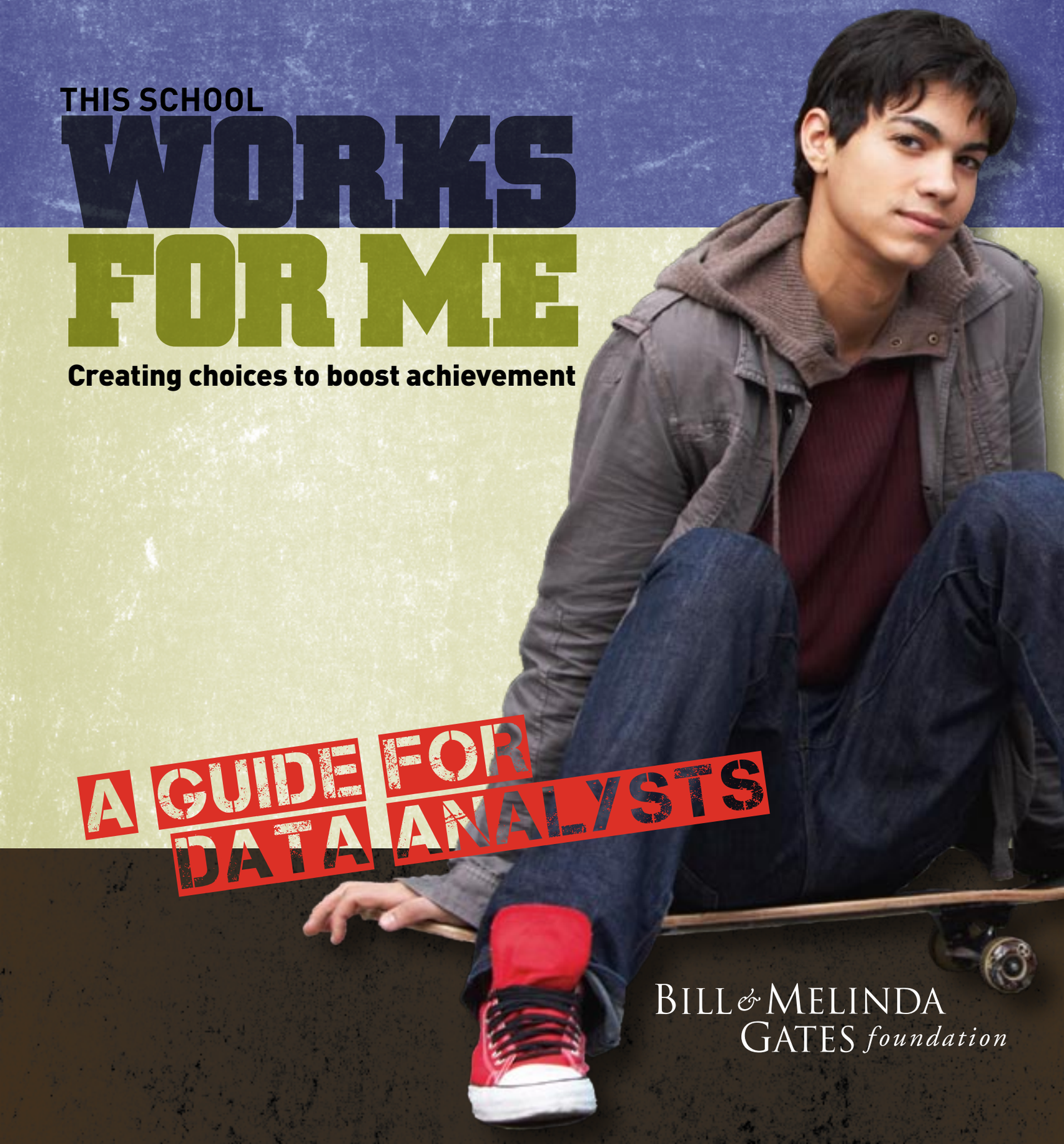
THIS SCHOOL

WORKS FOR ME

Creating choices to boost achievement



A GUIDE FOR DATA ANALYSTS

BILL & MELINDA GATES *foundation*

MANAGING HIGH SCHOOL PORTFOLIOS

This series of guides is designed to help school district leaders address one of the toughest challenges in American education: dropout rates of 30 percent nationwide, 50 percent in many big cities, and 60 percent or more in the lowest-performing schools.

The good news is that several large urban districts, intent on raising graduation rates and increasing college readiness, have been strategically addressing these challenges for the past several years. By better understanding the needs of their students, district leaders have created a mix of school designs and programs—a portfolio of educational options. This series shares their strategies, offers advice, and provides practical tools to help leaders break down this seemingly intractable crisis into a series of more manageable steps.

The approaches documented in these guides are promising and have some evidence of success. But the efforts remain a work in progress whose long-term impact will not be known for several more years.

The first guide in the series *(Leadership Guide)*, an overview for decisionmakers, describes in abbreviated form how districts can:

- pinpoint how students are progressing and which students, by name, are most likely to struggle in school and drop out
- introduce some high-leverage strategies to get students back on track for a diploma
- identify the mix of school choices and programs that will prepare more students for colleges and careers

The second guide *(Implementation Guide)* offers a more detailed examination of the six key questions that districts are addressing:

- How are your students progressing—and which are struggling?
- What kind of school choices do you provide to meet diverse student needs—and how well are those schools and programs performing?
- How will you manage a change process, inviting multiple stakeholders inside and outside the system to make the kinds of changes that the data suggest are needed?
- How can you strengthen your portfolio of options?
- How will you provide support to schools?
- What policy changes are needed?

The third guide *(Analyst Guide)* includes tools for data analysts to drill down into the data and use their findings to arm school leaders with actionable information (online only).

These guides build on the first phase of education work of the Bill & Melinda Gates Foundation—helping districts build a portfolio of smaller, theme-based schools. They respond to multiple requests from policymakers and educators who asked us to share what we have learned in a form that they can use in their own communities. Information is drawn from Atlanta, Boston, Charlotte-Mecklenburg, Chicago, Dallas, Portland, and New York City and their partnerships with the Bridgespan Group, Boston Consulting Group, McKinsey & Company, Education Resource Strategies, and The Parthenon Group.

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Based on lessons learned from this phase, the foundation is now focused on three areas in which we are uniquely positioned to make a large-scale impact:

- supporting the development and implementation of college-ready standards, as well as tools for students and teachers to implement them
- empowering excellent teachers
- finding innovative ways to support the next generation of school models

In light of the proposed criteria for education stimulus funding through the U.S. Department of Education's *Race to the Top,* the advice offered in these guides is particularly relevant and timely for any district committed to establishing data systems to track student achievement, turning around low-performing schools, and developing the right mix of offerings for each and every one of its students—and the thousands of others who share the dream of a better life.

The guides are intended to be just that—guides, not instruction manuals. You will have your own answers to the questions found here and can browse quickly through whole sections to learn how your experience matches that of other districts. Likewise, you can approach this work in a different sequence, beginning with building community support for change or assessing the effectiveness of the mix of schools and programs you have now.

1. USE DATA TO INFORM KEY DECISIONS

Every district uses data. The most important question is *how* and to what end those data are used.

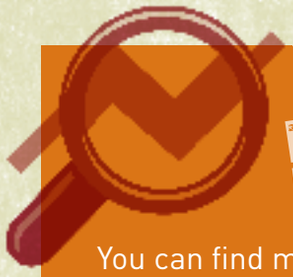
Urban districts are using data—or should be—to address the challenge of students dropping out of school. Numbers are crunched in databases with hundreds of thousands of student records to know the size of the dropout problem and the track record of schools in stemming the loss. Data tools are employed to calculate the cost of various options, from closing schools and opening new ones to providing interventions such as evening school. Performance data are analyzed to evaluate the success of the district's portfolio of schools. In sum, data provide the foundation for the myriad district decisions involved in matching student needs to school and program choices.

It is quite likely that leaders in your district are intent on using data to inform some hard choices ahead—but they need your help. The analyses and charts in this guide illustrate the work you need to do to answer the questions they encountered in the *Leadership* and *Implementation* guides. If you are not familiar with these guides, then the first step is to spend some time with them.

After a review of the other guides and an examination of this one, you will be in a better position to move to the next step—assessing whether your district has the requisite system for data collection and analysis, and if not, where you will pull the information from. You can then move forward with data analysis or invest resources to increase the internal capacity for analysis or request outside help as needed. (For an example of an RFP for data support, see Jobs for the Future, *Bringing Off-Track Youth into the Center of High School Reform,* pages 50–55.) Several of the districts cited in these guides turned to consultants for support for the initial round of data analysis to identify which indicators were most predictive of future dropout rates and which schools were beating the odds. Since this guide depicts the analyses conducted, you may need less support from consultants as a result.

However, an assignment of this magnitude is not one you will want to undertake alone. After consulting with district leadership, you can form a team of school and central office administrators to generate questions, confirm the validity of the analysis, and ensure that findings are clearly presented. A budget analyst on the team will be valuable, for example, when it is time to calculate the cost of various school and program options and their return on investment.

Every 26 seconds another student gives up on school. Three students in 10 fail to graduate from public high school with their class, according to the Alliance for Excellent Education. Good data presented well create a picture of a problem that everyone can see. Use the tools and charts in this guide as models to generate and present the data that your district needs to better serve students.



THERE'S MORE TO LEARN

You can find more tools, charts, and graphs in the *Supplement to the Analyst Guide*. Look for this icon for a description of these additional resources.

2. CONDUCT THREE KEY ANALYSES

THE IDEA

This guide details three kinds of analysis that will inform district decisions: looking at student data to learn who is progressing and who is most at risk of dropping out, analyzing school and program performance to match student needs with school choices, and analyzing resource allocation to match resources with priorities.

A.

Examine student progress, school/program strengths, and district investments.

The table below identifies key questions to be answered and the decisions that can be made once good data are available.

	Major Analyses	Questions Answered	Decisions/Actions Enabled
Student	**Track Student Progress**	Which students are struggling and dropping out?	Dispelling myths about the nature of dropouts
		Which student performance indicators predict falling off track or dropping out?	Defining at-risk and off-track indicators to monitor student progress and trigger early intervention
School and District	**Create a Mix of Schools and Programs**	Are there systematically over- and under-performing school models?	Phasing out ineffective schools and models
		What are the potential improvements in graduation rates from different options?	Replacing ineffective schools with models that maximize the probability of success
		Do we currently offer effective options for off-track students?	Prioritizing options—school models and programs—to match demonstrated student need
		What options "best" serve different groups of struggling students?	Designing admissions and programs for recuperative models
		How does the supply of seats and options match the level of demand for services?	Planning for new construction/new seats
	Optimize Resources	What resources are currently allocated to which students and schools?	Aligning resources based on student and school need
		What additional investments are necessary to meet district needs?	Prioritizing resources to most effective programs
		What are the expected returns/results from investments?	Organizing people and time in ways that facilitate high performance

B.

Be clear on the goals of the analysis.

Understand what your district's leaders want to learn—the focus of their strategy and the data required for specific decisions. Are you creating an initial diagnostic to see how well your schools are serving students now, or are you beginning the analysis with a focus on finding the potential dropouts in your schools? The guide includes data tools for each of the three kinds of analysis, but your district's plan of attack determines where you start. You can help determine the extent of the analysis, advising decisionmakers on the tradeoff between cost and depth of analysis. For example, your district may decide to identify and support just those students who are severely off track toward graduation rather than including those who are slightly behind in credits.

C.

Know the district's target for graduation.

While every district wants 100 percent of its students to graduate, setting a target of 100 percent will not give you the focus you need to make changes. Some schools in your district may be graduating 80 percent or more of their students, while others graduate considerably fewer. You will want to work with the schools that need the most attention. Consider an initial target of 60 percent and determine how many schools are failing to hit this target. Now you can focus your efforts on the students in these schools.

D.

Know which indicators will be used to measure progress.

Outcome indicators include measures such as graduation rate and the number of students attending college. Leading indicators measure behaviors or characteristics that tend to predict future events or behavior. For example, being behind in credits earned and failing at least one core course by the end of 9th grade could be a leading indicator of dropping out. These indicators will dictate the data you need to collect.

Sample Outcome Indicators

- Graduation rates
- Standardized test scores
- College admissions rates
- College success rates

Sample Leading Indicators

Early at-risk indicators: performance

- Low-to-failing grades in core courses (math and English) in 8th grade
- Poor standardized test scores in 8th grade
- Consistent absenteeism

Early at-risk indicators: demographic

- Special education status (especially students in substantially separated classrooms)
- Age upon entering high school
- English language learner status

9th grade at-risk indicators

- Behind in credits accumulated during first year in high school
- Course failures (especially core courses such as math and English)
- Consistent absenteeism

Collect and prepare the data.

This step requires defining and collecting the necessary data, cleaning the data, and creating longitudinal cohorts of students.

Collecting and Preparing Data

Define and Collect Necessary Data Elements	Determine what data are required to perform an analysis and where data elements exist across district systems
	Clarify the definitions and calculations of key data elements (i.e., graduation rates)
	Collecting necessary data elements may require several weeks of work, depending on the formats, complexity, and disparateness of district data systems
Identify Data Inconsistencies	Some metrics are not consistently tracked nor input into systems across all school types
	Definitions and metrics may be inconsistent across schools. Common data inconsistencies include: ■ Student credits earned toward graduation ■ Reason for discharge/transfer between programs ■ Attendance rates
Create Longitudinal Cohorts of Student Data	Determine rules for which students are in which cohort
	For each student, capture relevant demographic and performance metrics (e.g., student attendance prior to and after entry to a specific recuperative school)

Insight

Most data are available in the district systems—the challenge lies with the complexity and accuracy of data collection, synthesis, and analysis.

Defining What Data Are Needed and Making a Request

Type of Data	Example Fields	
Student Identification and Demographics	■ Student ID ■ Gender ■ Birth date ■ ELL status	■ Free/Reduced-price lunch ■ Home ZIP Code ■ Ethnicity ■ SPED status
Enrollment Status	■ Date of entry to schools ■ Completion/withdrawal	■ School enrolled ■ Date of exit from schools
Academic Performance	■ Course numbers ■ Course absences ■ Credits earned	■ Course grades ■ Course tardies ■ Standardized test results
Student Behavior	■ Attendance	■ Discipline record
District Information	■ Complete list of schools	■ School type for each school

Success Factor

Gathering data can take significant amounts of time, so spending time at the beginning of the project and requesting all the data you may conceivably need can save time later.

Key Steps

1. Determine the types of analyses to be performed and the data required.
2. Put together a data request that outlines the data needed in a simple form.
3. Request data for multiple points during the school year, beginning with 8th grade, if a longitudinal analysis is to be performed to allow monitoring of students.
4. Carefully check data after arrival to ensure inclusion of all fields and all dates requested.

Key Questions

1. How many years of data are needed to sufficiently perform the analysis?
2. How long will it take to receive data and what can be done during the waiting time?

Structure the data sets.

Decide whether to use linked data sets or a single comprehensive data set. Each has advantages and drawbacks. Linked data sets provide more flexibility but are more difficult to program. Single sets are simpler to create but require a powerful system to manage.

OPTION 1—LINKED DATA SETS

Option 1

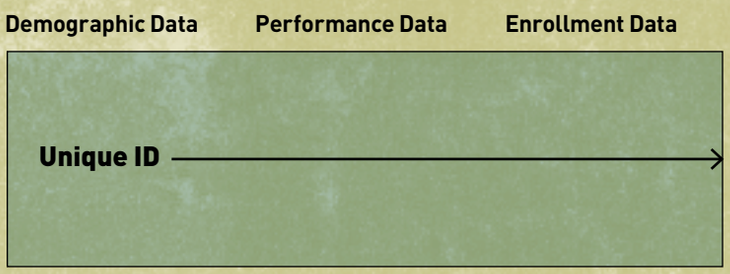
Pros

- Requires minimal upfront work to format
- Provides greater flexibility
- Relatively fast with an advanced database program such as SAS or SPSS

Cons

- More difficult to program and use on a daily basis
- More difficult to keep track of where all the relevant data fields are stored

OPTION 2—SINGLE, COMPREHENSIVE DATA SET



Option 2

Pros

- Simpler way to have all necessary data in a single place
- Easier to conceptualize work
- Can be faster for programs such as Access that do not link data sets efficiently

Cons

- Requires significant time upfront to collapse all data sets into a single set
- Produces a very large data set that can require a powerful computer to manage

MORE ANALYSIS

This slide is accessible online in the *Supplement to the Analyst Guide:*

Creating a Project Timeline is a sample of a three-month timeline for launching the project, conducting analysis, and engaging stakeholders.

3. FIND OUT WHICH STUDENTS ARE STRUGGLING

THE IDEA

Use data from a recent graduating class to help you better understand the shape of your dropout challenge. You will be able to see who is on track to graduate, who is off track and by how much, and which early warning indicators are most predictive.

A.

Create a database with students in the most recent graduating class.

Include fields for all demographics, such as date of birth, ethnicity, poverty status, English language learner (ELL) status, special education status and disability type; academic performance fields, such as credits earned and test scores; behavior data elements, such as attendance; and school(s) attended. Start your data collection with student history from 8th grade and continue through graduation.

Key questions:

- Are there students who should be excluded from the cohort, e.g., severely developmentally delayed students?
- Should the cohort include students who transferred into the district after 9th grade?
- Should the cohort include students who transfer out before graduating?

B.

Identify struggling students by all the indicators that might predict future dropouts.

At-risk indicators can vary across districts but commonly include age at entering 9th grade, absenteeism, low-to-failing grades in core courses, special education or English proficiency status, and poor standardized test scores.

Off-track indicators include course failures, behind in credits earned, and poor performance on achievement tests.

Four indicators have been predictive of future dropout rates in multiple districts. While they may not be as meaningful in your district, it would be worthwhile to use these four:

- age 15 or older when entering 9th grade
- absent more than 10 days of fall semester of 9th grade
- failed two or more courses fall semester of 9th grade
- had fewer than five credits or failed two or more courses in the spring semester of 9th grade

Some students will be in more than one group; e.g., an ELL student could be in a group of males, minority males, students who failed two or more courses, and students with high absenteeism.

C.

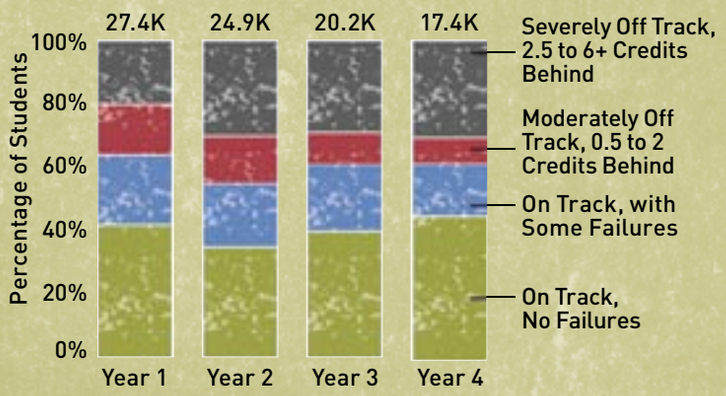
Measure the accumulation of credits.

A key predictor of future dropouts is the accumulation of credits for graduation. Once you have defined how many credits a student must earn to stay on track, use credits earned to gauge when students are off track.

In the chart below, students who were .5–2 credits behind were defined as moderately off track, while those who were 2.5 to 6 credits behind were severely off track.

Your ability to pull the data and produce charts that clearly display student progress will be invaluable to your district in planning interventions. While nearly 20 percent of 9th graders were already severely off track at the end of Year 1, and even more by the end of Year 2, early interventions might have prevented such outcomes for these students.

Credit Status by Student Year, Spring 2007



Key Steps

1. Select a cross-sectional population of all students enrolled in high school at a given time—likely either the beginning or end of a school year.
2. Apply the off-track definition to *all* students enrolled (exclude students who have dropped out of the system).
3. Group students based on severity of off-track status using some combination of years in high school and credits earned relative to being on pace.

Key Questions

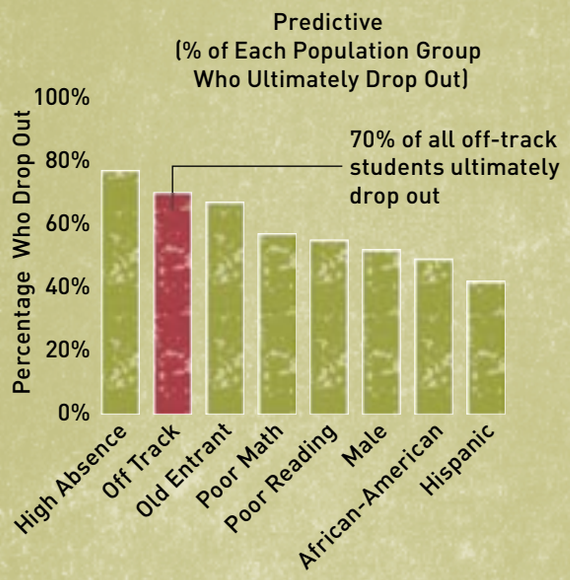
1. At what point in time does the district measure the off-track population?
2. How do the off-track students split based on levels of need?
3. How has the size of the off-track poplulation changed over time?

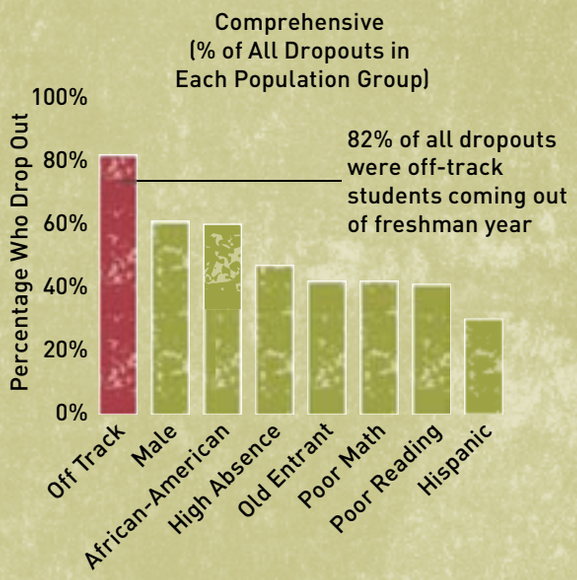
D.

Learn which indicators are most predictive of whether a student will drop out.

Predictive indicators. Calculate the dropout rate for previous cohorts of students who fit the definition of your selected indicators, for example, students with many absences, ELL students, students off track for credits needed by 10th grade, African-American students, male students, or students with a D or F in math and English courses. Once this analysis is complete, your data will look similar to the chart below on the left.

Comprehensive indicators. Now determine the size of any one group of dropouts in a historical cohort relative to the entire population of dropouts in that cohort, represented as a percentage. In the chart below on the right, students with many absences represent 47 percent of the dropouts in this cohort.





Key Definitions

***Predictive* means the percentage of a population group that drops out of high school.**
***Comprehensive* means the percentage of all dropouts that belong to a population group.**

Key Steps

1. Define the outcome metric and cohort to be used.
2. Calculate the predictiveness of an indicator.
3. Calculate the comprehensiveness of an indicator.
4. Repeat for multiple demographics and early performance results to find a set of indicators that are collectively comprehensive.

Calculation Example

1. A district has 10,000 high school dropouts in a class. Three thousand students enter high school overage, of whom 1,500 drop out of school.

Predictiveness:
1,500 dropouts in an overage population of 3,000 = 50 percent

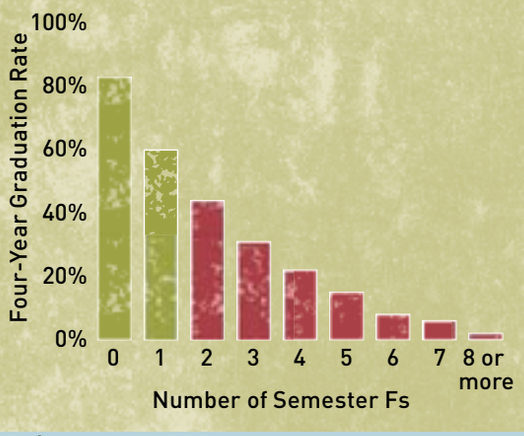
Comprehensiveness:
1,500 overage dropouts in a total dropout population of 10,000 = 15 percent

Use what you have learned to decide where to focus attention with your current students.

In the example on the previous page, off-track students made up 82 percent of the total dropout population. Based on this information—and what has been learned about off-track status as a predictor of dropouts in urban schools—a district would want to monitor and intervene with students who fall off track. The district also might monitor students with many absences, since 77 percent of them eventually dropped out, and just under half of the total dropout class was made up of high-absence students.

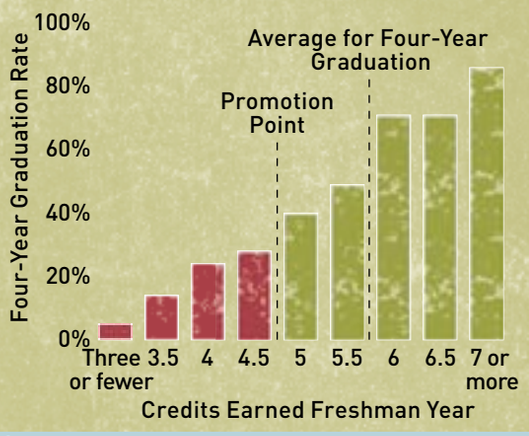
The sample charts below illustrate how a district tracked two indicators from freshman year that were both predictive and comprehensive—the number of Fs in core courses and the number of credits earned.

Four-Year Graduation Rate by Number of Core Course Fs Freshman Year, Class of 2004 Cohort



Percentage of students	51%	13%	9%	6%	5%	4%	4%	3%	4%

Four-Year Graduation Rate by Credits Earned Freshman Year, Class of 2004 Cohort



Percentage of freshmen	15%	3%	4%	5%	6%	7%	13%	11%	37%

Insight

You can use predictive data to help your district decide how to define "off track." In this case, the number of students who eventually drop out is almost the same for two groups of students: those who have two or more Fs and those who earn fewer than 5.5 credits in their freshman year.

Key Steps

1. After examining characteristics for predictiveness and comprehensiveness, choose one or several characteristics that combine to be highly predictive and comprehensive.
2. Extend your on-track analysis such that an on-track indicator exists for each year of school—it may be as simple as aligning with credits needed each year to remain on pace.
3. Store your on-track indicator as a flag that can be easily referenced.

Key Question

Some indicators require complex data elements and extensive calculations. How do you ensure that an effective indicator is well understood?

Apply what you have learned from the historical data to one or more classes of current students (Class of 2013, Class of 2014, etc.).

Identify the students in the class of interest, beginning with those who were in your school system in 8th grade.

Include fields for all the indicators of interest—demographic, academic, and behavioral. If you have to narrow your analysis, use the indicators that your historical analyses found to be both predictive and comprehensive. Remove students who are not first-time 8th graders. You will need to decide whether to exclude certain other students, such as those who are severely developmentally delayed.

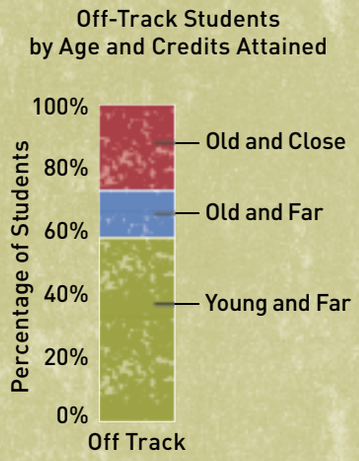
G.

Identify groups of students by indicators of interest.

Now you have indicators you can use to break down groups of students into even more discrete categories.

The categories should be based on combinations of predictive and comprehensive indicators. For example, group students by age entering school and credits earned. In the chart below, students are grouped into three categories:

- **Younger, far from graduation:** 16 or 17 years old; two or more years off track for graduation
- **Older, far from graduation:** 18 or older; two or more years from graduation
- **Older, close to graduation:** 18 or older; graduation possible within one year



Insight

Knowing how far from graduation students of different ages are will allow you to customize your interventions. An 18-year-old far from graduation will need a much different approach than an 18-year-old only a few credits away.

Another example: The chart below groups students using performance on the 8th grade English test as one indicator that is cross-tabbed to the student's age when entering high school. A key finding from this analysis is that nearly one-fourth of students who are proficient in English and arrive in high school at age 13–14 still fall off track. This suggests that schools must provide supports for students as they transition to 9th grade and throughout that important first year of high school, rather than wait until the end of the year to see who needs help.

Percentage of All Students Who Are Off Track

Age at High School Entry

8th Grade English Test Score	Over Expected Age (15+)	At Expected Age (13–14)
Proficient or Above	**5% of Off Track** (3,000 students) enter high school **overage** but with **sufficient literacy skills**	*Least challenged entering high school:* **24% of Off Track** (16,000 students) enter high school **on-age** with **sufficient literacy skills**
Below Proficient	*Most challenged entering high school:* **19% of Off Track** (12,000 students) enter high school **overage** and with **literacy challenges**	**52% of Off Track** (34,000 students) enter high school **on-age** with **literacy challenges**

Insight

Although the majority of students who fall off track during high school enter high school with significant, predictable challenges, a large group of students enters on-age and nominally prepared but still struggles.

Key Steps

1. After at-risk or off-track designations have been developed, determine groups of interest.
2. Use data for a single cohort of students that tracks longitudinally.
3. Link off-track designation to student characteristics, such as age at entry or entering test scores, to determine breakdown of students.

Key Question

Does the analysis reveal "quick wins," such as the option to provide students who are overage but proficient with a few extra classes to earn credits?

MORE ANALYSES

These slides are accessible online in the *Supplement to the Analyst Guide:*

Developing Baseline District Facts: Cross-Sectional Analysis offers key steps on using existing data, such as ethnicity and students receiving free and reduced-price lunch, to determine graduation rates for those groups.

Click here to read more about student segmentation and the identification of risk indicators in *Identifying Potential Dropouts,* by Craig Jerald for Moving Forward: High Standards and High Graduation Rates, a joint project of Achieve and Jobs for the Future.

Click here to read about the guidelines the National Governors Association has established for creating a cohort. The district assigns the expected year of graduation (which then identifies the cohort, e.g., Class of 2014) as soon as the student first enters 9th grade. If students transfer in after 9th grade, information on their transcript is used to assign them to a cohort.

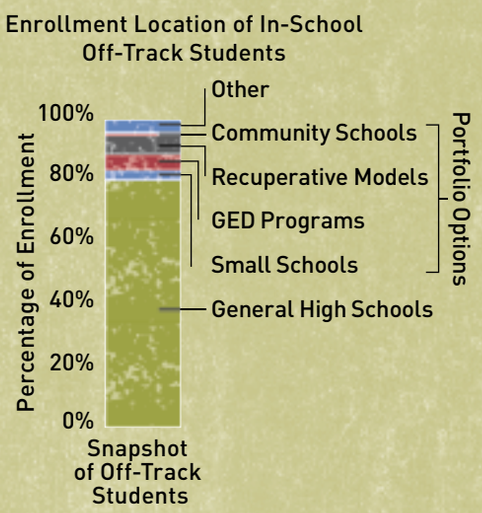
4. STRENGTHEN EFFECTIVE OPTIONS

THE IDEA

Some schools do a better job than others in helping students navigate their way to a diploma and postsecondary education. Just as you need to segment your students, you need to segment your schools. Some schools and programs might be strong all around, meeting or exceeding your goals for all student groups. Some might succeed with certain student groups but not with others. With good data, you can share the practices of the high performers and deal proactively with struggling schools.

A. Collect data to show where students who are off track are currently enrolled.

In the example below, most off-track students were enrolled in general high schools, even though these schools were less successful than other school models or programs in graduating this population of students.



Key Steps

1. Use a cross-sectional population as shown on the chart on page 8 of this report.
2. Link students to the school attended as of the date of analysis (may not necessarily be the school used for accountability analyses).
3. Match schools to the type of model and roll up student populations by type of school.

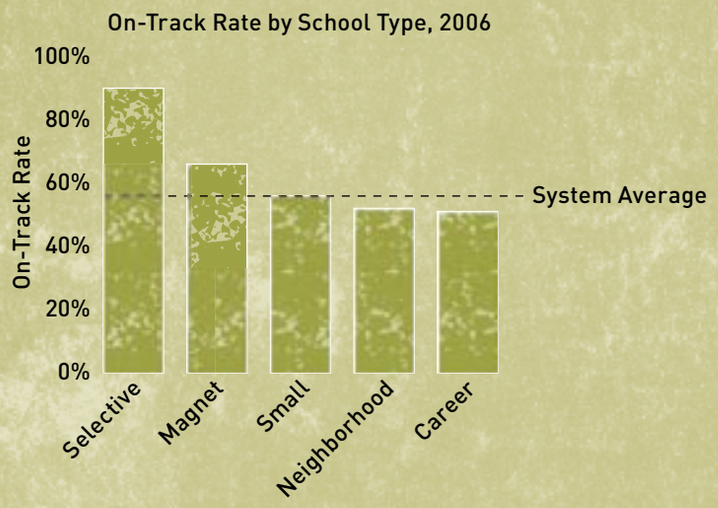
Key Questions

1. How does the size of the off-track population compare to the number of dedicated seats?
2. Has the method of serving off-track students changed over time?

B.

Determine the success of your current mix of schools.

Use the data to better understand which schools have the highest percentages of students who are on track to graduate.



	Selective	Magnet	Small	Neighborhood	Career
Graduation rate	88%	69%	N/A	54%	52%

Insight

Calculating the performance of individual schools and school models without taking into account the types of students served in a school can hide significant differences in performance that more complex analysis reveals.

Key Steps

1. Use either a cross-sectional or longitudinal student population, depending on questions to be answered.
2. Determine the outcome metric to be calculated (e.g., graduation rate, on-track rate, credits accumulated).
3. Segment schools into model or program type and roll up the associated students by type.
4. Calculate the outcome metric to provide an unadjusted view of relative success of different options.

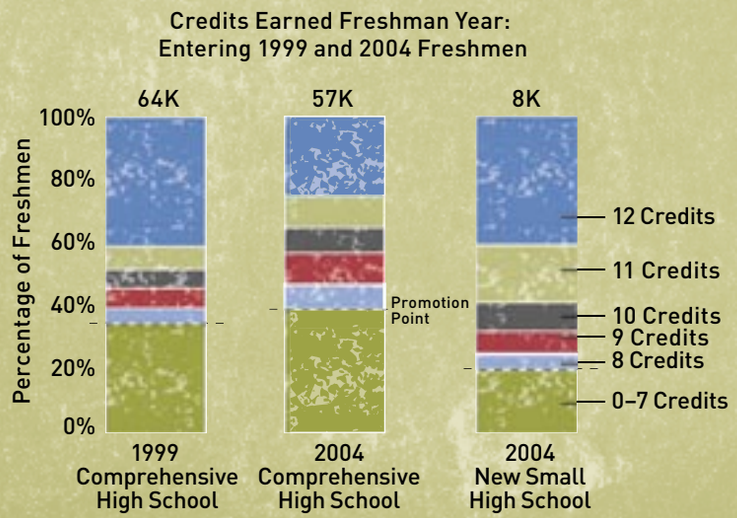
Key Questions

1. When are students tagged to a school for the purposes of this analysis? What happens if a student changes schools?
2. How have outcomes changed over time, unadjusted for student population?

C.

Compare the success of different options.

In the example below, new small schools were having greater success with 9th graders than larger, comprehensive high schools. The goal is for students to earn 12 credits by the end of freshman year, but they can be promoted with as few as seven.



Key Steps

1. Identify options to compare—in this case, a historical baseline and then an alternative model to the current mainstream system.
2. Calculate an outcome variable for each individual student included in the analysis.

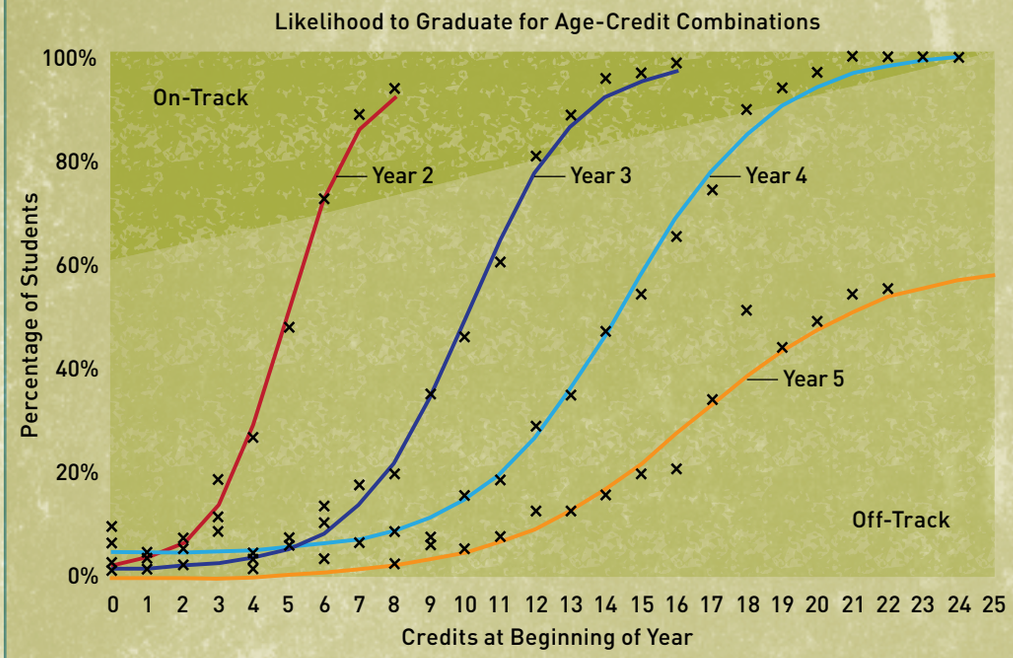
Key Question

Do basic statistics, such as percentage of students being promoted, disguise actual declines in performance?

D.

Predict a school's future performance based on early performance.

This analysis requires development of a basic predictive model that helps establish predicted outcomes and interim performance goals for various options. The chart below illustrates the likelihood of graduation for students representing different combinations of age and credits earned.



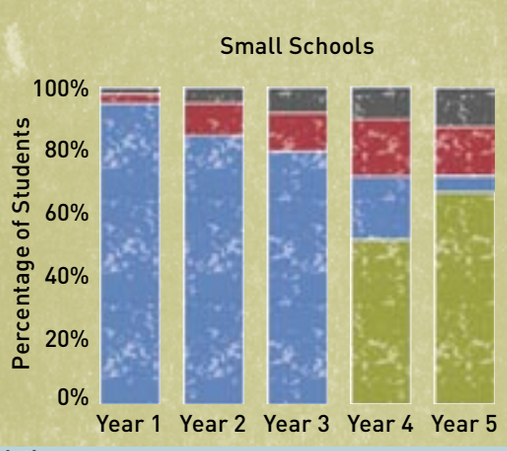
Key Steps

1. Use a longitudinal student population representing a single cohort of students.
2. For each student, determine the number of credits earned each year and the enrollment status at the end of the year (e.g., still enrolled, graduate, dropout, transfer).
3. Calculate the graduation rate for each combination of age and credits earned for each year in time.

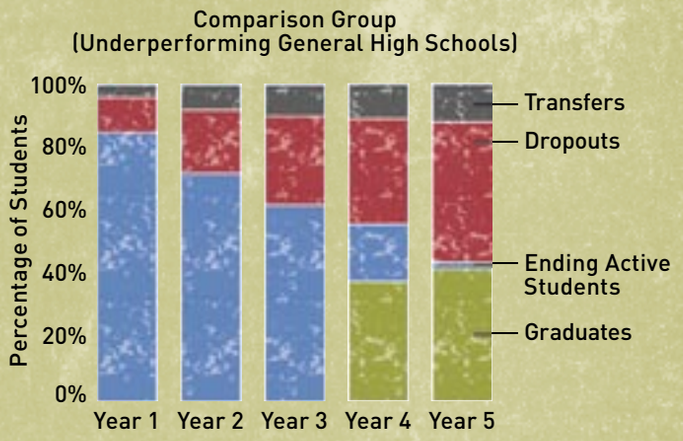
Key Questions

1. When should total credits earned be calculated for a year? Including summer school credits?
2. Which graduation rate should be used—four-year, five-year, seven-year?

The charts below indicate that small schools are more likely to have higher graduation rates, based on the performance of students in Years 1 and 2.



Cumulative graduation rate	0%	0%	1%	63%	73%



Cumulative graduation rate	0%	0%	1%	42%	47%

Key Steps

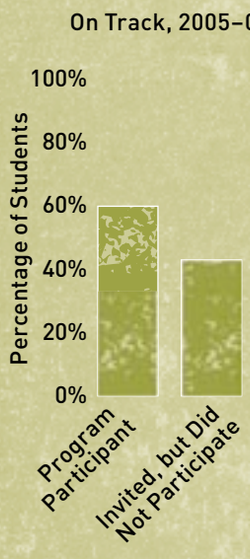
1. Develop a basic predictive model and as much early data as possible that matches the predictive model.
2. Determine early performance (e.g., freshman credits earned) in the comparable options and apply the predictive model that translates performance into outcomes.
3. Establish intermediate outcomes by applying student progression in similar models.

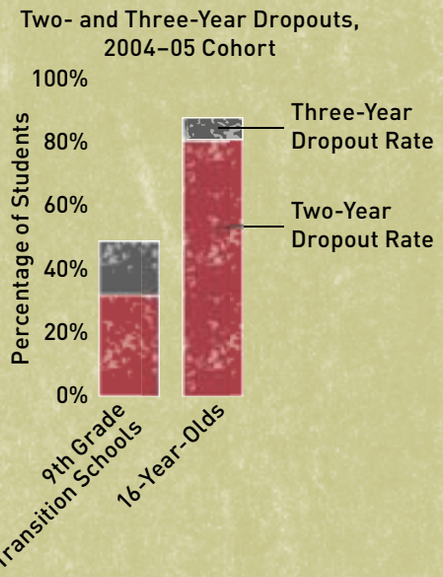
Key Questions

1. What variables can be known early in a student's career that increase the power of simple model?
2. Do similar models exist externally that can provide guidance about expected results?

Compare outcomes of different programs.

In the left chart below, participants in the program analyzed were about 50 percent more likely to be on track for graduation than those who did not participate. The chart on the right demonstrates the positive impact of 9th grade transition schools.





Key Steps

1. Select programs to be evaluated.
2. Flag students who participated in the programs (the experimental group).
3. Identify students with similar demographics to those who participated—those who chose not to participate or are the most similar population (the control group).
4. Choose an outcome to be tested and calculate outcomes for both student groups.

Key Question

Are there significant differences between students who participate in the program and those eligible who do not participate?

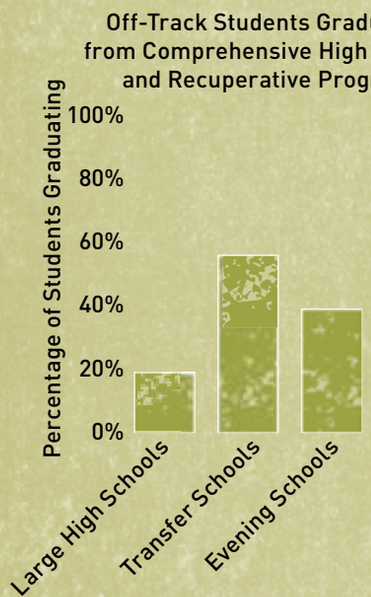
Insight

Modeling expected program performance requires making educated estimates of the performace of new students and expanded programs. In choosing these rates, keep in mind that because of a selection bias, additional students may not achieve as significant an improvement as students who opted in to programs early or on their own.

F.

Calculate graduation rates for specific student groups.

In this example from **New York City,** graduation rates for off-track students in Transfer Schools were nearly three times higher than for their peers in large, comprehensive high schools.



Key Steps

1. Use a longitudinal student population representing a single cohort of students.
2. Select a student population of interest (e.g., off-track students).
3. Link students to schools, generally based on where the student achieved a final outcome rather than based on accountability.
4. Calculate a graduation rate for different options—likely a longer-term graduation rate than four years to account for recuperative models.

Key Questions

1. Which programs are significantly more successful than traditional schools with challenged populations?
2. Are different models more successful with specific student groups?

Insight

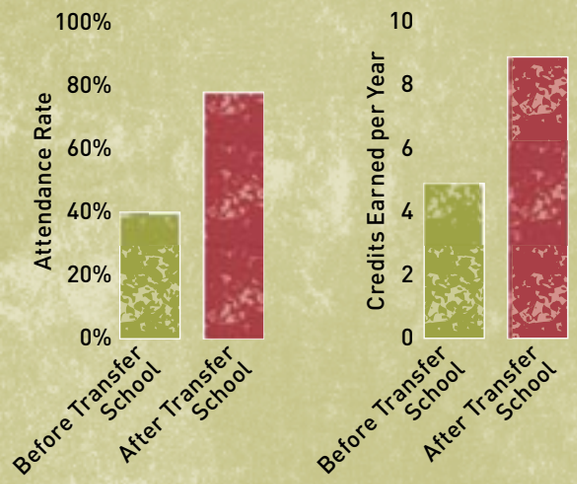
To understand the success of recuperative school models, compare similar populations in traditional schools versus other school models. Without comparing apples to apples, other school models may appear to perform poorly because they enroll more students with significant challenges.

G.

Analyze the effect of changing schools.

In this chart, again from **New York City,** students did much better in terms of attendance and credit accumulation after they enrolled in Transfer Schools.

Comparative Student Performance: High School History Prior to Transfer School versus After Enrolling at Transfer School



Key Steps

1. Identify students enrolled in the program or school of interest.
2. Decide which suspected student performance changes to analyze.
3. Link students to performance (e.g., attendance, credits earned) in the current school and in the prior school.
4. Calculate the change in performance for the set of students who were in a traditional school and moved to a recuperative school.

Key Questions

1. How quickly does student performance change after transferring?
2. Are certain schools better at specific aspects of student improvement—attendance improvement, credit recovery?

MORE ANALYSES

These slides are accessible online in the *Supplement to the Analyst Guide:*

Geographical Concentrations of Student Need links off-track students to zip codes and then illustrates highest concentrations in regions within a district.

Determining Effect of Structure on Specific Students illustrates the success of small schools versus other schools in graduating students who perform at high and low levels on achievement tests.

Developing Basic Predictive Models illustrates graphically the likelihood of graduation for students representing different combinations of age and credits earned.

Predicting Graduation Rates uses weighted averages to predict graduation rates for students in different schools.

Advanced Predictions of Performance: Regression Analysis describes the use of multiple variables to determine which can predict performance.

Using Multivariate Regression Analysis to Calculate Over and Under Performance relies on the methodology described in the previous slide to create a scatter diagram illustrating school performance falling above or below the line.

Identifying More Effective School Models applies information from the advanced predictive model to illustrate how different schools support various groups of students.

Understanding Model Variables under District Control describes the steps to test the extent to which changes, such as fewer students in a school, increase the graduation rate.

Understanding the Effect of Size and Concentration on Individual Students shows how to calculate the projected graduation rate for a "representative" student in a different school structure, e.g., a school of 500 versus a school of 3,000.

Determining Differential Effectiveness illustrates the actual (versus predictive) effect of different schools on different groups of students.

5. CALCULATE THE FINANCIAL IMPACT

THE IDEA

School reform efforts can be advanced or derailed by one well-timed question: What does it cost? Knowing which students could benefit from a different school choice takes you only so far in a world of scarce resources and competing agendas. District leaders must know the cost of serving students with different needs, the operating costs of different options, and the return on investment based on school performance.

A. Allocate costs on a per-pupil basis.

There typically is a wide variation in resource allocation for each type of student.

Sample District, Fully Allocated Cost per Pupil

	Cost per Pupil	Ratio
All Students	$14.3 K	1.3
Regular Education	$10.6 K	1.0
Limited English Proficient	$13.6 K	1.3
Poverty	$11.2 K	1.1
Students with Disabilities (All)	$28.9 K	2.7
■ Students with Disabilities (Resource)	$24.6 K	2.3
■ Students with Disabilities (Self-Contained)	$41.5 K	3.9

Key Steps

1. Merge budget and payroll data, linking salaries with benefits, and identify all nonoperating line items and code into the budget.
2. Allocate costs as school specific, central costs, or central costs that can be allocated to a specific school to determine which costs flow to which students.
3. Calculate both school-attributed and fully allocated weights for each type of student (regular education, poverty, mainstream or substantially separate special education, and ELL/limited English proficient).

Key Questions

1. How are funds allocated on a per-pupil basis?
2. Is the allocation of funds equitable?
3. How does this snapshot look across schools?

3.

Determine the incremental cost of options.

Disaggregating the fixed and variable costs of various options will help you determine if you can afford to open new schools or programs without closing some current ones. The chart below illustrates per-pupil allocation by groups of students; for example, students receiving special education services incur higher per-pupil costs than students in regular education. After calculating the district per-pupil cost, it is important to determine the per-pupil costs of different groups at each school to see if the allocation by group is equitable from school to school.

Key Steps

1. Work closely with the Budget Office to determine baseline total costs for existing traditional comprehensive high schools.
2. Break baseline funding down into variable costs that move with the student if he leaves a school and fixed costs that do not move with a student if his old school does not close down.
3. Calculate the incremental cost of new options depending on the district decision whether a new option will be supplementary or will replace an old school.

Key Question

Will new schools replace old, failing schools, or will new schools be supplementary to the current system?

Key Definitions

"Cost avoidance" describes savings that occur when students leave one school to attend another. If the old school remains open, there may be only partial cost avoidance because the fixed cost of running the old school remains. If the old school closes, there is a total cost avoidance of the cost to operate the old schools.

Use the tools developed by Education Resource Strategies to get a rough estimate of the cost of different options, such as rich/lean staffing or smaller versus larger class sizes (www.erstools.org/Dream/index.cfm). You will choose options from an abbreviated menu to enter data on the size of your district, the percentage of students in special education, and per-pupil costs. It is easy to try different scenarios in these interactive worksheets, and the approximations can help you decide whether to do additional, more specific analysis.

C.

Calculate the return-on-investment.

Return-on-investment calculates the amount of improvement in a performance metric a district can expect given a certain value of investment placed against that improvement. These kinds of calculations will help you determine the incremental cost of each graduate, with or without school closures. The chart shows that a small school spends more per pupil each year but graduates more students—thus the per graduate cost is lower.

	Small Autonomous School	**Comparison Group (Under-Performing General High Schools)**
Number of incoming students (assumption)	100 students	100 students
Average length of stay in high school	3.84 years	3.35 years
Five-year graduation rate	73%	47%
Approximate Cost per Pupil per Year	**$11,120**	**$9,000**
Total cohort cost	$4.27MM (= 100 students x 3.84 years x $11,120)	$3.02MM (= 100 students x 3.35 years x $9,000)
Student outcomes	64 graduates	41 graduates
	12 transfers	12 transfers
	16 dropouts	43 dropouts
	7 still active after five years	4 still active after five years
Cost per Graduate	**$66,591**	**$73,160**

The chart below illustrates how to calculate cost avoidance: the savings that occur when students leave one school to attend another. If the former school remains open, then there may be only partial cost avoidance given the fixed costs of operating that school. If the school closes, then there is total cost avoidance of operating costs.

Potential "cost avoidance" of new schools	$9,000 per pupil (with closures)
	$3,000 per pupil (no closures)
Total incremental cost	$1.25 MM (with closures)
	$3.26MM (no closures)
New graduates	23 graduates
Incremental Cost per New Graduate	**$55K (with closures)**
	$143K (no closures)

Key Steps

1. Finalize cost and performance figures:
   - Graduation rate (including transfers)
   - Cost per student
   - Length of time enrolled
2. Calculate cost per graduate: **(length of stay) X (cost per year) / graduation rate**
3. Finalize cost avoidance figures.
4. Calculate incremental cost per graduate: **(cost of new option – cost of old option) / new graduates produced**

Key Question

Can the district afford to open new options without closing down other schools?

6. USE DATA TO DRIVE CHANGE

THE IDEA

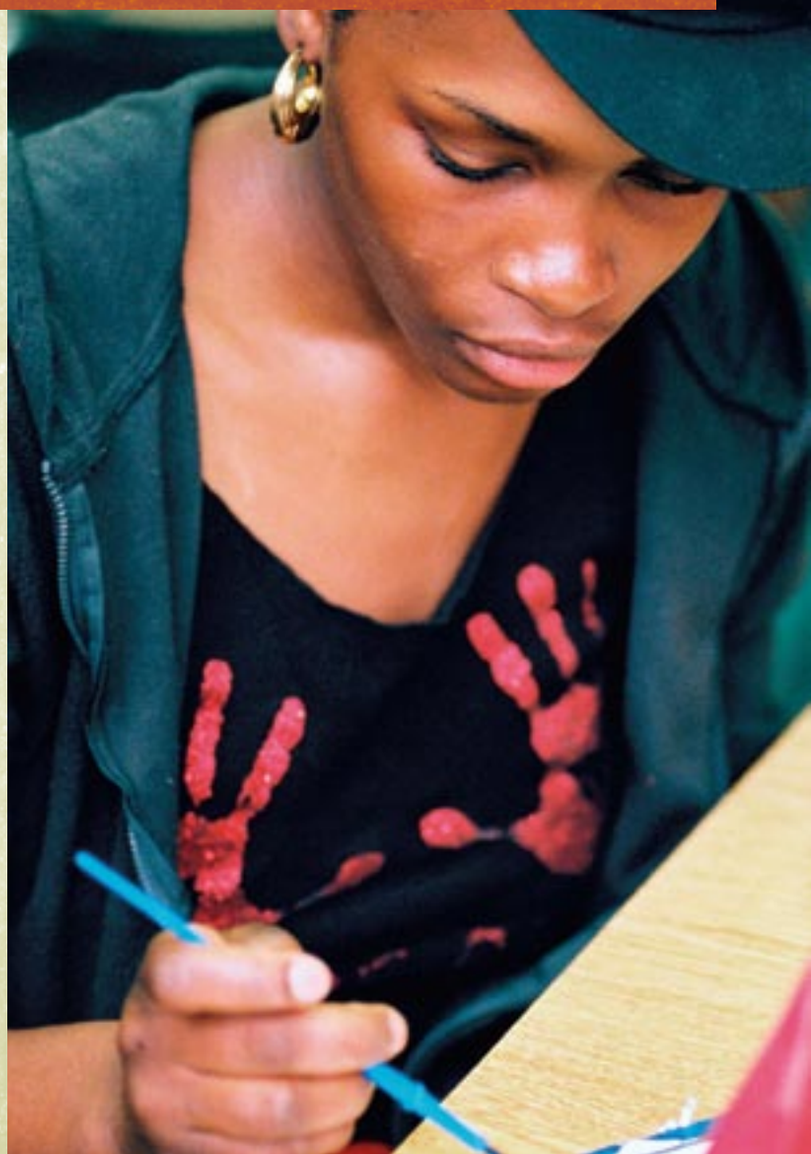
The leaders in your school district will rely on the data generated by these analyses to make decisions on how to intervene to support struggling students and how to prioritize available resources. There are few decisions more important than how to serve students and use taxpayer dollars wisely. At least one member of the data team should be at the table to present findings, respond to questions, and ensure that conclusions are warranted, whether the table is in the superintendent's conference room or in the school board meeting room.

The data tools in this guide inform steps in a long-term process that includes stakeholder engagement, organization design, and policy alignment.

If the data are credible and presented in a format that is easy to understand, district leaders can make the case for change to families and students who have the most to gain—or lose—from those decisions.

If those who work in portfolio development offices can get their hands on the return on investment for each school in the portfolio, they will be able to make judicious decisions on how to support those schools.

And if leaders and school board members adopt policies that take data into account, the result is more thoughtful and instructive direction for district action.



Information for this report is drawn from Atlanta, Boston, Charlotte-Mecklenburg, Chicago, Dallas, Portland, and New York City and their partnerships with the Bridgespan Group, Boston Consulting Group, McKinsey & Company, Education Resource Strategies, and The Parthenon Group.

Resources

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John M. Bridgeland, John J. Dilulio, Jr., and Robert Balfanz. *On the Front Lines of Schools: Perspectives of Teachers and Principals on the High School Dropout Problem*. Civic Enterprises. June 2009.

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Craig Jerald. *Identifying Potential Dropouts: Key Lessons for Building an Early Warning Data System*. A white paper prepared for Moving Forward: High Standards and High Graduation Rates, a joint project of Achieve and Jobs for the Future. June 2006.

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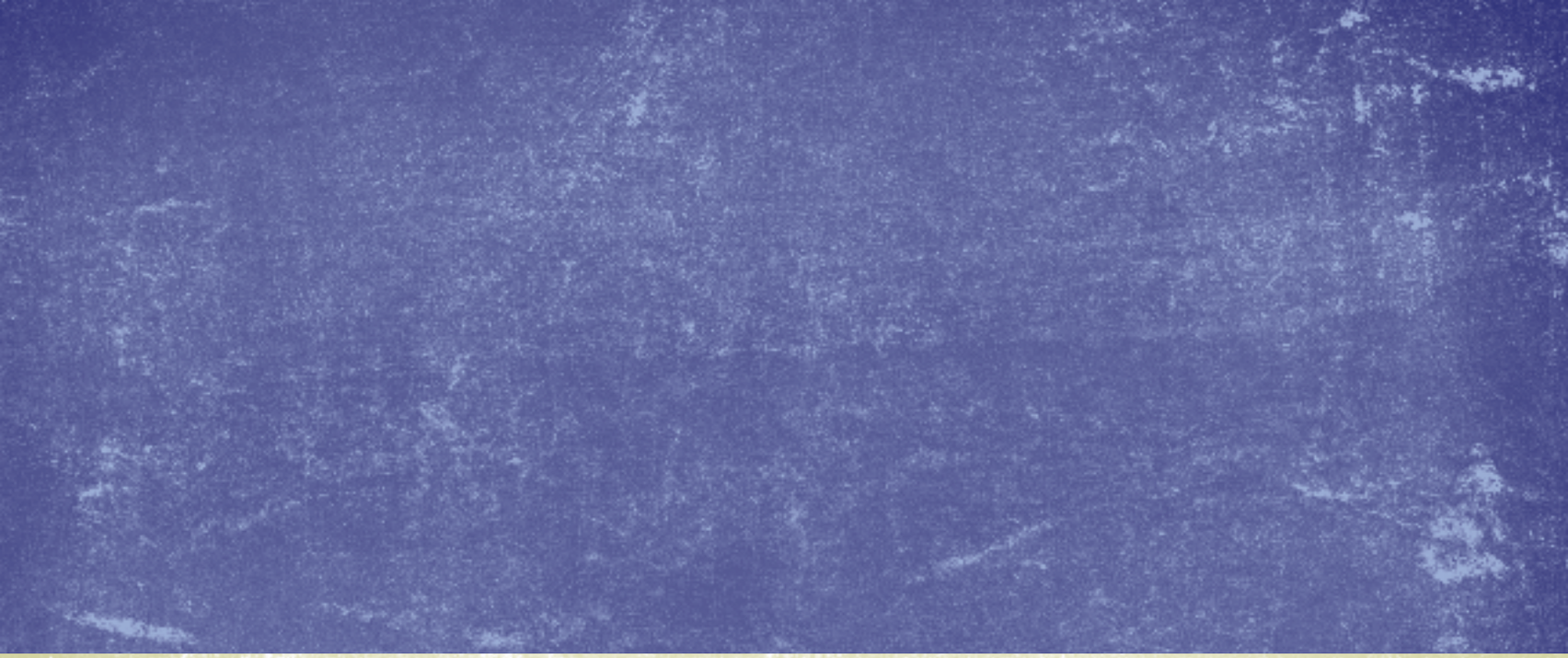

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