

40%

of 9th graders in Washington, DC today aren't expected to graduate on-time.

Who are they? Where do they fall off-track? And what can be done about it?

District of Columbia Graduation Pathways Project Summary

Prepared for the Office of the Deputy Mayor for Education
September 2014



Contents

Project goals	3
Structure + approach	4
Analytic sample	5
What did we learn?	6
<i>Early warning</i>	8
<i>High school effects</i>	12
<i>Student segmentation</i>	18
<i>Other analyses</i>	21
What's next?	36



WHAT DID WE SET OUT TO DO?

In support of Raise DC's citywide goal to improve graduation rates, the Graduation Pathways project began in summer 2013 and widely engaged education agencies, school leaders and civic partners in both the analysis and strategic planning phases.

Project Objectives

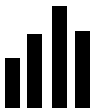
- Conduct an **analysis of DC students' high school outcomes** to identify when students fall off-track, why, and identify programs and schools that are able to get students back on-track.
- Create **a set of citywide graduation strategies** that coordinate efforts and guide the investment of new resources related to 1) increasing rates of on-time, 4-year graduation; 2) improving opportunities for off-track students to graduate in 5- or 6-years; and 3) identifying opportunities to re-engage students who have dropped-out.
- Inform the creation of **a statewide early warning system** that supports school leaders' needs.

Components + Sequence



Setup: Initial engagement of DC's education leaders to gather input & research questions.

Identify key project questions, define data requests, gather previously completed work.



Situation Assessment: Analyze DC students' high school outcomes.

Identify when students fall off-track, why, and identify programs and schools that are able to get students back on-track.



Strategic Planning: Coordinate efforts & investments as a city.

Identify key strategies for prevention and intervention and the resources required to implement them.

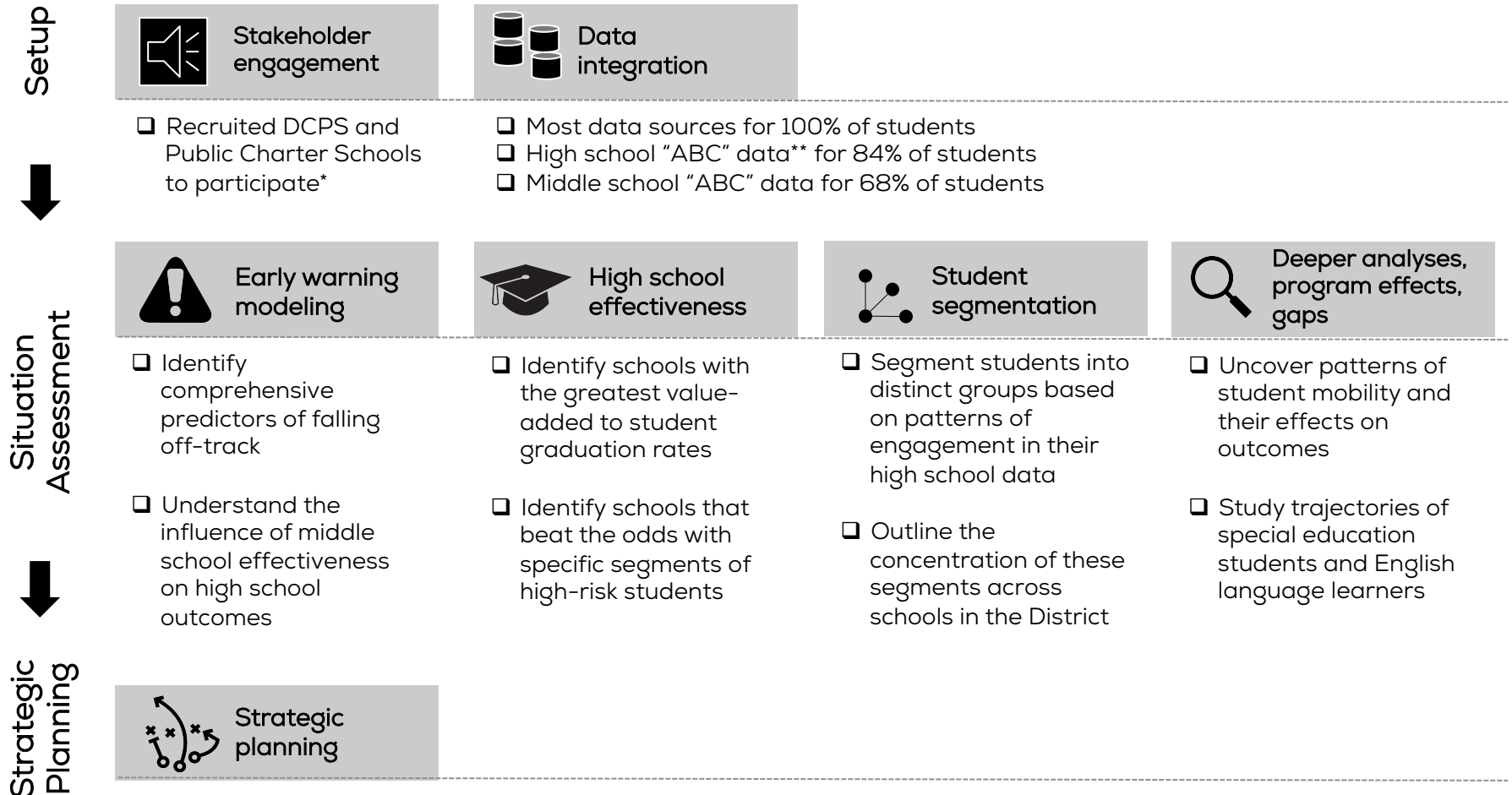


Improve outcomes.

Increase rates of on-time, 4-year graduation, Improve opportunities for off-track students to graduate in 5- or 6-years, and Identify opportunities to re-engage students who have dropped out.

PROJECT ROADMAP

The project involved a groundbreaking data collection effort, integrating rich longitudinal student information from OSSE, with LEA-provided data on attendance, behavior and course marks (ABC) from DCPS and several charter LEAs. While the dataset for this project is not perfect, it is the first of its kind in the District and is complete for a significant share of the student population. The project team acknowledges that the insights in this report were created with some analytic flexibility and that analyses involving “ABC” data are produced with varying levels of precision due to the incomplete nature of the data collected.

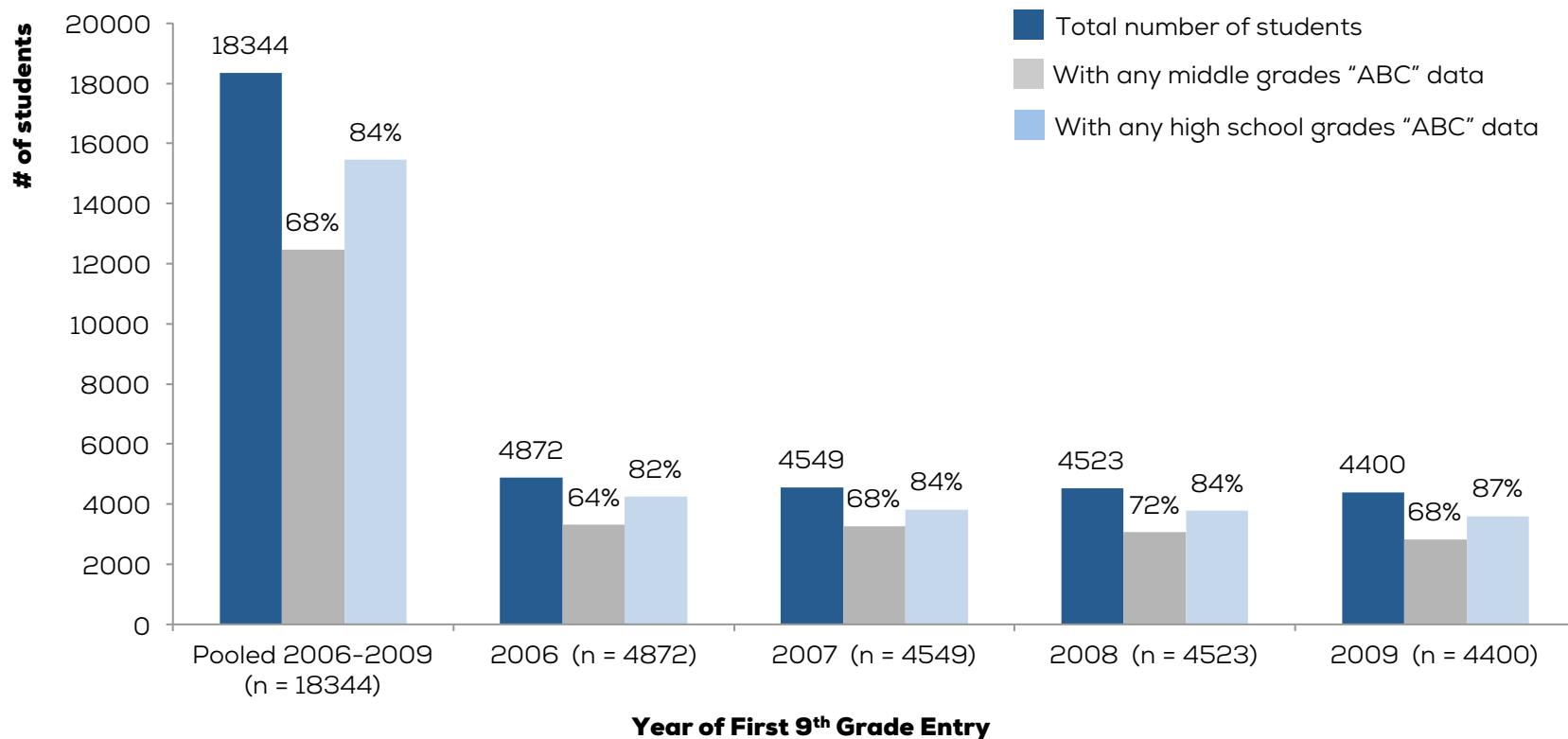


*Participating LEAs included: DC Public Schools, Perry Street Prep PCS, KIPP PCS, Maya Angelou PCS, and Cesar Chavez PCS

**ABC = attendance, behavior and course-taking/marks data

WHO IS IN OUR ANALYTIC SAMPLE?

Throughout this report, results are presented for **first-time 9th graders** from 2006 through 2009. These “cohorts” prior to 2006 had extremely limited data for key outcomes of interest and the 2009 cohort reached its 4-year on-time graduation mark in summer 2013, when this project began.



WHAT DID WE LEARN?

The key points below represent the project's most compelling and instructive findings. The underlying data are further detailed throughout the report and are accompanied by additional analyses.



Early warning modeling

- ❑ Middle schools matter. 26% of the total variation in students' high school outcomes is **observable by the end of grade 8**. (13% of the variation in student outcomes is attributable to **differences in middle school quality** and not individual student characteristics or high school variation.)
- ❑ 7 factors emerge as both **predictive** of off-time graduation and **comprehensive**, meaning that a significant share of the eventual dropout population exhibited that characteristic, by the end of grade 8: Special education status in grade 8, limited English proficiency in grade 8, overage at HS entry, basic or below basic performance on grade 8 CAS, suspensions before HS, absences and course failures before HS.



High school effectiveness

- ❑ Even **the city's highest performing students have wildly different odds of graduating on-time** based on their high school. There is a 70% point difference in the on-time graduation rates of top-quartile grade 8 students between the highest and lowest performing high schools.
- ❑ Status at grade 9 entry isn't destiny. **Some schools are beating the odds** both overall and with specific subsets of high-risk students (achieving graduation rates 14% points more than what's expected), **but these schools enroll only 9% of the highest-risk students**.
- ❑ **While more still needs to be known about what sets these schools apart, the most effective schools are able to recuperate more credits among off-track students** in a given year than other schools (5.1 versus 3.7 credits in year 2 of high school).



Student segmentation

- ❑ Credit accumulation isn't the only measure of high school engagement. **Students fall into 6 distinct segments**, each with unique needs and different chances of graduating in 4 years.
- ❑ **50% of the most extremely disengaged students are concentrated in just 7 schools**. These are students who fall off-track immediately and are more likely to have behavioral issues and system involvement.
- ❑ Among students who didn't graduate on-time but are still enrolled, **15% are within 5 credits of graduation**. Among all non-graduates (both those still enrolled and those that have dropped out), 8% are within 5 credits of graduation.

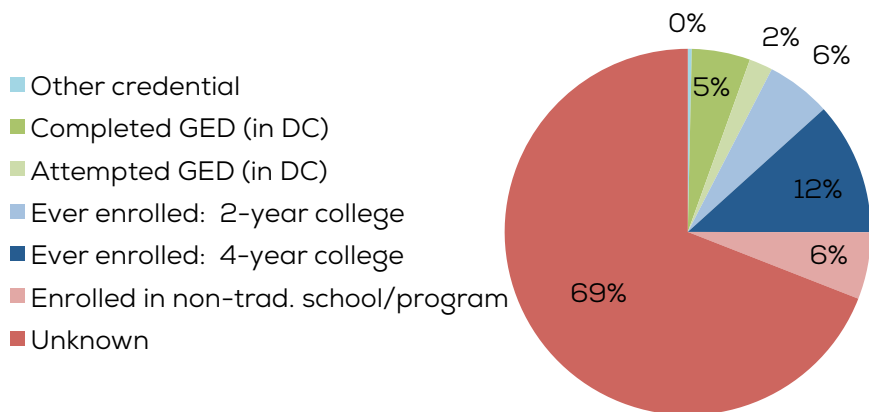
Finding: Only 30% of non-graduates have continued on in some way in our public education system*

This project focused on analyzing several key student outcomes among graduates: 4-year on-time graduation, 5+ year graduation and post-secondary enrollment. The green right-hand side of the figure below shows the distribution of these outcomes among diploma-recipients. The red left-hand side shows the outcomes of non-diploma recipients, including the year after which these students did not promote a grade level in high school and their eventual outcomes (eg, GED completion).

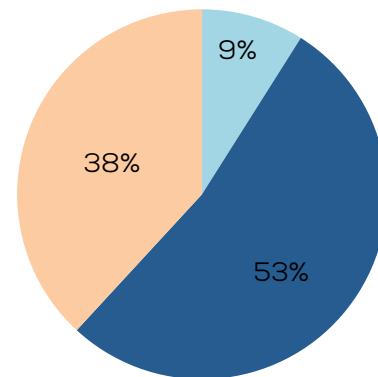


Approximately 30% of DC's non-graduates have participated or enrolled in some type of non-traditional program in the DC public education system.*

More than half of DC's graduates have gone on to enroll in 4-year postsecondary institutions. Another 9% have enrolled in 2-year postsecondary institutions.



- Ever enrolled: 2-year college
- Ever enrolled: 4-year college
- No college





Early warning modeling



Finding: Two students with divergent personal and academic profiles by grade 8 have wildly different chances of graduating on-time.

“Early warning” modeling is important for three reasons. First, it enables school leaders to identify students most at-risk of not graduating before they even set foot in high school. Second, when the magnitude of a given risk factor is considered, it allows policy makers to understand the potential impact of improvements on that factor citywide. Finally, it allows for a more fair comparison of high schools by adjusting for the risk profiles of their incoming 9th grade cohorts.



2 African American Students



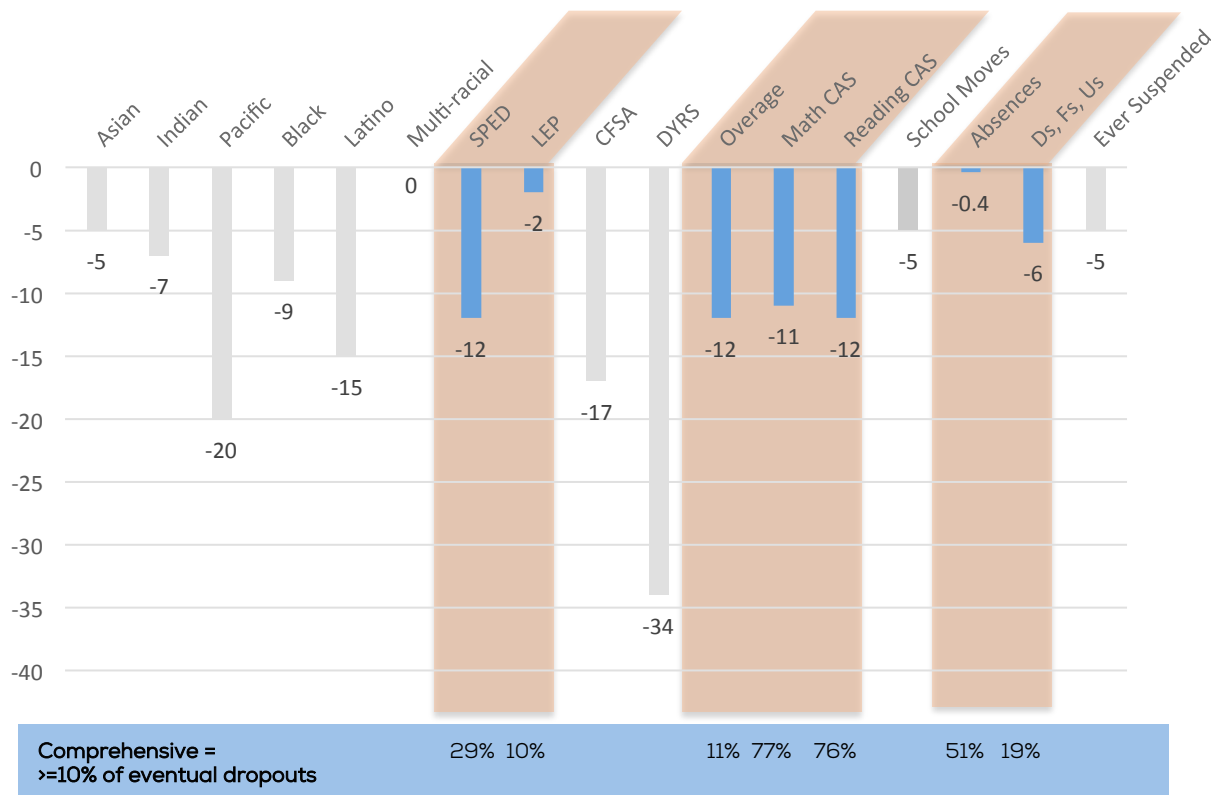
Student Characteristic	Student 1 (African American)	+/- Effect on Graduation Likelihood	Student 2 (African American)	+/- Effect on Graduation Likelihood
Baseline Graduation Rate	91%		91%	
Math Grade 8 CAS	Proficient	0%	Below Basic	-11%
Reading Grade 8 CAS	Proficient	0%	Basic	-12%
SPED	No	0%	Yes	-12%
LEP	No	0%	No	0%
CFSADYRS Involvement	No	0%	No	0%
Overage	No	0%	Yes	-12%
Grade 8 Absences	2	-1%	6	-2%
Grade 8 Fs	0	0%	1	-6%
Grade 6-8 Suspensions	0	0%	0	0%
Chance of Graduating On-Time	90%		36%	



Finding: 26% of the variation in students' high school outcomes is explained by the end of grade 8.

The table below shows the percentage decrease in students' probabilities of graduating on-time based on whether or not they exhibit a certain characteristic. These results are presented both for "All Students," which includes all students in the 2006-2009 cohorts and "GP Only," which are limited to students who set foot in a Graduation Pathways-participating LEA. These latter results "control" further for the effects of "ABC" factors.

Comprehensive Predictors



Findings

Total variance explained. About a quarter (26%) of the variation on-time graduation rate is explained by pre-high school student characteristics.

School effects. School-level factors account for 40% of the variation in graduation outcomes: 26% from high school quality and 13% from middle school quality.

Key predictors. Seven factors emerge as both predictive ($\beta \geq 0.05$) and comprehensive ($\geq 10\%$ of eventual dropouts):

- SPED in grade 8
- LEP in grade 8
- Overage at HS entry
- Math DC CAS grade 8
- Reading DC CAS grade 8
- Total course failures in grade 8
- Total absences in grade 8

*White students are included in the model as the reference group.

Finding: 26% of the variation in students' high school graduation outcomes is explained by the end of grade 8.

The table below shows the percentage point decrease in students' probabilities of graduating on-time based on whether or not they exhibit a certain characteristic. These results are presented both for "All Students" and "GP Only", which are limited to students who set foot in a Graduation Pathways-participating LEA. These latter results control further for the effects of "ABC" factors.

Predictors	Comprehensiveness		Additional Findings
	All Students	GP Only*	
Asian (0,1)	-2	-5	1%
Indian (0,1)	-21***	-7	0%
Pacific (0,1)	-9	-20	0%
Black (0,1)	-8***	-9***	2%
Latino (0,1)	-15***	-15***	7%
Multi (0,1)	0	0	0%
<p>Relative to white students*</p>			
SPED in grade 8 (0,1)	-11***	-12***	29%
LEP in grade 8 (0,1)	+3	-2	10%
CFSA (0,1)	-23***	-17.**	2%
DYRS (0,1)	-49***	-34***	7%
Overage at 9th grade (0,1)	-25***	-12***	11%
Math grade 8 CAS B/BB (0,1)	-15***	-11***	77%
Reading grade 8 CAS B/BB (0,1)	-16***	-12***	76%
Per school move (6-8)	-1	-5***	24% (ever moved)
Per grade 8 absence		-0.4***	51% (absent 7+ days)
Per grade 8 D, F or U		-6*	19% (ever failed math or Eng.)
Ever suspended gr 6-8 (0,1)		-5**	4%
Constant	93***	99***	
Observations	10,283	6,289	
R-squared	0.158	0.261	

% of all students who eventually dropped out who were special education in 8th grade

Students who were special education in 8th grade were 12% points less likely to graduate on-time than similar non-special education students.

Additional Findings

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- Overage at HS entry
- Math DC CAS grade 8
- Reading DC CAS grade 8
- Total course failures in grade 8
- Total absences in grade 8

Predictive factors have a statistically significant effect of 5% points or more on on-time graduation likelihood and comprehensive factors account for 10% or more of the eventual dropout population.

*** p<0.01, ** p<0.05, * p<0.1

*White students are included in the model as the reference group.

First-time 9th graders 2006–2009. Results obtained from linear probability estimation (OLS) of on-time graduation. Variance decomposed in follow-up multi-level model. For proportions among dropouts, total absences coded as >=7; total failures coded as ever failing math or English; total school moves coded as ever moving. Note that non-academic indicators, such as free/reduced price lunch status, are not included due to data quality issues for the years and cohorts studied. Even if they were available, they are likely highly correlated with other predictors in our early warning model.



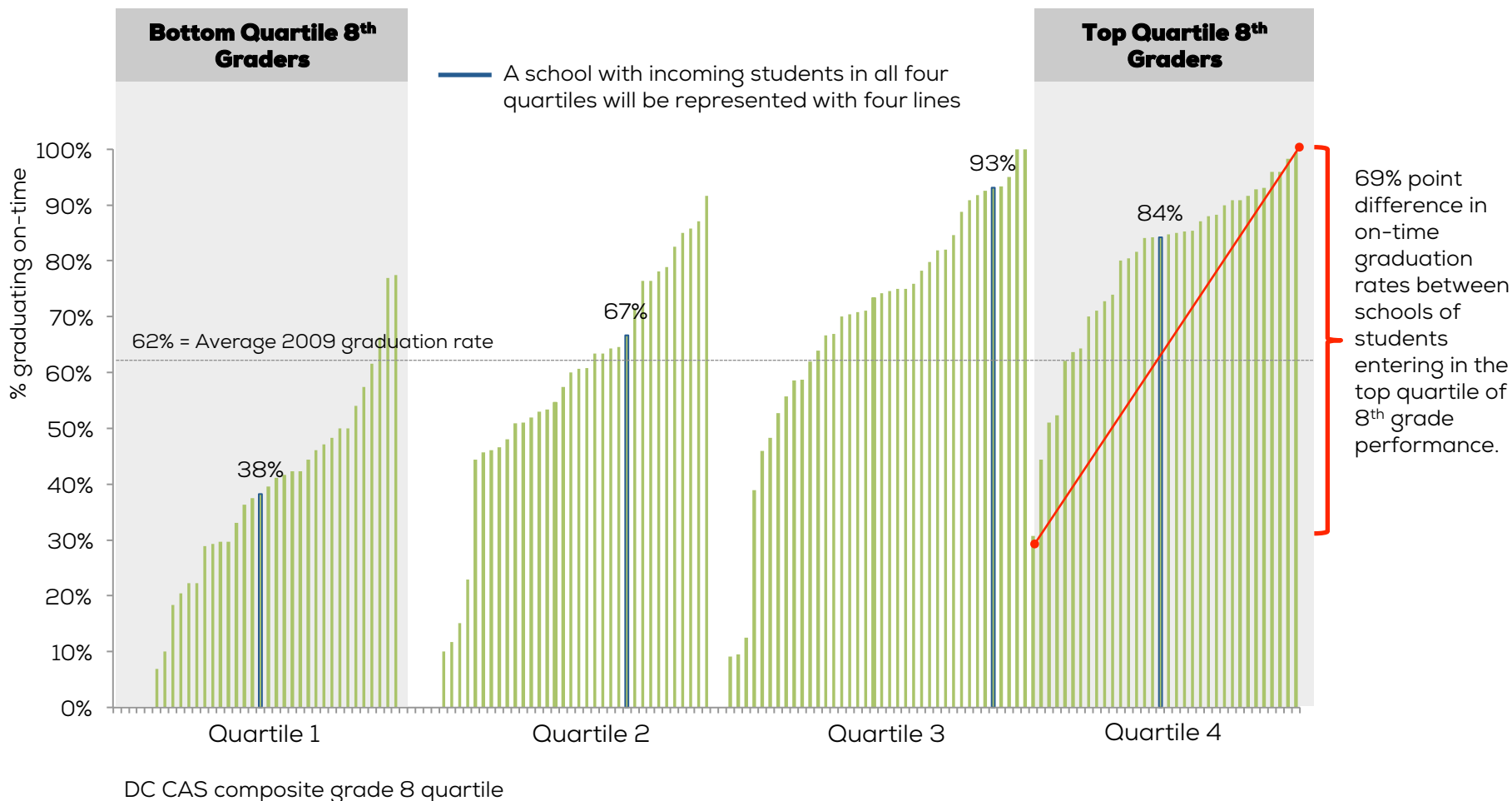


High school effectiveness



Finding: Even when adjusting for incoming 9th graders' performance, there is significant variation between schools' rates of on-time graduation.

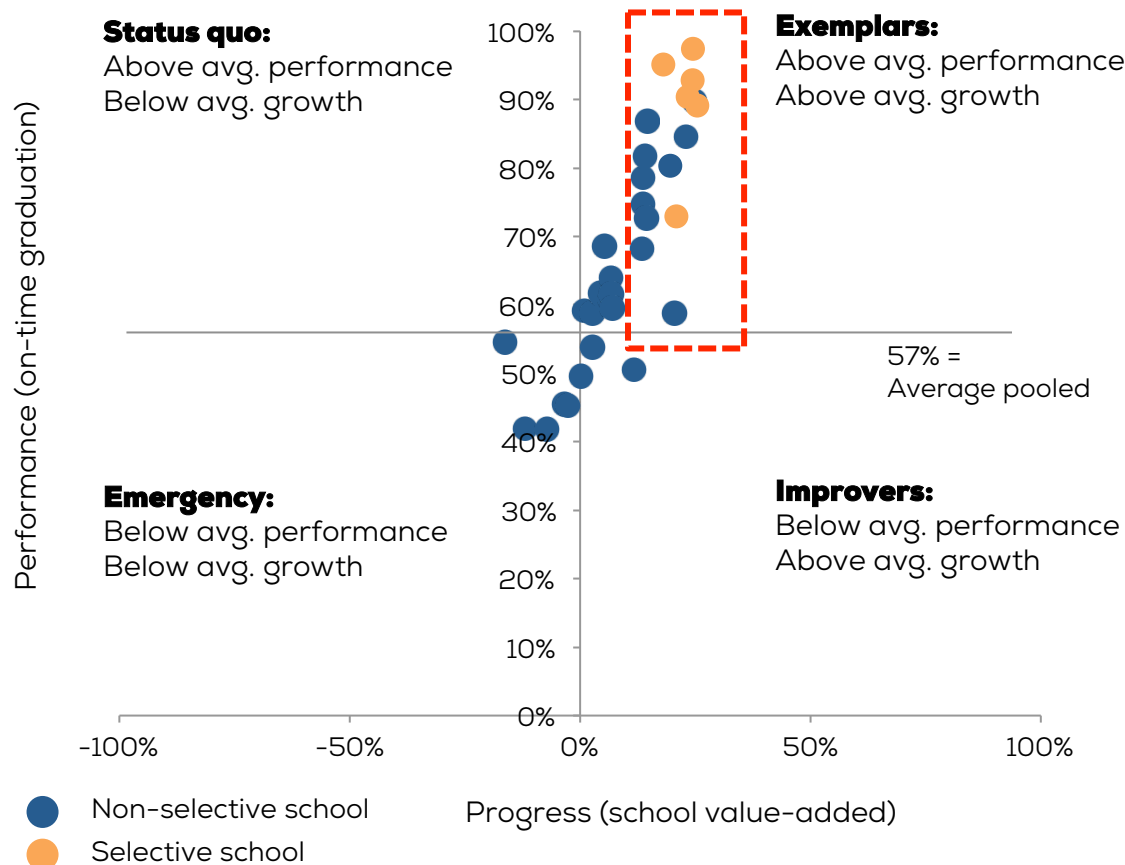
While students' middle grades performance matters a lot, it's not destiny. The figure below shows that even among the highest performing students in the city at the end of middle school (quartile 4 8th graders on the right-hand side), there are wildly different odds of graduating based on where students go to high school. Fortunately, some schools are able to graduate the lowest performing students at rates that exceed the district average for all students (see quartile 1 8th graders on the left-hand side.)



Finding: Adjusting for incoming students' characteristics, a mix of selective, charter and traditional high schools are helping students beat the odds.

It's not enough to simply compare two high schools' on-time graduation rates to determine which school has better outcomes for students. Instead, the figure below shows the "value-added" or "school effect" of each DC high school in raising students' odds of graduating on-time accounting for their fixed and pre-high school characteristics (per the early warning model). Importantly, only 9% of "high risk" students (those with probabilities of graduating less than 40% by the end of middle school) matriculate into a high value-added high school.

Graduation rate vs. graduation value-added, by school



Schools with ≥ 14% value added rates

School (type, % hi risk)	Value-Added	Pooled Grad. Rate
School 2 (selective, 4%)	25%	89%
School 4 (charter, 0%)	25%	90%
School 3 (selective, 0%)	25%	97%
School 1 (selective, 0%)	24%	93%
School 5 (selective, 2%)	23%	90%
School 8 (charter, 14%)	23%	85%
School 6 (selective, 9%)	21%	73%
School 7 (traditional, 29%)	20%	59%
School 9 (charter, 10%)	20%	80%
School 10 (selective, 0%)	18%	95%
School 14 (charter, 0%)	17%	80%
School 13 (charter, 7%)	15%	87%
School 11 (charter, 19%)	14%	73%
School 16 (charter, 0%)	14%	82%
School 12 (traditional, 9%)	14%	79%
School 15 (charter, 8%)	14%	75%

This school's value-added means that its actual graduation rate is 14 points higher than predicted.

Finding: The schools that best serve high-risk students of various backgrounds enroll very few of them. (1 of 2)

The figures below show the on-time and 5+ year graduation rates, as well as GED completion rates, of students exhibiting various risk factors that were found to be significant in the project's "early warning" work. In every case, a small subset of schools are moving at-risk students to graduation rates that exceed the citywide average for all students. In most cases, however, these schools have relatively few students with a given risk factor enrolled.

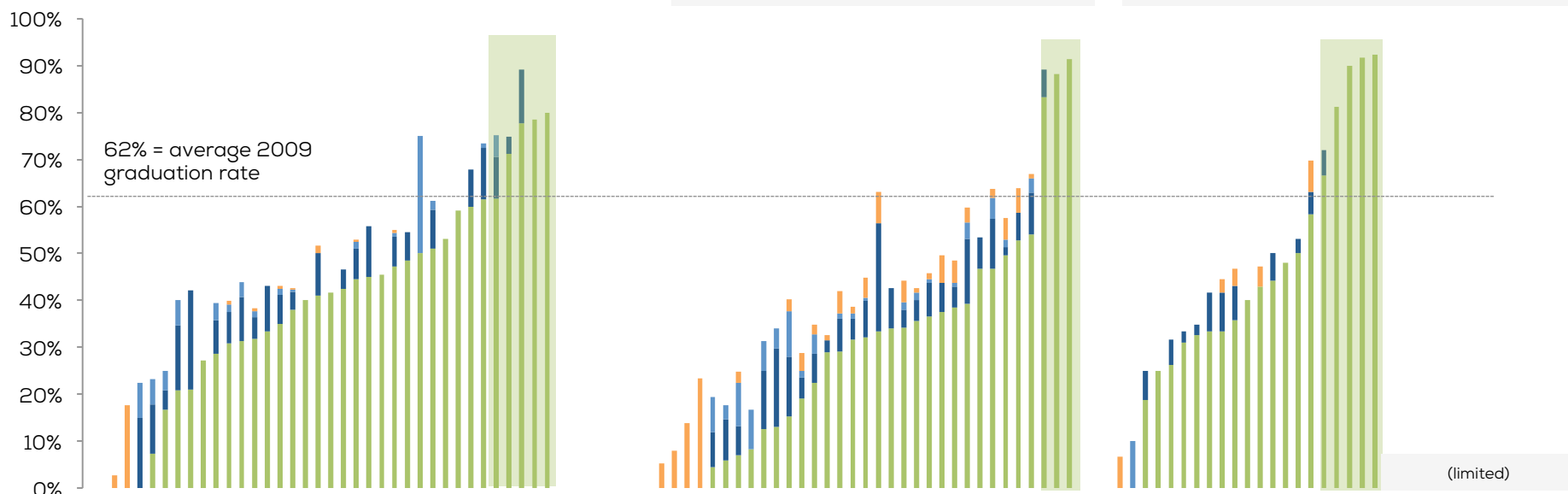
Bottom Grade 8 DC CAS Quartile

3+ Grade 8 Ds, Fs & Us

Suspended in MS

Limited to Grad Pathways participants

Limited to Grad Pathways participants



School (% with risk factor)	4yr	5yr	6yr	GED
School 5 (3%)	80%	0%	0%	0%
School 2 (8%)	79%	0%	0%	0%
School 8 (12%)	78%	11%	0%	0%
School 9 (10%)	71%	4%	0%	0%
School 18 (20%)	62%	9%	5%	0%

School (% with risk factor)	4yr	5yr	6yr	GED
School 13 (26%)	91%	0%	0%	0%
School 2 (10%)	88%	0%	0%	0%
School 8 (6%)	83%	6%	0%	0%

School (% with risk factor)	4yr	5yr	6yr	GED
School 2 (6%)	100%	0%	0%	0%
School 5 (3%)	91%	0%	0%	0%
School 1 (2%)	90%	0%	0%	0%
School 13 (17%)	80%	0%	0%	0%
School 9 (2%)	71%	7%	0%	0%

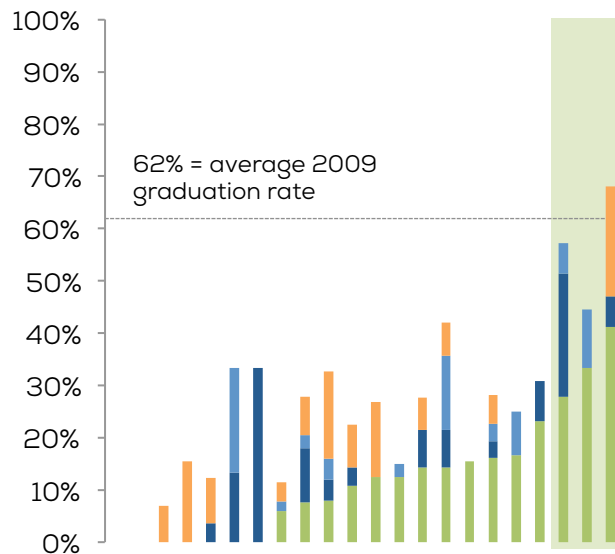
- 4-Year On-Time Graduation
- 5-Year Graduation
- 6+ Year Graduation
- GED Completion

Highlighted schools are beating the citywide overall graduation rate for all students with their high-risk students. First-time 9th graders 2006-2009.



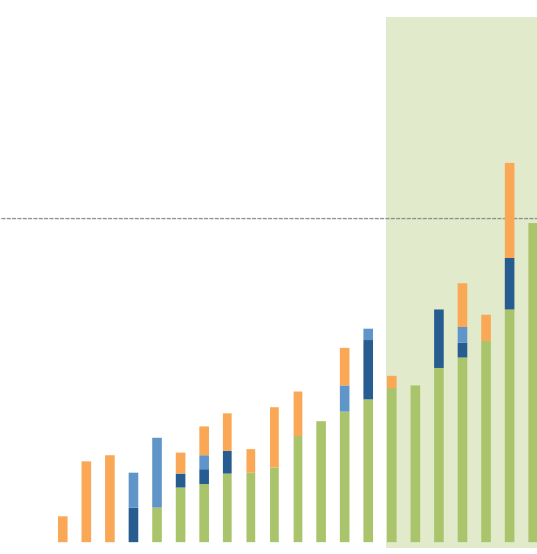
Finding: The schools that best serve high-risk students of various backgrounds enroll very few of them. (2 of 2)

Agency Involvement



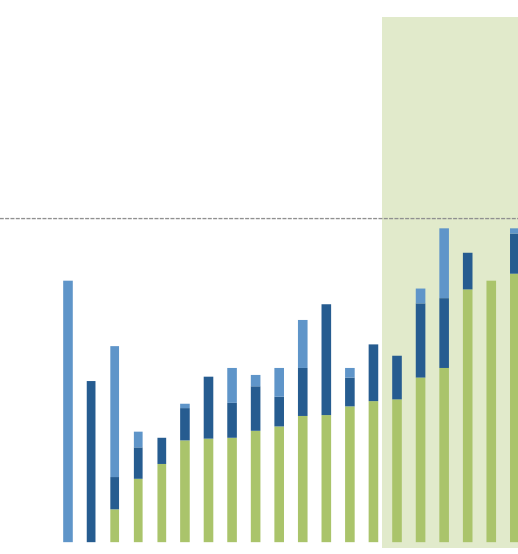
School (% with risk factor)	4yr	5yr	6yr	GED
School 9 (2%)	41%	6%	0%	21%
School 28 (3%)	33%	0%	11%	0%
School 20 (3%)	28%	24%	6%	0%

Overage at Entry



School (% with risk factor)	4yr	5yr	6yr	GED
School 9 (2%)	61%	0%	0%	0%
School 14 (6%)	44%	10%	0%	18%
School 12 (1%)	38%	0%	0%	5%
School 23 (5%)	35%	3%	3%	8%
School 17 (5%)	33%	11%	0%	0%
School 33 (4%)	30%	0%	0%	0%
School 22 (6%)	29%	0%	0%	2%

SPED Level 3/4 in Grade 9



School (% with risk factor)	4yr	5yr	6yr	GED
School 8 (4%)	100%	0%	0%	0%
School 9 (2%)	67%	5%	0%	0%
School 17 (60%)	51%	8%	1%	0%
School 11 (10%)	50%	0%	0%	0%
School 30 (11%)	48%	7%	0%	0%
School 31 (10%)	33%	13%	13%	0%

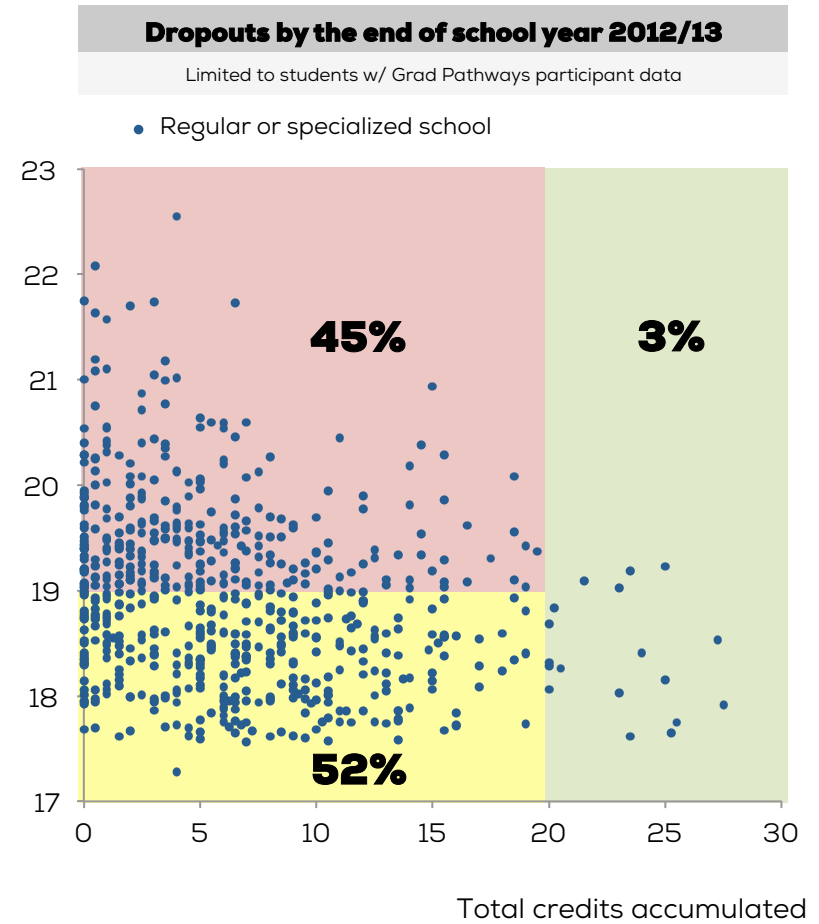
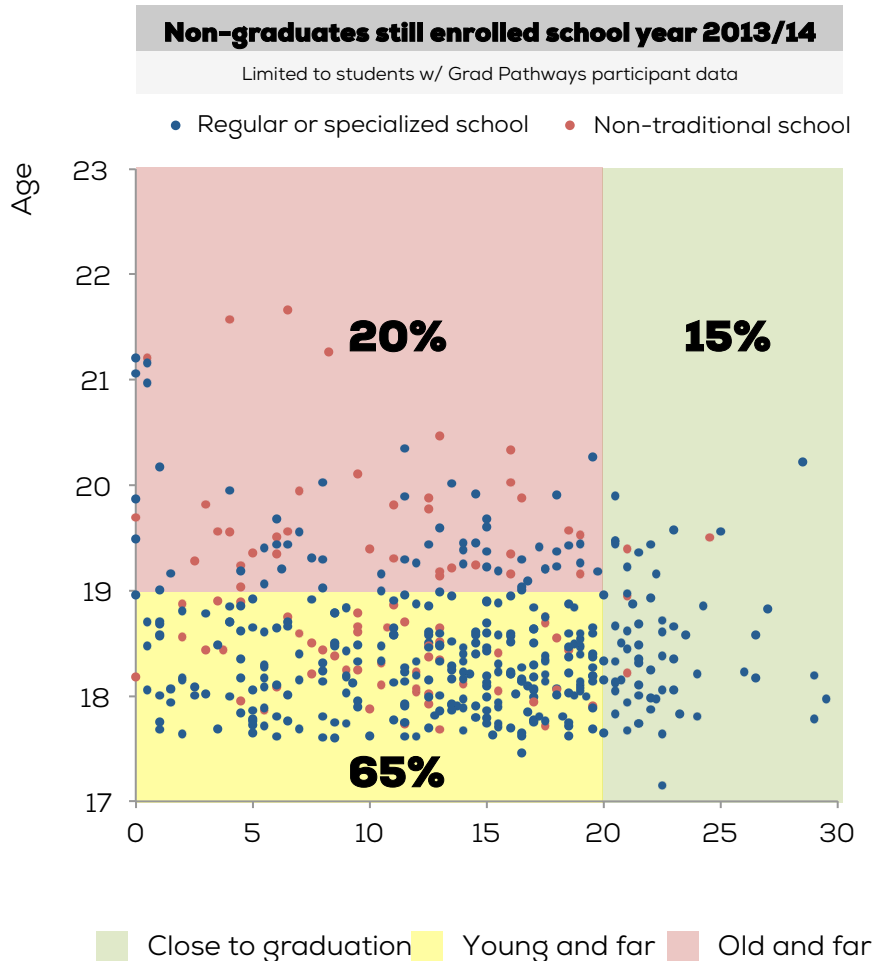
- 4-Year On-Time Graduation
- 5-Year Graduation
- 6+ Year Graduation
- GED Completion

Highlighted schools are graduating their high-risk students at twice the rate of the median school. First-time 9th graders 2006-2009.



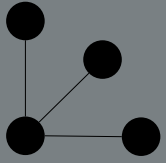
Finding: Some off-track and dropped-out students are close to graduation, but the vast majority are 5 or more credits away from the minimum*

The figures below show the age and credit accumulation of students who started high school in the fall of 2009 **and did not graduate on-time in the summer of 2013**. While 15% of all still enrolled non-graduates were within 4 credits or less of the District's 24 credit minimum, they were missing key requirements.



First-time 9th graders of 2009.
*24 credits are required to graduate.



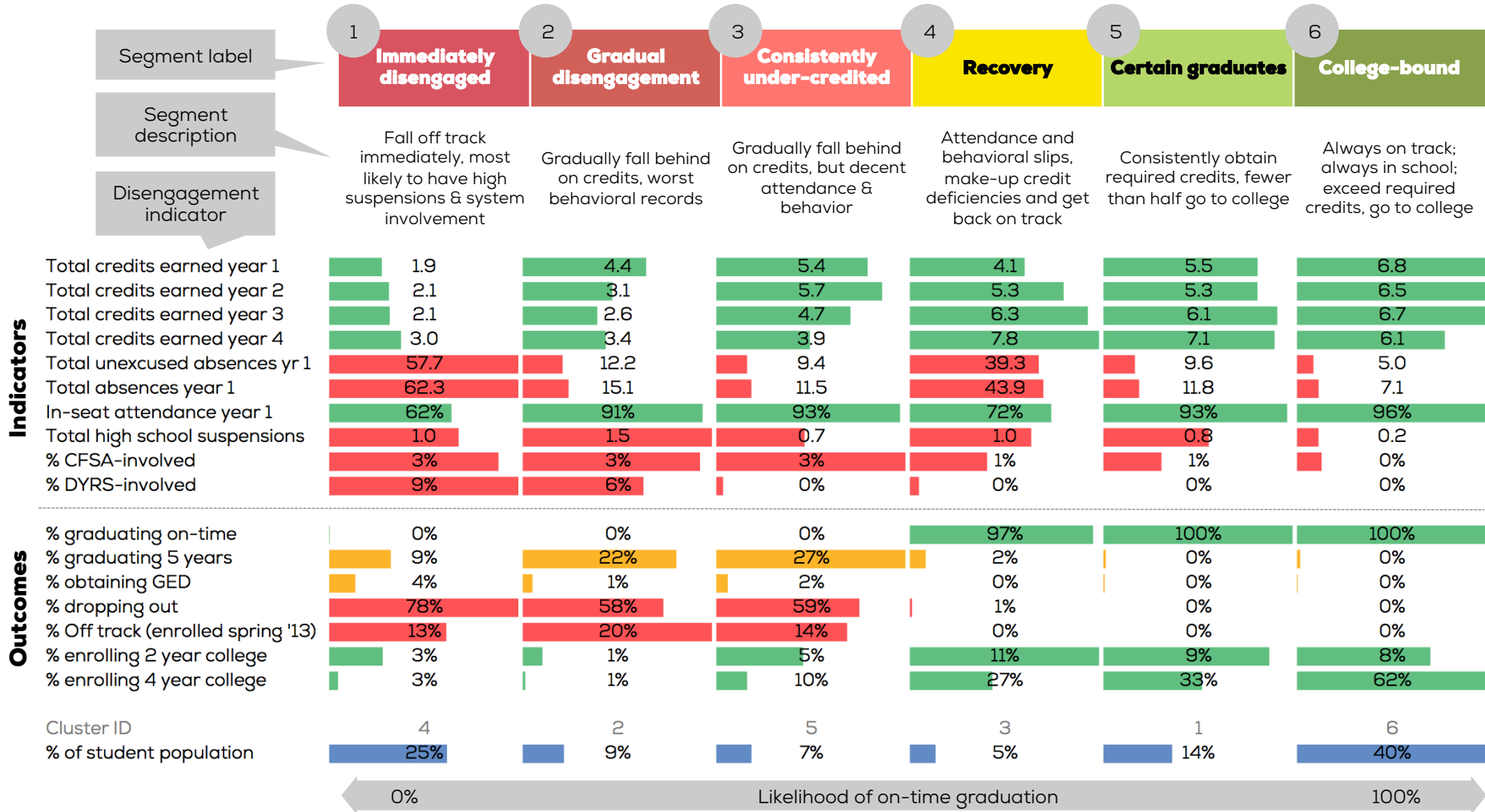


Student segmentation



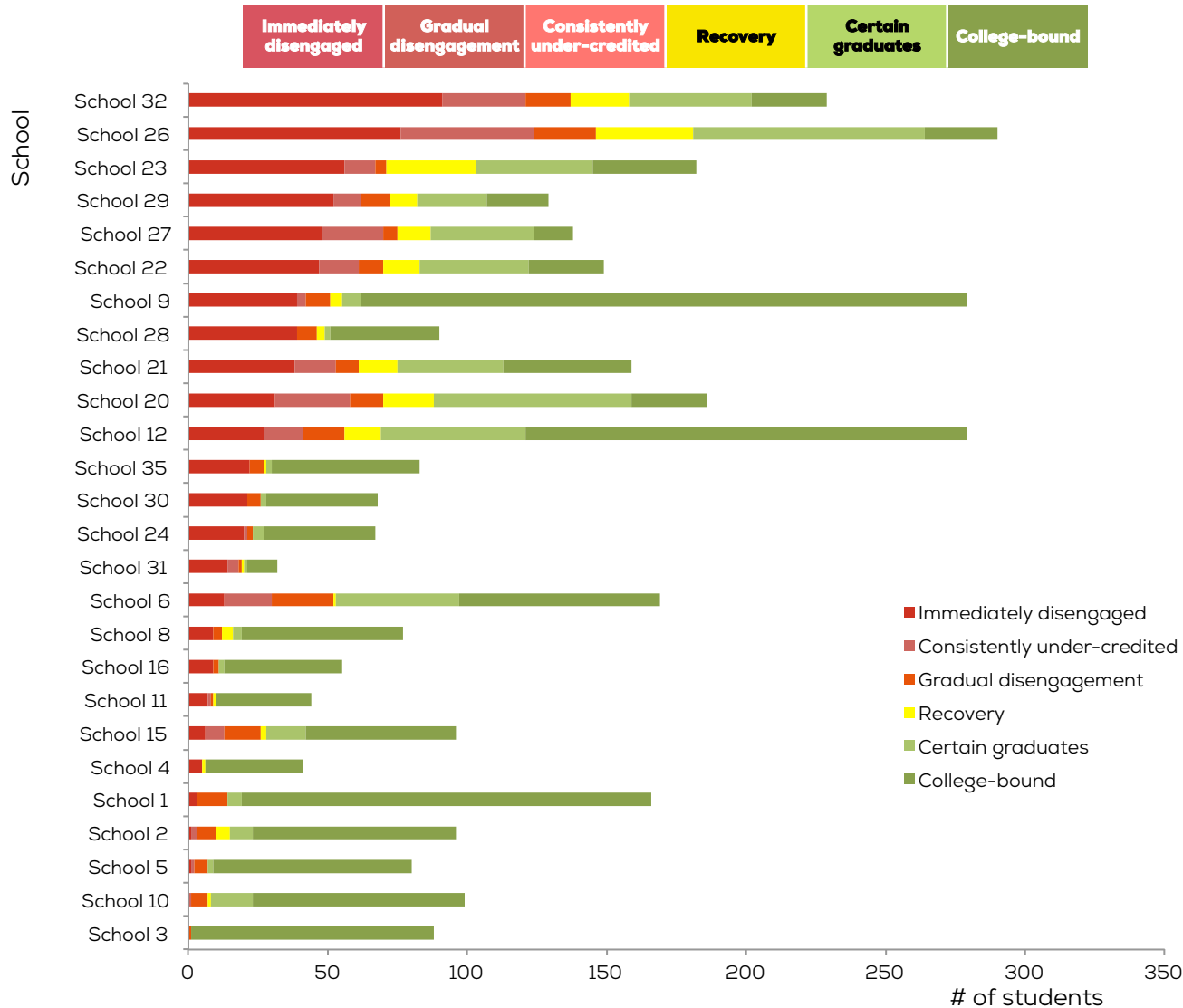
Finding: Fully 25% of high school students are immediately disengaged by the end of their first year. (1 of 2)

Whereas "early warning" analyses sought to identify those factors most predictive of students' high school outcomes based on their middle grades characteristics, the figure below details the six distinct experiences of students once they enter high school. Each column represents a statistically distinct student segment and the rows beneath compare those segments' averages on various high school characteristics and key outcomes.



Finding: 50% of immediately disengaged students are concentrated in just 7 schools. (2 of 2)

The distributions below reflect the volume of students from the 2008 first-time 9th grade cohort that attended each of the city's DCPS and charter high schools. (Note that non-traditional schools are not included in this distribution.)



"Uncontrolled" model with no covariates. First-time 9th graders of 2008.





Other analyses

Exemplar School Characteristics

Grade 8 Attendance, Course Failures, and DC CAS Scores

Middle School "Value-Added"

School Mobility

Students with Disabilities and Limited English Proficiency

Non-Traditional High Schools

Postsecondary Entry



Finding: Compared to other schools, the most effective schools confer more than 1 additional credit per year in years 2 + 3 of HS to off-track students.

While the project team has not yet conducted a qualitative comparison of high value-added schools (“exemplars”) and other schools, it’s clear that these schools confer more than 1 additional credit to off-track students in years 2 and 3 of high school compared to other schools. Students in these schools also have significantly lower absences in the first year of high school compared to students in other schools.

	Exemplar	Other	Stat Sig?
Mean credits earned in year 1	5.8	4.1	✓
Mean credits earned in year 2 (on-track students)	6.7	5.4	✓
Mean credits earned in year 2 (off-track students)	5.1	3.7	✓
Mean credits earned in year 3 (on-track students)	6.4	5.6	✓
Mean credits earned in year 3 (off-track students)	5.6	4.2	✓
Mean credits earned in year 4 (on-track students)	5.9	5.2	✓
Mean credits earned in year 4 (off-track students)	6.3	5.0	✓
Average number of suspensions (year 1)	0.60	0.96	✓
Average in-seat attendance (year 1)	94%	84%	✓
Average total absences (year 1)	9.5	26.2	✓
Average unexcused absences (year 1)	7.0	23.4	✓
Percent overage at high school entry	2%	5.7%	✓
Percent enrolling in 2-year college (off-track students)	9.3%	5.4%	✓
Percent enrolling in 4-year college (off-track students)	25.4%	9.9%	✓

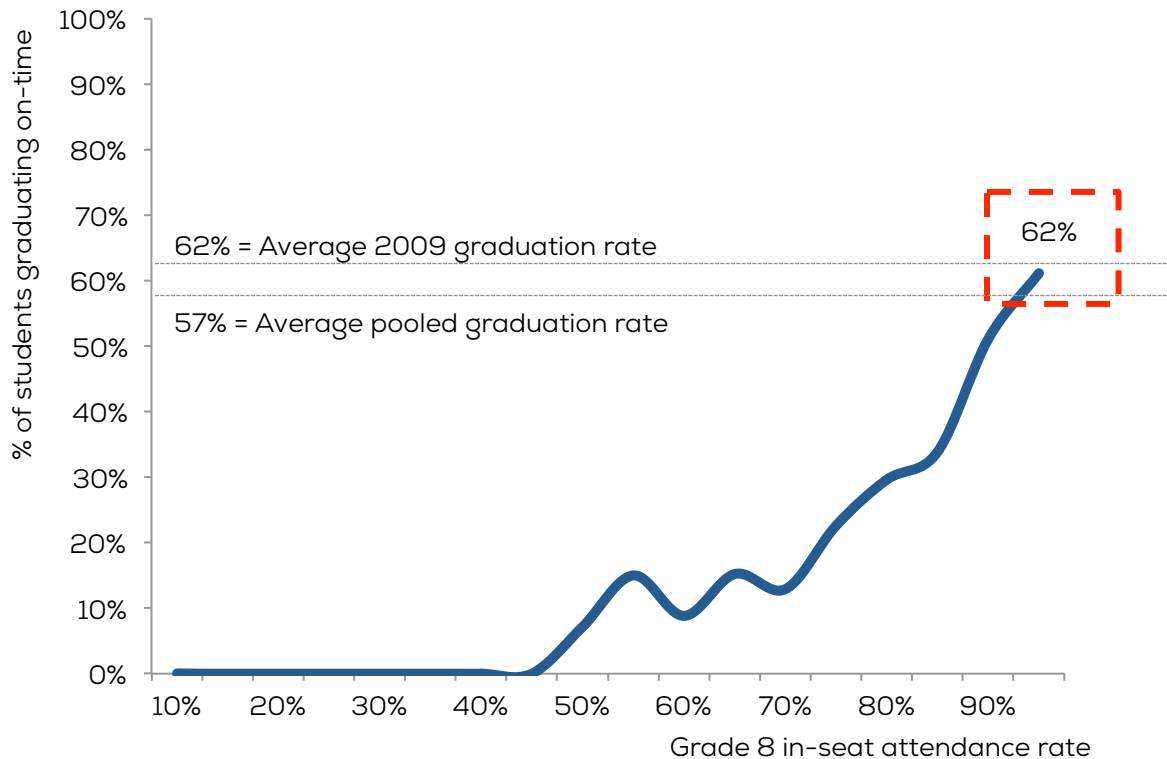
2009 first-time 9th graders

“Off track” refers to students with fewer than 6 credits by the end of year 1



More detail on **grade 8 attendance rates and absence totals**

Even students with high rates of grade 8 seat time graduate on-time only 61% of the time. Students with 7 or more total absences or 6 or more unexcused absences graduate on-time at a rate of only 55%.



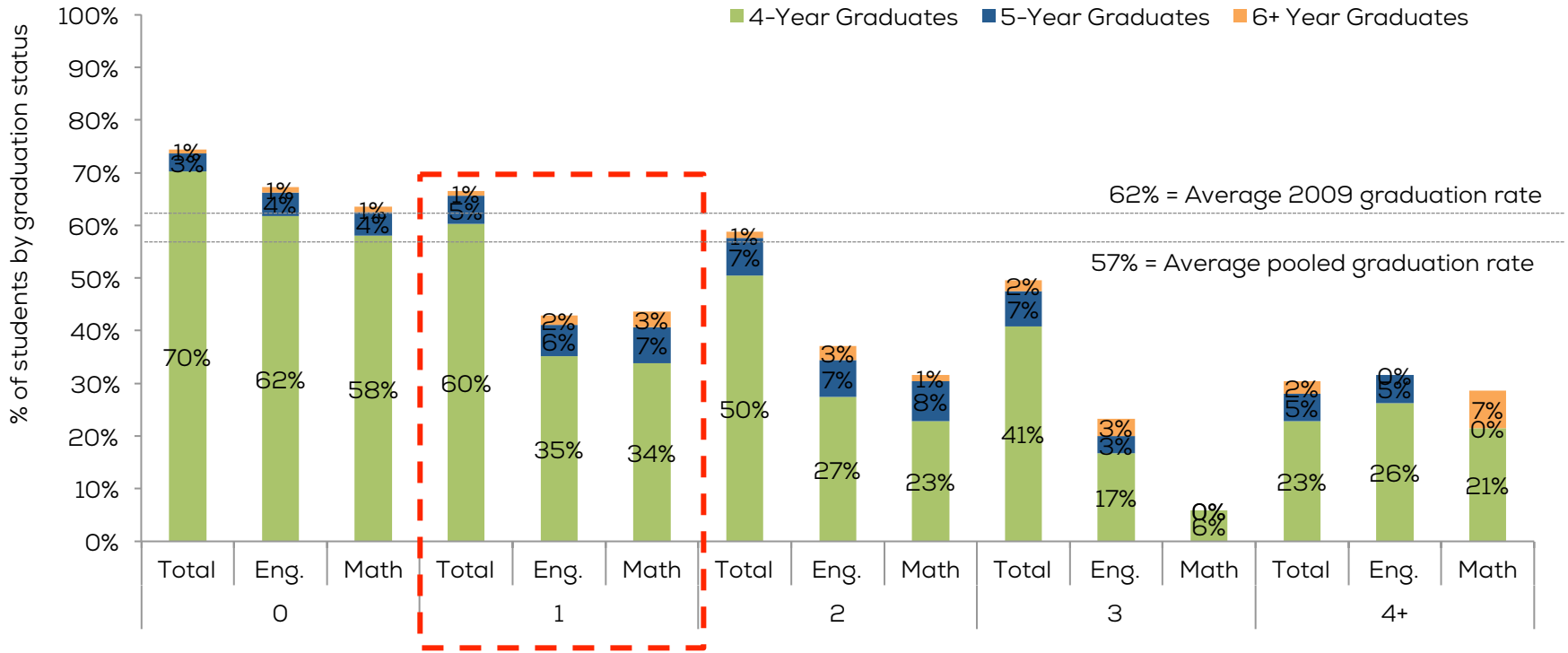
4-Year Graduation Rate by Total Accumulated Days Absent

Days	All Absences	Unexcused Absences
0	58%	62%
1	68%	67%
2	66%	66%
3	61%	58%
4	62%	58%
5	61%	58%
6	68%	55%
7	55%	52%
8	58%	51%
9	56%	53%
10	57%	46%
11	54%	45%
12	51%	42%
13	55%	43%
14	47%	40%
15	46%	38%
16	42%	38%
17	44%	36%
18	49%	41%
19	45%	41%
20	41%	23%



More detail on grade 8 course failures

Students with just one course failure in grade 8 have an on-time graduation rate of 60%. If this failure is in either English or math, on-time graduation rates are closer to 35%.



Total accumulated Ds, Fs & Us* in grade 8 - overall and in English and math

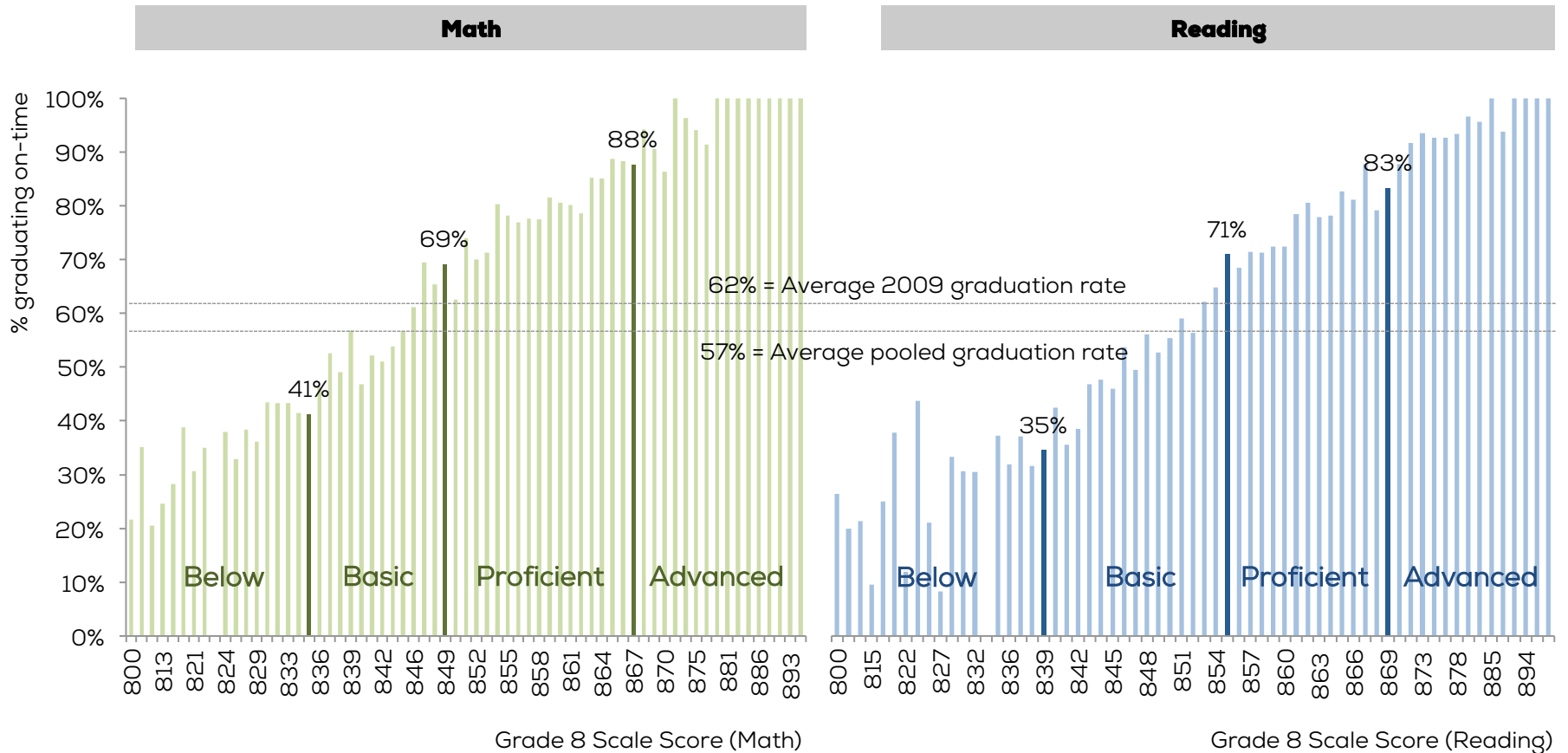
First-time 9th graders 2006-2009 .

*U grades represent unsatisfactory or incomplete marks for students.



More detail on grade 8 DC CAS performance

Most students entering grade 9 with basic or below basic proficiency in reading or math graduate at a significantly lower rate than average.

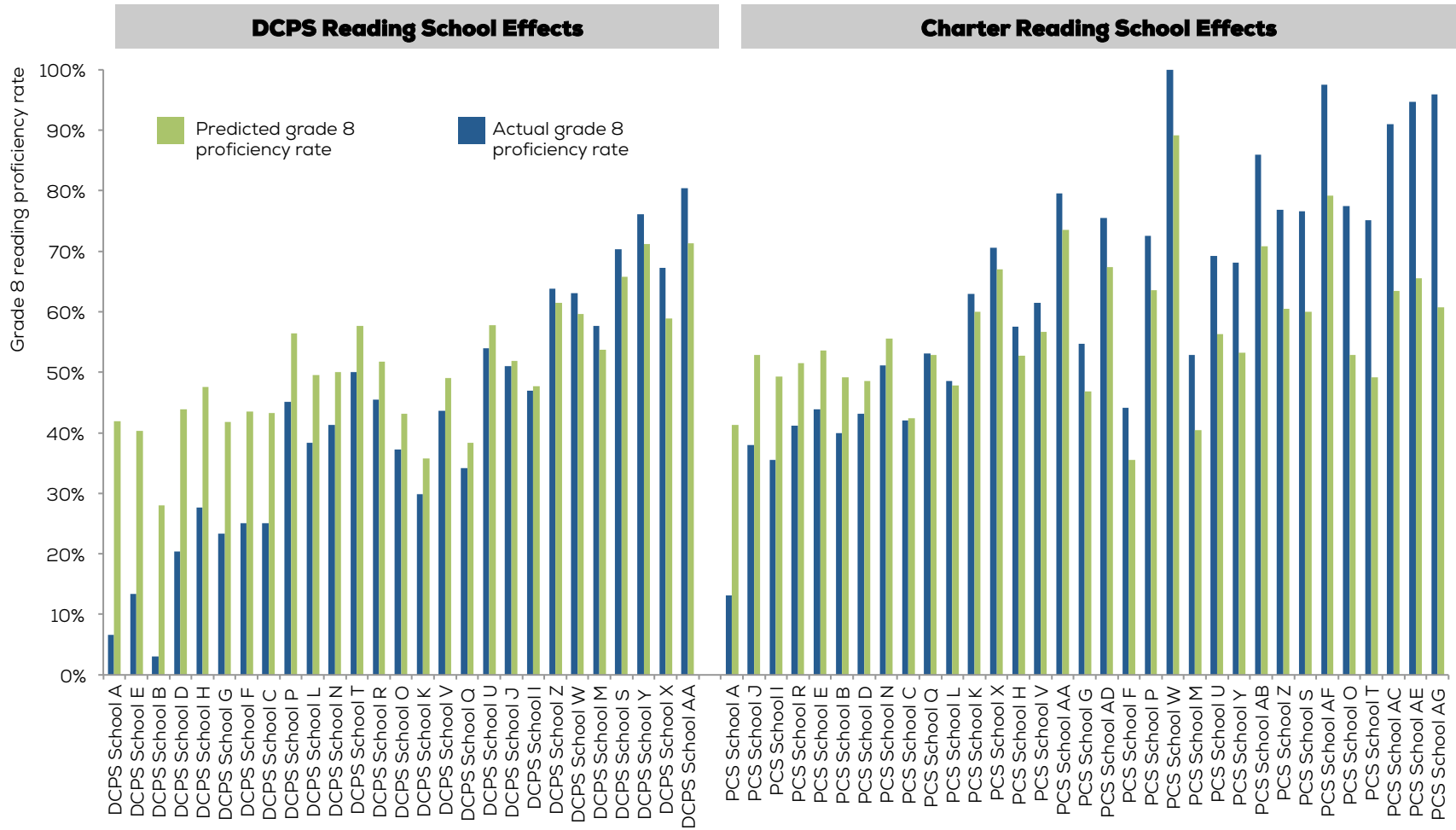


Results include all students.
First-time 9th graders 2006-2009.



More detail on middle school effects

Disparities in students' grade 9 odds of graduating on-time 4 years later are driven by extreme variation in middle schools' effectiveness. The figures below show the differences between schools' predicted 8th grade proficiency rates, adjusted for the academic achievement levels of rising 6th graders, and their actual proficiency rates.



Sample not limited to GP dataset.

Estimates based on multi-level random effects model predicting same-subject grade 8 proficiency controlling for grade 5 scale score..

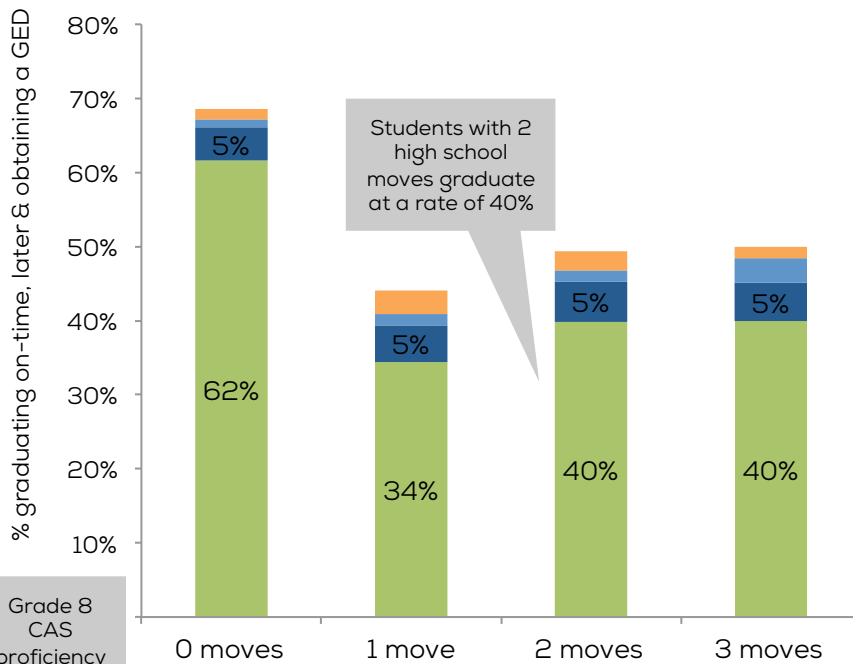


More detail on high school student mobility

Mobile students are less likely to graduate, but they are also lower performing on grade 8 DC CAS overall. Adjusting for differences in CAS performance, each high school change reduces students' chances of graduating on-time by 10 percentage points on average.

Mobile students are less likely to graduate and this pattern holds even after adjusting for DC CAS performance.

After adjusting for student performance, each high school change lowers students' chances of graduating on-time by 10 percentage points, on average.*



Grade 8 CAS proficiency

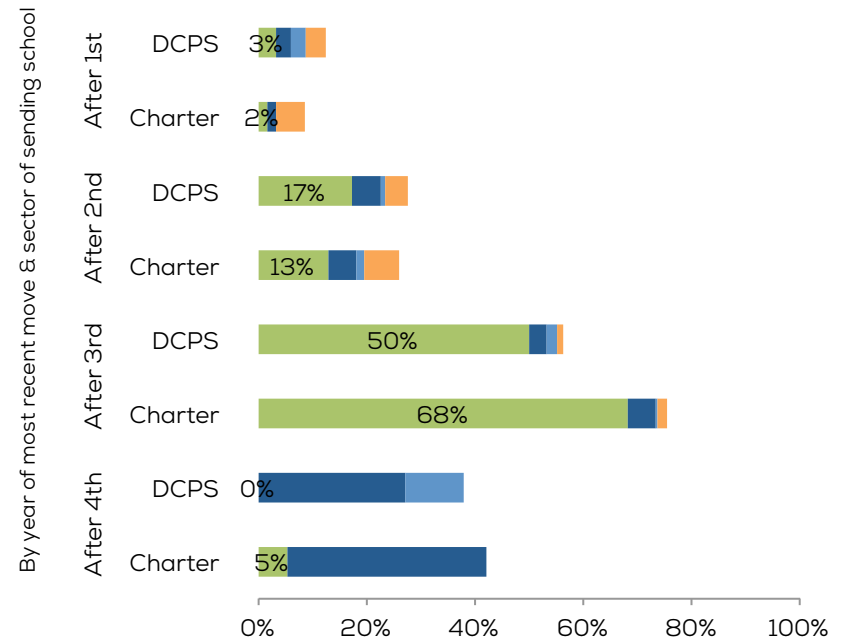
Math
Reading

Math	43%	28%	25%	25%
Reading	43%	31%	31%	20%

% of students

% of students	88%	9%	3%	<1%
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Among mobile students, those switching in the 3rd year of high school have the highest likelihood of graduating.

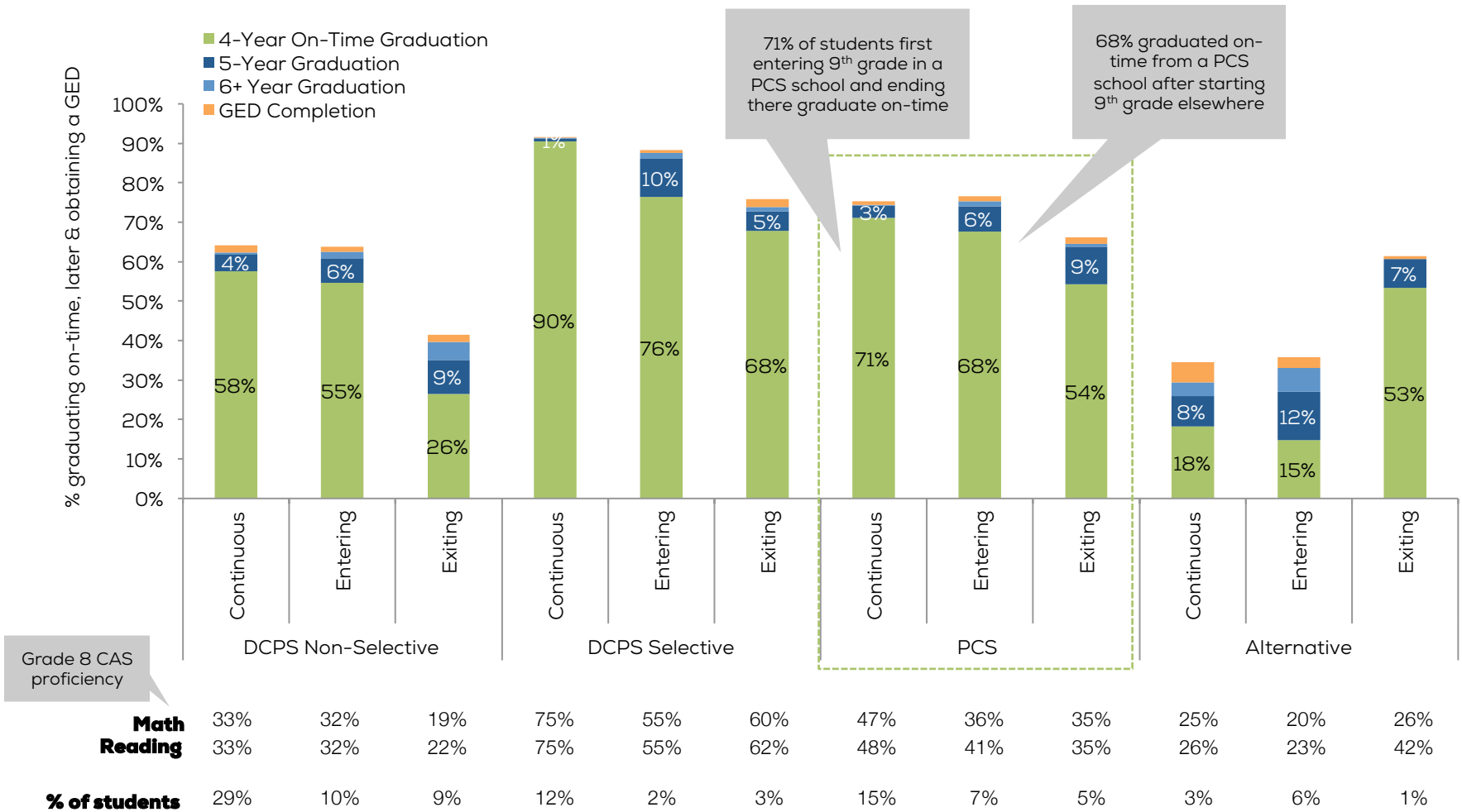


4-Year On-Time Graduation
5-Year Graduation
6+ Year Graduation
GED Completion



More detail on student mobility

30% of DC students don't start and end high school in the same school. The figure below outlines the graduation and GED outcomes of students based on their starting high school and whether or not they stay enrolled in that school, enter from another school, or exit the school.

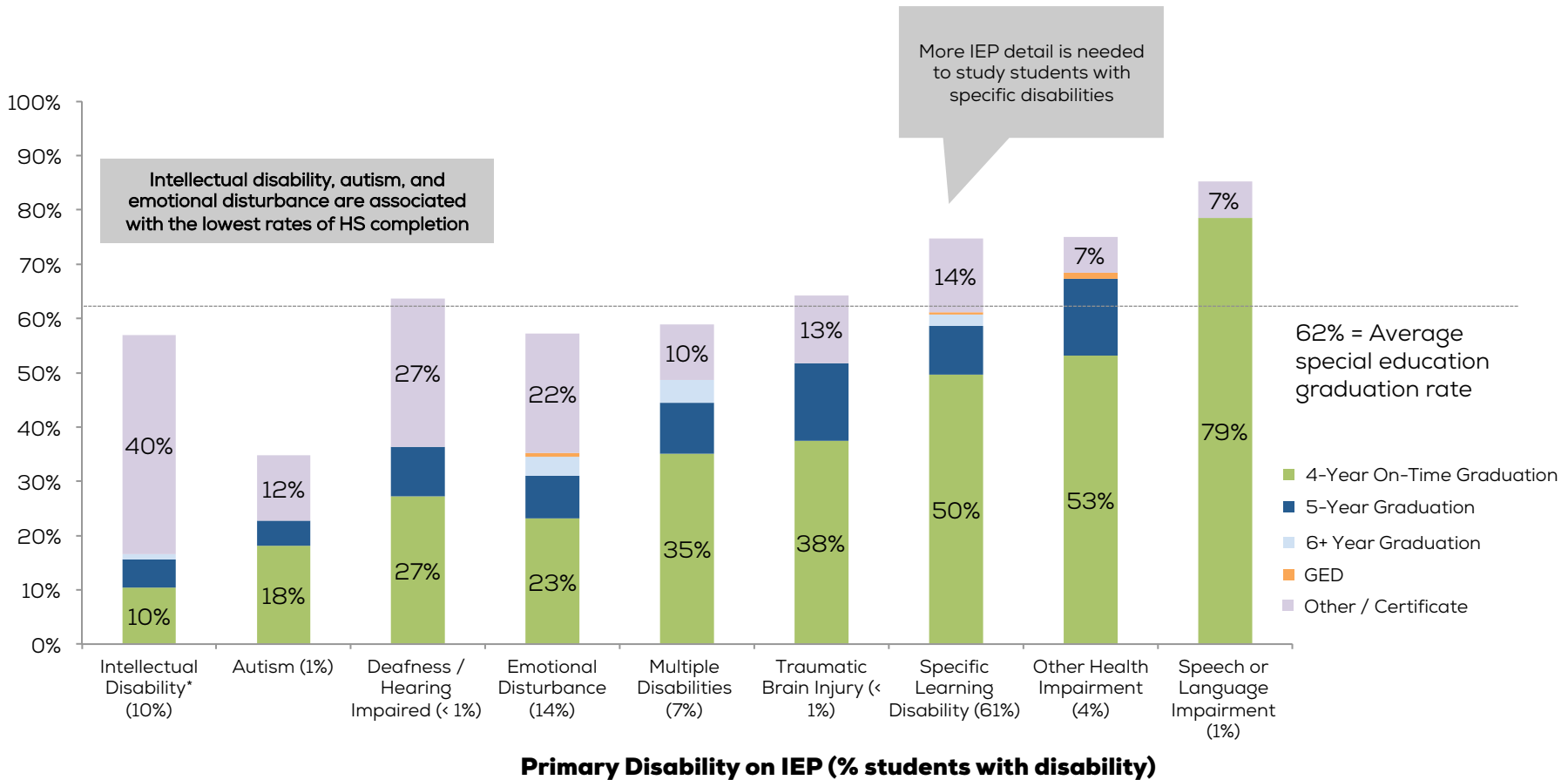


Dropouts are included in analyses based on schools of enrollment prior to dropping out. They are not necessarily counted as 'exiting'.
First-time 9th graders 2006-2009.



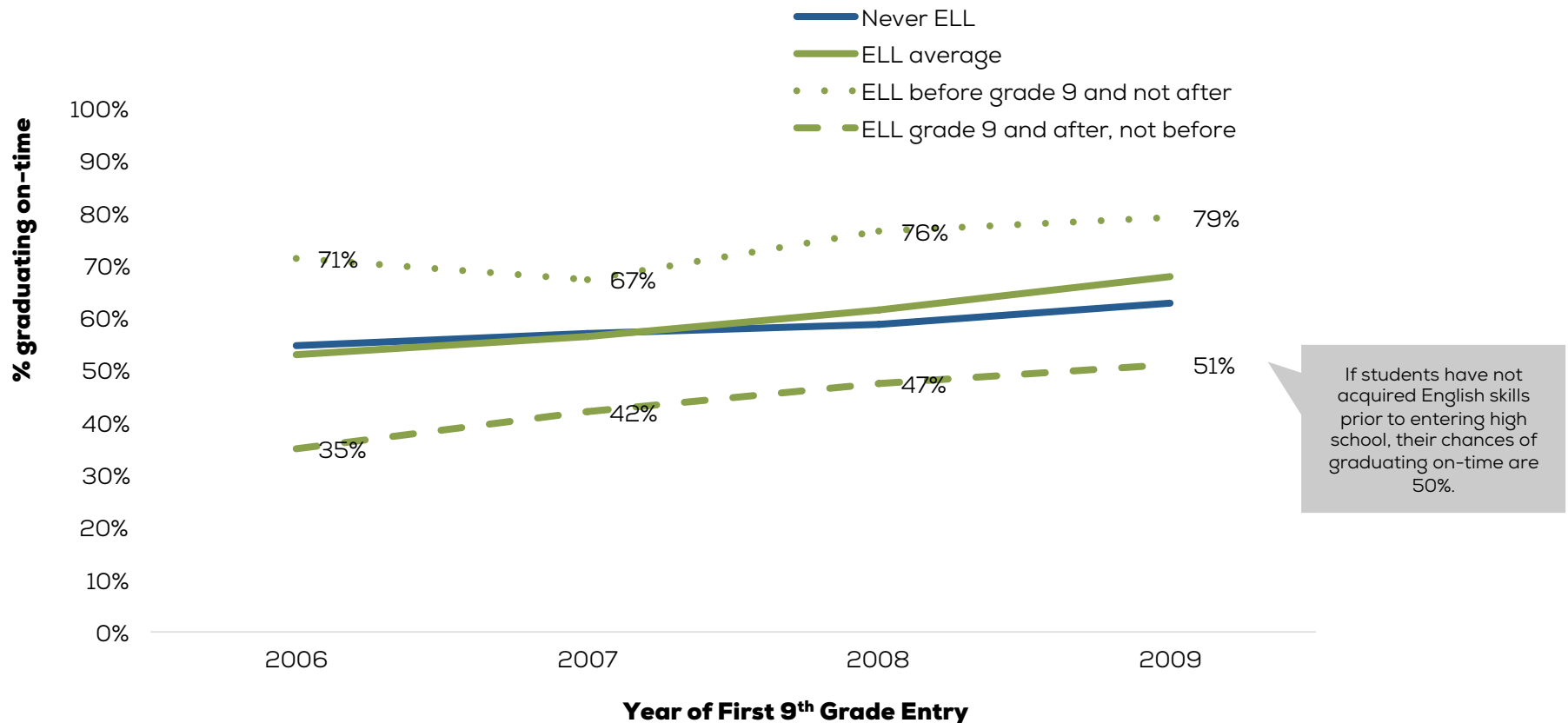
More detail on students with disabilities

The figure below shows the graduation and GED outcomes of students ever having Individualized Education Plans (IEPs), who account for 27% of students in the dataset. Emotional Disturbance (ED) is the primary disability category that accounts for the largest share of students with graduation rates below 50%.



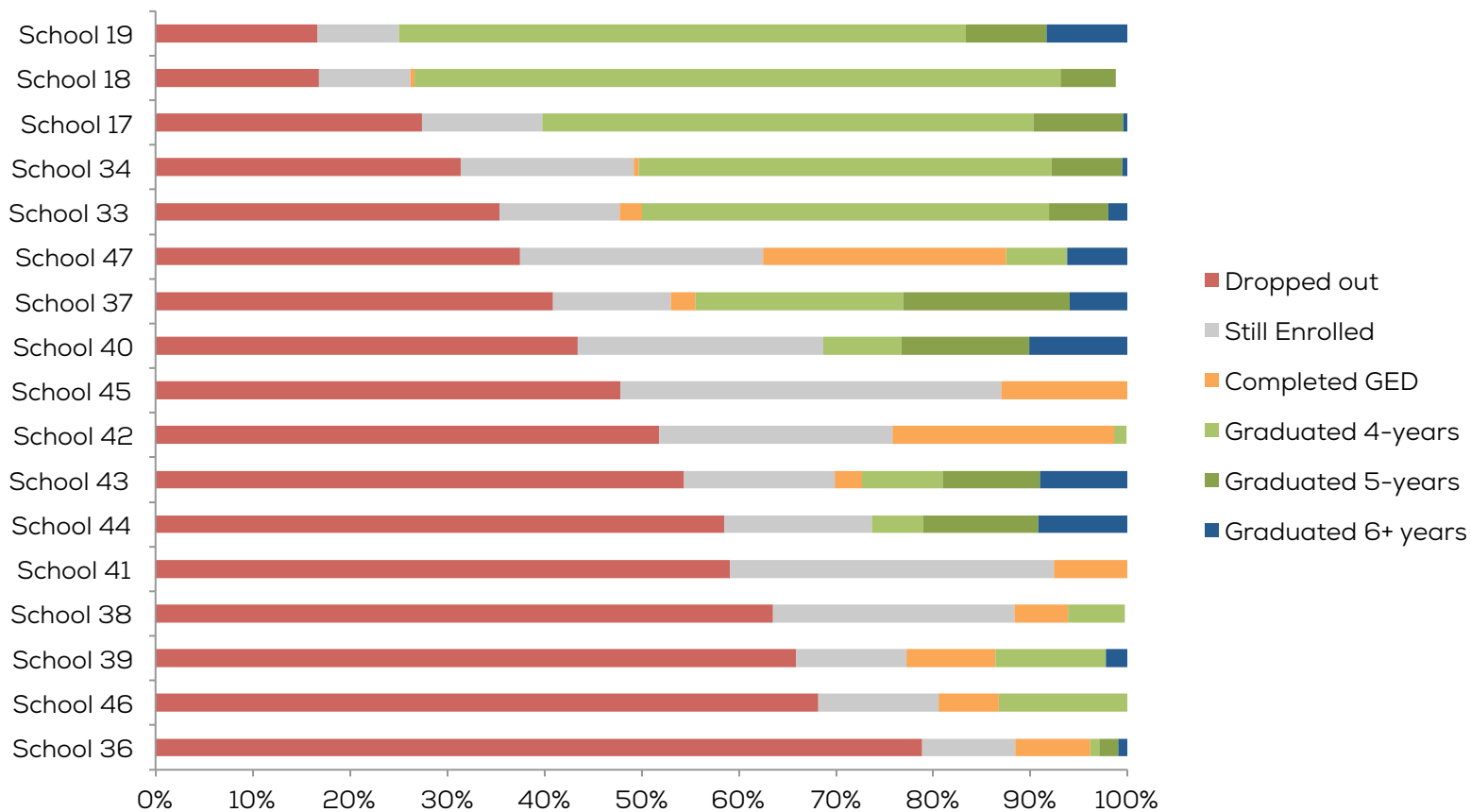
More detail on **students with limited English proficiency**

Late-entry English Language Learners have significantly lower odds of graduating on-time compared to those entering DC schools before 9th grade. English Language Learners account for 13% of the student population studied, and 11% of the eventual dropout population.



More detail on the **outcomes of students last attending non-traditional high schools**

Non-traditional schools achieve a variety of different outcomes among students they receive, with schools concentrating either in diploma conferral or GED completion. These results show the outcomes of all four cohorts of first-time 9th graders last attending non-traditional schools.



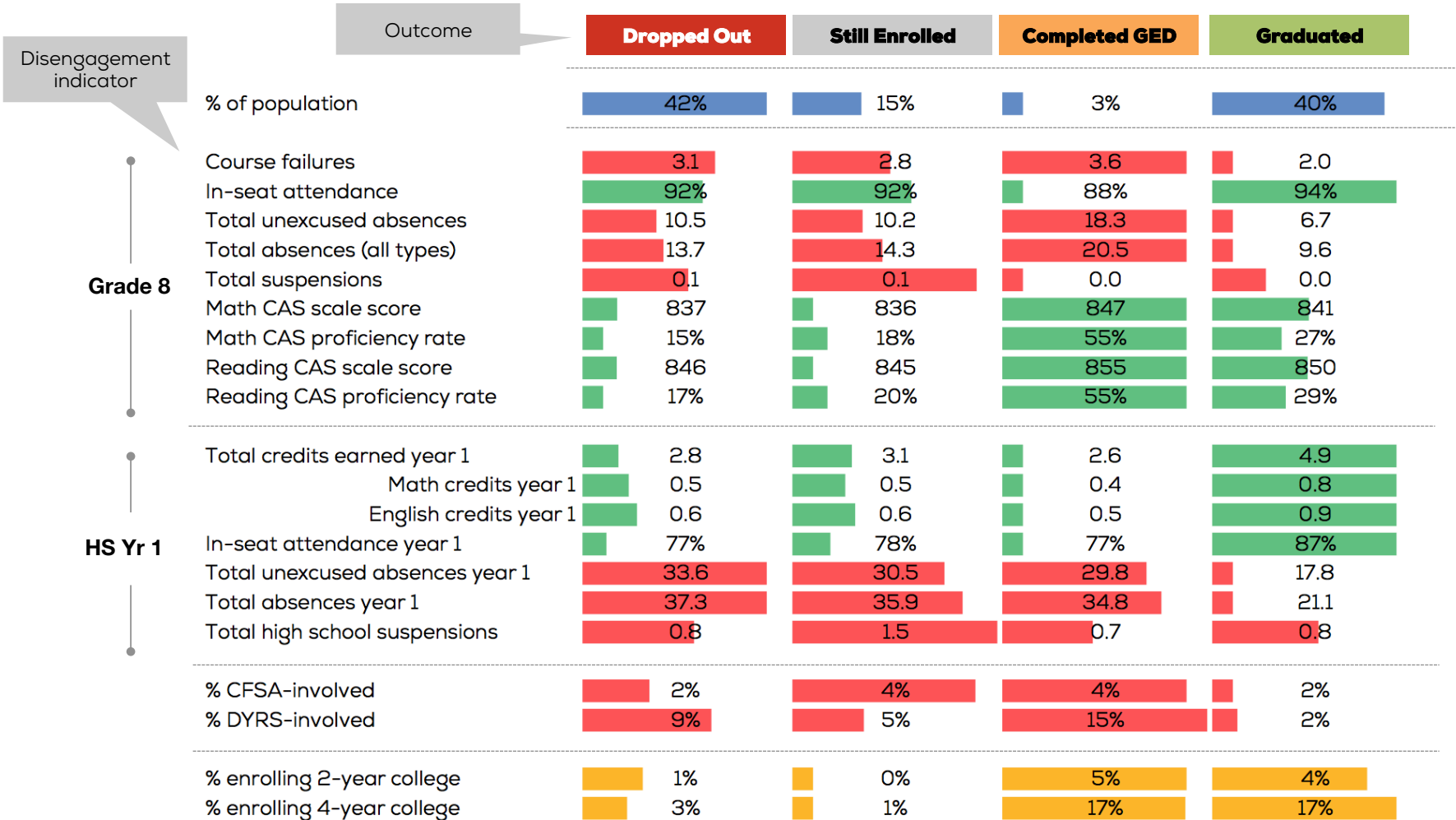
First-time 9th graders 2006-2009.

Note that not all schools represented grant high school diplomas; some are focused solely on GED preparation and workforce education.



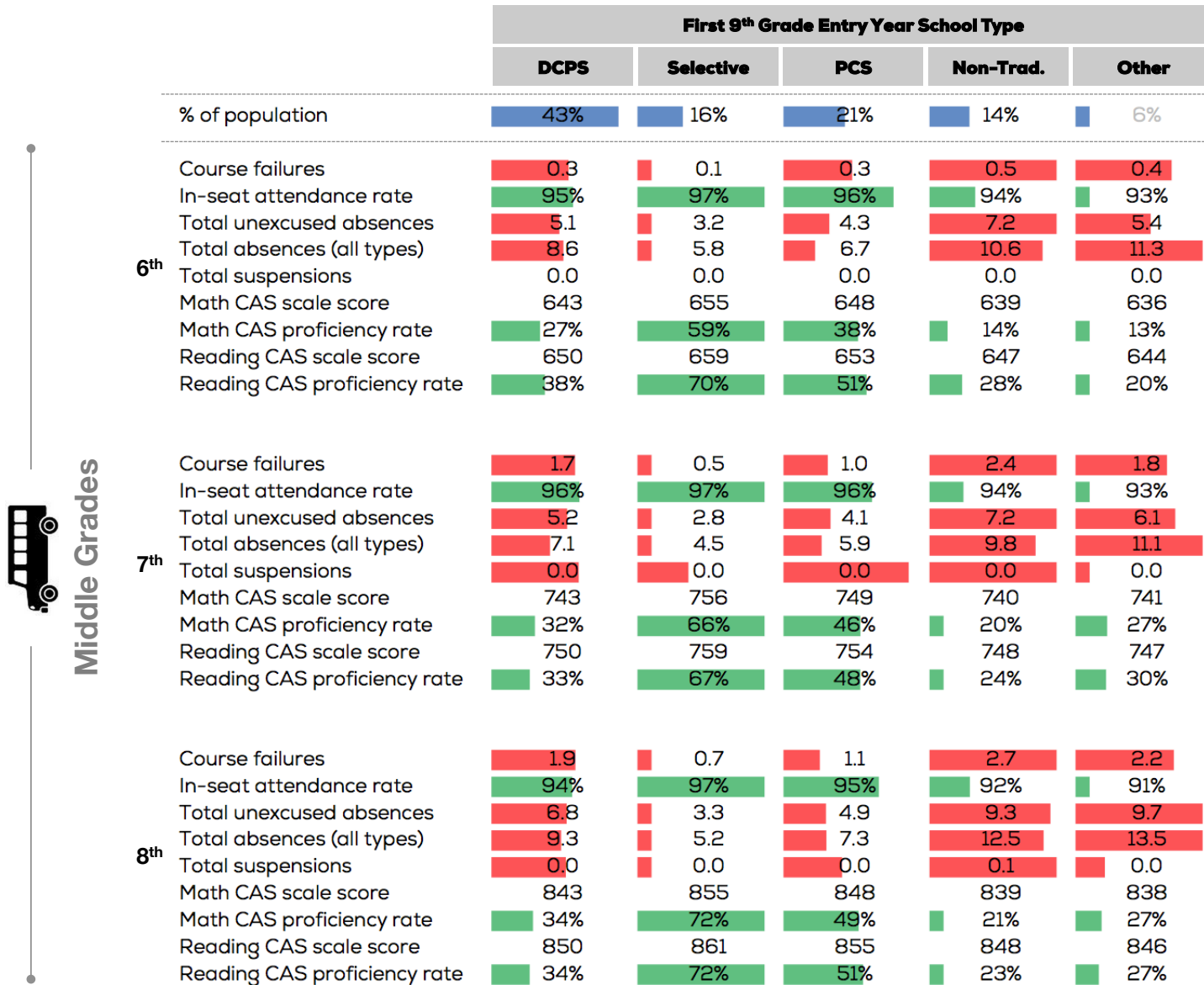
More detail on the middle and high school histories of students last attending non-traditional high schools, by outcome

A very small proportion of students last attending non-traditional schools complete GEDs. The 2- and 4-year postsecondary entry rates of these students are equal to those receiving diplomas.



More detail on the middle grades histories of students last attending non-traditional high schools, by type of first 9th grade entry school

Students eventually matriculating into non-traditional schools have divergent performance in the middle grades.

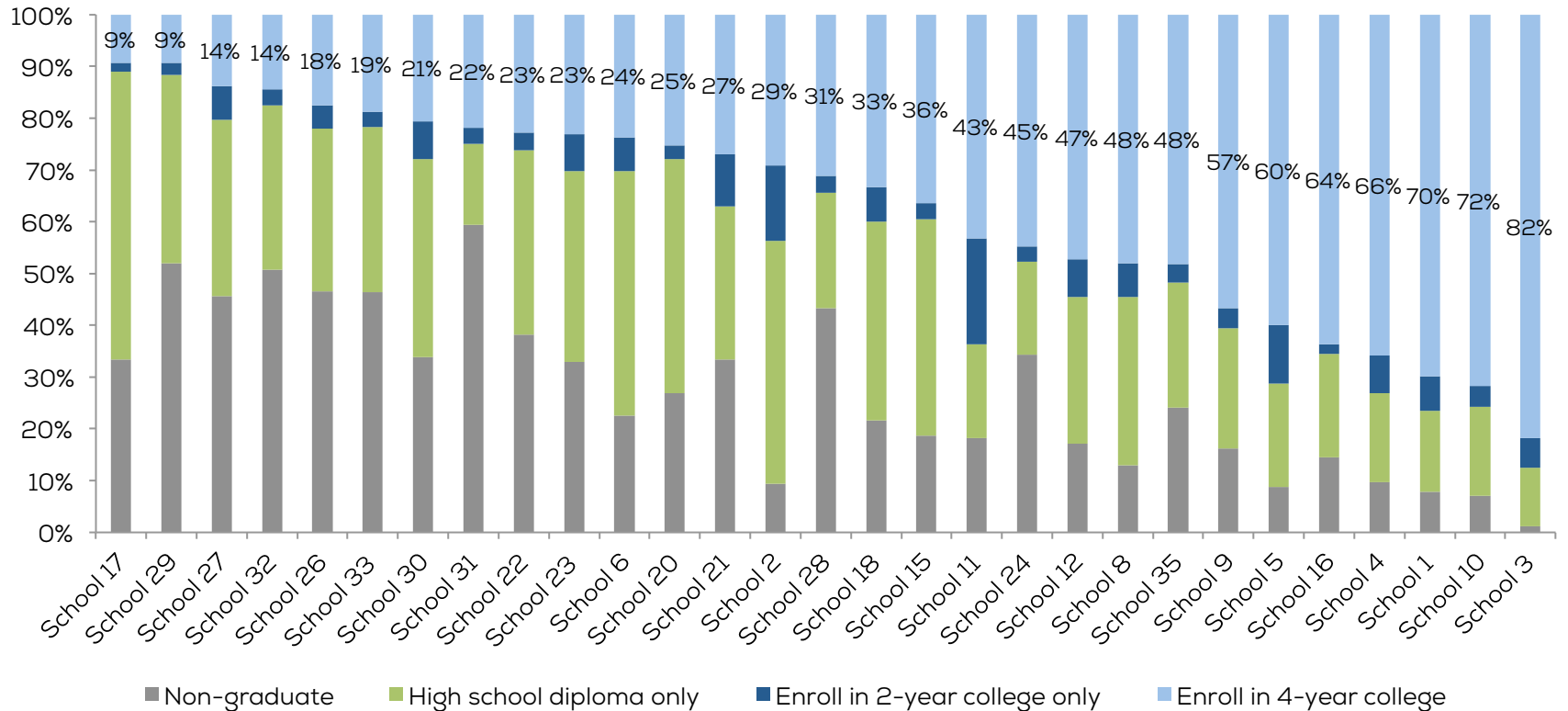


Middle Grades



More detail on postsecondary entry, by school

The wide variation in schools' graduation rates is mirrored by a wide distribution in postsecondary entry. Even among schools graduating more 60% of their students, some schools send fewer than 10% to 4-year colleges.

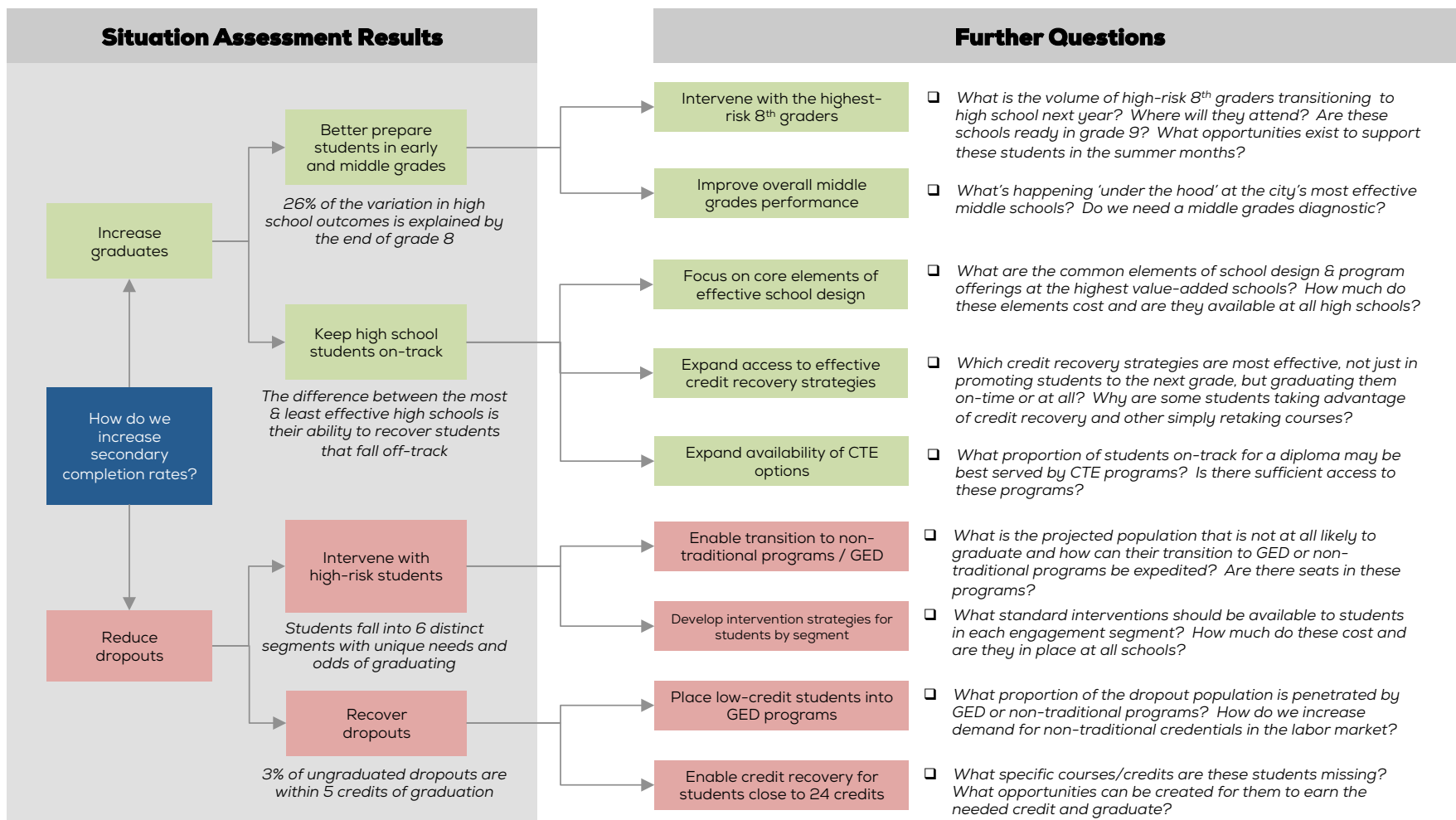


**What's
next?**



FUTURE ANALYSES

The previous analyses have provided a knowledge-base for secondary school reform. As the project's stakeholders begin to organize around the Graduation Pathways strategic plan, these additional questions should be explored.



WHAT DO WE DO NOW?

Launch a strategy that a wide range of stakeholders can grow and sustain.

