
(iii) research demonstrating the efficiency of cost effectiveness of larger schools, and
(iv) research demonstrating the positive impact of small schools on school climate and student achievement (particularly for less affluent students).

(i) Research Indicating That There Is No Significant Relationship Between School Size And Student Achievement

The most compelling research arguing for a limited relation between elementary school size and student achievement, is the work recently published by Kerry Reimer Jones and Anthony Nnajiofor Ezeife. In their 2011 study, Jones and Ezeife examined Ontario Grade 3 and Grade 6 EQAO results from 10 Ontario school Boards. Jones and Ezeife report that "overall, there was no statistically significant correlation between school size and student achievement." Despite this overall claim, the authors did find several trends in the data, favouring large or medium sized schools, including:

> "The mean percentage of students achieving at stipulated provincial standards in Grade three writing and in Grade six reading, writing and mathematics were highest in large-sized schools (schools with more than 420 students). Results further indicated that the mean percentage of students performing above

> provincial standards in Grade six reading and writing was also highest in large schools. Students in medium- sized schools (between 246 and 420 students) also had the highest mean percentage of students performing above provincial standards in Grade three writing and in Grade six mathematics." (Jones and Ezeife, 2011)

(ii) Research Discussing The Combined Impact Of Multiple Sociological/Demographic Factors On Student Achievement (Including School Size)

A large number of studies in the past 20 years have examined student achievement in small schools, in the context of other sociological/demographic factors, including, student age and socio-economic status. Most researchers have concluded that the relationship between poverty and low student achievement is significantly decreased in smaller schools and that poorer students produce increasing lower results in larger schools (Howley, 1995; Howley, Strange, & Bickel, 2000; Abbott, Joireman & Stroh, 2002; Bickel, Howley, Williams & Glascock, 2001; Caldas, 1993; Franklin & Crone, 1992). Some researchers have also examined student age, finding that elementary aged students appear to benefit from smaller schools, whereas secondary aged students benefit from larger schools (Friedkin and Necochea, 1988; Texas Education Agency,1999). Canadian Researchers have examined the effects of school size, controlling for socio-economic status (Lytton, & Pyryt, 1998; Ma, & Klinger, 2000). In both cases, the researchers found that once demographic factors were accounted for, there were no significant effects of school size on student achievement. American studies have confirmed these findings – both Caldas (1993) and Lamdin (1995) found that the factor most significant in predicting elementary student achievement was student poverty (including family socio-economic status and percent of students receiving subsidized lunches).

(iii) Research Demonstrating The Efficiency Of Cost Effectiveness Of Larger Schools

Historically, researchers have argued that economies of scale provide for greater program offerings, and reduced operating costs per student, leading to greater student achievement (Conant, 1956; McGuffey, & Brown, 1979). Some have suggested, however, that these economies of scale may be limited

– i.e., after a certain point, there is no greater savings in per student operating costs (Gooding and Wagner, 1985; Hattie, 2009)

(iv) Research Demonstrating The Positive Impact Of Small Schools On School Climate And Student Achievement

Leithwood and Jantzi (2009) have summarized several empirical articles examining the impact of school size on student achievement. The authors concluded that in all studies reviewed, there were no effects, or the effects favoured smaller elementary schools – that is, at least at the elementary level, smaller schools maximize student performance. Abalde (2014) came to similar conclusions, finding for the OECD, that at the elementary level, smaller schools appear to have greater evidence for increased student achievement.

The Public Schools of North Carolina, State Board of Education (2000) found similar results – findings are not conclusive, however where there are differences in achievement, student behaviour, and school climate, data in each case favour smaller schools.

Recently, in the state of Florida, the private government watchdog, *Florida TaxWatch*, examined this issue and concluded that smaller schools had a greater effect than small classrooms on student behaviour, participation in extracurricular activities, and overall student achievement (2014).

III – TCDSB DATA

Tables 1 and 2 contain data for schools identified in the main report. Data include Grade 3 and Grade 6 EQAO Reading and Mathematics results for 2013-2014 as well as 3 year averages. Table 1 lists student achievement for schools identified in the Small School Matrix. Table 2 lists schools for schools identified in the sample.

A review of the data provided indicates that student achievement in the small schools is comparable to Board results in terms of Grade 3 Reading – approximately half of the schools have a greater percent of students at or above the provincial standard than the Board (both for 2013-3014 and the three year average). Grade 6 Reading results for 2013-3014 are similar. However, more than half of the smaller schools have a greater percent of students above the Board average for Grade 3 Mathematics ('13-14), Grade 6

Mathematics ('13-14), Grade 3 Mathematics (3 year average) and Grade 6 Reading and Mathematics (3 year average).

This data appear to indicate that in the small schools identified in the main report, students are achieving somewhat better than the Board average.

Table 1: TCDSB Small Schools *(in ascending order of October 2014 enrolment)*

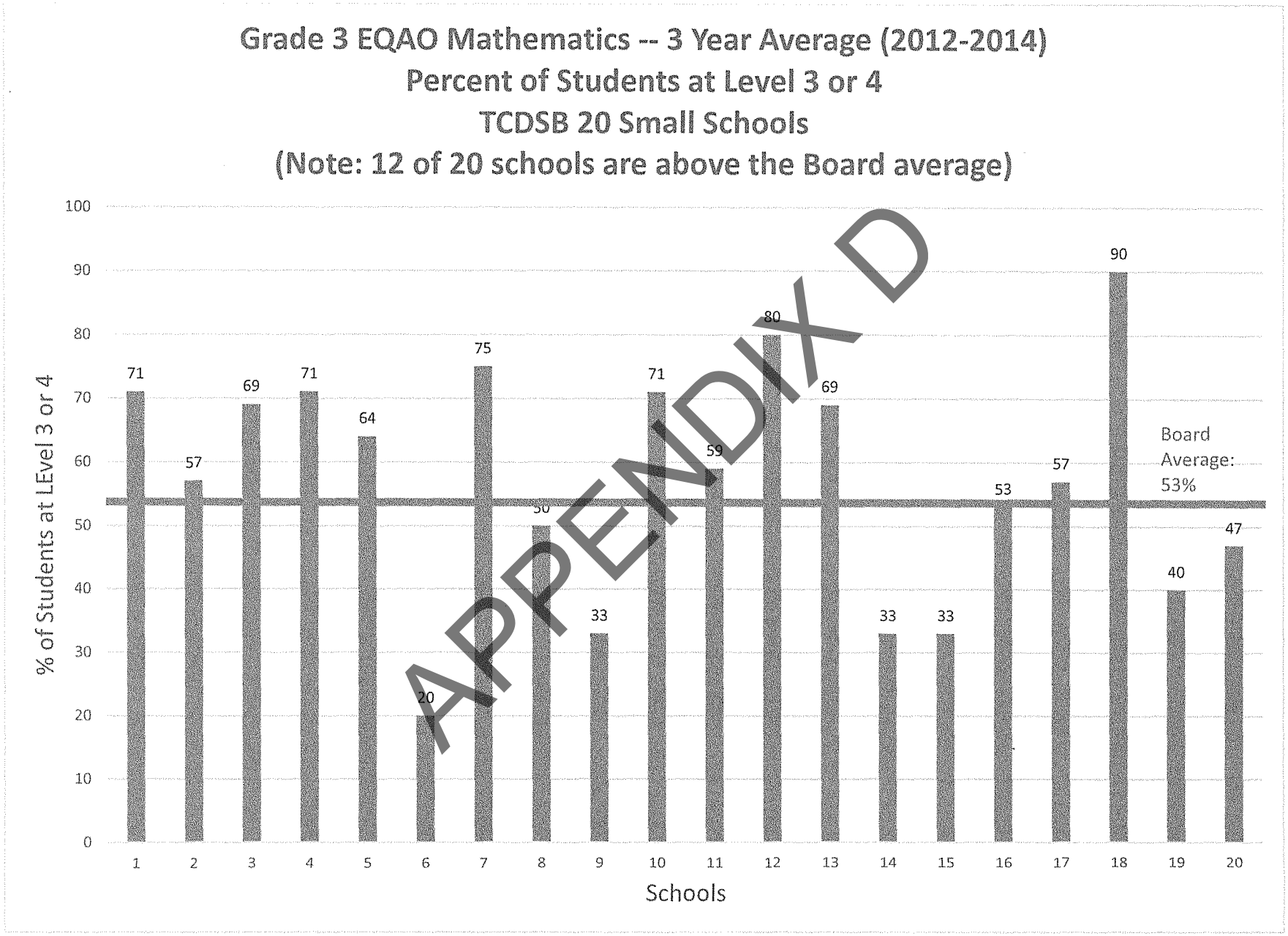
School	Enrolment (Oct. 2014)	EQAO 2013-14 Grade 3		EQAO 2013-14 Grade 6		Rolling Average Gr. 3 (2012 - 2014)		Rolling Average Gr. 6 (2012 - 2014)	
		Reading	Math	Reading	Math	Reading	Math	Reading	Math
Provincial		70	67	79	54	68	67	77	56
TCDSB		70	66	74	53	68	67	72	55
Holy Redeemer	82	80	80	100	71	65	79	84	58
St Bruno	97	100	71	71	57	81	66	77	73
St Marguerite Bourgeoys	99	70	80	69	69	69	75	80	78
Senhor Santo Cristo	100	89	89	100	71	96	85	71	63
St Bartholomew	108	60	40	64	64	68	56	73	60
St Rita	109	56	67	80	20	51	51	71	32
St Catherine	110	78	67	75	75	69	72	80	63
St Rene Goupil	113	64	82	92	50	63	73	88	63
St Elizabeth Seton	142	64	50	53	33	56	50	57	53

Epiphany of Our Lord	147	91	73	64	71	74	82	73	71
St Ignatius of Loyola	148	63	63	65	59	65	69	68	65
St Michael	151	45	50	100	80	56	56	76	59
The Divine Infant	156	90	80	92	69	85	87	96	64
St Raymond	159	73	73	67	33	58	58	67	55
St Florence	160	61	61	60	33	59	58	75	53
St Bede	161	39	48	47	53	52	55	56	49
Our Lady of Guadalupe	163	80	67	57	57	88	76	58	42
St Josaphat	164	73	92	83	90	73	83	83	88
St Francis of Assisi	165	94	83	73	40	73	69	64	45
Blessed Trinity	167	70	70	76	47	71	69	71	52

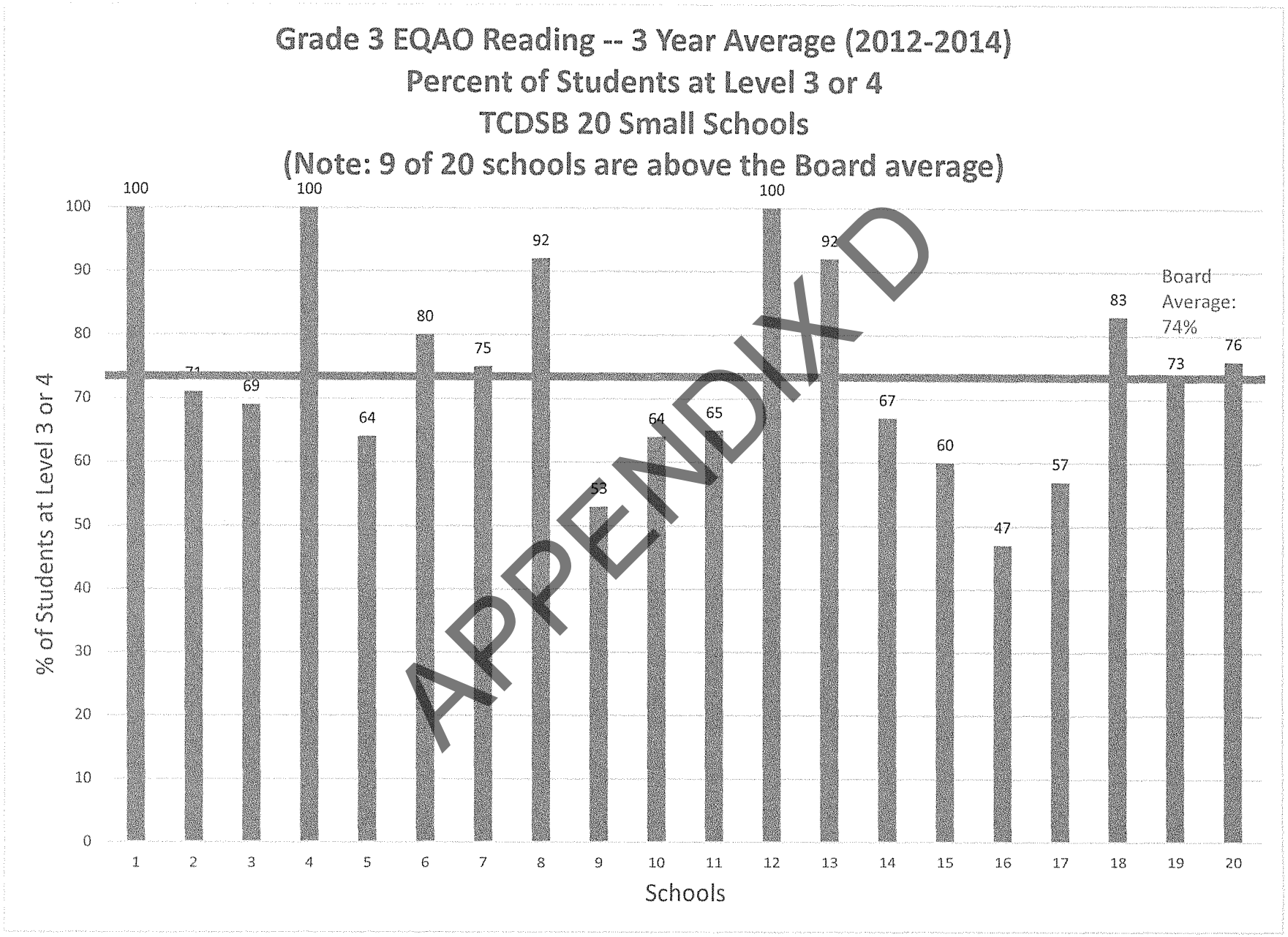
Table 2: TCDSB Sample Schools *(by size category and in ascending order of October 2014 enrolment)*

School	Enrolment (Oct. 2014)	EQAO 2013-14 Grade 3		EQAO 2013-14 Grade 6		Rolling Average - Gr. 3 (2012 - 2014)		Rolling Average - Gr. 6 (2012 - 2014)	
		Reading	Math	Reading	Math	Reading	Math	Reading	Math
Provincial		70	67	79	54	68	67	77	56
TCDSB		70	66	74	53	68	67	72	55
Holy Redeemer	82	80	80	100	71	65	79	84	58
St Bruno	97	100	71	71	57	81	66	77	73
St Marguerite Bourgeoys	99	70	80	69	69	69	75	80	78
Senhor Santo Cristo	100	89	89	100	71	96	85	71	63
St Bartholomew	108	60	40	64	64	68	56	73	60
St John XXIII	362	88	67	83	55	65	54	69	50
Holy Angels	411	100	98	78	53	96	92	84	67
Nativity of Our Lord	424	68	73	87	79	66	74	76	71
James Culnan	431	60	56	52	40	73	63	50	38
St Jerome	443	56	42	77	37	64	59	78	48
St Charles Garnier	448	66	31	59	24	47	36	48	26
Precious Blood	450	71	71	84	47	79	71	76	44

Immaculate Conception	451	63	52	63	55	51	46	68	61
St Simon	453	69	65	81	41	65	68	73	40
St Stephen	454	56	56	54	24	55	57	56	24
St Albert	456	78	65	78	52	70	65	71	54
St Helen	471	62	68	75	62	62	66	78	62
St Conrad	484	71	55	71	44	57	49	64	41
St Pius X	489	85	83	92	79	81	81	87	74
Our Lady of Fatima	722	70	63	87	50	71	65	79	56
St Jane Frances	749	49	42	57	26	56	55	49	24
Our Lady of Sorrows	786	92	90	91	77	85	89	83	76
All Saints	879	77	78	87	59	76	78	81	69
St Maria Goretti	1010	65	56	78	63	65	63	81	65


Grade 3 EQAO Mathematics -- 3 Year Average (2012-2014)
Percent of Students at Level 3 or 4
TCDSB 20 Small Schools
(Note: 12 of 20 schools are above the Board average)
% of Students at LEvel 3 or 4
Schools
Board Average: 53%
71
57
69
71
64
20
75
50
33
71
59
80
69
33
33
53
57
90
40
47
APPENDIX D

APPENDIX 'D'


Grade 3 EQAO Reading -- 3 Year Average (2012-2014)
Percent of Students at Level 3 or 4
TCDSB 20 Small Schools
(Note: 9 of 20 schools are above the Board average)
% of Students at Level 3 or 4
Schools
Board Average: 74%
100
71
69
100
64
80
75
92
53
64
65
100
92
67
60
47
57
83
73
76
APPENDIX D

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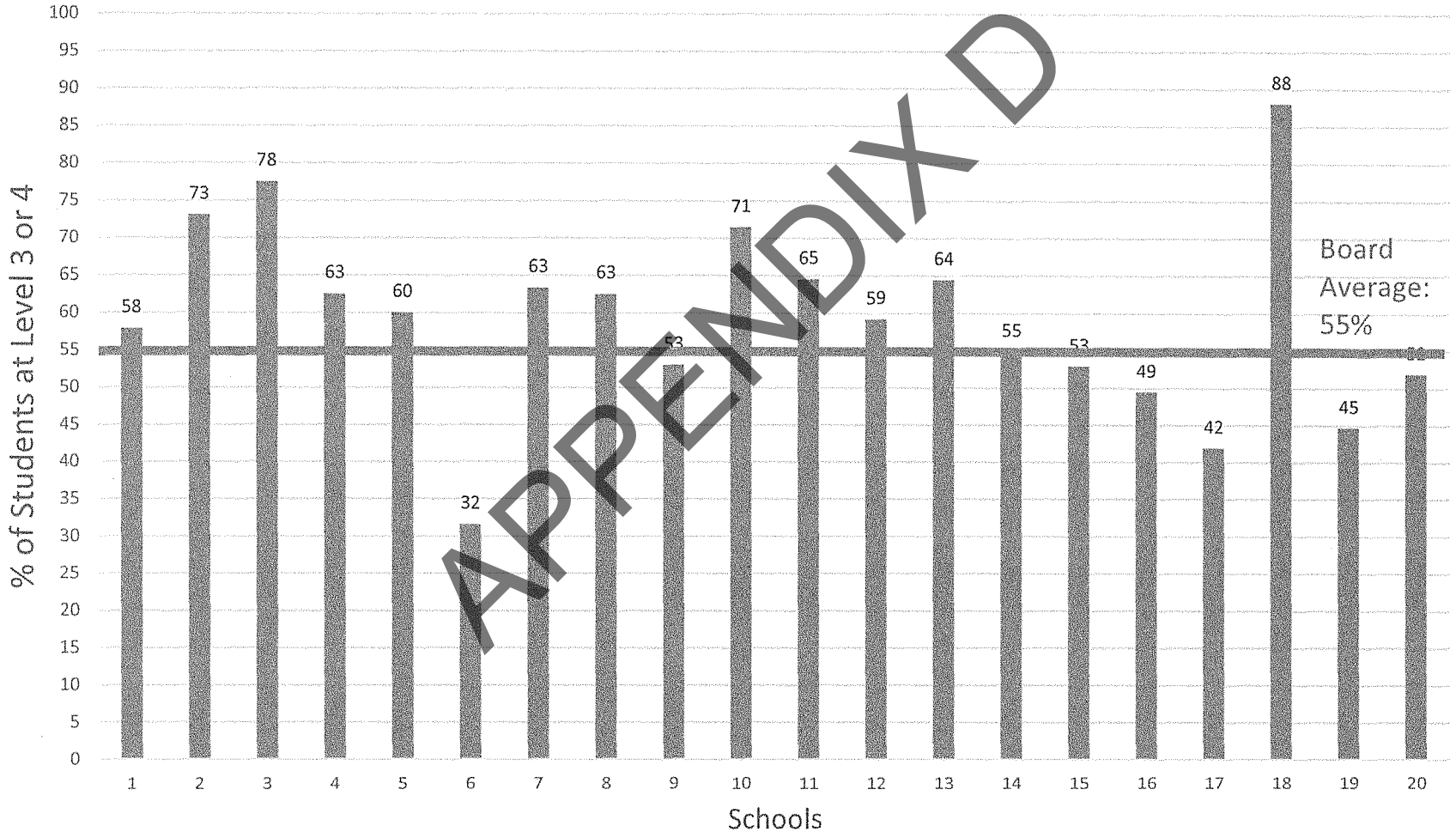
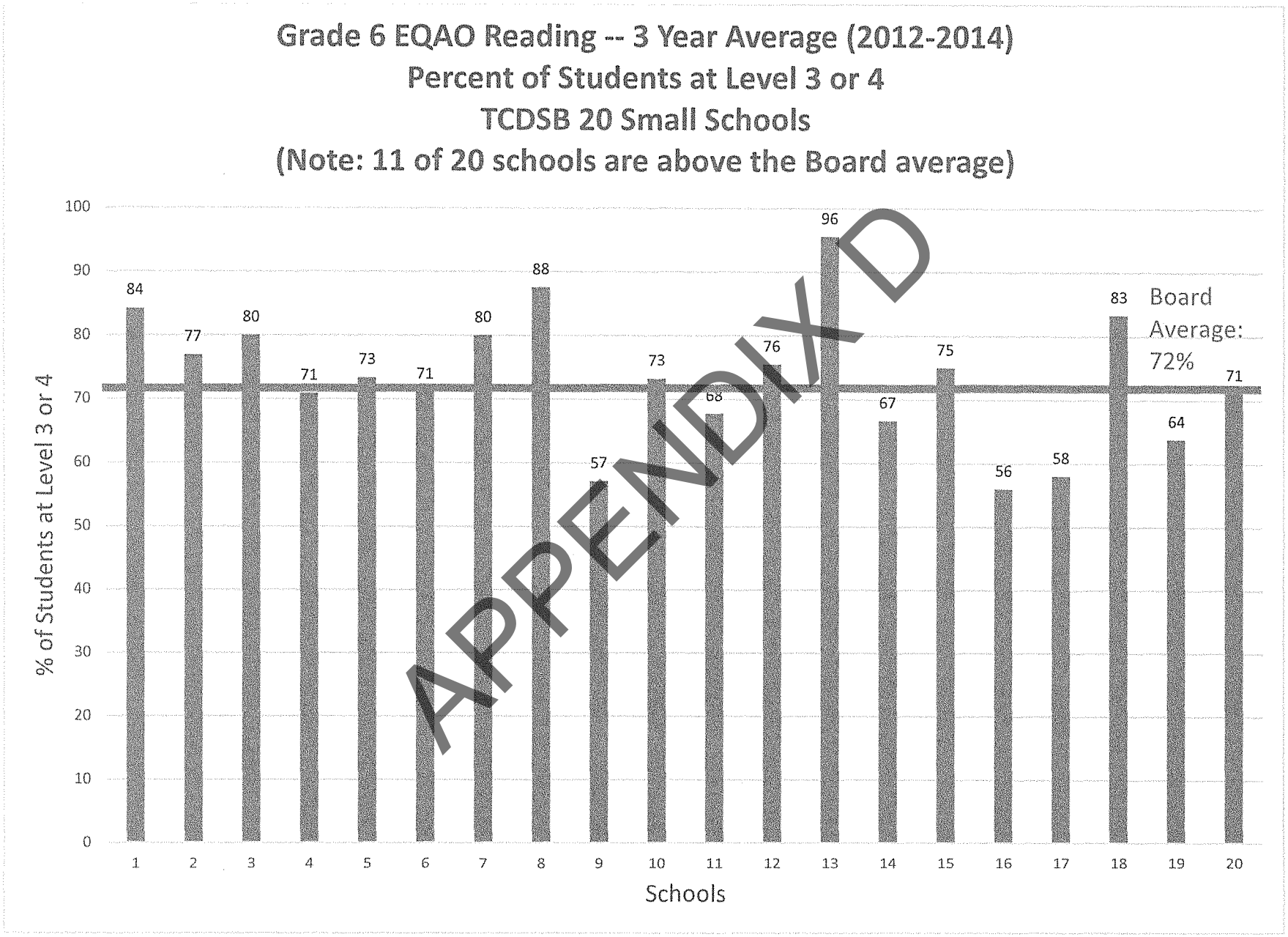
Grade 6 EQAO Mathematics -- 3 Year Average (2012-2014)
Percent of Students at Level 3 or 4
TCDSB 20 Small Schools
(Note: 12 of 20 schools are above the Board average)




Grade 6 EQAO Reading -- 3 Year Average (2012-2014)
Percent of Students at Level 3 or 4
TCDSB 20 Small Schools
(Note: 11 of 20 schools are above the Board average)
% of Students at Level 3 or 4
Schools
Board Average: 72%
84
77
80
71
73
71
80
88
57
73
68
76
96
67
75
56
58
83
64
71
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