

THE TROUBLE WITH COURSE CHOICES IN ONTARIO HIGH SCHOOLS

Should low income = high applied?

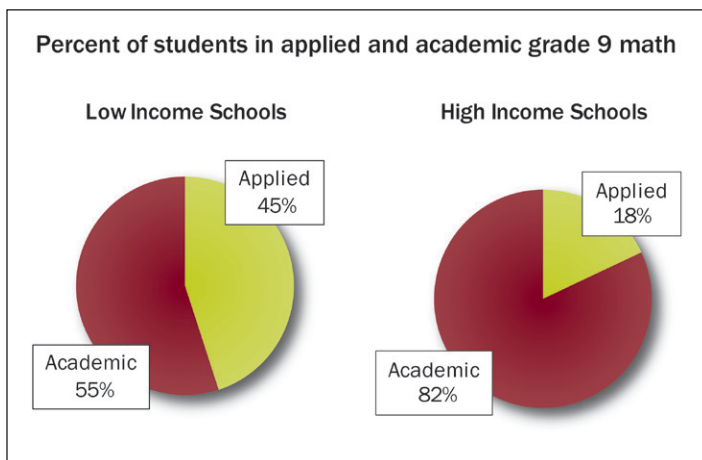
Over the last decade, Ontario has had great success increasing high school graduation rates (5 year rates have improved from approximately 68% to 82%¹), and sending more graduates on to university, college, or apprenticeships.²

But some students—Aboriginal, low-income, disabled, and those from the English-speaking Caribbean and Central and South America—still do not share equally in educational success.³

Improved graduation rates stem largely from the province’s Student Success Strategy, which has created more caring, motivating environments for students in grades 7 to 12, with focused support for at-risk learners and at key transitions.

Ontario has also expanded co-operative education, developed ways to make up components of failed courses through a system known as “credit recovery,” created focused programs called Specialist High Skills Majors, and designed programs that let students earn dual credits that count toward both their high-school diploma and a post-secondary diploma, degree or certification.⁴

All of these policies have played a significant role in helping more students succeed, but new findings in this report show that it is time to address continuing issues for students taking applied courses in grades 9 and 10.



QUICK FACTS

- On average, 32% of students take applied mathematics in grade 9.
- The average family income in schools with a high proportion of applied math students is almost half that of the schools with the low proportion of applied math students.
- 34% of schools report that students are required to take a course to transfer from applied to academic math. Of those, 81% do not offer the course during school hours.

THE ROOTS OF INEQUALITY

In Ontario, students entering secondary school have to choose between taking applied or academic courses in grades 9 and 10.

This report shows that students taking applied courses have a reduced chance of graduating from high school. It also shows that, worryingly, the schools where a large proportion of students take applied courses are most likely to have lower average family incomes and lower levels of parental education.

While the roots and patterns of inequality are complex and interconnected, there is long-standing research to show that these patterns can be reproduced, or even exacerbated by students’ course choices in high school.

International evidence suggests that course enrollment often falls along race- and class-based lines, where students from disadvantaged groups are far more likely to be enrolled in courses with lower expectations, more limited opportunities to learn, and fewer post-secondary options.⁵

The educational practice of “ability grouping”, where students are directed into particular academic options on the basis of their presumed abilities, has been identified as a significant barrier to equity and excellence in public education systems, particularly when it occurs early in students’ school careers.⁶

ONTARIO: APPLIED AND ACADEMIC COURSES BUT NOT STREAMING?

In 1999, Ontario abolished the formal grouping of students by presumed academic destination—that is, streaming—with the introduction of new Ontario Secondary School curriculum.⁷ This followed a barrage of studies in the 1970s and 1980s that criticised streaming as a discriminatory practice, which separated racialised, recent immigrant and poor children into lower streams and white middle-class students into higher streams.⁸

Some have questioned whether the changes to the Ontario curriculum in 1999 were more a matter of form than function.⁹

Currently, Ontario high school students are offered a range of courses. In grades 9 and 10, they must choose between academic, applied, or locally developed¹⁰ courses in math, English, science, geography, history, and French. Other courses—arts, technology, and health and physical education, for example—are designated as “open.”¹¹ Students in upper grades (11 and 12) can choose between open, college prep, university prep, university or college prep, and workplace prep courses, and they have more options for technical, co-operative, and experiential learning.¹²

Students can opt to mix and match applied, academic, locally developed, and open courses, but data from the Ontario Ministry of Education shows that the majority of students (62%) taking Grade 9 applied math are taking three or more applied courses. Only 10% of students take applied math and no other applied courses.¹³

NO EXIT?

Many factors affect students’ decisions about what course to take,¹⁴ including prior achievement, parental and peer expectations, attitudes to school, courses offered at a particular school and possible special education needs.

There is also a widespread perception that applied courses are easier.

Once a decision has been made to take a number of applied courses in Grade 9, it is unlikely a student will change back to an academic track.

In 2013

- 91% of principals report students transfer from applied to academic courses “never” or “not very often.”¹⁵ Interestingly, in 9% of schools, principals report that students transfer “often,” which suggests that school-level policies have a significant effect on students’ decisions to transfer.

In most cases, it is possible to transfer to a course of a different type in Grade 10—but only if the student has met the prerequisites.

Transfer courses do not adequately prepare students in most cases for success (e.g. math). Often better to redo the grade level at the academic level through summer school or day school.

Secondary principal, Peel DSB

DEMOGRAPHIC CHARACTERISTICS OF ONTARIO SCHOOLS (N=746) WITH THE HIGHEST AND LOWEST PERCENTAGE OF STUDENTS IN GRADE 9 APPLIED MATH (N=75)

Demographic characteristics by school (averages)	10% of schools with highest levels of applied math enrolment	Provincial average	10% of schools with lowest levels of applied math enrolment
Applied students	58%	32%	10%
Family income	\$61,720	\$84,440	\$112,420
Households living in poverty (LICO) ¹⁹	18.2%	12.8%	14.8%
Parents without high-school diploma	14.2%	8.3%	5.6%
Parents with university education	15.9%	25.2%	43.2%
Recent immigrants (arrived in Canada within 5 years)	5.5%	4.5%	6.6%
Immigrants	14.1%	13.8%	21.2%
English Language Learners	9%	3.9%	4.6%
Aboriginal students	4.8%	2.9%	1.3%

According to Ministry policy, “a student who is planning to move from the Grade 9 applied mathematics course to the Grade 10 academic mathematics course must take either the designated transfer course or the Grade 9 academic mathematics course.” Principals are, however, permitted to waive any prerequisite on request of a parent or adult student, or on their own initiative.¹⁶

- 34% of schools report that they require students to take a transfer course. Of those requiring a transfer course, 81% do not offer one during school hours.
- A number of principals report that transfer courses are usually offered in the summer or in night school.

The requirement of a transfer course depends on whether there is one available and on the demonstrated strengths of the students. Sometimes they have to go back a year or two (in math for example) in order to have a reasonable chance at success.

Secondary principal, Toronto DSB

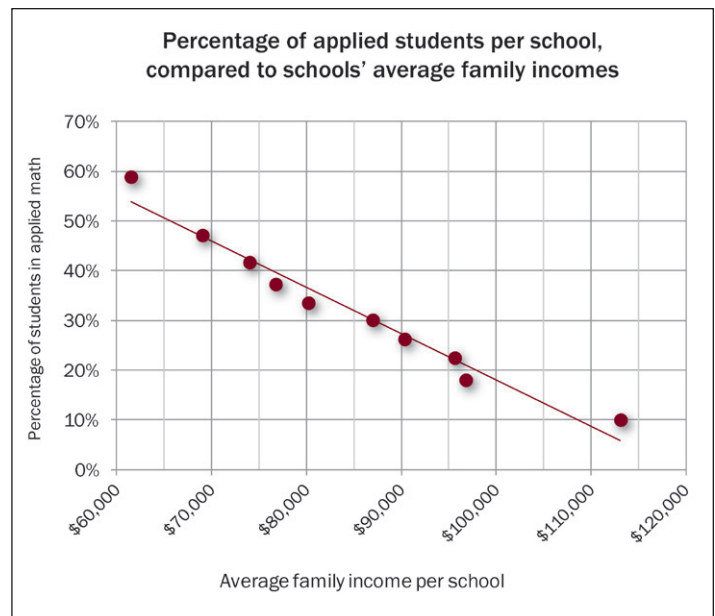
SHOULD LOW INCOME = HIGH APPLIED?

Despite the stated purpose of applied courses (“develop students’ knowledge and skills through practical applications and concrete examples; ...give more opportunities to experience hands-on applications”¹⁷), applied and academic course-taking patterns appear to be heavily influenced by students’ family background.

This year, the Educational Quality and Accountability Office (EQAO) granted People for Education access to school-level demographic data derived from Statistics Canada census data (2006), analyzed by postal code. We used it to compare high schools with the highest and lowest percentages of students registered in applied math in 746 public high schools in Ontario.¹⁸

On average, across the province, 32% of students taking EQAO’s grade 9 mathematics test were enrolled in applied math in 2011-12.

But there were wide variations among schools. In the schools with the highest percentage of applied math students, 58% of students were enrolled in applied math. In the schools with the lowest percentage of applied math students, only 10% of students were enrolled in applied math.



There were also startling differences between the two groups of schools in terms of students’ socio-economic backgrounds including their average family incomes, parental education, Aboriginal identity and language needs.

In the 10% of schools with the highest concentration of students taking applied mathematics in Grade 9, relative to the 10% of schools with the lowest concentration of such students, the students were:

- 2½ times as likely to have parents who did not finish high school
- almost two-thirds less likely to have parents who attended university
- from families where the average family income was almost half that of the schools with the smallest proportion of student taking applied mathematics
- more than three times (3.7 times) as likely to be Aboriginal
- nearly twice as likely to be English-language learners

APPLIED COURSES AND THE ACHIEVEMENT GAP

All grade 9 students in applied and academic math must take the provincial math assessment administered by the Education Quality and Accountability Office (EQAO). To graduate, students must also pass the Ontario Secondary School Literacy Test (OSSLT), usually taken in grade 10.

Since the tests were introduced, there has been a substantial gap between the results for applied students as compared to academic students.

In 2012:

- Only 44% of students in applied math achieved the provincial standard, versus 84% of those in academic math.²⁰
- 53% of students in applied English passed the OSSLT, while 93% of those enrolled in academic English passed.²¹

In 2005, the Ministry of Education implemented revised applied mathematics curriculum for grades 9 and 10. Scores have improved since then, but they are still far below the scores of students in academic math.

Students enrolled in applied courses in Grade 9 are also less likely to graduate within four or five years and less likely to pursue post-secondary education.²²

The most recent public data on relative student outcomes for those taking applied courses is available from the Toronto District School Board. In a 2012 report, the TDSB reported 29% more students enrolled in “academic” courses graduate in five years (88.1%) compared to students in “applied” courses (59.1%).²³ Fewer than half of student in applied courses confirmed receiving an offer of admission to university *or* college, relative to those in academic programs.²⁴

According to the Ministry of Education, 41.3 % of students who started in grade 9 applied mathematics had not earned 16 credits by the end of grade 10; that is, they are not on track for graduation.²⁵ In comparison, only 14.4% of students who started in academic math had not earned 16 credits.

Remarkably, given the ongoing questions around the applied program, the Ministry does not calculate graduation rates based on subpopulations such as those enrolled in applied courses.

A 2010 Colleges Ontario report, using data from 2007-8, calculated:

- students in grade 9 applied math had a 58.4% chance of graduating in five years, while students in grade 9 academic math had an 86.5% chance of doing so.
- 55.7% of students in grade 9 applied English graduated in five years, compared to 85.3% of students in academic.²⁶
- 24.1% of students in applied math were registered in university or college directly after secondary school, compared to 60.6% of students in academic.
- 6% of students were registered in apprenticeship programs directly out of high school²⁷—50.2% of them had taken applied math in grade 9, and 43.8% had taken academic math (5.9% had taken locally developed math).²⁸

A SIMPLE CHOICE; A WORRYING OUTCOME

Last year EQAO released a paper based on over 100,000 Ontario students, which shows that students who choose applied math are more likely to struggle, no matter how they did on the Grade 3 and Grade 6 EQAO assessments.²⁹

The EQAO research identifies a number of factors that affect student achievement, such as students’ attitudes towards math and school, their self-confidence, previous course grades, and homework patterns which differ between students in academic and applied courses. At the bottom, though, the research suggests that students’ ‘simple choice’ to take applied may contribute to the achievement gap.

- Of the students who *met* the provincial standard in both Grade 3 and Grade 6, 92% met it again in Grade 9 in the academic math course, compared with only 79% in the applied course.
- Of the students who had *not met* the provincial standard in Grade 3 or Grade 6, 53% did not meet it in Grade 9 in the academic math course, compared with 70% of students in the applied course.
- Of the students who had *not met* the provincial standard in Grade 3 but had met it in Grade 6, 77% met it in the Grade 9 academic mathematics course, compared with 61% in the applied course.

Ironically, then, students taking the course widely perceived as ‘easier’ are less likely to meet the provincial standard—even controlling for prior achievement—than those taking the course that is perceived as harder.

This finding is consistent with international research that suggests decreased educational opportunity follows educational “ability grouping.”³⁰ That body of research demonstrates that streaming does not merely mirror, but exacerbates educational inequality and gaps in educational achievement.

STUDENTS WITH SPECIAL NEEDS

Special education services can involve anything from a different way of teaching, to specialized equipment to help students with their school work, to simply providing students with extra time for writing tests. Some students also have program ‘modifications’, which are changes to grade-level expectations for a subject or course.³¹

The vast majority of secondary students with special education needs are taught in the regular classroom. Meeting these students’ needs is a critical part of teachers’ expertise and professional responsibility.

Neither the applied nor the academic curriculum was particularly designed to be more suitable for students with special education needs. And applied courses are no more likely to have extra support for special education students.

Nevertheless, a student with special education needs are far more likely to be enrolled in applied mathematics than academic math. Across the province, in academic math, 6% of students are receiving special education support. In applied math, that proportion increases to 37%.

THE PICTURE IN THE GREATER TORONTO AREA

We also analyzed a subset of the sample—secondary schools in the Greater Toronto Area³²—to see if there were differences in the pattern of applied and academic course-taking by demographic factors.

We looked at the 20% of schools with the highest levels of applied math enrolment and the 20% of schools with the lowest applied math enrolment. (We examined 20% instead of the 10% cut off in the provincial sample to limit the effect of any outliers in a smaller population of schools.)

In Ontario’s largest metropolitan area, the patterns are broadly similar to the province in terms of income, family education and Aboriginal status.

However, there is a marked difference in the results between the GTA (where most immigrants settle) and the rest of the province for recent immigrants and English-language learners. Students who are recent immigrants are more than 40% more likely to be found in schools with a high concentration of applied course-taking than those with a very low concentration of applied course-taking. And English language learners are more than three times as likely to attend schools with a high percentage of applied courses.

DEMOGRAPHIC CHARACTERISTICS OF GTA SCHOOLS (N=193) WITH THE HIGHEST AND LOWEST PERCENTAGE OF STUDENTS IN GRADE 9 APPLIED MATH (N=40)			
Demographic characteristics by school (averages)	20% of schools with highest levels of applied math enrolment	GTA Average	20% of schools with lowest levels of applied math enrolment
Applied students	53%	28.4%	9%
Family income	\$56,480	\$80,724	\$110,851
Households living in poverty (LICO)	30.2%	22.6%	18.7%
Parents without high-school diploma	16%	10.6%	7.0%
Parents with university education	24.8%	35%	46.7%
Recent immigrants (arrived in Canada within 5 years)	15.1%	12.2%	9.6%
Immigrants	38.5%	34.6%	29.8%
English Language Learners	16.1%	9.3%	5.7%
Aboriginal students	6%	4%	4%

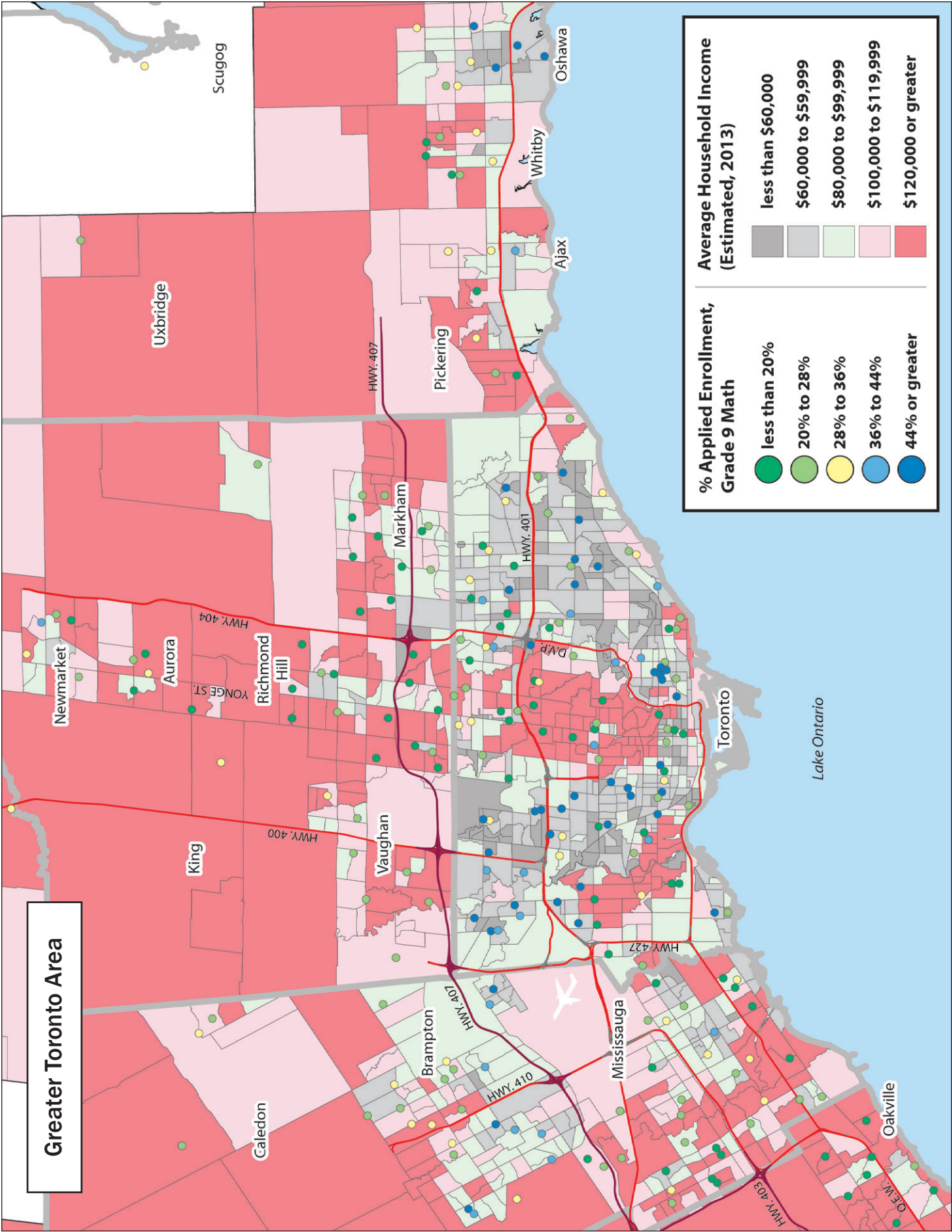
CONCLUSION

Numerous academic studies point to a strong concern that practices of streaming, tracking, or grouping students by ability is likely to reproduce and even exacerbate patterns of disadvantage based on family backgrounds, including socioeconomic status and race.

Although Ontario moved almost 15 years ago to formally end streaming, a large number of students in Ontario today take applied courses for a majority of their compulsory credits in Grade 9. The work of EQAO and others has pointed to a significant achievement gap for students in applied courses, raising concerns that students in applied courses are experiencing lower expectations, reduced opportunity to learn, and more limited post-secondary options. Data from the People for Education survey show that students have relatively limited prospects of switching from an applied course to an academic course; many schools require transfer courses, and of those that do, only 19% offer them during the day.

Based on data from all Ontario high schools, the analysis in this report shows a strong correlation between students' family backgrounds, their history of immigration and learning English, or their Aboriginal identity and the chances that students will attend a school with a high percentage of applied students. Unless we assume that wealthier students are inherently more academically capable, this correlation is disturbing, all the more so given the international and Ontario evidence that suggests that taking applied courses itself may not merely reproduce disadvantage, but actively exacerbate the risk of problematic academic outcomes.

This new research shows that it is time to look more closely at who is choosing applied courses, why they are being chosen, what advice parents and students are receiving in grade 8 when the choices must be made, and, ultimately, whether having two versions of any required course leads to some groups of students—particularly students who already experience disadvantage—being further disadvantaged.



THE GEOGRAPHY OF EDUCATIONAL OPPORTUNITY

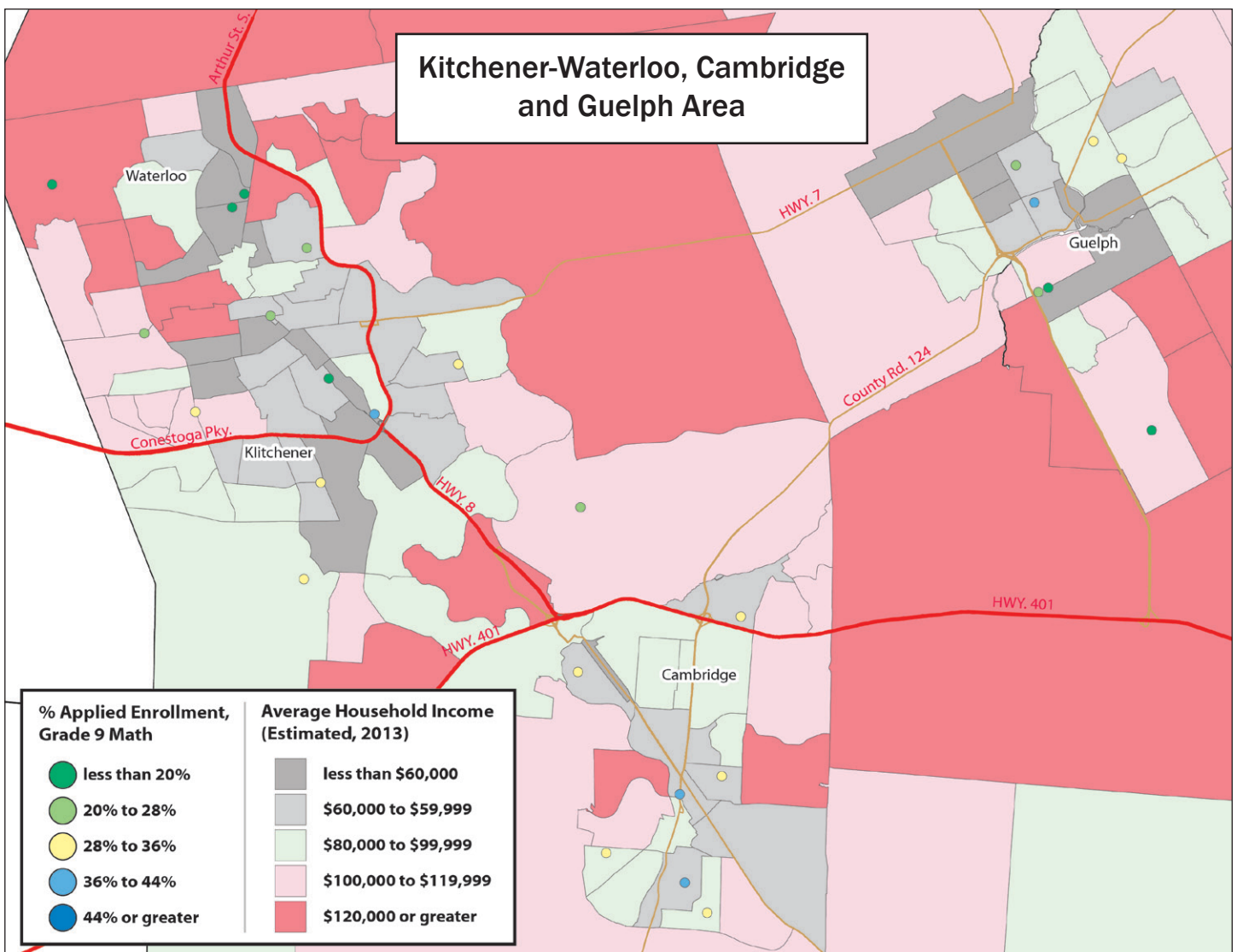
We were interested in seeing how the patterns, in terms of applied or academic enrollment, played out geographically: to what extent does where a student live, affect the program of study that would be the norm in her school? In most large Ontario centres, students' neighbourhoods are quite polarized on income lines, and the level of neighbourhood income is strongly related to the percentage of students in local schools taking applied courses.

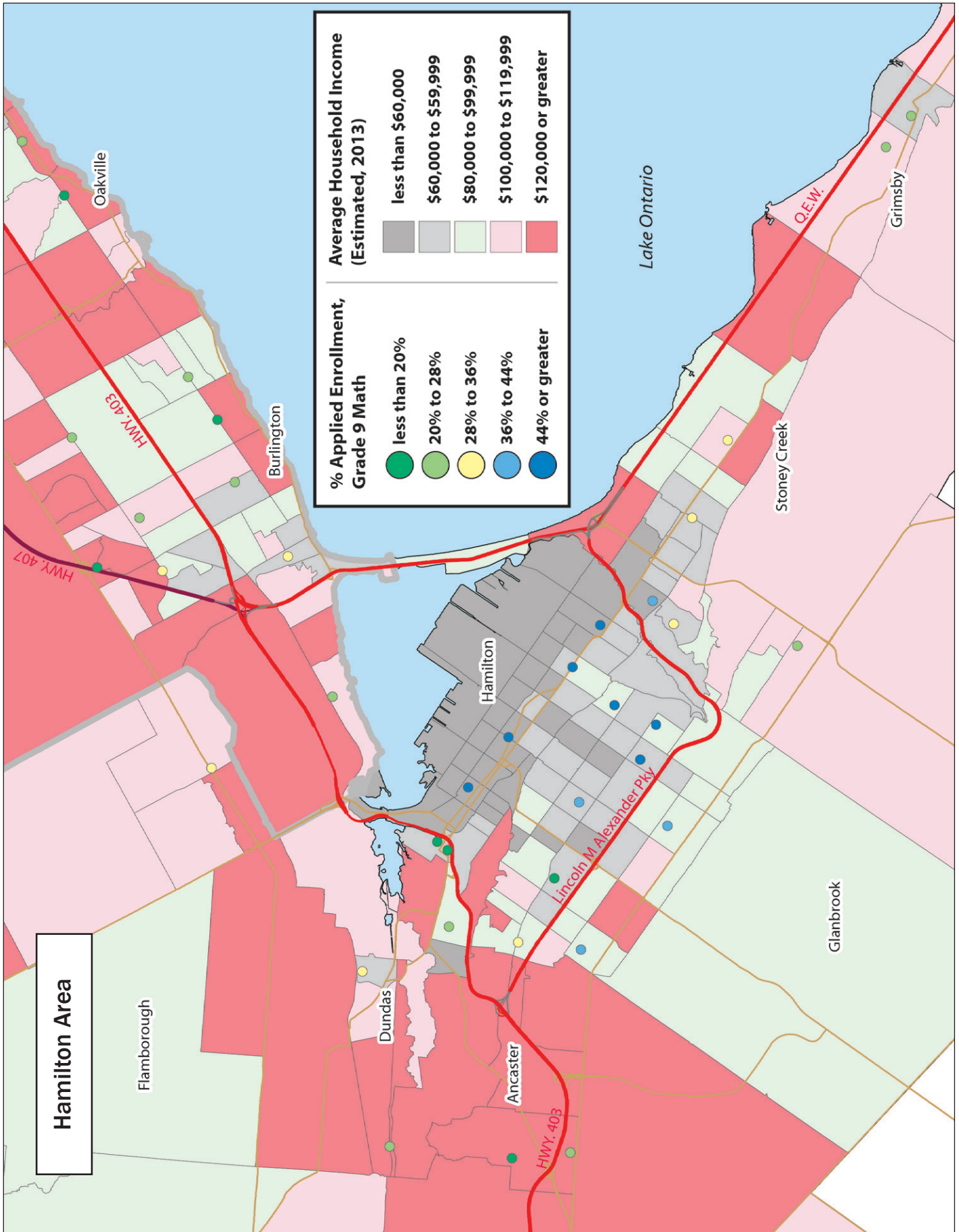
The map has two types of information.

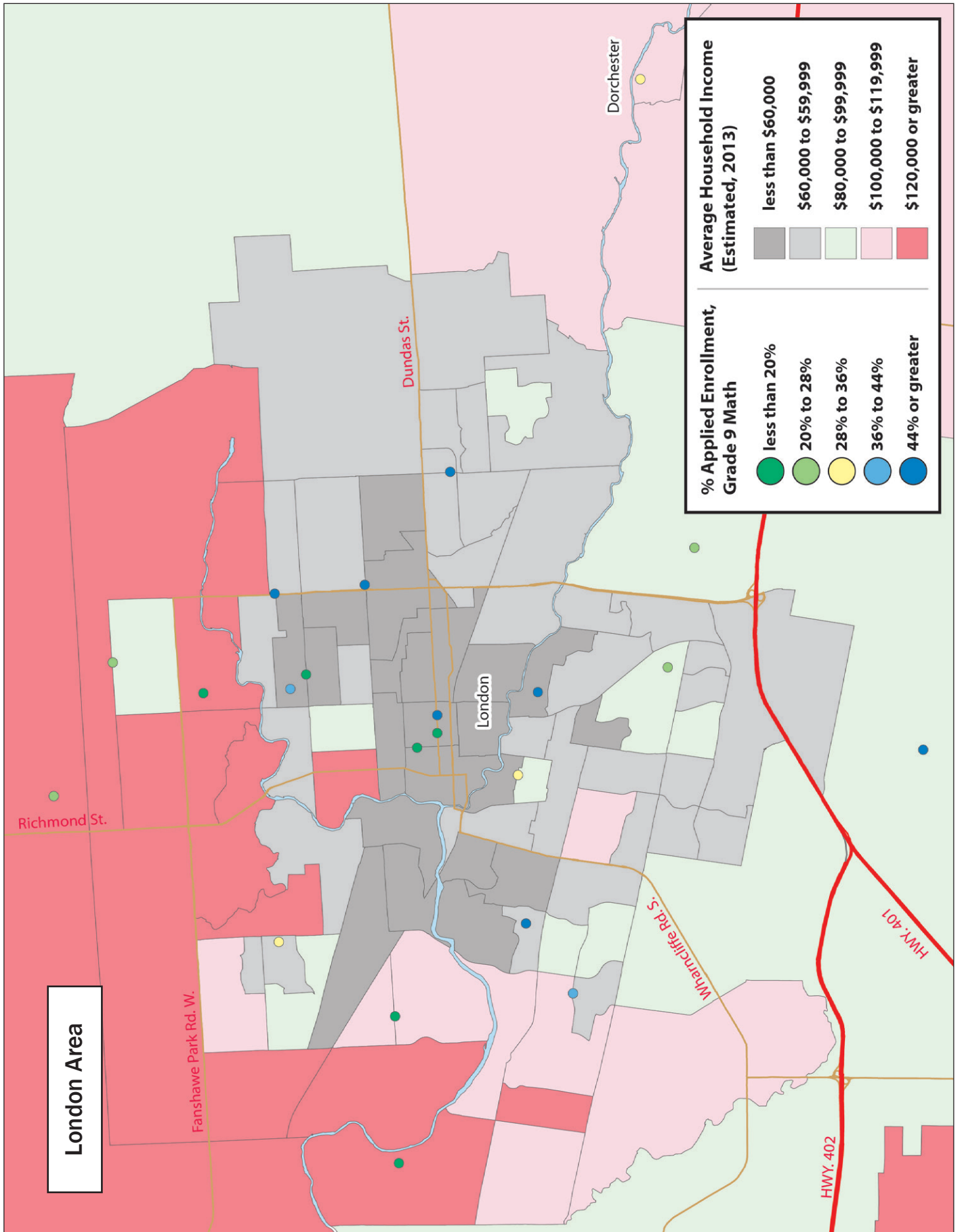
First, the background colour shows the average family incomes by neighbourhood.³³ Where the background is grey, family incomes are lower; where it is red, family incomes are higher.

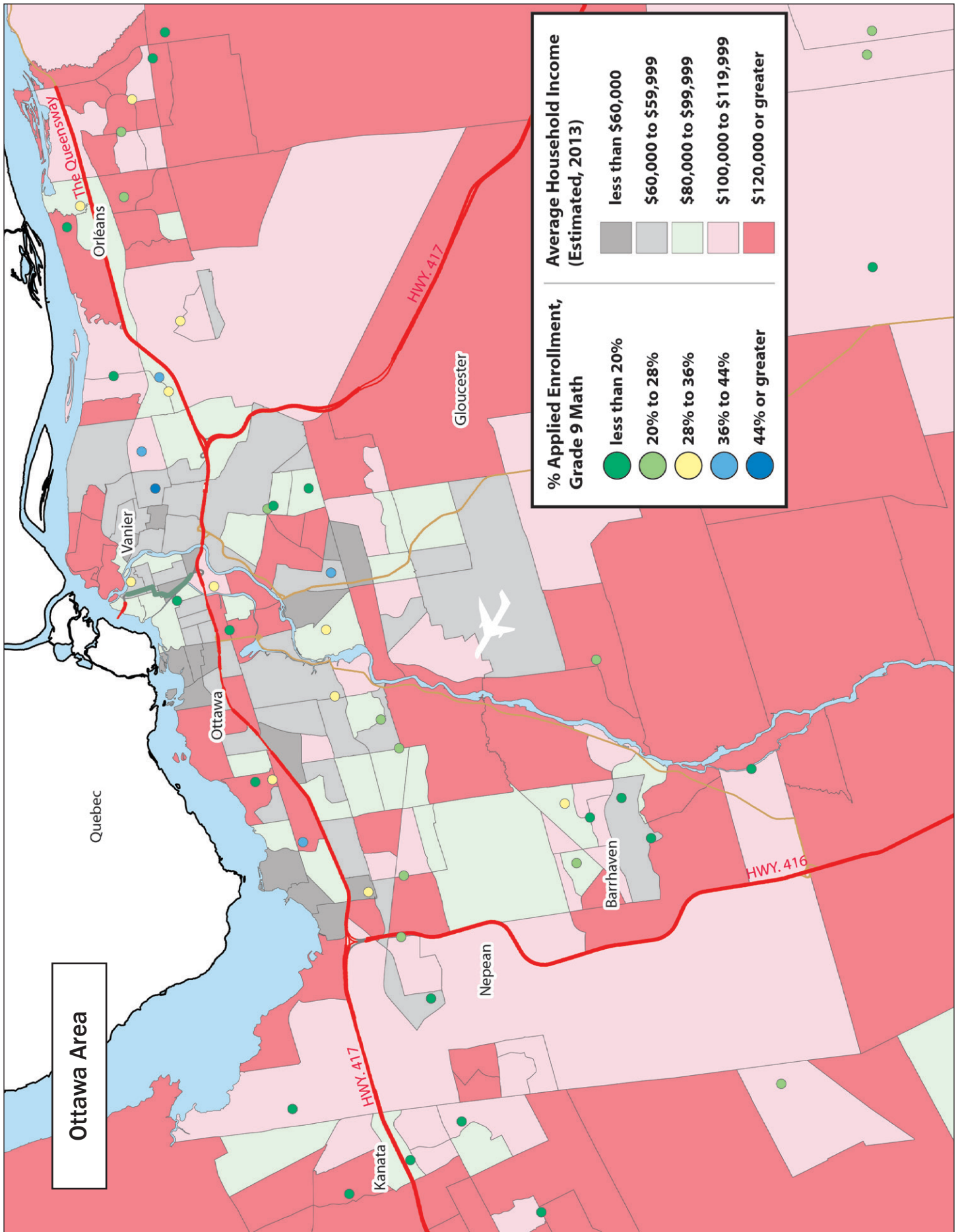
The map also shows the percentage of students in each secondary school who are taking applied courses. Schools represented with blue dots have a higher percentage of students in applied courses; schools represented with green dots have a lower percentage of applied courses.

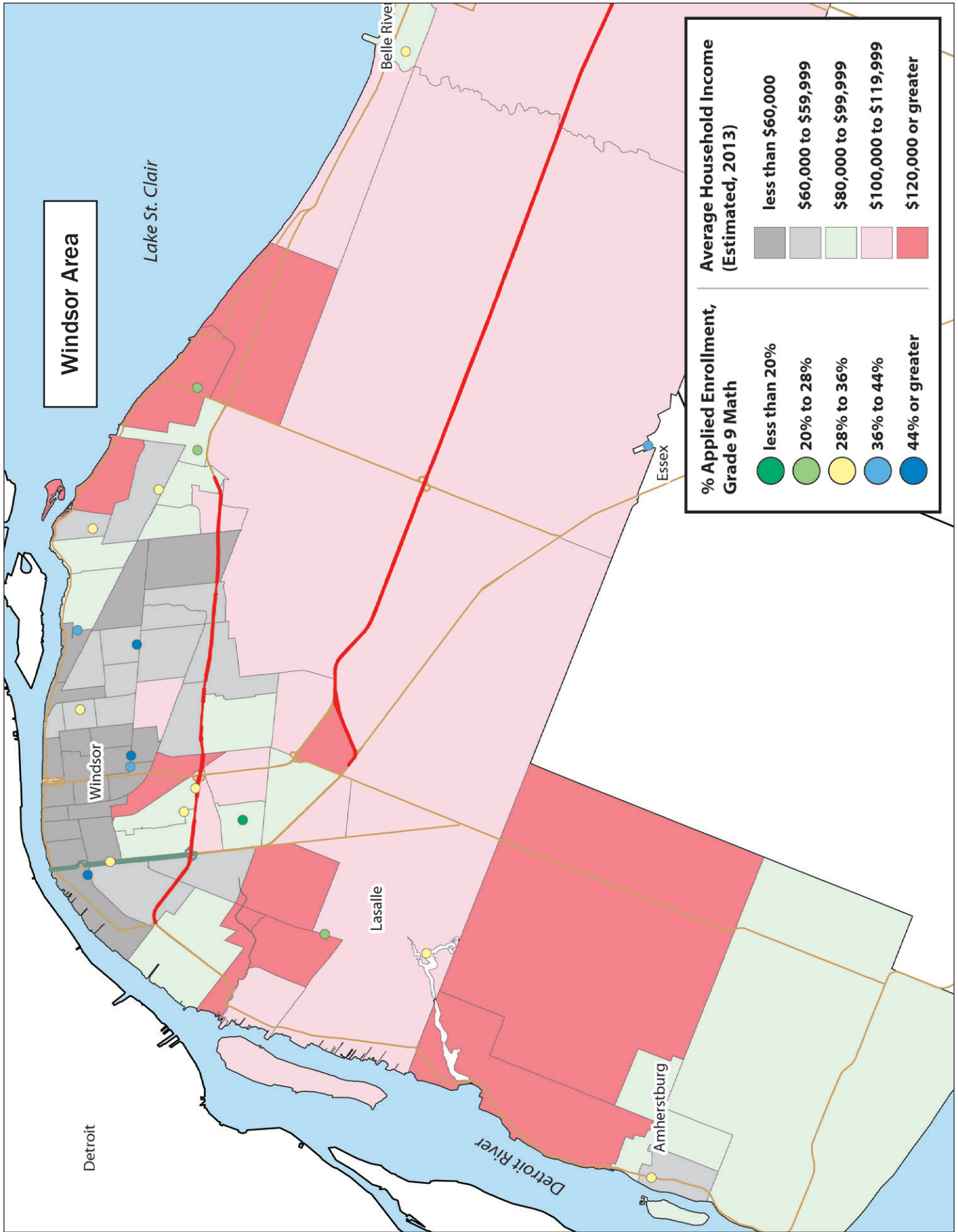
A quick check shows blue dots far more concentrated in grey areas, and green dots in the red areas.











NOTES

- 1 Ontario Ministry of Education. (2012). 93,000 extra high school students graduated since 2003 [News release]. Retrieved from <http://www.edu.gov.on.ca/eng/document/nr/12.03/nr0308.html>
- 2 Ontario Ministry of Colleges, Training and Universities. (2012) Results-based plan 2011-12. Retrieved March 13, 2013, from <http://www.tcu.gov.on.ca/eng/about/annualreport/1112/index.html#1>
- 3 See, e.g., King, A., & Warren, W. (2010). *Who doesn't go to post-secondary education?* Toronto: Colleges Ontario; Brown, R. (2010). *The grade 9 cohort of 2004* (pp. 59). Toronto: Toronto District School Board; Auditor General of Ontario. (2012). *Education of Aboriginal students*. Ch.3.05. Toronto: Government of Ontario; Auditor General of Canada. (2011). *Status report: Programs for First Nations on reserves* (pp. 1-54). Ottawa: Government of Canada. Davies, S., & Maldonado, V. (forthcoming). Socioeconomic inequalities in Canadian education. *Social Inequality in Canada: Patterns, Problems, and Policies* (5th ed.). E. Grabb & N. Guppy (Eds.). Toronto: Prentice Hall; Anisef, P., Brown, R., Phythian, K., Sweet, R. & Walters, D. (2010). Early school leaving among immigrants in Toronto secondary schools. *Canadian Review of Sociology*, 47, 103-128.
- 4 See Zegarac, G., & Franz, R. (2007) *Secondary school reform in Ontario and the role of research, evaluation and indicator data*. Paper presented at American Educational Research Association, Chicago. Retrieved March 11, 2013 from <http://www.edu.gov.on.ca/eng/research/ssreform.pdf>; Ungerleider, C. (2008). *Evaluation of the Ontario Ministry of Education's Student Success / Learning to 18 Strategy*. Toronto: Government of Ontario; Levin, B. (2011). *More high school graduates: How schools can save students from dropping out*. Thousand Oaks, CA: Corwin.
- 5 Strand, S. (2012). The White British-Black Caribbean achievement gap: Tests, tiers and teacher expectations. *British Educational Research Journal*, 38, (1), 75- 101. There is considerable research on the concept of opportunity to learn, and it can include a multitude of factors, such as the richness of curriculum; amount of classtime used for instruction; teacher quality; classroom- and school-level resources. See, e.g. McDonnell, L. M. (1995). Opportunity to learn as a research concept and a policy instrument. *Educational Evaluation and Policy Analysis*, 17(3), 305-322; Guiton, G., & Oakes, J. (1995). Opportunity to learn and conceptions of educational equality. *Educational Evaluation and Policy Analysis*, 17(3), 323-336.
- 6 Eg., Organization for Economic Cooperation and Development (OECD). (2012). *Equity and quality in education: Supporting disadvantaged students and schools*. Paris: Author; Strand, S., see note 5; Loveless, T. (2013). *The persistence of ability grouping and the resurgence of tracking*. Washington, D.C.: Brookings Institution. See also references at note 7.
- 7 Ministry of Education and Training. (1999). *Ontario secondary schools, grades 9- 12: Program and diploma requirements, 1999*. Toronto: Queen's Printer for Ontario. Retrieved from <http://www.edu.gov.on.ca/eng/document/curricul/secondary/oss/oss.pdf>
- 8 In the United States in the 1980's, researcher Jeannie Brooks (see notably, (1985) *Keeping Track: How schools structure inequality*. New Haven: Yale University Press) was one of the central voices in the movement to build a body of research around the process of streaming which resulted in successful civil rights litigation and resolutions condemning the practice, passed by national political organizations including the National Governors Association, the American Civil Liberties Union, the Children's Defense Fund, and the NAACP Legal Defense Fund. In Ontario, an influential study was Curtis, B., Livingstone, D. W., & Smaller, H. (1992). *Stacking the deck: the streaming of working-class kids in Ontario schools*. Toronto: Our Schools Our Selves Educational Foundation; see also Krahn, H. and Taylor, A. (2007). "Streaming" in the 10th grade in four Canadian provinces in 2000. Statistics Canada Catalogue no. 81-004-XIE. *Education Matters*, 4(2): 16-26.
- 9 Brown, R. (2010). *The grade 9 cohort of 2004*. Toronto: Toronto District School Board.
- 10 According to the Ministry of Education, 6.4% of students in Ontario initially enroll in a locally developed course in grade 9 math. (Email April 25, 2013 on file with People for Education). Students in locally developed courses do not take EQAO's curriculum-based Grade 9 assessment of mathematics from which we obtained our data (see below), so the analysis in this chapter does not include students in these courses.
- 11 Ontario Ministry of Education. *Ontario schools, kindergarten to Grade 12: Policy and program requirements, 2011*. Retrieved March 13, 2013, from <http://www.edu.gov.on.ca/eng/document/curricul/secondary/oss/oss.html>
- 12 Ibid.

- 13 Personal communication, Tadesse Haile, Ontario Ministry of Education. E-mails dated March 11, 2013, and February 14, 2013. OnSIS 2010-2011 Collection (February, March 2013). Includes courses taken at regular day schools only. Excludes multiple instances of the same applied course code—e.g., if a student had two course enrolments in ENG1P, it would only count as one applied course enrolment.
- 14 See, eg. Tilleczek, K. (2007). *Fresh starts / false starts: A review of literature on the transition from elementary to secondary school*. Toronto: Community Health Systems Group, Hospital for Sick Children.
- 15 Principals from 200 secondary schools, representing 23% of the province's high schools, responded to the 2012-2013 survey. For additional details about the methodology of the survey and report, please see People for Education. (2013) Annual Report on Ontario's Publicly Funded Schools (forthcoming, May 2013).
- 16 *Ontario schools: kindergarten to grade 12: Policy and program requirements*. See note 11.
- 17 Ibid.
- 18 For this analysis, we removed schools with fewer than 15 students, as well as schools where more than 50% of students were identified as having special education needs in the EQAO statistics. In total, 69 schools were excluded.
- 19 Family income below the low-income cut-off (LICO) as defined by Statistics Canada. For a single-parent family with two children in 2012, the LICO was \$27,000. Ontario Ministry of Children and Youth Services. (2012). *Breaking the cycle: Ontario's poverty reduction strategy annual report 2012*. Retrieved from <http://www.children.gov.on.ca/htdocs/English/documents/breakingthecycle/2012AnnualReport.pdf>
- 20 Education Quality and Accountability Office. (2012). *Ontario student achievement: English-language students: EQAO's provincial report on secondary schools* (p. 2-4). Toronto: Queen's Printer for Ontario.
- 21 Ibid., p. 73.
- 22 See, e.g., King & Warren, note 3.
- 23 Toronto District School Board. (2012). The TDSB Grade 9 Cohort of 2006-2011: Graduation rate patterns - Fact sheet #2. Toronto: author, retrieved April 8, 2013 from http://www.tdsb.on.ca/wwwdocuments/about_us/external_research_application/docs/Gr9CohortFactSheet2GraduationRatePatterns.pdf.
- 24 Toronto District School Board. (2012). The TDSB Grade 9 Cohort of 2006-2011: Graduation rate patterns - Fact sheet #3. Toronto: author, retrieved April 8, 2013 from http://www.tdsb.on.ca/wwwdocuments/about_us/external_research_application/docs/Gr9CohortFactSheet3PostSecondaryPathwaysREV09Oct12.pdf
- 25 Email from office of Chief Student Achievement Officer, April 24, 2013, on file with People for Education, reporting on 2010-11 Grade 10 Credit Accumulation—Students whose Earliest Math Course Enrolment was Grade 9 Applied, Academic or LDC. Data is as reported by schools in OnSIS, selected years. (2009-10 to 2010-11). Includes only those students who were part of the 2010-11 grade 10 credit accumulation cohort (grade 9 cohort of 2009-10). Includes only those students whose earliest math course taken was grade 9 applied. Data includes credits awarded through PLAR. Data includes credits from publicly funded day schools, private secondary schools, publicly funded hospital and provincial schools, summer, night and adult continuing education day schools. Data excludes credits from care, treatment and correctional facilities
- 26 King & Warren, note 3, p.45.
- 27 Ibid., p.ii.
- 28 Ibid, p.145.
- 29 Education Quality and Accountability Office. (2012). An Analysis of questionnaire and contextual data for Grade 9 students in the Academic and Applied Mathematics Courses. Toronto: EQAO.
- 30 See e.g., references at notes 5 and 8.
- 31 See Government of Ontario. (2004) The Individual Education Plan: A resource guide. Toronto: author, retrieved April 3, 2013 from <http://www.edu.gov.on.ca/eng/general/elemsec/speced/guide/resource/iepresguid.pdf>. A small number of students will have alternative expectations, outside the curriculum, usually to help prepare for daily life.
- 32 The GTA includes all the schools in Toronto (postal code beginning with "M") and schools in the regional municipalities of Durham, Peel, Halton, and York (postal code beginning with "L").
- 33 Source: Pitney Bowes Software, Inc. (2013) Canadian Demographic Data: 2013 update.



People for Education is a registered charity that works to support public education in Ontario's English, French and Catholic schools.

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