BACK ON TRACK

How Off-Track Ninth Graders Progressed in Later Years of High School, Class of 2017 and 2018

Molly Pileggi, Lindsey Liu, Alyn Turner • August 2020

RFA | RESEARCH for ACTION

PERC Philadelphia Education Research Consortium

Acknowledgements

The authors gratefully acknowledge the intellectual contributions of Joy Lesnick, Theodore Wills, Lucas Westmas, and Ji Eun Park from the School District of Philadelphia. From Research for Action, Kate Shaw provided helpful feedback on report drafts, and Samantha Slade and Alison Murawski prepared the report design and graphics.

This work was made possible through the support of the Neubauer Family Foundation and the William Penn Foundation. Neither Foundation exercised editorial control over this report, and the contents of the report do not necessarily reflect their views.

About PERC

The mission of the Philadelphia Education Research Consortium (PERC) is to provide timely, actionable, rigorous, and non-partisan research on the most pressing issues facing Philadelphia public education. To do this, PERC seeks to engage the region's colleges and universities, nonprofits, and the Philadelphia public education sector in respectful, mutually beneficial research-practice partnerships. By providing Philadelphia's leaders and citizenry with high-quality information about progress, challenges, and effective strategies in education, PERC aims to increase education opportunities and achievement for all Philadelphia students.

Suggested Citation

APA Style:

Pileggi, M., Liu, L., & Turner, A. (2020). How Off-Track Ninth Graders Progressed in Later Years of High School, Class of 2017 and 2018. Philadelphia: The Philadelphia Education Research Consortium.

Chicago Style:

Pileggi, Molly, Liu, Lindsey, & Turner, Alyn. (2020). *How Off-Track Ninth Graders Progressed in Later Years of High School, Class of 2017 and 2018.* Philadelphia: The Philadelphia Education Research Consortium.

Getting Back on Track:

How Off-Track Ninth Graders Progressed in Later Years of High School, Class of 2017 and 2018

Molly Pileggi, **Lindsey Liu**, **Alyn Turner** • August 2020

Summary

Students who successfully transition to ninth grade are more likely to graduate from high school. In 2018, the School District of Philadelphia (SDP) developed an indicator for being "on track" at the end of a high school student's freshman year. As part of the district's overall strategy for improving graduation rates, school administrators currently use the Ninth Grade On-Track indicator as an early marker of progress towards graduation and to identify students in need of intervention.

Using four cohorts of SDP data prior to its development and implementation, PERC found that one-third of first time freshman in 2013-2017 would have been flagged by On-Track indicator as "off-track" after their first year of high school.[1] Although the On-Track indicator was not yet in place, the reports serve as a benchmark against which progress can be measured.

Building upon this prior work, this report examines two of those same cohorts of off-track freshman in the expected graduating classes of 2017 and 2018, following them over time to understand which students were able to graduate and when they got back on track. Similar to our prior work, these findings describe student experiences that pre-date the establishment of SDP's On-Track indicator. Thus, this report serves as baseline for the district to assess progress toward efforts to improve graduation rates through schools' use of the On-Track indicator to identify and connect students to supports.

We also assess graduation rates for students at varying degrees of being off-track and for subgroups of students and schools to examine compounding risk factors for off-track students. We examine graduation rates for students at varying degress of being off-track, *i.e.,* what it means to be securely or marginally on track versus marginally, moderately, or very off-track at the end of 9th grade. The subgroup analyses draw attention to disparities in recovery from 9th grade off-track status and include student subgroups defined by gender, race/ethnicity, low-income status, 9th grade special education status and English Learner status, and 9th grade attendence and suspensions. We also examine the graduation rates for off-track students separately for those attending schools with small and larger enrollments and across school admission types.

Finally, we examine when students get back on track and graduation rates of students who leverage credit recovery to get back on track. These findings apply to subsamples of students for whom data can support the analyses, thus are exploratory and require additional research to understand more fully.

[1] Crofton, M., & Neild, R. C. (2018). *Getting On Track to Graduation: Ninth Graders' Credit Accumulation in the School District of Philadelphia, 2014-2016.* The Philadelphia Education Research Consortium.; Pileggi, M. & Strouf, K. (2018). *On Track Across Four Cohorts: Ninth Grader On Track Patterns in the School District of Philadelphia, 2013-2017.* The Philadelphia Education Research Consortium. https://www.phledresearch.org/on-track-4-cohorts

The goal of examining these patterns is to understand which off-track students and which schools might need the most support. This report offers a first-time look at graduation rates for off-track students in SDP. We anticipate the findings will be informative to school and district administrators working to support high school students who fall off-track in ninth grade. These findings raise questions about whether some students and schools may benefit from more resources and/or different systems or approaches than others. The findings also point to the need for more research to examine why some students in some schools recover at higher rates than others and build evidence for effective interventions for getting students back on track.

Key Findings

- **Compared to 82% of on-track ninth graders, only 57% of off-track ninth graders graduated on time—a difference of about 25 percentage points.** This is a considerable, statistically significant difference and reinforces the utility of the On-Track indicator for flagging students as at risk of failing to graduate.
- **Among off-track 9th graders who were able to get back on track to graduate, two-thirds did so in 12th grade,** possibly reflecting historical district priorities in place at the time these data were collected to target efforts to get seniors to graduate**.** A third of students got back on track during earlier grades. Of course, all students who got back on track in 12th grade graduated. Among those who got back on track before 12th grade, 85% stayed on track and graduated on time, suggesting that early intervention is valuable, though more research is needed to unpack intervention timing. An additional area of exploaration is the impact of the development and implementation of the district's On-Track indicator in 2018 for motivating earlier intervention.
- **Off-track males had a graduation rate of 51%, nearly 12 percentage points lower than the graduation rate of 62% for off-track females.** Males were also more likely to be off-track than their female peers.[2] The double disadvantage of males is troubling and highlights that substantial work remains to be done to improve their educational experiences.
- **Very poor attendence and suspensions are additional warning signals for off-track students.** The graduation rate of off-track students receiving one or more suspensions in 9th grade was almost 10 percentage points lower than their off-track peers with no suspensions. Very poor attendance was an even stronger predictor of graduation. The graduation rate of off-track students with very poor attendance (average daily attendance below 80%) was 27 percentage points lower than their off-track peers with strong attendance (90% or higher average daily attendance).
- **Off-track students enrolled in Citywide and Special Admission high schools had substantially higher graduation rates than their off-track peers enrolled in Neighborhood high schools.** The graduation rates at Neighborhood schools trailed those at other schools by more than 20 percentage points.
- **The farther off track a student was at the end of 9th grade, the lower their graduation rate.** The graduation rate for students missing just one of the five indicators of being on-track was about 69%, compared to rates of about 50% of students missing 2 or 3 requirements and about 27% for students missing 4 or 5.

[2] Pileggi, M. & Strouf, K. (2018). *On Track Across Four Cohorts: Ninth Grader On Track Patterns in the School District of Philadelphia, 2013-2017.* The Philadelphia Education Research Consortium. https://www.phledresearch.org/on-track-4-cohorts

- **Only 20% of off-track 9th grade students in the Class of 2018 enrolled in credit recovery in 2017-18, though those who did had a much higher graduation rate than those who did not.** Students who recovered credits during their senior year had a graduation rate of 84%, nearly 30 percentage points higher than their peers who did not attempt credit recovery in 2017-18. Students who attempted to regain credits, even if they were not successful, had a graduation rate of almost 12 percentage points higher than students who did not use credit recovery that year.

Implications for policy and practice

- **The findings in this report reinforce SDP's recent adoption and use of the Ninth Grade On-Track indicator as a strategy for identifying and supporting off-track students to improve graduation rates.** Of course, because the data presented here are correlational, we are cautious to not make strong claims that graduation rates would improve if recovery rates increased among off-track students. We encourage the district to build upon this body of research by examining the underlying reasons why students fall off track in 9th grade and evaluate efforts to help these students recover.

- **While our report does not address what kinds of supports work for which off-track students, it suggests the need for targeted supports that attend to the reasons for increased risk of failing to recover for certain students.** Importantly, findings suggest that attendence and suspension rates are additional warning signs that could identify off-track students for more targeted supports. Additionally, off-track male students were at a moderately greater risk of failing to graduate than their female peers. These disparities in rates of recovery call into question a one-size-fits-all approach to helping students get back and stay on track.

- **The district should consider supporting principals, teachers, and other school support team members in understanding the implications of the degree to which students are off-track at the end of 9th grade and adjust tracking systems to expand the indicator to include "marginal," "moderate," and "far off-track" categories.** Our study does not examine school efforts to get students back on track nor does it document school-based approaches to supporting off-track students. However, it is likely that the causes of course failure for marginally off-track student are different than those for students who are far off-track. Thus, a one-size-fits-all approach will have muted effects, and schools armed with information about student's degree of off-track may be able to tailored supports that address variable root causes.

- **Helping students recover from being off-track will likely require different solutions in different school settings.** Our finding that off-track students in Neighborhood schools have a graduation rate that is substantially lower than their peers in Special Admit or Citywide schools deserves more attention. Though our report does not address reasons for differences, it could be that Neighborhood schools, many of which have large proprotions of off-track 9th graders, might need additional capacity or different systems than schools with smaller off-track cohorts to help their students recover.

Table of Contents

Why this study 1

What the study examines 2

Limitations of this study 3

Graduation Rates for On- and Off-Track 9th Graders from the Classes of 2017 and 2018 6

Compared to 82% of on-track ninth graders, only 56% of off-track ninth graders graduated on time, a difference of 26 percentage points. 6

When Did Off-Track 9th Graders Get Back On Track? 7

Nearly two in three students who got back on track did so in 12th grade 7

Student Characteristics Associated with Graduation Rates for Off-Track Students 9

Off-track males had a graduation rate of 51%, nearly 12 percentage points lower than the grauation rate of 62% of off-track females. 9

Suspensions and low attendance are important additional warning signals for off-track students. 11

School Characteristics Associated with Graduation Rates for Off-Track Students 12

Off-Track students attending neighborhood schools are at significantly greater risk than those attending Citywide and Special Admission schools. 12

Digging Deeper into the Off-Track Indicator 14

The farther off-track a student was at the end of 9th grade, the lower their adjusted graduation rate 15

For students missing only one credit, it mattered little which credit requirement was missing. 16

The Use of Credit Recovery to Get Back On Track 17

While representing only a fifth of off-track students, most who used Credit Recovery in 2017-18 to recover credits graduated on time 18

Implications for policy and practice 19

Continuing to focus on getting students on track after their first year of high school is an important strategy in improving the high school graduation rate. 19

The district should consider providing schools with support for reviewing and understanding degree of off-track, as well as reviewing the On-Track indicator alongside other student-level data. 19

All off-track students need support, and helping off-track students recover may require different solutions for different students and in different school settings 19

Appendices 21

Why this study

The successful transition to ninth grade is a critical predictor of high school graduation. For most ninth graders, the first year of high school brings broader course and extracurricular choices as well as increased academic challenges and greater independence. Evidence from Philadelphia and other cities shows that students who struggle to manage the transition from middle to high school and fall off track in ninth grade have a much higher risk of not completing high school, even if they were high-achieving students in middle school.[3]

The School District of Philadelphia (SDP) defined "on track" at the end of the first year of high school as having earned at least one course credit in each core course (English, math, social studies, and science) and one additional course credit in any subject. SDP established this definiton in 2018 and demonstrated its utility for tracking student progress and motivating continuous improvement.[4] Importantly, SDP's On-Track indicator takes into account which subject areas students earned credits in, not just the total number of credits they received, distinguishing the On-Track indicator from grade promotion requirements. The rationale for this approach is that graduation requirements include subject-specific credits, so being "on track to graduate" should as well.[5]

With a definition in place, the "Ninth Grade On-Track" indicator is currently being used to provide principals, teachers, and other student support staff with an early indicator of student progress towards graduation. This simple, dichotomous indicator is used by schools to intervene with individual students to help them get back on track.

Box 1: SDP's Ninth Grade On-Track Definition

To be considered on track at the end of ninth grade, a student must earn at least:

- One course credit in each of the four core subjects (English, math, social studies, and science), and
- One additional course credit in any subject.

To help inform how to effectively support off-track students, this study focuses on which off-track students were able to graduate and when and how they got back on track. In 2018, PERC found that one-third of SDP high school students were off-track after their first year of high school, according to SDP's new definition, and that off-track rates varied by student and school characteristics.[6] Taking PERC's earlier analyses further, this report investigates how off-track students progressed through their later high school years to understand which students from what kinds of schools were more likely to recover from being off-track and graduate on time.

---

[3] Allensworth, E. M. & Easton, J. Q. (2005). *The On-Track Indicator as a Predictor of High School Graduation*. Consortium on Chicago School Research. https://consortium.uchicago.edu/publications/track-indicator-predictor-high-school-graduation; Neild, R. C. & Balfanz, R. (2006). *Unfulfilled Promise: The Dimensions and Characteristics of Philadelphia's Dropout Crisis, 2000–2005.* Philadelphia Youth Network. http://www.projectuturn.net/docs/Unfulfilled_Promise_Project_U-turn.pdf

[4] Wills, T. (2018). *Defining 9th Grade Success: A New 9th Grade On Track Definition.* The School District of Philadelphia. https://www.philasd.org/research/wp-content/uploads/sites/90/2018/05/On-Track-Focus-Brief_May-2018.pdf

[5] The School District of Philadelphia. (2018). *Keeping Pace for Graduation: Suggested Credit Totals by Grade*. https://www.philasd.org/research/wp-content/uploads/sites/90/2018/08/Suggested-Credit-Totals-by-Grade.pdf

[6] Crofton, M., & Neild, R. C. (2018). *Getting On Track to Graduation: Ninth Graders' Credit Accumulation in the School District of Philadelphia, 2014-2016.* The Philadelphia Education Research Consortium.; Pileggi, M. & Strouf, K. (2018). *On Track Across Four Cohorts: Ninth Grader On Track Patterns in the School District of Philadelphia, 2013-2017.* The Philadelphia Education Research Consortium. https://www.phledresearch.org/on-track-4-cohorts

What the study examines

This study examines the graduation rates of two cohorts of on- and off-track SDP ninth graders: first-time ninth graders in 2013-14 and 2014-15 (i.e., the expected graduating classes of 2017 and 2018). This study includes students who completed their first year of high school at one of the 52 traditional high schools[7] in SDP, excluding students at charter schools or alternative schools (such as evening schools within the SDP Opportunity Network). These analyses apply the SDP's On-Track indicator to students who were in ninth grade prior to its establishment in 2018 to serve as a benchmark against which progress can be measured.

In addition to overall graduation rates, we examine patterns by student and school characteristics to identify compounding risk factors for off-track students. We assess graduation rates for subgroups of off-track students, including by gender, race/ethncity, low-income status, 9th grade special education status and English Learner status, 9th grade attendence and suspensions, and school admission type and size. An analysis of these patterns is helpful for identifying disparities in the recovery from being off-track, the goal of which is to generate conversations about why disparities exist and ideas for providing supports that address them.

We take a deeper look at the the degree to which students are off-track, examining cases right on the cusp of being on track (i.e, marginally off-track), those who are moderately off-track, and those who are far off-track. For marginally off-track students, who are missing only one credit, we also examine whether the consequences for graduation differ depending on the course subject that the student failed.

Finally, this report examines when students tended to get back on track and how many of them leveraged credit recovery to do so. This analysis sheds light on how students have successfully gotten back on track to graduation in the past to inform strategies that could be helpful for off-track students in the future. These findings apply to subsamples of students for whom data can support the analyses, thus are exploratory and require additional research to understand more fully (see *Limitations of this study* section below).

The research questions studied in this report are:

- What percentage of off-track 9th graders were able to graduate on time? Within five years?
- Of the students who were off-track in 9th grade but recovered to graduate on time, when did those students get back on track?
- How do graduation rates of off-track students vary?
    - By student characteristics (e.g. gender, race/ethnicity, low-income public assistance, and 9th grade special education status and English learner status, and 9th grade attendance and suspensions)?
    - By school characteristics (i.e. admission type and size)?
    - By how many credits students were missing or by the type of credits that were incomplete?

[7] For the purposes of this report, we use the term "traditional" high school to refer to schools that held courses exclusively during the day and fit into one of the following SDP categories: Neighborhood, Citywide, or Special Admission high school. Schools in these categories may provide non-traditional programming, such as project-based learning, early college enrollment, work-based internships, or other innovative approaches, but for the sake of simplicity, in this report, they are all considered "traditional" high schools. Educational Options Programs (EOPs), entire schools serving students with alternative needs (e.g. Widener Memorial School), and other schools in SDP's Opportunity Network are not included in our analyses.

- How do graduation rates of students who were marginally off-track compare to those who are marginally on track?
- How many Class of 2018 students who were off-track at the end of their 9th grade year engaged in credit recovery during 2017-18?[8] Did engaging in Credit Recovery help these students graduate on time?

Limitations of this study

This study examines the association between being off-track and eventual graduation for students who were in school prior to the advent of the district's 9th Grade On-Track indicator. While we offer a descriptive analysis of patterns in graduation rates, the study has several limitations. First, this study is correlational and does not attend to the very-important questions of why students are off track, why some students are at increased risk of failing to recover, and whether and how different interventions might improve likelihood of graduation. Our results, however, 1) can be used as a benchmark against which district efforts can be compared, 2) suggest the need for On-Track indicators to be reviewed alongside other student-level data, and 3) draw attention to important disparities that should motivate the design and assessment of interventions.

Second, our results may overestimate graduation rates because of sample restrictions. Students are excluded from the study if they permanently leave the district, because their graduation status cannot be determined. This may lead to overestimating graduation rates for off-track students because off-track students with greater risk of failing to graduate may be more likley to leave the district. This overestimation may be more pronounced the farther off track a student is, because far-off track students are more likely to leave the district (See Table B1 in Appendix).

Several analyses in this report required additional sample restrictions. First, we restricted the analysis of **when students got back on track** to students who were continuously enrolled in the district, excluding those who, for example, transferred out of and then returned to the distirct. This sample restriction leaves only 43% of the full analytic sample available for this subanalysis, potentially overestimating graduation rates for these students to a greater degree than the main analysis. Second, due to data limitations, our analysis of **graduation rates of students enrolled in credit recovery** is restricted to the freshman Class of 2018 who enrolled in credit recovery in their 4th year of high school (*i.e.,* 30% of the sample of the full analytic sample and 62% of the off-track sample of Class of 2018 students). This is because data on whether a course was taken in a traditional format or an alternative credit recovery format was first captured in SDP's data system for the 2017-18 school year. Students may have attempted or regained credits using alternative credit recovery formats before the 2017-18 year, but we could not identify those cases in the data. These analyses should be considered exploratory and built upon.

[8] This analysis was restricted to 2017-18 because that was the first year the data available clearly identified which courses were taken in a recovery format.

Box 2

Data and Variables

This study uses de-identified student-level data for first-time ninth graders in the School District of Philadelphia in 2013-14 and 2014-15 (expected graduating classes of 2017 and 2018). All identifying information was removed before the research team received the data.

The study sample was limited to students who finished their first year of high school at one of 52 traditional School District of Philadelphia high schools (see Footnote 7 for definition of "traditional high school").

The analysis is restricted to students who did not permanently transfer out of SDP during their high school years, so that we could determine their graduation status. Our sample consisted of 15,994 first-time 9th grade students, 8,084 from the 2013-14 cohort and 7,910 from the 2014-15 cohort.

Key variables are:

- ***9th grade on-track to graduation status:*** Indicator for each student indicating if the student was on- or off-track to graduation at the end of their first 9th grade year.
- ***Degree of off-track:*** With five distinct requirements to being on track in 9th grade (see Box 1), the research team developed an indicator for how far on or off track a student was based on how many of those requirements the student was missing: Securely on track, marginally on track, marginally off track, moderately off track, and far off track.
- ***On-time graduation status:*** Using the districts's indicator for whether a student graduated, dropped out, or transferrred out of SDP (along with the year that designation was reached), the research team created an indicator for "on-time" graduation, meaning that the student graduated within 4 years after entering 9th grade. We also examined 5-year graduation status (results in Appendix C).

This study also includes analysis of student- and school-level characteristics and courses taken in 2017-18. See Appendix A for definitions of those variables.

Box 3

Analytic Methods

Similar to high school graduation, we know from prior PERC research that on-track status at the end of ninth grade is associated with school and student characteristics, in part because features of educational systems put some students and schools at a disadvantage (See Footnote 6).

The goal of this report is to isolate attention to disparities in recovery from being off track apart from the risk of being off track, though these two processes are intertwined and jointly subject to the forces of inequality that are exerted on all students.

To address this goal, we employ **a multi-level logistic regression technique to estimate marginal graduation rates** for the study sample rather than presenting unadjusted rates. We explain the difference in these two approaches here:

- **Unadjusted graduation rates** can obscure the association between off-track status and graduation, as both are influenced by the school a student attends and other systematic differences in educational experiences across student subgroups. Differences between unadjusted graduation rates for on- and off -track 9th graders combine or confound factors associated with on-track status with those that are associated with graduation. Factors that might influence both "on-track status" as well as graduation include student socio-demographic characteristics, ninth grade participation in Special Education and English Learner services, school attendance rates and behavior incidents in ninth grade, and the school the student attended in ninth grade.
- **Marginal or "adjusted" graduation rates** account for factors that are jointly associated with ninth grade on-track status and graduation (e.g., which school a student attends) in order to focus attention on the consequences of being off track for graduation. The isolation of this relationship from confounders helps decision makers narrow the scope of intervention points to address the key issue at hand: how to support off-track students with varying risks of failing to graduate. However, this does not discount the importance of the social processes that put some students disproportionately at risk of being off-track in 9th grade. As our recommendations suggest, attempts to support recovery for these students will necessitate a close examination of root causes.

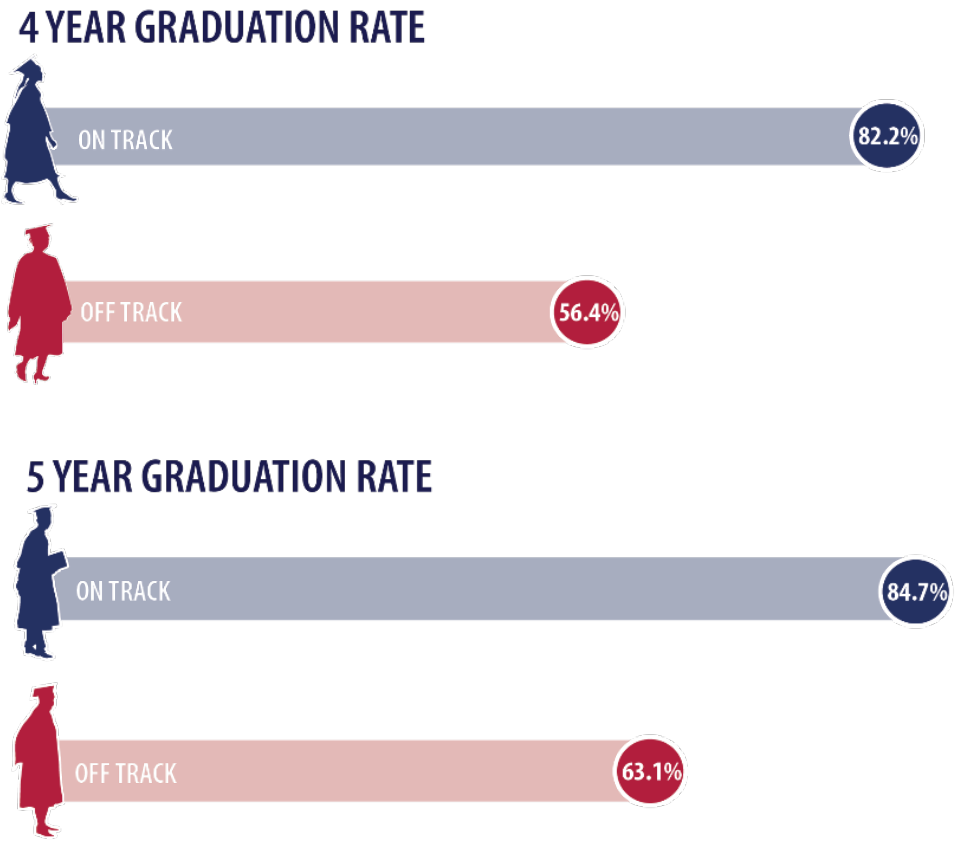
For the technical reader, Apppendix C presents the model building process and final regression model parameters. The preferred model was used to generate predicated marginal graduation rates, which were calculated with covariates set to the observed value of each student's record and then averaged over the estimation sample. A comparison of unadjusted and marginal 4- and 5-year graduation rates, overall and by student and school subgroups, can be found in Appendix C.

Graduation Rates for On- and Off-Track 9th Graders from the Classes of 2017 and 2018

Compared to 82% of on-track ninth graders, only 56% of off-track ninth graders graduated on time, a difference of about 26 percentage points.

This report examines graduation rates for two cohorts of 9th graders: the Classes of 2017 and 2018. First, we compare adjusted 4- and 5-year graduation rates for on- and off-track first-time ninth graders, using SDP's definition of "on track," i.e., students who, by the end of 9th grade, earned at least one credit in all four core courses and earned an additional credit in any subject area (Figure 1).[9]

Figure 1. Four- and five-year graduation rates for first-time ninth graders in 2013-14 and 2014-15 cohorts, adjusted for school and student characteristics, by 9th Grade On Track status, N=15,994



Note. Author calculations using data for School District of Philadelphia traditional high school students who first enrolled in ninth-grade in 2013-14 or 2014-15 and who did not permanently transfer out of SDP during the study period. The statistical model adjusts for school attended, school type and size, student gender, race/ethnicity, cohort, and 9th grade measures of average daily attendance, number of suspensions, and low-income, English Learner, and Special Education status. The total sample size for this analysis was 15,994 students (10,646 on-track students and 5,348 off-track students).

[9] See comparison to unadjusted rates in Appendix C.

This figure shows:

- **The on-time graduation rate for off-track 9th grade students was considerably lower than that of their on-track peers.** The on-time graduation rate for off-track ninth graders was 25.8 percentage points lower than that of their on-track peers ($p<0.05$).
- **A similar, but slightly smaller gap existed when looking at 5-year graduation rates.** Off-track students had adjusted 5-year graduation rates that were 21.6 percentage points lower than their on-track peers ($p<0.05$).

When Did Off-Track 9th Graders Get Back On Track?

As school administrators assess how to best support off-track students, it is worth considering if the timing of when a student gets back on track is also important. Does it matter if the student gets back on track in the next year of high school? Or can they wait and make up those final credits in their senior year, when they might have more flexibility in choosing courses?

Generally, students identified early can be matched with interventions to help them return more quickly to the on-time graduation track.[10] While our study does not address whether early or later intervention is more effective (and for whom), the analysis below describes patterns for when off-track students were first able to get back on track towards graduation and if timing matters. As a reminder, this analysis represents student experiences that predate the development of the on-track indicator and its utilization in schools to identify students for early intervention. More recent cohorts may exhibit different patterns as a result of district efforts to intervene earlier.

Nearly two in three students who were able to get back on track did so in 12th grade.

Table 1 shows which year the off-track 9th graders first got back on track to graduation. The columns separate off-track 9th graders who graduated on-time (Column A) from those who did not (Column B) and also displays the unadjusted graduation rate of students who first got back on track during that grade. These findings represent a subset of off-track students with on-track status observable for all four years of high school (about 43% of all off-track students).[11] We present unadjusted graduation rates because the sample size is too small to support a model-based approach.

[10] Heppen, J. B. & Therriault, S. B. (2008). *Developing Early Warning Systems to Identify Potential High School Dropouts.* https://files.eric.ed.gov/fulltext/ED521558.pdf; Jerald, C. D. (2006). *Identifying Potential Dropouts: Key Lessons for Building an Early Warning Data System.* Achieve, Inc. https://files.eric.ed.gov/fulltext/ED499838.pdf; Kennelly, L. & Monrad, M. (2007). *Approaches to Dropout Prevention: Heeding Early Warning Signs With Appropriate Interventions.* National High School Center, American Institutes for Research. https://files.eric.ed.gov/fulltext/ED499009.pdf; Neild, R. C., Balfanz, R., & Herzog, L. (2007). An early warning system. *Educational Leadership, 65*, 28–33.; Pinkus, L. (2008). *Using Early-Warning Data to Improve Graduation Rates: Closing Cracks in the Education System.* Alliance for Excellent Education. https://all4ed.org/wp-content/uploads/EWI.pdf

[11] A student might have missing data for other grades, thus are excluded from this analysis, if they: (1) left SDP district schools for a charter or non-public school in an intervening year, (2) dropped out of school prior to their 12th grade year, or (3) were otherwise missing course grades data in 10th or 11th grade. Because students who dropout prior to their 12th grade year are excluded from this sample, the graduation rates of those that continued are biased upwards. Unlike the data shown in the rest of this report, these analyses do not adjust for student or school characteristics, as the sample size is too small.

Table 1. First-time getting back on track: Grade-level when off-track ninth-grade students in 2013-14 and 2014-15 cohorts first recovered, N=2,307 students continuously enrolled in SDP for four years

	Off-track 9th Graders		COLUMN A …Who Graduated on Time		COLUMN B …Who Did Not Graduate on Time		
	#	% of All Off-Track 9th Graders	#	% of Those Who Got Back on Track	#	% of Those Who Got Back on Track	Grad Rate (unadjusted)
Grade level when first got back on track							
10th grade	262	18.6%	228	16.1%	34	2.4%	**87.0%**
11th grade	199	14.1%	171	12.1%	28	2.0%	**85.9%**
12th grade	951	69.3%	951	67.4%	-	-	**100.0%**
Total	**1,412**	**100%**	1,350	95.6%	62	4.4%	**58.5%**
All off-track students							
Did not get back on track	895	38.8%	-	-	-	-	-
Got back on track	1,412	61.2%	-	-	-	-	**-**
Total	**2,307**	**100%**	-	-	-	-	**58.5%**

Note: This analysis is restricted to off-track ninth-grade students for whom we had data on their on-track status for all years studied (43.1% of all off-track students). In addition, the definition of being On-Track in 12th grade is the same as the definition of what it takes to graduate. As a result, all students who got back on track in 12th grade graduated and none of the students who never got back on track graduated. The total sample size for this analysis was 2,307 students.

Table 1 shows:

- **Most 9th graders who got back on track did so for the first time in 12th grade.** Nearly 70% of off-track 9th graders who got back on track did so in 12th grade (n=951), potentially reflecting historical district efforts targeting supports for seniors in order to get them to graduate.
- **While relatively few students were able to get back on track in 10th or 11th grades, the vast majority who did graduated on time.** About a third (18.6+14.7= 32.7%) of off-track 9th graders got back on track for the first time in 10th or 11th grade. More than 85% of the students who got back on track in either of these grades graduated on time.

Student Characteristics Associated with Graduation Rates for Off-Track Students

As discussed above, off-track 9th graders in the Classes of 2017 and 2018 had an on-time graduate rate of 57% – considerably lower than the 82% on-time graduation rates of their on-track peers. In order to understand if certain groups of off-track students might be more at risk of failing to graduate on-time, we examined disparities in recovery by student and school characteristics. As discussed in Box 3, the rates presented in this section are adjusted to account for factors that are jointly associated with ninth grade on-track status and graduation.[12]

Off-track males had a graduation rate of 51%, nearly 12 percentage points lower than the grauation rate of 62% of off-track females.

In the table below, we examine graduation rates of off-track students by subgroups defined by socio-demographic and other characteristics, including gender, racial/ethnic group, and low-income status (measured as Free from Tape status),[13] special education status, and English Learner status. Looking only at students who were off-track following their first year of high school, we compare adjusted graduation rates across subgroups to understand any compounding risks factors for off-track 9th graders.

Table 2. Four-year graduation rates for off-track first-time ninth-grade students in 2013-14 and 2014-15 cohorts, adjusted for school and student characteristics, by student subgroups

	Adjusted Graduation Rates of Off-Track Students	Number of Off-Track Students (N=5,348)	Percentage of Off-Track Students (100%)
Gender			
Male	50.7%*	3,064	57.3%
Female (ref)	62.3%	2,284	42.7%
Race / Ethnicity			
Black	58.7%*	3,393	63.4%
Hispanic	59.2%*	1,144	21.4%
White, Asian, another race, or multi-racial (ref)	53.2%	811	15.2%
Family low-income status in 9th grade (Free from Tape)			
Participated in social service programs	55.7%	3,694	69.1%
Did not participate in social service programs (ref)	57.5%	1,654	30.9%
Special education services in 9th grade			

[12] For the technical reader, the statistical model specifies interactions between being off-track and student and school subgroup variables. See Appendix D for regression results.

[13] "Free from Tape" includes students who participate in SNAP, TANF, Medicaid, or other social service program

	Adjusted Graduation Rates of Off-Track Students	Number of Off-Track Students (N=5,348)	Percentage of Off-Track Students (100%)
Received services	50.6%*	1,332	24.9%
Did not receive services (ref)	57.6%	4,016	75.1%
English learner services in 9th grade			
Received services	56.4%	544	10.2%
Did not receive services (ref)	56.5%	4,804	89.8%

Note. Author calculations using data for School District of Philadelphia traditional high school students who first enrolled in ninth-grade in 2013-14 or 2014-15, who did not permanently transfer out of SDP during the study period, and who were off-track following their first year of high school. The statistical model adjusts for school attended, school type and size, student gender, race/ethnicity, cohort, and 9th grade measures of average daily attendance, number of suspensions, and low-income, English Learner, and special education status. The total sample size for this analysis was 15,994 students, but we are only reporting graduation rates here for off-track students (n=5,348). An * indicates the difference compared to the reference group in graduation rates was significant with a p-value of less than 0.05.

Notably:

- **Among off-track students, females had moderately higher adjusted graduation rates than their male peers.** Males were both more likely to be off-track and to fail to graduate than females.[14] We found a moderate 12-percentage point difference between female and male students ($p<0.05$).
- **Among the off-track students, Black and Hispanic students had slightly higher on-time graduation rates than students of other race/ethnicities.** Though more likely to be off-track to begin with,[15] we observe a slight advantage of 6 percentage points between the graduation rate of black and Hispanic students and students of other race/ethnicities ($p<0.05$).
- **Off-track students enrolled in general education had slightly higher on-time graduation rates than their off-track peers receiving special education services.** In addition to being much less likely to be off-track,[16] off-track general education students overall were 7 percentage points more likely to graduate on time compared to their peers who were off-track and received special education services ($p<0.05$).
- While slightly more likely to be off-track,[17] there were not significant differences between the graduation rates for off-track students who did and did not received English Learner services in ninth grade or for students whose families were and were not low-income that year.

[14] See Table B-1 in Pileggi, M. & Strouf, K. (2018). *On Track Across Four Cohorts: Ninth Grader On Track Patterns in the School District of Philadelphia, 2013-2017.* The Philadelphia Education Research Consortium. https://www.phledresearch.org/on-track-4-cohorts

[15] Ibid

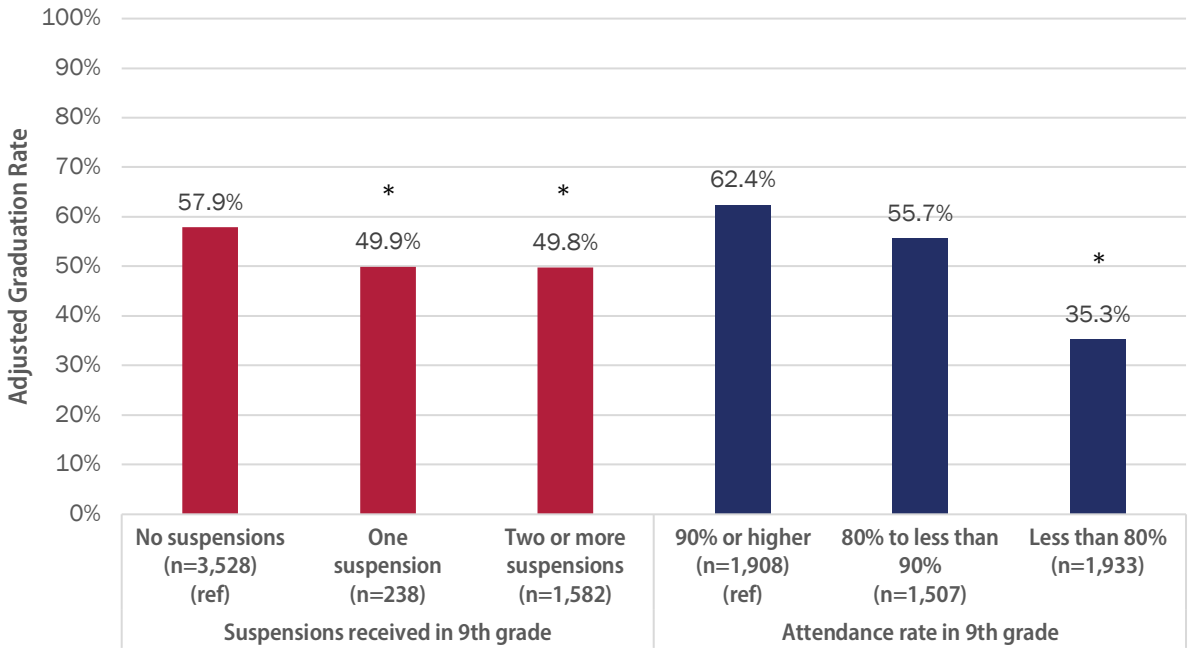
[16] Ibid

[17] Ibid

Suspensions and low attendance are important warning signals for off-track students.

We also examined associations between on-time graduation and 9th grade suspensions and attendance (Figure 2). For suspensions, we compared the adjusted graduation rates for students with no suspensions, one suspension, and two or more suspensions in their 9th grade year. For attendance, we compared adjusted graduation rates at different levels, noting that a student is considered chronically absent if they attend less than 90 percent of the their 9th grade year: 90% or higher, 80-90%, and less than 80%.

Figure 2. Four-year graduation rates for off-track first-time ninth-grade students in 2013-14 and 2014-15 cohorts, adjusted for school and student characteristics, by number of suspensions received and attendance rate in ninth grade



Note. Author calculations using data for School District of Philadelphia traditional high school students who first enrolled in ninth-grade in 2013-14 or 2014-15, who did not permanently transfer out of SDP during the study period, and who were off-track following their first year of high school. The statistical model adjusts for school attended, school type and size, student gender, race/ethnicity, cohort, and 9th grade measures of average daily attendance, number of suspensions, and low-income, English Learner, and special education status. The total sample size for this analysis was 15,994 students, but we are only reporting graduation rates here for off-track students (n=5,348). An * indicates the difference in graduation rates was significant with a p-value of less than 0.05.

This figure shows:

- **Both attendance and suspension are related to getting back on track and graduating on-time.**
    - **For off-track students, receiving at least one suspension in ninth grade is a clear warning sign.** Off-track students who received one or more suspensions had an adjusted on-track graduation rate almost 10 percentage points lower than off-track students without any suspensions ($p<0.05$).
    - **Attendance is an especially strong predictor, particularly for students with an average daily attendance below 80%.** Off-track students with an average daily

attendance below 80% had an adjusted graduate rate of about 35%, or 27 percentage points lower than their peers with 90% or higher average daily attendance ($p<0.05$).

School Characteristics Associated with Graduation Rates for Off-Track Students

In this section of the report, we assess whether off-track student graduation rates are associated with school characteristics, net of any increased risk of being off-track for some schools. These analyses draw attention to the challenge of supporting students at the school level. We examine the following characteristics of schools:

- ***Admission type.*** High schools in SDP admit students in different ways.[18] Neighborhood schools admit students based on catchment area, though some Neighborhood schools have specialized programs that draw students from around the city. Citywide schools admit students from the whole city, regardless of student residence address. Special Admission schools accept applicants based on criteria that may include grades, attendence, state test results, or disciplinary records. Prior PERC research, we found that neighborhood schools had the lowest on-track rates with values ranging from 49 to 61 percent compared to rates between 76 to 79% for Special Admit/Citywide schools, signaling that neighborhood schools are the ones with the greatest need for support.
- ***School size.*** In addition to admission type, we examined differences by school size. Following research that shows school size is associated with student learning, we defined schools of 600 students or less as small schools, 601-900 students as medium schools, and schools with 901 or more students as large schools.[19]

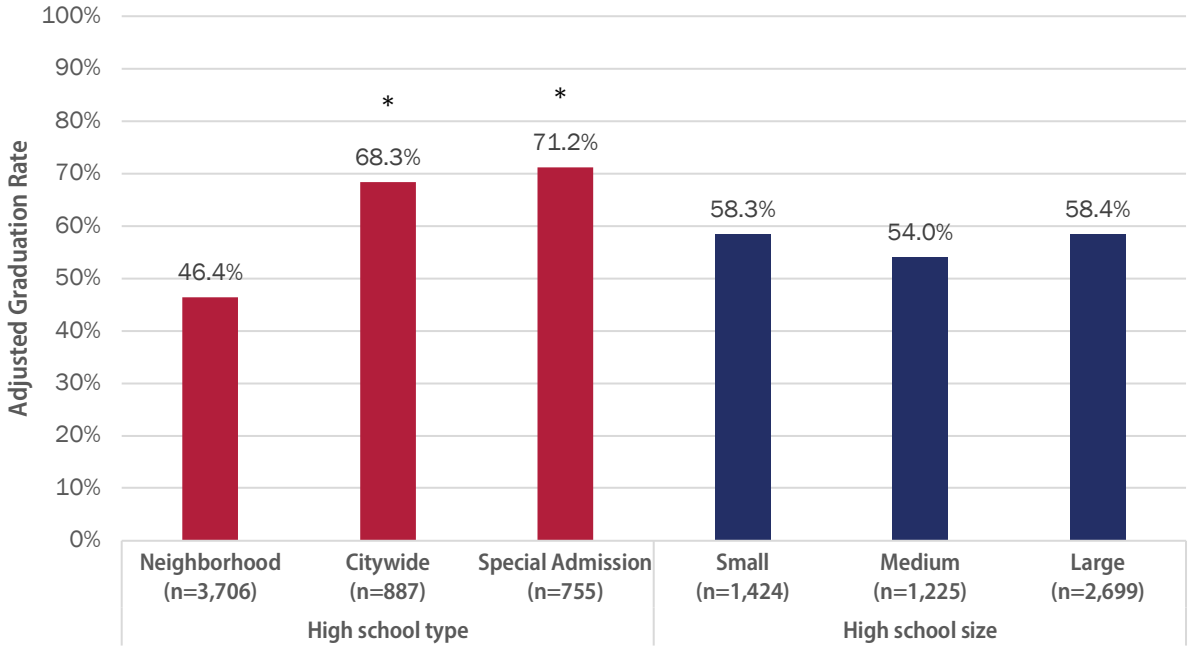
Off-Track students attending neighborhood schools are at significantly greater risk than those attending Citywide and Special Admission schools.

Figure 3 shows differences in adjusted graduation rates for students based on the characteristics of their 9th grade school. The bars on the left show different adjusted graduation rates for students in Neighborhood, Citywide, and Special Admit schools. The bars on the right categorize schools by size, showing adjusted graduation rates for small, medium, and large schools.

[18] The School District of Philadelphia. (2019). *High School Directory: Fall 2020 Admissions.* https://www.philasd.org/studentplacement/wp-content/uploads/sites/19/2019/09/HS-Directory-2020.pdf

[19] Lee, V. E. and Smith, J. B. (1997). High school size: Which works best and for whom? *Educational Evaluation and Policy Analysis, 19,* 205-227.

Figure 3. Four-year graduation rates for off-track first-time ninth-grade students in 2013-14 and 2014-15 cohorts, adjusted for school and student characteristics, by the type and size of high school they attended for ninth grade



Note. Author calculations using data for School District of Philadelphia traditional high school students who first enrolled in ninth-grade in 2013-14 or 2014-15, who did not permanently transfer out of SDP during the study period, and who were off-track following their first year of high school. The statistical model adjusts for school attended, school type and size, student gender, race/ethnicity, cohort, and 9th grade measures of average daily attendance, number of suspensions, and low-income, English Learner, and special education status. School size categories are defined as: Small = 600 or fewer students; Medium = 601-900 students; Large = 901 or more students. The total sample size for this analysis was 15,994 students, but we are only reporting graduation rates here for off-track students (n=5,348). An * indicates the difference in graduation rates was significant with a p-value of less than 0.05.

This figure shows:

- **The graduation rate for off-track students attending neighborhood schools in ninth grade was much lower than for off-track students at Citywide or Special Admission schools.** The adjusted graduation rate at neighborhood schools trailed other schools by more than 20 percentage points ($p<0.05$). Increased risks for off-track students at neighborhood schools may reflect the fact that these students have more off-track students than other schools,[20] straining recovery resources and pointing to the need for research on variable school capacity for supporting off-track students.
- **There was no association between school size and adjusted graduation rates.** While graduation rates vary slightly by school size, these differences are not statistically significant.

[20] Crofton, M., & Neild, R. C. (2018). *Getting On Track to Graduation: Ninth Graders' Credit Accumulation in the School District of Philadelphia, 2014-2016.* The Philadelphia Education Research Consortium.

Digging Deeper into the Off-Track Indicator

With five distinct course requirements for being on-track at the end of ninth grade, students can be off-track for multiple reasons and to different degrees after their first year of high school. Here we look more deeply into how adjusted graduation rates vary depending on degree of off-track. To do this, we categorized 9th graders into a continuum of five groups based on the number of requirements to being on-track (one credit in each core course, plus one additional credit, as explained in Box 1) and the total number of credits they earned.[21] Table 3 below provides definitions of these categories, as well as the number and percentage of students falling into each category.

Table 3. Definition of categories of on- and off-track students and the number and percentage of first-time ninth-grade students in 2013-14 and 2014-15 cohorts in each category

Category of On- or Off-Track	Definition of Category	Number of Students (N = 15,994)	Percent of Students (100%)
Securely On-Track	On-track students who earned more than 6 credits total.	9,008	56%
Marginally On-Track	On-track students who earned exactly one credit in each core course and 5-6 credits total.	1,638	10%
Marginally Off-Track	Off-track students missing a single requirement. These students had not earned one of the core subject credits or, if they had earned all of those credits, had not completed at least one additional credit.	2,264	14%
Moderately Off-Track	Off-track students that did not meet two or three of the five requirements.	1,960	12%
Far Off-Track	Off-track students missing four or five of the requirements for being on track.	1,124	7%

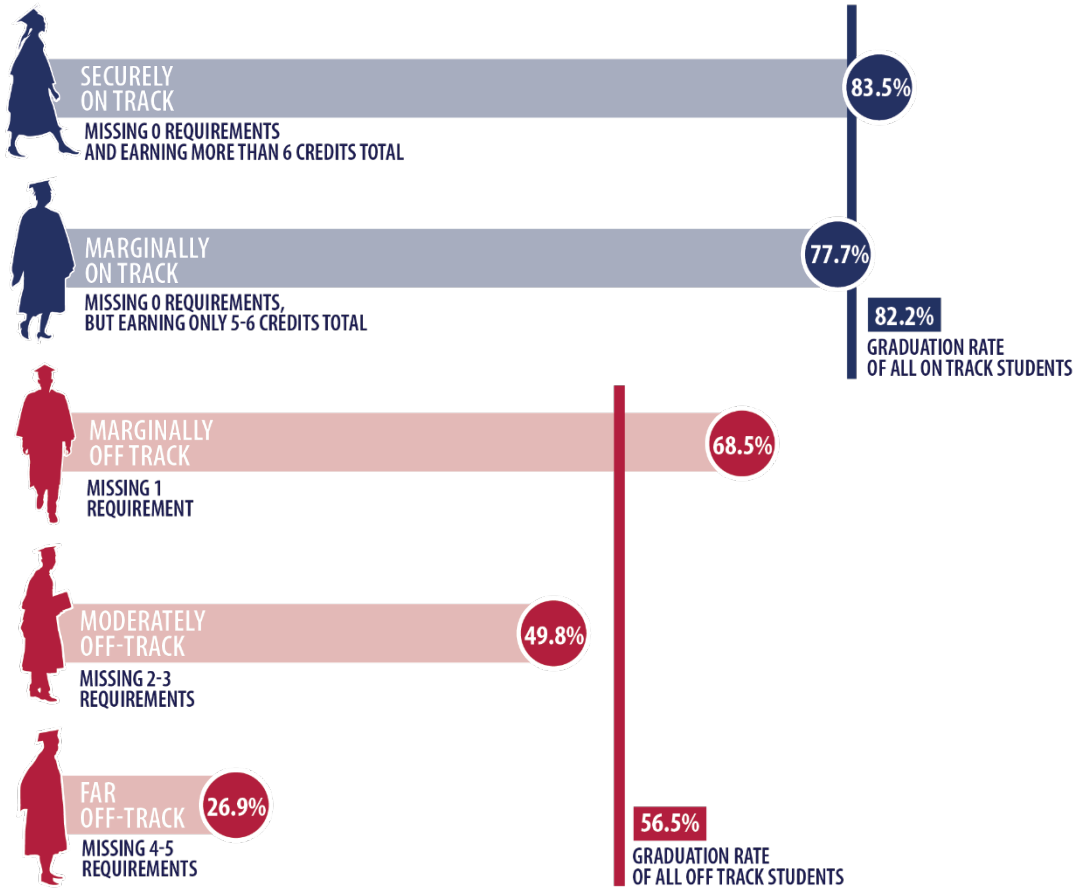
Note. Author calculations using data for School District of Philadelphia traditional high school students who first enrolled in ninth-grade in 2013-14 or 2014-15, who did not permanently transfer out of SDP during the study period, and who were off-track following their first year of high school. The total sample size for this analysis was 15,994 students, but we are only reporting graduation rates here for off-track students (n=5,348).

[21] These off-track categories are the same three categories used for the prior PERC report *Getting On Track to Graduation*, though we renamed the first category to "Marginally Off-Track" from "Almost On-Track" for clarity in this report.The on-track categories presented here differ from the on-track categories used in SDP's 2020 report on college matriculation of on-track ninth graders (Tanz., A. & Erdem-Akcay, E. (2020). *From Ninth Grade On-Track to College Matriculation: The Path of the 2015-16 SDP Ninth-Grade Cohort.* The School District of Philadelphia. https://www.philasd.org/research/2020/06/04/from-ninth-grade-on-track-to-college-matriculation-the-path-of-the-2015-16-sdp-ninth-grade-cohort/). That report uses the grades earned in courses as the differentiaion between a student being "Firmly On-Track" versus "On-Track But At Risk", whereas we use the number of total credits a student earned.

The farther off track a student was at the end of 9th grade, the lower their adjusted graduation rate.

Using these definitions for degree of on- and off-track, we modeled graduation rates for all students based on their on-track status at the end of ninth grade (Figure 4).

Figure 4. Four-year graduation rates for first-time ninth-grade students in 2013-14 and 2014-15 cohorts, adjusted for school and student characteristics, by degree on- or off- track in ninth grade



Note. Author calculations using data for School District of Philadelphia traditional high school students who first enrolled in ninth-grade in 2013-14 or 2014-15, who did not permanently transfer out of SDP during the study period, and who were off-track following their first year of high school. The statistical model adjusts for school attended, school type and size, student gender, race/ethnicity, cohort, and 9th grade measures of average daily attendance, number of suspensions, and low-income, English Learner, and special education status. The total sample size for this analysis was 15,994 students.

Notably:

- **The farther off-track students were during their ninth-grade year, the lower their graduation rates.** The more than 1,100 far off-track students had by far the lowest graduation rates, with about one quarter graduating on time. Because this category captures students who essentially began 10th grade a full year behind their peers, this is not surprising, but the scale of the challenge is clear from the difference in these percentages.

- **Even for students on the cusp of being on- or off-track, being on track at the end of ninth grade meant they were substantially more likely to graduate on time.** Marginally on-track students had an adjusted graduation rate 9 percentage points higher than marginally off-track students.

For students missing only one credit, it mattered little which credit requirement was missing.

As defined in Box 1, four of the five requirements to be on track at the end of ninth grade are tied to earning at least one credit in specific subject areas: math, English, science, and social studies. The fifth requirement is to earn one additional credit in any subject area. If any one of these five requirements were more consequential for eventual graduation, specific attention could be paid to student progress in that subject area in ninth grade.

To assess the relative importance of these five requirements, we examine the adjusted graduation rates based on the subject area of the missing credit for marginally off-track students (who were missing only one credit). We restricted this analysis to only those students who were marginally off-track (42.3% of off-track students), who had an adjusted graduation rate of 68.5% (Figure 4, above). As Table 4 shows, differences across categories were small.[22] It is notable that students missing the math credit graduated at 10 percentage points lower than those missing social studies – a finding that suggests the need for further examination. Yet, overall this difference is moderate and not statistically significant.

Table 4. Four-year graduation rates for marginally off-track first-time ninth-grade students in 2013-14 and 2014-15 cohorts, adjusted for school and student characteristics, by the credit they were missing in ninth grade

Student Was Missing the Credit for	Adjusted Graduation Rate	Number of Students in This Group	Percent of Off-Track Students in This Group	Total Credits Needed in the Subject Area to Graduate
Social Studies	73.5%	491	9.2%	4
English	68.6%	383	7.2%	4
Science	68.4%	662	12.4%	3
Math	63.5%	694	13.0%	3

Note. Author calculations using data for School District of Philadelphia traditional high school students who first enrolled in ninth-grade in 2013-14 or 2014-15, who did not permanently transfer out of SDP during the study period, and who were off-track following their first year of high school. The statistical model adjusts for school attended, school type and size, student gender, race/ethnicity, cohort, and 9th grade measures of average daily attendance, number of suspensions, and low-income, English Learner, and special education status. The total sample size for this analysis was 15,994 students, but we are only reporting graduation rates here for marginally off-track students who were missing a core course credit (n=2,230), excluding 34 marginally-off track students missing a non-core course credit.

[22] Since very few marginally off-track students were missing the fifth requirement of an "additional credit" (only 34 students), we excluded them from this analysis.

The Use of Credit Recovery to Get Back On Track

Knowing the graduation rates for different groups of students helps us understand which students might be in need of more support through their high school years. But how can schools provide that support? As discussed earlier, most students who got back on track did so in their senior year. This next section examines students who were able to get back on track in their senior year to try to understand if credit recovery opportunities in that year played a role.

How do students get off track? There are two ways a student can end their 9th grade year off-track. An off-track student might have failed one or more required courses in their freshman year, or they might not have enrolled in one or more courses bearing a required credit.

When does a student need to recover a credit from 9th grade? Not all students who fail a course in 9th grade need to recover that course credit in order to graduate. Even if the course is in a core subject, policies for which core courses are prerequisites for others vary by school. So, the need to recover the credit for graduation depends on whether students need it to progress in the subject area and gain the credits required for graduation.

What are student options for recovering a missing course? A student has three options to earn a missing course credit. For students who were not enrolled in the first place, they must enroll in the full course in a future year. If a student took the course but failed, they can recover the credit either by retaking the course completely or by enrolling in a credit recovery.

What are the different alternative credit recovery formats? There are two credit recovery formats: (1) face-to-face classroom-based recovery and (2) web-based recovery.[23] These two recovery formats differ from retaking the course in full because the courses are taken on a shorter timeline and with a modified structure compared to retaking the course in a traditional format. For this analysis, we focus on alternative credit recovery formats.

Note on data availability. Data on whether a failed course was retaken in a traditional format or an alternative credit recovery format was first captured in SDP's data system for the 2017-18 school year. Students may have attempted or regained credits using alternative credit recovery formats before the 2017-18 year, but we could not identify those cases in the data. For that reason, this analysis is restricted to the 2017-18 school year and uses only off-track 9th graders in the Class of 2018 (Cohort 2) and their course recovery pathways during their senior year year.[24] That means our analysis in this section is restricted to just 30% of the sample of off-track students that we have been studying through the rest of the report (62% of the off-track sample of Cohort 2 students). We present unadjusted graduation rates because the sample size is too small to support a model-based approach.

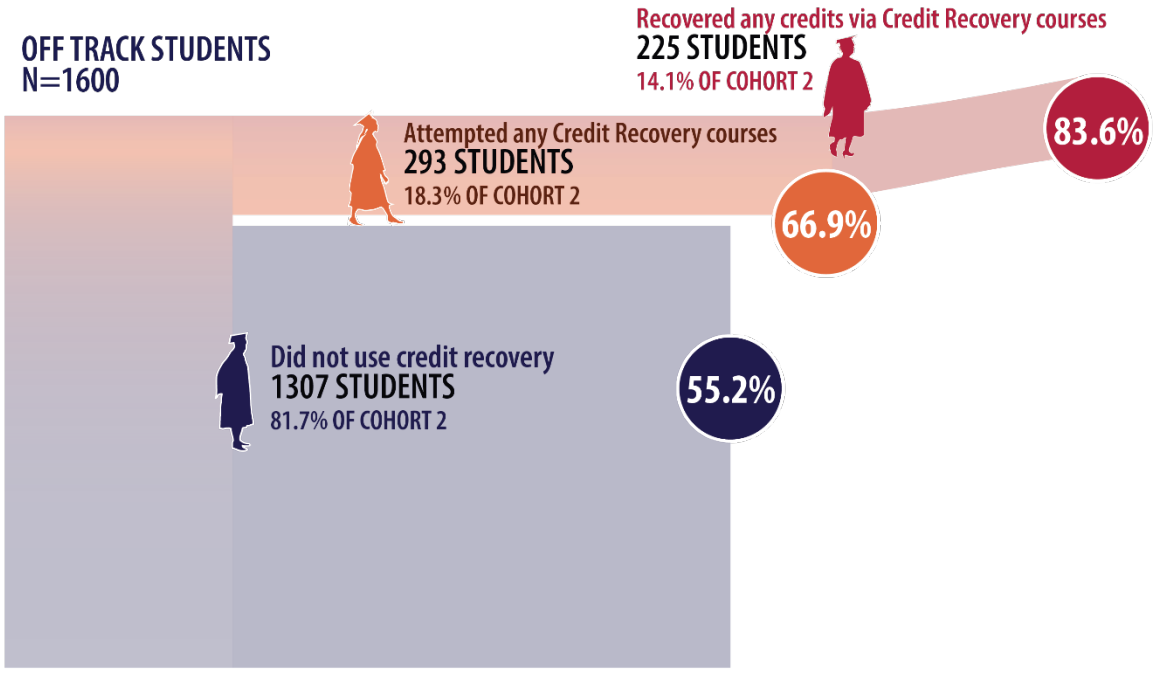
[23] The options available to a student vary by school, however, as schools have the flexibility to determine which formats of courses are offered to their students.

[24] We elected to leave Class of 2017 students out of this analysis because the number of students who remained in the district for a fifth year was much smaller than the overall cohort off-track students and they likely look substantially different than other students in that cohort. Those differences may have impacted whether or not they took credit recovery courses thus we did not include them in this analysis.

While representing only a fifth of off-track students, most who used Credit Recovery in 2017-18 to recover credits graduated.

Figure 5 shows how many off-track ninth graders in the Class of 2018 (Cohort 2) attempted and recovered credits during their senior year by each mode of alternative credit recovery and the *unadjusted* graduation rates of each group.[25] In this figure, four of five students did not use credit recovery (81.7%). The remaining, while only representing a little less than a fifth of off-track students (18.3%), at least attempted Credit Recovery in 2017-18 to recover credits.[26]

Figure 5. Number, percent, and unadjusted graduation rates of off-track ninth-grade students in 2014-15 cohort, by whether or not they used credit recovery in 2017-18, n=1,600



Note: Author calculations using data for School District of Philadelphia traditional high school students who first enrolled in ninth-grade in 2014-15, who did not permanently transfer out of SDP during the study period, who were off-track following their first year of high school, and who had course enrollment data for the 2017-18 school year. The total sample size for this analysis was 1,600 students.

Notably:

- **Most of the students who attempted credits via credit recovery were able to regain credits.** Out of 293 students who attempted a credit recovery course, three-fourths (N=225) were able to recover those credits.
- **Students who recovered credits via Credit Recovery courses had much higher graduation rates than their peers who did not attempt credit recovery through such courses.** Most students who recovered credits graduated (83.6%) compared to about half

[25] Appendix Table C7 shows the graduation rates and number of students who attempted and who recovered credits by mode of alternative credit recovery (classroom face-to-face or web-based). Students may have taken recovery courses using both formats, in which case they are included in both rows of that table.

[26] Appendix Table B2 shows the percent of students who attempted Credit Recovery by degree of off-track.

of those who did not attempt to use Credit Recovery (55.2%), a difference of about 28 percentage points ($p<0.05$).

- **Students who attempted credits, even if they did not earn those credits, had higher graduation rates than those that did not.** Two-thirds of those that attempted to recover a course through credit recovery graudated on time (66.9%), compared to about half (55.2%) of those who did not use credit recovery, a difference of about 12 percentage points ($p<0.05$).

Implications for policy and practice

Continuing to focus on getting students on track after their first year of high school is an important strategy for improving the high school graduation rate.

Ninth grade is a critically important year, and how a student manages the transition to high school is a strong indicator of their likelihood of graduating three years later. This research builds on prior research on SDP's Ninth Grade On-Track indicator and continues to make the case that students on track at the end of ninth grade are more likely to graduate on time or within 5-years of starting high school. A strong dropout prevention strategy should involve careful review of student-level data to identify 9th graders at risk of dropping out. With the Ninth Grade On-Track indicator, SDP high school school staff have access to a concise indicator for flagging students at risk early on.

The district should consider expanding the tracking system to include degree of off-track, as well as support school staff in reviewing the On-Track indicator alongside other student-level data.

Though there is parsimony and simplicity in a dichotomous indicator for flagging off-track students, our analysis above shows that recovery rates to eventual graduation are lower for some students. Reviewing a broader range of student level data in concert with the On-Track indicator will give schools a more nuanced understanding of the level of risk for their students. For example, far- and moderately off-track students have graduation rates far below their marginally off-track peers. Additionally, male students, students receiving Special Education services, and Black and Hispanic students show increased risk of failing to recover from being off-track in 9th grade. For other off-track students, paying attention to suspensions or attendance challenges might be used to flag students for more comprehensive and continuous supports both before and udring attempts to retake courses to get them back on track.

All off-track students need support, and helping off-track students recover may require different solutions for different students and in different school settings.

While this study did not examine school variation in approaches to getting students back on track, the evidence of varying levels of recovery by student and school characteristics provides fodder for a discussion of what works to support students. We consider support for all students to be a crucial strategy for improving graduation rates. Focusing, for example, only on far or moderately off-track students would have left over 2,200 marginally off-track students unsupported, among whom, as our analysis shows over 700 failed to recover. Thus approaches should be designed as inclusive of all off-track students.

However, school supports for off-track students should match the reasons for course failure in 9th grade as well as reasons students struggle to recover. Thus, crucial next steps for the district include understaing why students fail, what works to get students back on track, and the relationship between the two. While not definitive based on the data presented here, research in other districts suggests that off-track 9th graders usually become disengaged from school in primarily one of two ways: one rooted in an academic struggle and another in misbehavior or aversion to school attendence.[27]

While it may be unduly burdensome for the district to regularly provide school administrators with the kind of extensive and nuanced student-level data on root causes for academic failure and failure to recover, a study of the correlation between reasons for disengagement and recovery and degree of off-track and other student and school characteristics would be a reasonable next step. Armed with those corrleations, the district could leverage readily available student level data that is strongly associated with root causes and likelihood of recovery to enable schools to move toward matching students to effective supports.

This study also shows that schools matter and suggests that schools with many off-track students are suffering from an untenable strain on resources for off-track students' recovery. The district should consider more research on school variation in capacity to support off-track students, focused on strategies used across school admission types for preventing course failures and for supporting the recovery of off-track students, and what works in which settings.

[27] Balfanz, R., Herzog, L., & Mac Iver, D. M. (2007). Preventing student disengagement and keeping students on the graduation path in urban middle-grades schools: Early identification and effective interventions. *Educational Psychologist, 42,* 223-235.

References

Allensworth, E. M. & Easton, J. Q. (2005). *The On-Track Indicator as a Predictor of High School Graduation*. Consortium on Chicago School Research. https://consortium.uchicago.edu/publications/track-indicator-predictor-high-school-graduation

Balfanz, R., Herzog, L., & Mac Iver, D. M. (2007). Preventing student disengagement and keeping students on the graduation path in urban middle-grades schools: Early identification and effective interventions. *Educational Psychologist, 42,* 223-235.

Crofton, M., & Neild, R. C. (2018). *Getting On Track to Graduation: Ninth Graders' Credit Accumulation in the School District of Philadelphia, 2014-2016.* The Philadelphia Education Research Consortium.

Heppen, J. B. & Therriault, S. B. (2008). *Developing Early Warning Systems to Identify Potential High School Dropouts.* https://files.eric.ed.gov/fulltext/ED521558.pdf

Jerald, C. D. (2006). *Identifying Potential Dropouts: Key Lessons for Building an Early Warning Data System.* Achieve, Inc. https://files.eric.ed.gov/fulltext/ED499838.pdf

Kennelly, L. & Monrad, M. (2007). *Approaches to Dropout Prevention: Heeding Early Warning Signs With Appropriate Interventions.* National High School Center, American Institutes for Research. https://files.eric.ed.gov/fulltext/ED499009.pdf

Lee, V. E. and Smith, J. B. (1997). High school size: Which works best and for whom? *Educational Evaluation and Policy Analysis, 19,* 205-227.

Neild, R. C. & Balfanz, R. (2006). *Unfulfilled Promise: The Dimensions and Characteristics of Philadelphia's Dropout Crisis, 2000–2005.* Philadelphia Youth Network. http://www.projectuturn.net/docs/Unfulfilled_Promise_Project_U-turn.pdf

Neild, R. C., Balfanz, R., & Herzog, L. (2007). An early warning system. *Educational Leadership, 65*, 28–33.

Pileggi, M. & Strouf, K. (2018). *On Track Across Four Cohorts: Ninth Grader On Track Patterns in the School District of Philadelphia, 2013-2017.* The Philadelphia Education Research Consortium. https://www.phledresearch.org/on-track-4-cohorts

Tanz., A. & Erdem-Akcay, E. (2020). *From Ninth Grade On-Track to College Matriculation: The Path of the 2015-16 SDP Ninth-Grade Cohort.* The School District of Philadelphia. https://www.philasd.org/research/2020/06/04/from-ninth-grade-on-track-to-college-matriculation-the-path-of-the-2015-16-sdp-ninth-grade-cohort/

The School District of Philadelphia. (2018). *Keeping Pace for Graduation: Suggested Credit Totals by Grade*. https://www.philasd.org/research/wp-content/uploads/sites/90/2018/08/Suggested-Credit-Totals-by-Grade.pdf

The School District of Philadelphia. (2019). *High School Directory: Fall 2020 Admissions.* https://www.philasd.org/studentplacement/wp-content/uploads/sites/19/2019/09/HS-Directory-2020.pdf

Wills, T. (2018). *Defining 9th Grade Success: A New 9th Grade On Track Definition.* The School District of Philadelphia. https://www.philasd.org/research/wp-content/uploads/sites/90/2018/05/On-Track-Focus-Brief_May-2018.pdf

Pinkus, L. (2008). *Using Early-Warning Data to Improve Graduation Rates: Closing Cracks in the Education System.* Alliance for Excellent Education. https://all4ed.org/wp-content/uploads/EWI.pdf

Appendix A: Student and School Variable Definitions

Key variables for this analysis were defined in Box 2 of this report. Further detail about the variables used to classify students and schools are provided below.

- **Race / Ethnicity:** Categorical variable for if the student identified as Black, Hispanic, or another race (including: American Indian or Alaskan Native, Asian, Native Hawaiian or Pacific Islander, White, or multiracial)
- **Gender:** Indicator of whether the student identified as male or female.
- **Low-income status in 9th grade:** Indicator of whether a student's family received public assistance through Temporary Assistance for Needy Families (TANF), Supplemental Nutrition Assistance Program (SNAP), Medicaid, or other social service programs. While this measure identifies the most economically disadvantaged students, it underestimates the number of students living at or close to poverty compared to the previously available Free and Reduced Price Lunch eligibility measures.
- **Special education status in 9th grade:** Indicator of whether students were receiving special education services other than gifted and talented services.
- **English learner status in 9th grade:** Indicator of whether a student was classified as English learner and receiving linguistic support.
- **Courses taken in 2017-18:** All courses the student was enrolled in for the 2017-18 school year and the mode the course was taken in (e.g. in-person or web-based credit recovery).
- **High school attended:** The school each student attended for ninth grade. For students who attended more than one school in their ninth grade year, we used the last school attended.
- **High school type:** Based on SDP classifications of high schools, each high school was identified as a Neighborhood school (which primarily draws students from a catchment area based on the elementary school the student attended), a Citywide school (which draws students from all over Philadelphia and has a lottery-based admission process), or a Special Admission school (which are "magnet" schools with specific admissions requirements).
- **High school size:** Based on the total number of students enrolled in the school in the 2013-14 school year (or the first year it operated for schools that opened in 2014-15), the research team developed an indicator for small (600 or fewer students), medium (601-900 students), or large (901 or more students) schools.

Appendix B: Sample Size by Degree of Off Track, Missingness and Credit Recovery Attempts

Table B1. Number and percent of all ninth-grade students with valid and missing data in 2013-14 and 2014-15 cohorts, by on-/off-track status

On- / Off- Track Status in 9th Grade	Number of Students in Both Cohorts	Number of Students with Missing Data in Both Cohorts	Percent of Students with Missing Data
Securely On-Track (earning all 5 requirements and more than 6 credits total)	9,608	600	6%
Marginally On-Track (earning all 5 requirements, but only 5-6 credits total)	1,730	92	5%
Marginally Off-Track (Missing 1 requirement)	2,471	207	8%
Moderately Off-Track (Missing 2-3 requirements)	2,240	280	13%
Far Off-Track (Missing 4-5 requirements)	1,271	147	12%
All 9th Grade Students	**17,320**	**1,326**	**8%**

Table B2. Number and percent of off-track ninth-grade students in 2014-15 cohort, by whether or not they attempted any credit recovery in 2017-18

Off- Track Status in 9th Grade	Number of Off-Track 9th Grade Students Who Did Not Attempted Credit Recovery Courses	Number of Off-Track 9th Grade Students Who Attempted Any Credit Recovery Courses	Percent of Off-Track 9th Grade Students Who Attempted Any Credit Recovery Courses
Marginally Off-Track (Missing 1 requirement)	629	156	20%
Moderately Off-Track (Missing 2-3 requirements)	439	122	22%
Far Off-Track (Missing 4-5 requirements)	239	15	6%
All Off-Track Students	**1,307**	**293**	**18%**

Appendix C: 4- and 5-year Adjusted and Unadjusted Graduation Rate Tables

Table C1. Four- and five-year adjusted and unadjusted graduation rates for first-time ninth-grade students in 2013-14 and 2014-15 cohorts, by their ninth grade on-track status, N=15,994

	9th Grade On-Track Status	Model-Adjusted Graduation Rates	Unadjusted Graduation Rates	Percentage-Point Difference
4-year graduation rate	Off-track	56.5%	43.9%	12.6
	On-track	82.2%	88.0%	-5.8
5-year graduation rate	Off-track	63.1%	51.3%	11.8
	On-track	84.7%	89.9%	-5.2

Table C2. Four-year adjusted and unadjusted graduation rates for first-time ninth-grade students in 2013-14 and 2014-15 cohorts, by student characteristics and cohort, N=15,994

	Adjusted On-Time Graduation Rates		Unadjusted On-Time Graduation Rates		Number of Students	
	On-Track 9th Graders	Off-Track 9th Graders	On-Track 9th Graders	Off-Track 9th Graders	On-Track 9th Graders	Off-Track 9th Graders
Gender						
Male	79.1%	50.7%	84.5%	38.5%	4,886	3,064
Female	85.6%	62.3%	91.0%	51.1%	5,760	2,284
Special education services in 9th grade						
Received services	83.1%	50.6%	81.1%	33.6%	1,241	1,332
Did not receive services	81.9%	57.6%	89.0%	47.3%	9,405	4,016
Race / Ethnicity						
Black	81.5%	58.7%	87.7%	45.7%	5,384	3,393
Hispanic	79.8%	59.2%	82.8%	40.8%	1,178	1,144
White, Asian, or another race	83.7%	53.2%	91.3%	40.6%	3,484	811
Family low-income status in 9th grade (Free from Tape)						
Participated in social service programs	81.9%	55.7%	85.1%	40.7%	5,495	3,694
Did not participate in social service programs	82.9%	57.5%	91.1%	51.1%	5,151	1,654
English learner services in 9th grade						
Received services	82.1%	56.4%	83.4%	42.6%	1,025	544
Did not receive services	82.2%	56.5%	88.5%	44.0%	9,621	4,804
Suspensions received in 9th grade						
0 suspensions	84.9%	57.9%	89.8%	49.9%	9,718	3,528
1 suspension	74.4%	49.9%	75.8%	36.6%	219	238
2 or more suspensions	73.7%	49.8%	68.3%	31.6%	709	1,582

	Adjusted On-Time Graduation Rates		Unadjusted On-Time Graduation Rates		Number of Students	
	On-Track 9th Graders	Off-Track 9th Graders	On-Track 9th Graders	Off-Track 9th Graders	On-Track 9th Graders	Off-Track 9th Graders
Attendance rate in 9th grade						
90% or higher	90.4%	62.4%	93.2%	60.3%	8,015	1,908
80% to less than 90%	79.0%	55.7%	77.3%	48.1%	1,926	1,507
Less than 80%	64.8%	35.3%	59.0%	24.4%	705	1,933
Cohort						
2013-14	83.3%	56.4%	88.6%	44.0%	5,305	2,779
2014-15	81.1%	56.6%	87.5%	43.8%	5,341	2,569

Table C3. Four-year adjusted and unadjusted graduation rates for first-time ninth-grade students in 2013-14 and 2014-15 cohorts, by type and size of school attended in ninth grade, N=15,994

	Adjusted On-Time Graduation Rates		Unadjusted On-Time Graduation Rates		Number of Students	
	On-Track 9th Graders	Off-Track 9th Graders	On-Track 9th Graders	Off-Track 9th Graders	On-Track 9th Graders	Off-Track 9th Graders
High school admission type						
Neighborhood	78.3%	46.4%	79.5%	34.3%	4,560	3,706
Citywide	88.5%	68.3%	90.0%	59.1%	1,282	887
Special Admission	90.7%	71.2%	95.6%	73.2%	4,804	755
High school size						
Small (600 or fewer students)	83.3%	58.3%	88.8%	52.2%	2,823	1,424
Medium (601-900 students)	80.6%	54.0%	89.7%	47.8%	2,886	1,225
Large (901 or more students)	83.2%	58.4%	86.6%	37.7%	4,937	2,699

Table C4. Four-and five-year adjusted and unadjusted graduation rates for on- and off-track first-time ninth-grade students in 2013-14 and 2014-15 cohorts, by their degree of off-track in ninth grade, N=15,994

On- / Off- Track Status in 9th Grade	Adjusted Graduation Rates		Unadjusted Graduation Rates		Number of Students in This Group
	4-Years	5-Years	4-Years	5-Years	
Securely On-Track (earning all 5 requirements and more than 6 credits total)	83.5%	85.8%	88.8%	90.5%	9,008
Marginally On-Track (earning all 5 requirements, but only 5-6 credits total)	77.7%	81.0%	83.9%	86.8%	1,638
Marginally Off-Track (Missing 1 requirement)	68.5%	73.6%	63.8%	69.6%	2,264
Moderately Off-Track (Missing 2-3 requirements)	49.8%	58.4%	37.7%	46.7%	1,960
Far Off-Track (Missing 4-5 requirements)	26.9%	38.0%	14.6%	22.3%	1,124

Table C5. Four-year adjusted and unadjusted graduation rates for off-track first-time ninth graders in 2013-14 and 2014-15 cohorts, by the requirement(s) they were missing in ninth-grade, N=15,994

If the Student Was Missing the Credit for…	Adjusted Graduation Rates	Unadjusted Graduation Rates	Number of Off-Track Students	Percent of Off-Track Students	Total Credits Needed in Subject Area to Graduate
Social Studies	73.5%	76.8%	491	9.2%	4
English	68.6%	65.0%	383	7.2%	4
Science	68.4%	70.2%	662	12.4%	3
Math	63.5%	66.9%	694	13.0%	3
Additional Credit	76.4%	61.8%	34	0.6%	-
Missing Multiple	43.5%	37.8%	3,084	57.7%	-
All Off-Track Students	**56.5%**	**43.9%**	**5,348**	**100.0%**	**-**

Table C6. Which credit off-track first-time ninth-grade students in 2013-14 and 2014-15 cohorts were missing in ninth grade, N=5,348

Missing Requirement	Number of Off-Track Students	Percent of Off-Track Students
Marginally Off-track Students (missing only one requirement)		
Only missing **math**	694	13.0%
Only missing **science**	662	12.4%
Only missing **social studies**	491	9.2%
Only missing **English**	383	7.2%
Only missing the **additional credit**	34	0.6%
Moderately and Far Off-track Students (missing more than one requirement, so each student included in multiple rows)		
Missing **math** plus at least one other requirement (most commonly science)	2,281	42.7%
Missing **science** plus at least one other requirement (most commonly math)	2,379	44.5%
Missing **social studies** plus at least one other requirement (most commonly science)	2,105	39.4%
Missing **English** plus at least one other requirement (most commonly math)	2,064	38.6%
Missing the **additional credit** plus at least one other requirement (most commonly English)	616	11.5%

Table C7. Number, percent, and unadjusted graduation rates of off-track ninth-grade students in 2014-15 cohort, by whether or not they used each mode of credit recovery in 2017-18, N=1,600

Course Recovery Enrollment in 2017-18	Number of Off-Track 9th Grade Students	Percent of Off-Track 9th Grade Students	Unadjusted Graduation Rates
Did not use credit recovery in 2017-18	1,307	81.7%	55.2%
Attempted any Credit Recovery courses	293	18.3%	66.9%
Any Face-to-Face Recovery	179	11.2%	68.7%
Any Web-based Recovery	127	7.9%	63.0%
Recovered any credits via Credit Recovery courses	225	14.1%	83.6%
Any Face-to-Face Recovery	140	8.8%	85.7%
Any Web-based Recovery	93	5.8%	80.6%

Appendix D: Model Building Process and Model Regression Results

As discussed in Box 3, we employed a multi-level regression model to estimate marginal graduation rates for the study sample rather than presenting unadjusted rates. Marginal or "adjusted" graduation rates account for factors that are jointly associated with ninth grade on-track status and graduation. Factors that might influence both "on-track status" as well as graduation from high school, include student demographic characteristics, ninth grade program participation (e.g., reciept of Special Education and English Learner services), school attendance rates and behavior incidents in ninth grade, and the school the student attended in ninth grade.

The final multi-level statistical model specificies students nested within schools where the student finished their freshman year. To identify the covariates and interaction terms that provided the best model fit, researchers engaged in a step-wise model building process, comparing log-likelihoods with the addition of covariates (Table D1). Table D2 shows regression coefficients and standard errors of all variables used in models 1, 7, and the final model.

Table D1. Model fit indices used during model-building to assess addition of covariates

	Multi-Level Models	Log likelihood	LR Test Statistic (compared to previous model)
Model 1	Empty model predicting on-time graduation	-8051.81	-
Model 2	Add off-track status binary indicator	-6986.63	2130.37
Model 3	Add student-level demographic characteristics	-6920.81	131.64
Model 4	Add student-level characteristics (special education, English Learner, and low-income)	-6897.74	46.14
Model 5	Add 9th grade attendance	-6579.68	636.12
Model 6	Add 9th grade suspensions	-6533.55	92.26
Model 7	Add school size and school type variables	-6506.46	54.18
Final	Add interaction terms	-6455.58	101.76

Table D2. Logistic regression coefficients for on time graduation regressed on student and school characteristics, N=15,994, School District of Philadelphia, Classes of 2017 and 2018

	Model 2 - Base Model	Model 7 - Main Model prior to adding interaction terms	Final Model - with significant interaction terms
Off-Track in 9th Grade	-1.978***	-1.555***	-1.570***
	(0.0449)	(0.0477)	(0.147)
Student-level covariates			
Female		0.569***	0.567***
		(0.0459)	(0.0459)
Black		0.0218	-0.128
		(0.0654)	(0.0856)
Hispanic		-0.0806	-0.260***
		(0.0742)	(0.0994)
Cohort 1 student (first enrolled in SY2013-2014)		0.0787*	0.190***
		(0.0453)	(0.0652)
Received English Learner services in 9th grade		-0.00696	-0.00476
		(0.0767)	(0.0772)
Low-income status in 9th grade		-0.0994**	-0.0887*
		(0.0487)	(0.0490)
Receieved special education services in 9th grade		-0.195***	0.104
		(0.0556)	(0.0894)
9th grade Average Daily Attendance (ADA) between 80% and 90%		0.842***	0.808***
		(0.0620)	(0.0987)
9th grade ADA >= 90%		1.487***	1.802***
		(0.0617)	(0.0963)
Student received 1 Suspension in 9th grade		-0.541***	-0.800***
		(0.117)	(0.174)
Student received 2 or more suspensions in 9th grade		-0.510***	-0.844***
		(0.0597)	(0.0978)
School-level covariates			
Attended a Special Admission school for 9th grade		1.132***	1.075***
		(0.123)	(0.123)
Attended a Citywide school for 9th grade		0.749***	0.728***
		(0.139)	(0.138)
Attended a school for 9th grade that enrolled fewer than 600 students		0.128	0.125
		(0.117)	(0.117)
Attended a school for 9th grade that enrolled more than 900 students		0.219	0.190
		(0.135)	(0.134)

	Model 2 - Base Model	Model 7 - Main Model prior to adding interaction terms	Final Model - with significant interaction terms
Interaction Terms			
Offtrack_g9#Black			0.371***
			(0.120)
Offtrack_g9#Hispanic			0.426***
			(0.140)
Offtrack_g9#Cohort1			-0.202**
			(0.091)
Offtrack_g9# Special education status			-0.446***
			(0.115)
Offtrack_g9# ADA between 80% and 90%			0.138
			(0.125)
Offtrack_g9# ADA >= 90%			-0.542***
			(0.121)
Offtrack_g9#1 Suspension			0.414*
			(0.229)
Offtrack_g9#2 or More Suspensions			0.453***
			(0.119)
L2 – Last School Enrolled in 9th grade	0.819***	0.0797***	0.0779***
	(0.178)	(0.0264)	(0.0260)
Constant	2.167***	0.0871	0.0185
	(0.131)	(0.141)	(0.159)
Observations	15,994	15,994	15,994
Number of groups	52	52	52
chi2	1943	2716	2724

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note. Author calculations using data for School District of Philadelphia traditional high school students who first enrolled in ninth-grade in 2013-14 or 2014-15 and who did not permanently transfer out of SDP during the study period.