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Strategic Designs: Lessons from Leading Edge Small Urban High Schools

Education Resource Strategies

Regis Anne Shields and Karen Hawley Miles

Acknowledgments

Like everything we do at Education Resource Strategies, this report represents a team effort. Core team members Nicole Ireland, Liz City, Julie Derderian, and Randi Feinberg collaborated to create the framework, collect and analyze data, and summarize results. Their persistence, energy, insight, and passion made this report possible. We also would like to thank the entire Education Resource Strategies staff for its support and patience throughout this project.

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Education Resource Strategies, Inc., is a nonprofit organization that has worked extensively with urban public school systems to rethink the use of district- and school-level resources and build strategies for improved instruction and performance.

Our mission is to be a catalyst for the creation of high-performing urban school systems by promoting and supporting the strategic management of education resources. Our unique strength is in our action research where our partnerships with school systems bridge research and practice. We support our clients with Web-based tools, research and training, and diagnostic analyses tailored to their districts. Together, we outline strategies that are actionable and transformational both within and beyond the districts in which we work.

ERS's work and research have identified several areas in which school systems effectively leverage their resources to improve instruction, forming the basis for our five practices areas: Strategic School System Design; School Funding and Staffing Systems; Strategic School Design; School Support, Planning, and Supervision; and Human Capital.

For more information on Education Resource Strategies and our work and practice areas, visit www.educationresourcestrategies.org.

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Executive Summary

Thirty years ago, urban high school organization looked very similar from one school to the next. Today, rising dropout rates and persistent achievement gaps — less than three-quarters of all students graduate from high school, and only about half of African American and Latino students do (Greene & Winters, 2005) — have generated an urgency around redesigning the urban high school. Creating small high schools has become a central element of this redesign movement, based on research showing that small schools may be especially effective for urban students (Cotton, 1996). Few would argue that simply making schools smaller would lead to dramatic student improvement. Instead, reformers envision improving instruction and, through the "smallness," being able to create a supportive community of adult and student learners.

At Education Resource Strategies (ERS), we work with school and district leaders to help them more strategically use resources — people, time, and money — to improve student performance. We have found that many school districts begin creating small high schools without a clear sense of how much they will spend or how to ensure that small schools organize in ways that will promote high performance. To begin to address these challenges, the Bill & Melinda Gates Foundation supported ERS in a three-year effort aimed at building understanding and tools to support districts in creating cost-effective systems of high-performing urban high schools.

Today, rising dropout rates and persistent achievement gaps — less than three-quarters of all students graduate from high school, and only about half of African American and Latino students do — have generated an urgency around redesigning the urban high school.

This report summarizes our four main findings from detailed case studies of nine small urban high schools (see Figure A). We have dubbed these nine schools "Leading Edge Schools" because they stand apart from other high schools across the country in designing new ways to "do school" while outperforming most high schools in their local districts. This report explores how the Leading Edge Schools organize their resources — people, time, and money — including how they take advantage of their smallness to improve student performance. The report also looks at how much each of these schools spends to achieve their organizational designs and how the local context — funding levels, administrative policies, and union contracts — affects resource decisions. Although these schools spend varying amounts per pupil and organize resources in unique ways, they share a set of practices that distinguishes them from typical large urban high schools.

FIGURE A

Characteristics of Leading Edge Schools in SY2005–06[i]

	High Tech High School	Life Academy of Health and Bio-science	MetWest High School	Univer-sity Park Campus School	Noble Street Charter High School	Perspec-tives Charter School	Academy of the Pacific Rim	Tech-Boston Academy	Boston Arts Academy
District	San Diego	Oakland	Oakland	Worcester	Chicago	Chicago	Boston	Boston	Boston
Governance	Charter	District	District	District	Charter	Charter	Charter	Pilot[ii]	Pilot
Grades	9–12	9–12	9–12	7–12	9–12	6–12	6–12	9–12[iii]	9–12
Total enrollment grades 9–12	507	255	128	149	482	186	130	227	395
Free and reduced-price lunch	22%	92%	58%	68%	85%	86%	53%	69%	56%
Below, near, or *above* local district in ELA[iv]	Above	Above	Above	Above	Above	Below	Above	Above	Above
Below, near, or *above* local district in math	Above	Near	Above	Above	Above	Below	Above	Above	Below
Attendance rate	97%	97%	95%	96%	95%	94%	94%	95%	93%
Graduation rate	99%	96%	96%	91%	87%	91%	91%	83%	84%
Percentage points above local district graduation rate	+17	+26	+25	+24	+14	+18	+32	+24	+26

ELA = English language arts
Note: The tests used for the ELA and math measurements are the Massachusetts Comprehensive Assessment System, Prairie State Achievement Examination (Illinois), and California High School Exit Examination. The graduation and attendance rates are self-reported from the schools' report cards: www.boston.k12.ma.us (Boston), www.wpsweb.com (Worchester), www.cde.ca.gov/ta (California), and www.cps.k12.il.us (Chicago).
[i] Boston schools were studied in SY2004–05, and all other schools were studied in SY2005–06. Data shown are for the study year.
[ii] A pilot school in Boston is a district school that has significant waivers from both union contract and administrative policies.
[iii] TechBoston Academy only had grades nine through 11 in the year of our study (SY2004–05).
[iv] We have defined "near" as within +/– 5 percentage points of the local district average.

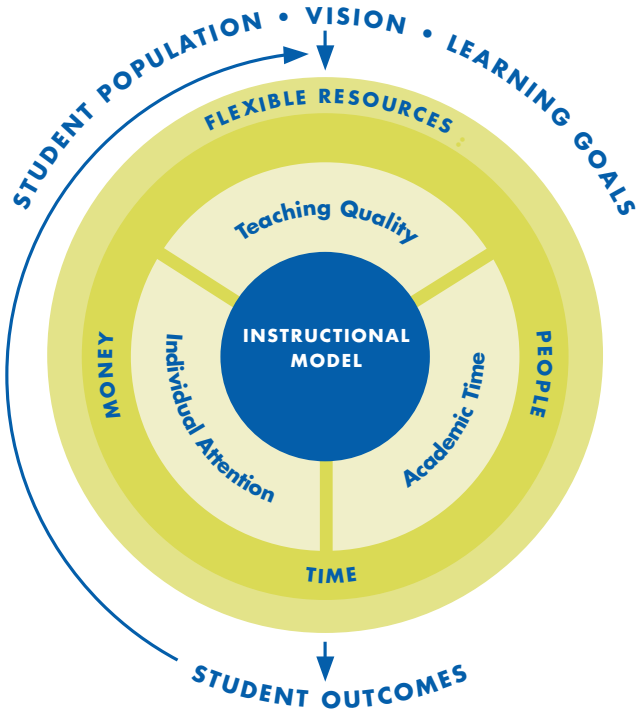
Finding 1: Leading Edge Schools create customized Strategic Designs that organize resources — people, time, and money — to advance a clearly defined instructional model.

We found that Leading Edge Schools create high-performing organizational structures — or Strategic Designs — that deliberately organize people, time, and money to advance their specific instructional models (see Figure B). They create these Strategic Designs through four interconnected practices:

1. Clearly defining an instructional model that reflects the schools' vision, learning goals, and student population;
2. Organizing people, time, and money to support this instructional model by (a) investing in teaching quality, (b) using student time strategically, and (c) creating individual attention for students;
3. Making trade-offs to invest in the most important priorities when faced with limits on the amount, type, and use of people, time, and money; and
4. Adapting their strategies in response to lessons learned and changing student needs and conditions.

FIGURE B

Strategic Design



Teacher characteristics, staffing patterns, schedules, and budgets look very different across the Leading Edge Schools. Many of these differences can be linked to each school's "instructional model," the decisions a school makes about how it organizes and delivers instruction, what the focus of its content will be and whether it will be the same for all students, where and when learning will take place, and which specific programs or pedagogies will be implemented. Choices about how schools organize and deliver instruction reflect their beliefs about how young adults learn and develop. Although many high schools treat these decisions as given or unchangeable, leaders at Leading Edge Schools make them deliberately and organize their resources to support them.

Leading Edge Schools' instructional models reflect three broad approaches to teaching and learning:

1. **Core academics:** a rigorous core academic college-preparatory program for all students;
2. **Relevance:** a curriculum that is relevant to student interests and/or the world in which they live; and
3. **Personalization:** personal relationships between adults and students are fostered to ensure all students are known well by at least one adult.

All Leading Edge Schools incorporate some aspects of each approach, while tending to emphasize one over the others. Differences in Strategic Designs reflect different decisions about resource use that depend on the relative priority and interplay of the three approaches, combined with varying levels of and control over resources.

Finding 2: Leading Edge Schools share a common set of high-performing practices — investing in teaching quality, using student time strategically, and creating individual attention — that advance their instructional models.

To explore whether and how our case study schools organize resources in high-performing ways, we used a framework based on more than a decade of research (Miles & Frank, 2008). Although these Leading Edge Schools organize resources in unique ways, they share a set of common practices that distinguish them from typical large urban high schools. They organize people, time, and money in high-performing ways to (a) invest in teaching quality, (b) use student time strategically, and (c) create individual attention for students.

In looking across the resource strategies at the Leading Edge Schools, we found that they all:

- Organize around **rigorously selected, highly talented, and flexible teaching staff** that fit their specific instructional models and can serve in a variety of roles, teach multiple subjects, and respond to a range of student needs. Depending on the school's instructional model, this can range from hiring teachers who are generalists and interested in forming personal bonds with small numbers of students to hiring subject specialists who are able to carry large teacher loads.

- Require much **more formal time for teacher professional development and collaboration** — an average of five times more than local districts. Even the three Leading Edge Schools that are district high schools and are constrained by the negotiated length of teacher day and year devote from 44 to 116 more hours to professional development and collaborative planning time than their districts require.
- Schedule an average of 20 percent **more student time** and devote an average of 233 equivalent days **more in core academics** over the student career than traditional local district schools. This extra time translates into more than a full year of academic instruction. They accomplish this mostly through a combination of extending the school day and increasing the number of required core academic classes that students take across the four years.
- Create small class sizes that combine students across programs and performance levels, and integrate into the school day formal **time for targeted individual and small group academic support** delivered by classroom teachers rather than volunteers.
- Use **multiple data sources to assess student needs,** both at entry and throughout a student's career. They systematically combine quantitative and qualitative information on incoming students gathered from student orientations, school-developed writing assessments, home visits, and parent surveys. They have structures and systems that enable teachers to adjust instruction and support based on ongoing student learning needs.
- Weave into school designs multiple ways of **fostering relationships between teachers and students,** rather than relying solely on advisory structures. Schools combine purposefully designed advisory programs to complement other structural supports, including small class size, individual academic support, and keeping students and teachers together for multiple years to create continuity.

Finding 3: Leading Edge Schools work within small school size and funding-level constraints to prioritize core academics and professional community over program diversity.

Each of the Leading Edge Schools balances the use of people, time, and money within their own resource context — including funding levels and the flexibility to use people, time, and money in desired ways — to support their instructional models. This explains why budget and staffing patterns look so different across even those schools with similar designs and priorities. This balancing requires the schools to make trade-offs among priorities and results in different organizational structures. However, *regardless of funding levels or size, Leading Edge Schools invest first to assemble high-quality core academic teachers and school leadership to facilitate the creation of professional learning communities.*

Except for the smallest Leading Edge Schools, most choose to maintain traditional leadership and guidance positions, even though they have the flexibility to eliminate them. These positions consume a greater portion of the small school budget because they are spread over a smaller number of students. This leaves less money for these small schools to devote to the other traditional high school functions. So, most Leading Edge Schools choose to prioritize core academics. They do this through two related practices. First, they offer a single, common program of study with few or no electives in noncore courses. Second, they hire a cadre of expert core academic teachers who teach multiple subjects, including noncore academics classes, and play multiple roles. At almost all the Leading Edge Schools, 84 percent or more of classroom teachers are core academic teachers as compared to approximately 65 percent in their local large high schools. Many of the Leading Edge Schools also leverage community resources to expand opportunities for students.

What makes these designs strategic is that resources align with the schools' instructional models in the context of their specific resource levels and constraints at a particular moment.

Finding 4: Leading Edge Schools require flexibility from traditional administrative practices and union contracts around hiring, staffing, and time to implement their Strategic Designs.

Leading Edge Schools can support their designs so effectively within the constraints presented by school size and given funding levels because they have the flexibility in both the amount and use of their other resources — people and time. All Leading Edge Schools choose their staff and structure their roles to fit the schools' needs. And they all find ways to increase the amount and change the structure of teacher and student time.

Conclusion

As these Leading Edge Schools demonstrate, creating small schools is about so much more than smallness. It is about the way schools create Strategic Designs by taking advantage of size and rethinking the high school experience for urban students. These designs begin with clearly defined instructional models, and they organize people, time, and money in high-performing ways to invest in teaching quality, use student time strategically, and create individual attention.

Through this summary report and the accompanying individual case studies, we provide nine high-potential ways of organizing small schools that could serve as starting points for school designers and districts seeking to redesign high schools. However, leaders should note that these profiles provide snapshots in time. What makes these designs strategic is that resources align with the schools' instructional models in the context of their specific resource levels and constraints *at a particular moment*. Leading Edge School leaders understand that the inputs and

outputs of schools are a collection of moving parts, some more predictable than others. They also understand that even when informed by evidence and experience, not every resource decision will hit the mark.

These insights suggest a new paradigm for supervising and supporting schools — especially as schools are outlining their improvement plans, budgets, and staffing needs each year. In this new paradigm, supervision would be less about *enforcing* a specific use of resources and much more about *enabling* schools to more effectively match their hiring, staff assignment, student grouping, and schedules to their particular challenges.

[E]ffective resource use is not about a single strategy — but about how resources are combined to support a well-defined instructional model and highly capable teachers. *Schools and districts must begin to systematically measure their use of people, time, and money and compare those allocations to their instructional models to ensure they are putting their resources toward their most important priorities.*

Although Leading Edge School leaders do not necessarily use a systematic approach to aligning resources to their designs, the research framework and quantitative measures we used to understand them could serve as powerful tools for assessing resource use and promoting discussion and problem solving between school leaders and those who support and supervise them.

With this in mind, we have created a set of *diagnostic indicators* that describe how schools use people, time, and money in ways that seem to matter most for improving student performance. Many of these are not typically measured or reported. These indicators cannot determine whether a particular resource use is "right" or "wrong." Instead, they can serve as a basis for understanding and reflecting on how schools organize resources to support instructional models and respond to student learning needs. Because people, time, and money are limited assets and schools must make trade-offs and choices, diagnostic indicators should be viewed collectively for a full understanding of a school's resource use. These diagnostic indicators would be especially powerful if schools could compare their resource use against other schools in their state or district with similar characteristics, resource flexibilities, and instructional models.

The lesson for both research and practice is that *effective resource use is not about a single strategy — but about how resources are combined to support a well-defined instructional model and highly capable teachers.* Schools and districts must begin to systematically measure their use of people, time, and money and compare those allocations to their instructional models to ensure they are putting their resources toward their most important priorities. In the meantime, although there are no simple solutions, we can draw on a powerful set of resource strategies and invest to recruit, develop, and support strategic school leaders to enact those strategies in ways that align with a clear instructional model and goals for student learning.

I. Introduction

Thirty years ago, urban high school organization looked very similar from one school to the next — classrooms organized by age and subject, class sizes of 25 to 30 for all subjects, daily student schedules of six or seven rigid periods, and students grouped in courses based on performance. Today, this landscape is changing. Persistent achievement gaps and rising dropout rates have generated urgency around redesigning urban high schools. Less than three-quarters of all students graduate from high school, and only about half of African American and Latino students do (Green & Winters, 2005). On the 2005 National Assessment of Educational Progress, only 36 percent of high school seniors scored proficient or advanced in reading, and 23 percent scored proficient or advanced in math.[1]

Creating small high schools has become a central element of this redesign movement, based on research showing that small schools may be especially effective for urban students (Cotton, 1996). Few would argue that simply making schools smaller would lead to dramatic student improvement. Instead, reformers envision that those designing smaller schools also will attend to improving instruction and, through the smallness, be more able to create a supportive community of adult and student learners.

At Education Resource Strategies (ERS), we work with school and district leaders to improve student performance by using resources — people, time, and money — more strategically. We have found that many school districts begin creating small high schools without a clear sense of how much they will spend or how to ensure that small schools organize in ways that will promote high performance. To begin addressing these challenges, the Bill & Melinda Gates Foundation supported ERS in a three-year effort aimed at building understanding and tools that would support districts in creating cost-effective systems of high-performing, urban high schools. To do this, we began with three main research questions:

1. How much do districts and charter schools spend to operate small urban high schools?
2. How do high-impact small urban high schools organize their resources?
3. How do school *systems* need to change to support a portfolio of high schools, including small schools, in organizing for high performance?

We have explored these questions through two connected research projects. Detailed case studies of nine high-impact small high schools helped us identify common trends and models for organizing resources for higher performance in small high school settings. These case studies also allowed us to understand the constraints that district schools face in doing so. At the same time, we collaborated with three urban districts — Boston, Chicago, and Baltimore — to deeply analyze their spending levels and identify the resource-related challenges they face as they redesign their systems of high schools.

We describe the district-level findings and resulting tools elsewhere. This report summarizes the findings from our nine case studies of small urban high schools. It explores what they spend and how they organize their resources to take advantage of their smallness to improve student performance. A more detailed description of the full project can be found in Appendix A, and the full case studies can be found on our Web site at www.education resourcestrategies.org.

School selection and methods

Because small schools only make sense if they encourage a new way of "doing" high school, we chose urban schools that represented a range of instructional and organizational models. We aimed to find a set of schools that could provide lessons and concrete models for others attempting to redesign high school. We spoke with dozens of highly regarded individuals in urban education reform to identify schools that were relatively high performing, were beyond the initial start-up stages, and served students with demographics similar to each local district. We also wanted the case study schools to be diverse geographically and include both charter and traditional district schools so that we could explore how regulatory and local context influenced resource use. We define "small" as having a student enrollment of 500 or fewer students and "school" as an autonomous entity — that is one with its own budget, and budget code within a district, and distinct from a "small learning community," which is a subset of students grouped together within a large high school.

Finding relatively high-performing small urban high schools that had been operating for four or more years proved difficult in 2005, the year our study began. Defining "high performance" created particular challenges. We discovered that many highly regarded small high schools were new, had not yet reached full capacity, and did not yet have sufficient or available performance data. In addition, many students enter these schools years below grade level, and reliable measurements of student growth at the secondary level are extremely hard to come by. Most secondary measures of student performance assess learning at only a snapshot in time — usually grade 10 or 11 — too soon to measure the full impact of a redesigned high school. Thus, graduation and attendance rates become the most powerful existing tool to rate school performance.

Understanding that the small schools movement is young and schools are evolving, we selected only schools with continuously improving student performance levels that were higher than the average schools in their local districts. As shown in Figure 1, all schools selected exceeded or equaled district academic performance, and they significantly outperformed their local district graduation and attendance rates. Because they are so far ahead of districts in designing new ways to "do school" and *promoting attendance and graduation at extraordinary rates,* we dub these "Leading Edge Schools."

FIGURE 1

Characteristics of Leading Edge Schools in SY2005–06[i]

	High Tech High School	Life Academy of Health and Bio-science	MetWest High School	Univer-sity Park Campus School	Noble Street Charter High School	Perspec-tives Charter School	Academy of the Pacific Rim	Tech-Boston Academy	Boston Arts Academy
District	San Diego	Oakland	Oakland	Worcester	Chicago	Chicago	Boston	Boston	Boston
Governance	Charter	District	District	District	Charter	Charter	Charter	Pilot[ii]	Pilot
Years in existence	6	5	4	9	7	9	8	3	7
Grades	9–12	9–12	9–12	7–12	9–12	6–12	6–12	9–12[iii]	9–12
Total enrollment, grades 9–12	507	255	128	149	482	186	130	227	395
Free and reduced-price lunch	22%	92%	58%	68%	85%	86%	53%	69%	56%
Students with disabilities resource	9%	8%	13%	8%	13%	16%	15%	8%	13%
Students with disabilities self-contained	1%	0%	0%	0%	0%	0%	0%	4%	0%
English lan-guage learners	9%	29%	19%	1%	3%	0%	0%	3%	0%
Proficient and *above* in ELA[iv]	93%	54%	73%	66%	49%	29%	83%	46%	53%
Below, *near*, or *above* local district in ELA[v]	Above	Above	Above	Above	Above	Below	Above	Above	Above
Proficient and *above* in math	84%	46%	52%	66%	53%	21%	87%	32%	27%
Below, *near*, or *above* local district in math	Above	Near	Above	Above	Above	Below	Above	Above	Below
Attendance rate	97%	97%	95%	96%	95%	94%	94%	95%	93%
Graduation rate	99%	96%	96%	91%	87%	91%	91%	83%	84%

(continued)

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	High Tech High School	Life Academy of Health and Bio-science	MetWest High School	Univer-sity Park Campus School	Noble Street Charter High School	Perspec-tives Charter School	Academy of the Pacific Rim	Tech-Boston Academy	Boston Arts Academy
Percentage points above local district graduation rate	+17	+26	+25	+24	+14	+18	+32	+24	+26
Total general education spending[vi]	$2,773,349	$1,799,885	$997,167	$1,078,459	$4,183,136	$2,017,404	$1,402,313	$2,530,835	$6,015,270
Fully allocated general educa-tion spending per pupil[vii]	$5,470	$7,058	$7,790	$7,238	$8,679	$10,846	$10,787	$11,148	$15,229

ELA = English language arts
Note: The tests used for the ELA and math measurements are the Massachusetts Comprehensive Assessment System, Prairie State Achievement Examination (Illinois), and California High School Exit Examination. The graduation and attendance rates are self-reported from the schools' report cards: www.boston.k12.ma.us (Boston), www.wpsweb.com (Worchester), www.cde.ca.gov/ta (California), and www.cps.k12.il.us (Chicago).

i. Boston schools were studied in SY2004–05, and all other schools were studied in SY2005–06. Data shown are for the study year.
ii. A pilot school in Boston is a school that has significant waivers from both union contract and administrative policies.
iii. TechBoston only had grades nine through 11 in the year of the study (SY2004–05).
iv. Performance scores for California schools (High Tech High, Life Academy, and MetWest) are only reported as percentage passing.
v. We have defined "near" as within +/– 5 percentage points of the local district average.
vi. For extended discussion of the method used for calculating general education spending, see Appendix I: Detailed Methodology at www.educationresourcestrategies.org.
vii. Fully allocated general education spending per pupil includes all school-level and district-level management and leadership resources. For more detailed information on how this was calculated, see Appendix I: Detailed Methodology at www.educationresourcestrategies.org.

In each of the nine case study schools, we collected detailed strategic plans, staffing lists, budgets, and bell schedules. We then conducted interviews with leadership teams, often supplemented with teacher focus groups, to explore the school structure, organization, and obstacles to achieving the desired organizational design. We also collected district budget data and union contracts to help us understand the full spending picture and local context.

To contrast spending and organization of Leading Edge Schools to large comprehensive high schools, we assembled comparison benchmarks. Since spending levels and patterns vary widely across districts, we worked with local districts to select the highest-performing schools in each district that did not select students based on academic performance. We then compiled spending and staffing data for each school using the most detailed information possible.

We use a slightly different set of comparison data to understand differences in resource use. For critical diagnostic indicators that vary by local district, such as the length of student and teacher day, we used the local district average as our basis for comparison. However, other

indicators, such as average teacher load, vary less across districts, so we created a prototype of a national urban comprehensive large high school. The national prototype combines national composite data with our own detailed research on how typical large schools organize resources. The detailed methodology can be accessed at www.educationresourcestrategies.org, including data collection protocol, per-pupil spending and diagnostic indicator calculation methods, and comparison case study selection.

Key findings

The nine small urban high schools we studied spend varying amounts per pupil, and each school has different staffing plans, schedules, and instructional models. Despite these differences, they share a set of common practices that can provide guidance for those seeking to create or support more effective urban high schools. These schools stand apart from most high schools across the country because they create high-performing organizational structures — or Strategic Designs — that deliberately organize people, time, and money to advance their specific instructional model (the decisions a school makes about how it organizes and delivers instruction).

The following is a list of the four main findings of our study. They explain how these nine Leading Edge Schools create these designs and what they look like. Leading Edge Schools:

1. Create customized Strategic Designs that organize resources — people, time, and money — to advance a clearly defined instructional model.
2. Share a common set of high-performing practices — investing in teaching quality, using student time strategically, and creating individual attention — that advance their instructional models. In particular, they all:
    - Prioritize **strategic hiring and rigorous evaluation** to ensure an **expert teaching staff** that meets the needs of their unique instructional models.
    - Devote an average of five times **more time to teacher professional development and collaboration** than the local school district requires.
    - Rely on **internal professional communities to deliver professional development** instead of outside experts and more formal structures.
    - Use **school mission and professional community** rather than compensation and career structures to **attract, retain, and reward** expert teachers.
    - **Increase the overall amount of time students spend in school** by an average of 20 percent more than local district schools, largely by lengthening the school day.

- Devote an average of 233 equivalent days **more to core academics** than traditional district schools, primarily by expanding and extending core academic expectations throughout students' school careers, while also supplementing this time through targeted individual and small group academic support.
- Build a **school schedule** that strategically advances the school's instructional model and addresses student needs.
- Use **multiple data sources** to assess student needs both at school entry and through graduation.
- Create **small class sizes and teacher loads** that combine students across programs and performance levels, and offering targeted support outside standard academic courses.
- Weave into school models multiple ways of **fostering personal relationships between teachers and students,** rather than relying solely on an advisory structure.

3. Work within small school size and funding-level constraints to prioritize core academics and professional community over program diversity.
4. Require flexibility from traditional administrative practices and union contracts around hiring, staffing, and time to implement their Strategic Designs.

II. How Leading Edge Schools Create Strategic Designs

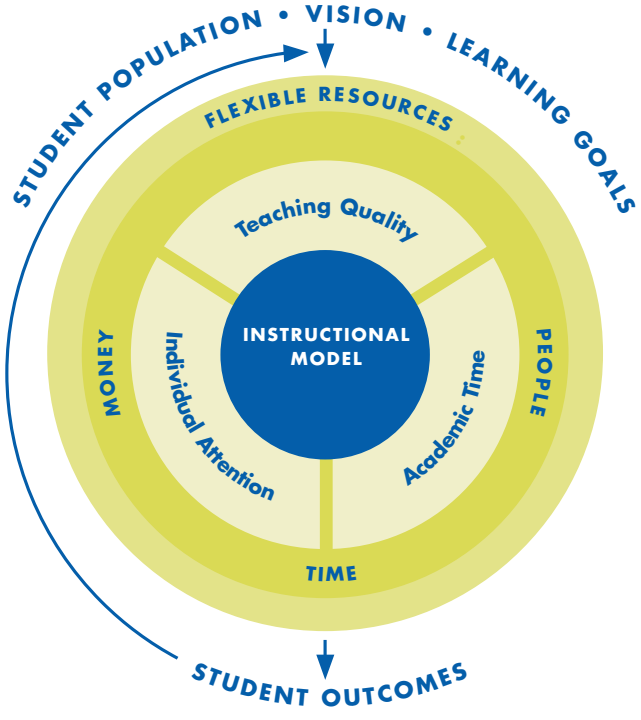
Finding 1: Leading Edge Schools create customized Strategic Designs that organize resources — people, time, and money — to advance a clearly defined instructional model.

Leading Edge Schools create Strategic Designs — customized high-performing organizational structures that support student achievement — by deliberately managing their resources to advance their instructional models (see Figure 2). Leading Edge Schools have resource-savvy leaders who have a clear idea of their destination — student learning outcomes — and how they plan to get there. This clarity enables these leaders to organize the resources they have to work with — people, time, and money — in ways that complement and advance their goals.

Drawing on a toolkit of scheduling, staffing, and other organizational techniques, the leaders of Leading Edge Schools implement strategies that reflect current research on how to improve student achievement. They also understand that organizations do not remain static; they must evolve in response to changes in student need and new understandings about what practices are best for students and teachers.

FIGURE 2

Strategic Design



These leaders create Strategic Designs through four interconnected practices. They:

1. Clearly define an instructional model that reflects the schools' vision, learning goals, and student population.
2. Organize people, time, and money to support this instructional model by (a) investing in teaching quality, (b) using student time strategically, and (c) creating individual attention for students.
3. Make trade-offs to invest in the most important priorities when faced with limits on the amount, type, and use of people, time, and money.
4. Adapt their strategies in response to lessons learned and changing student needs and conditions.

The first step in creating a Strategic Design — defining an instructional model — is the foundation for all the other steps. We define "instructional model" as the set of decisions Leading Edge Schools make about how they organize and deliver instruction. Although many high schools treat these decisions as given or unchangeable, leaders at Leading Edge Schools deliberately defined their instructional models. Figure 3 lists the eight components of Leading Edge Schools' instructional models that most influence organizational structure — including content focus, whether the program of study will be the same for all students, and where and when learning will take place. Although displayed neatly as extremes, the Leading Edge Schools for the most part made decisions somewhere along the continuum rather than at either extreme.

Leading Edge Schools' instructional models reflect three broad approaches to teaching and learning:

1. **Core academics:** a rigorous core academic college-preparatory curriculum for all students;
2. **Relevance:** a curriculum that is relevant to student interests and/or the world in which they live; and
3. **Personalization:** personal relationships between adults and students are fostered to ensure all students are known well by at least one adult.

Although we characterize these emphases to teaching and learning as distinct from each other, they are not mutually exclusive. All Leading Edge Schools incorporate some aspects of each emphasis, while tending to stress one over the others.

These approaches to teaching and learning influence instructional model decisions. For example, schools that emphasize core academics may make more traditional instructional decisions toward the left of the spectrum described in Figure 3, with content specialization and a common program of study for all students. Schools emphasizing personalization tend to have more individualized programs of study, with student schedules varying based on students' interests and performance needs. These schools also might set aside time during the school day for teachers and students to interact in ways in which students' academic and social needs are understood and addressed. And

schools that emphasize relevance make decisions that reflect their chosen theme. Themes can take many forms: They can be subject oriented, such as a core or noncore academic subject; structured around a type of pedagogy, such as project-based learning; interdisciplinary with a career or community focus; or some combination of the three.

Leading Edge Schools organize their resources — people, time, and money — in ways that support their instructional model. In the next section we explore some common resource organization practices across the Leading Edge Schools, but it is important to note that Leading Edge Schools with similar emphases and similar instructional model decisions will not be organized in identical ways.

FIGURE 3

Instructional model decisions influencing organizational structure

Instructional model components	Continuum of decisions ←		→
Assessment	Standardized	*Is the type of information the school uses to assess student learning based on standard content knowledge or individualized to match school model?*	Customized
Content delivery	Teacher delivered	*What is the school's belief about pedagogy and how students learn best?*	Teacher facilitated/ project based
Content organization	Subject specialization	*Is content knowledge taught in discrete single-subject focused courses or integrated across the curriculum?*	Interdisciplinary
Curriculum materials	Purchased	*Does the school primarily use purchased curriculum materials, or does it develop and customize its own materials?*	School developed
Learning locale	School	*Where does student learning happen?*	Community
Program content	Traditional	*Does the school curriculum and model include a particular theme or focus based on student engagement?*	Theme
Program of study	Common for all	*Does the school offer a primary set of courses for all students, or does it vary student schedules based on student need and interest?*	Customized
School role	Academic	*What is the primary focus of the work with students?*	Whole student

As described in the Leading Edge School vignettes that follow and throughout this report, schools make different decisions about resource use depending on the relative priority and interplay of the three emphases: core academics, relevance, and personalization. They also make different resource decisions because they have different levels of resources — people, time, and money — and varying levels of control over how they use those resources depending on their district and governance status (see section IV). Figure 4 shows how we have categorized the *primary* emphasis for each Leading Edge School.

FIGURE 4

Instructional model emphasis

Area of emphasis		
Core academics	**Relevance**	**Personalization**
• University Park Campus School • Academy of the Pacific Rim • Noble Street Charter High School	• Life Academy of Health and Bioscience • High Tech High School • Perspectives Charter School • Boston Arts Academy • TechBoston Academy	• MetWest High School

Core academic emphasis

University Park Campus School. Of the three Leading Edge Schools that emphasize core academics, University Park Campus School, in Worchester, MA, represents the paradigm of a core academic school. University Park focuses on rigorous preparation in core academic classes to prepare all students to be successful in college and life. University Park maintains a close relationship with Clark University, and it relies on that relationship to help students view college as a given instead of a remote and intangible concept.

University Park's mission

The goal of University Park Campus School is to produce students who become confident in their ability to tackle new learning situations, who grow in an appreciation of community, who come to understand that desire beats adversity, and who learn to realize that people working together with a common cause can indeed make promises come true.

www.upcsinstitute.org

University Park students often come to the school performing several years below grade level. Structured as a grade 7–12 model, the school uses the seventh and eighth grades to help these students catch up and become prepared for the high school curriculum. Beginning in ninth grade, all students participate in a common program of study with an honors-level curriculum. Core academic content is organized in specialized subjects, with the expectation that all teachers will teach literacy skills through their content area.

University Park's traditional core curriculum extends through the senior year, with students required to take four years of math, science, English, and history, as well as three years of Spanish. Students have a six-period day that looks the same each day of the week. It includes five core classes and one noncore class, such as physical education or art. Although most required courses are offered on campus, students have the opportunity to enrich their curriculum by taking elective courses at Clark University.

As a traditional core academic school, University Park fosters personalized relationships between faculty and students primarily through core academic courses. It uses standardized assessments to monitor students' progress and learning needs.

Academy of the Pacific Rim. As its name and mission statement suggest, the Academy of the Pacific Rim charter school, located in Boston, is infused with the teachings and traditions of the Far East. Pacific Rim's instructional model emphasis is core academics. It is one of three schools in the study that includes the middle grades. It organizes its core academic courses in specialized subjects, with a comprehensive college-preparatory curriculum. The school has a common program of study. In all four grades, students are expected to take the same courses: English, math, science, history, and Mandarin Chinese.

Pacific Rim places a large emphasis on creating a culture of respect and community — a key part of this is the morning greeting over breakfast and the closing ceremony at the end of the day. To reinforce the idea of self-discipline, students perform the basic custodial duties; this teaches them the responsibility of being part of a community and to respect their surroundings.

Pacific Rim's mission

The Academy of the Pacific Rim's mission is to empower urban students of all racial and ethnic backgrounds to achieve their full intellectual and social potential by combining the best of the East — high standards, discipline, and character education — with the best of the West — a commitment to individualism, creativity, and diversity.

www.pacrim.org

Students at Pacific Rim have a longer school day and year than their peers in traditional Boston public schools, with all learning happening at the school. Much of this extended school day and school year is devoted to academic support activities that support the school's promotion and graduation requirements.

The school uses a combination of standardized and customized assessments to measure and monitor students' progress throughout the year. The school also has a bonus system for teachers, 50 percent of which is based primarily on schoolwide performance — a sign that the school is intent on raising student achievement in core academic areas. Pacific Rim incorporates an advisory as well as community activities to facilitate relationships between students and adults that extend beyond its core academic emphasis.

Noble Street Charter High School. Noble Street Charter High School, in Chicago, is the third of the Leading Edge Schools that emphasizes core academics. It is a college-preparatory charter school whose foundation is based on a culture of hard work and respect and a belief that all Noble Street students will go to college. The halls of the school are covered with college pennants of Noble Street alumni, providing a tangible indicator of the school's mission and priorities and serving as an inspiration for its students.

Noble Street organizes the delivery of instruction in a traditional way, with content taught in specialized subject areas. Noble Street's curriculum requires students to complete nine more core academic courses than district-run Chicago Public Schools requires. This includes four

English language arts courses, three literature courses, two reading courses, six math courses, four science courses, three history courses, and two foreign language courses. Unlike other schools in our study, Noble Street organizes its core courses by student skill level. The class groupings are flexible so that students can advance at various points during the year if they have demonstrated improvement and proficiency.

Noble Street's mission

Noble Street Charter High School campuses seek to prepare Chicago's youth to function successfully in our society through commitment to educational excellence, civic responsibility, and respect for their community, the environment, and people from all walks of life.

Summarized from www.goldentigers.org

Noble Street students also spend about a quarter of their time in noncore academic classes, much more than University Park or Pacific Rim students. Although on-campus offerings are limited, half of this noncore academic time is outside of the regular school day and offered off campus though a variety of external partnerships.

To be eligible for extracurricular activities, students must pass all of their classes. Grades are posted every two weeks to inspire compliance, and promotion to the next grade level is contingent on students' successfully passing all classes, including physical education and a fitness test. Noble Street uses bonuses and annual performance contracts related to student performance to reward teachers for meeting target performance goals.

Relevance emphasis

Life Academy of Health and Bioscience. Founded for students who have an interest in science, Life Academy of Health and Bioscience, in Oakland, is one of five Leading Edge Schools with an emphasis on relevance. Life Academy's goal is to prepare students for college through project-based learning and real-world experiences. It weaves health and bioscience throughout its curriculum and internships.

The program of study is common for all students, but students can choose a specific area of science to major in. Their choice of major affects the two science courses they take in each grade as well as their internship placement. Although courses are generally specialized, Life Academy is only one of three Leading Edge Schools to offer a humanities course. Life Academy has a strong core academic focus in addition to its science theme, and it devotes a portion of advisory time to improving writing skills. The school offers a minimal noncore program of study, the bulk of which is taught by core academic teachers during a "post-session" at the end of the school year.

Life Academy's mission

Life Academy of Health and Bioscience strives to provide a rigorous college-preparatory experience for its students. The school is driven to improve opportunities for Oakland students in the fields of medicine, mental health, biotechnology, and science.

Summarized from www.essentialschools.org

In supporting this core academic focus, Life Academy provides a college counseling center for seniors, organizes field trips, and partners with local biotechnology companies and the Oakland Children's Hospital, among others, for internships.[2] It uses both the classroom and community as the learning locale for students.

The Gary and Jerri-Ann Jacobs High Tech High School. The Gary and Jerri-Ann Jacobs High Tech High charter school, in San Diego, integrates academic and technical education into a rigorous interdisciplinary curriculum to prepare students for postsecondary education. High Tech High emphasizes personalized project-based learning, and it taps the local community to enrich the student experience and increase student engagement.

High Tech High prioritizes real-world immersion by requiring every 11th grader to complete a semester-long internship at a local business or organization. The delivery of content is project based and supported by an interdisciplinary content organization, with core subjects combined in a humanities course and a math-science course. These combined courses are taught in longer blocks of time, allowing for more meaningful engagement in projects.

High Tech High also customizes how it measures student progress to align with its project-based and technology theme. The primary means of assessing students and determining promotion are digital portfolios and public exhibitions of work that include peers, the community, and families.

High Tech High's mission

The Gary and Jerri-Ann Jacobs High Tech High School's mission is to develop and support innovative public schools in which all students develop the academic, workplace, and citizenship skills for postsecondary success. The school combats the twin problems of student disengagement and low academic achievement by creating personalized project-based learning environments in which all students are known well and challenged to meet high expectations.

Summarized from www.hightechhigh.org

Perspectives Charter School. Perspectives Charter School, in Chicago, believes that school is relevant to students when it is connected to their interests, the world outside the school walls, and what students need to know and be able to do to be successful in life.

Perspectives' program of study is common for core academic classes, but it is customized to student interests through internships. Likewise, school leaders purposefully align the student schedule to ensure students actively engage in learning in both the classroom and the community. Two full days a month, students participate in a field study excursion in the community that is related to their academic curriculum. Two days a month, ninth and 11th graders also participate in internships in their chosen fields of interest, and they are paired with a mentor to learn critical work skills.

The organization of content is specialized within specific courses but with an emphasis on making connections to the real world. A critical component of Perspectives' theme is how students understand themselves and their place in the world. This is accomplished through A Disciplined Life curriculum that is woven throughout the school culture and is the focus of the student's advisory for all four years. Perspectives also has a College for Certain program to prepare students for four-year universities, which includes weeklong trips to colleges in grades 10 and 11 and an expectation that students apply to at least five colleges.

Perspectives' mission

Perspectives Charter School's mission is to provide students with a rigorous and relevant education — based on A Disciplined Life© — that prepares them for life in a changing and competitive world and helps them further become intellectually reflective, caring, and ethical people engaged in a meaningful life. The following five principles guide the work of teachers and leaders:

- *We teach ethics.* (A Disciplined Life)
- *We are intellectuals.* (Academic Rigor)
- *We connect students to the community.* (Community Engagement)
- *We partner with parents.* (Family Involvement)
- *We grow educators.* (Professional Development)

Summarized from www.perspectivescs.org

Boston Arts Academy. Viewed as the "Center for the Arts" within Boston Public Schools, Boston Arts Academy operates on the belief that academics and the arts are equally important to student development and achievement, and it views its role as enhancing both. Although the school does not look at students' academic records prior to acceptance, students must audition in their chosen arts major — visual arts, dance, music, or theater — to be accepted to the school.

Boston Arts' mission

Boston Arts Academy, a pilot school within the Boston Public Schools, is charged with being a laboratory and a beacon for artistic and academic innovation. Boston Arts Academy prepares a diverse community of aspiring artist-scholars to be successful in their college or professional careers and to be engaged members of a democratic society.

www.boston-arts-academy.org

Believing in the necessity of connecting learning to student interests and passion, students spend almost as much time in arts instruction and rehearsal as core academics. To that end, Boston Arts considers itself two schools in one: a laboratory for artistic innovation and an academic institution driving students to succeed in college and beyond.

Similar to Perspectives, Boston Arts offers students a common program of study for core academic courses but customizes courses to students' interests in their chosen major. The majority of student learning happens at the school, with Boston Arts leveraging its close proximity to Boston's art institutions to bring in outside experts as adjunct faculty. Boston Arts views its role as developing students' academic and artistic pursuits, as well as developing the whole student to be an engaged member of school and society. It uses both standardized and customized assessments, including exhibitions, to track students' progress.

TechBoston Academy. TechBoston Academy is unique among Boston Public Schools in its extensive use of technology as a tool for learning and how it integrates technology into every aspect of its college-preparatory curriculum. Through its relevance emphasis, it aims to prepare students for college and technology-related careers, such as computer science and engineering. All TechBoston students have laptops they use for their coursework and homework, which include activities such as creating PowerPoint presentations and constructing Web sites.

TechBoston's mission

TechBoston Academy's essential belief is that every student can learn and develop into a responsible citizen by providing an environment that is both nurturing and challenging. TechBoston offers a college-preparatory curriculum, which includes interdisciplinary project-based learning where technology is the bridge that connects the student to their learning experiences.

www.techbostonacademy.org

TechBoston uses a common program of study and course specialization but customizes through student choice of community service and internships at local companies. Although for the most part learning takes place on campus, TechBoston students also work on individual and group projects with high-tech mentors from the Boston area and take classes at a local college.

A secondary emphasis at TechBoston is personalization. TechBoston's bedrock principle is that every student can learn when supported by a nurturing and challenging environment. In this sense, the school sees its role as developing the whole student to be successful academically. The school creates small class sizes and devotes a significant amount of time during the school day to academic-support activities, such as Project Room, in which students receive additional help from classroom teachers. In addition, TechBoston leaders draw on multiple data sources to individualize student schedules to best meet student needs.

Personalization emphasis

MetWest High School. MetWest High School, in Oakland, represents the paradigm of a school with a personalization emphasis: It provides students a college-preparatory curriculum that focuses on personalizing their education to align with their strengths and interests.

MetWest's mission

MetWest High School prepares young adults to recognize and take advantage of all resources to further their personal well-being. Graduates will have the skills, habits, knowledge, and community to overcome obstacles to their success, access four-year colleges, and contribute positively to our world.

Summarized from www.bigpicture.org

MetWest leaders see the school's role as developing the whole student. Students are grouped in 17-person advisories that stay together with the same teacher/advisor for two years. These advisors are responsible for the oversight of all aspects of their students' curriculum as well as nonacademic needs. Students at MetWest work with advisors, parents, and workplace mentors to model a curriculum that is project-based and customized to their interests. The heart of this curriculum is the "Learning Through Internship," a two-day-a-week internship in the community that is based on student interests.

As student interests drive the program of study, they also drive to some extent the amount of time spent in core and noncore activities. Campus school days also are individualized, but there are some required subjects, including math and literacy. In addition, assessments are customized: Advisors assess students' progress and effort through presentations of their research projects, which must incorporate critical thinking in the areas of math, history, literature, and science.

MetWest leaders believe the school's unconventional and personalized approach empowers its students to take charge of their learning and to gain the skills and knowledge necessary to achieve success beyond high school and become lifelong learners.

As these examples begin to illustrate, the mission, core values, and target population of each school inform its choice of instructional model. The next critical step Leading Edge Schools take is organizing their resources — people, time, and money — around these models. We turn now to explore the commonalities and differences this creates.

III. How Leading Edge Schools Organize Resources To Enable High Performance

Finding 2: Leading Edge Schools share a common set of high-performing practices — investing in teaching quality, using student time strategically, and creating individual attention — that advance their instructional models.

To explore whether and how our Leading Edge Schools organize resources in high-performing ways, we used a framework based on more than a decade of research (Miles & Frank, 2008). Although no school organizes resources exactly the same way, high-performing schools organize people, time, and money to implement three high-performance resource strategies. They:

A. Invest to continuously improve **teaching quality** through hiring, professional development, job structure, and collaborative planning time.

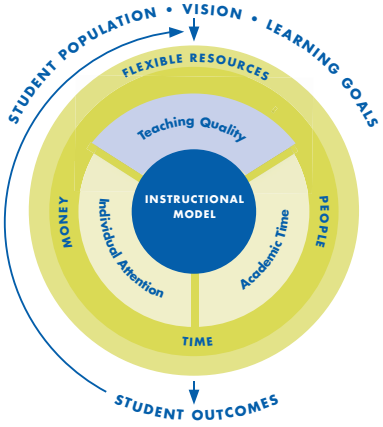
B. Use **student time** strategically, linking it to student learning needs.

C. Create **individual attention** and personal learning environments.

This framework and these high-performance resource strategies are described more fully in Appendix B. The sections that follow elaborate on the common powerful ways in which Leading Edge Schools implemented these three strategies to fit their unique instructional models and accommodate their small size and varying funding levels.

A. Invest in teaching quality

Leading Edge Schools focus foremost on ensuring high-quality teaching in their classrooms. They do this by:



1. Prioritizing **strategic hiring and rigorous evaluation** to ensure an **expert teaching staff** that meets the needs of their unique instructional models.
2. Devoting an average of five times **more time to teacher professional development and collaboration** than the local school district requires.
3. Relying on **internal professional communities** to deliver professional development instead of outside experts and more formal structures.
4. Using **school mission and professional community** rather than compensation and career structure to **attract, retain, and reward** expert teachers.

Common Practice 1. *Prioritizing strategic hiring and rigorous evaluation to ensure an expert teaching staff that meets the needs of their unique instructional models*

Leading Edge Schools demand strong teachers with the skills to generate student achievement and work collaboratively with colleagues. Like most educators, the principals at the Leading Edge Schools recognize that these teachers do not miraculously appear. What sets Leading Edge Schools apart is the deliberate and thoughtful process they undertake to ensure that only the most-qualified teachers are in classrooms. This is the case for all Leading Edge Schools, even those that have district staffing policies and/or teacher union contract provisions that define and constrain hiring and staffing decisions.

Each piece of the hiring process helps ensure that the school not only is getting the highest-quality teacher but also is finding the candidate with characteristics that fits its model, culture, and beliefs.

This investment in human capital is all the more critical due to the relatively limited number of staff members in a small high school. The principal of University Park notes, "We're at a bare minimum [number of teachers] and at the district's will for further cutbacks. You can't be a mediocre teacher here … . We're so small that one weak link can make a huge impact on the school."

To ensure an expert teaching staff that meets the needs of their unique instructional models, Leading Edge Schools use a *strategic hiring practice* reinforced by a *rigorous evaluation system*.

Strategic hiring practice

Most Leading Edge Schools implement a strategic hiring process that includes:

- Well-defined teacher profiles that detail role, expertise, and workday based on student needs and instructional model;
- A timely and proactive recruiting process; and
- A multistep interview process that includes numerous stakeholders and often an exhibition of competency through demonstration lessons.

Teacher profiles

Each piece of the hiring process helps ensure that the school not only is getting the highest-quality teacher but also is finding the candidate with characteristics that fits its model, culture, and beliefs. Teacher profiles look very different across Leading Edge Schools. A highly effective teacher at MetWest, a model that requires educators to be generalists and deeply interested in

forming close personal bonds with small numbers of students, may be less effective at Noble Street, whose core academic focus and instructional model require teachers to be subject specialists and carry large teacher loads.

Although teaching profiles vary based on instructional model emphasis, all Leading Edge Schools invest in a cadre of high-capacity core academic teachers who make up the majority of each school's teaching staff. Many of the Leading Edge Schools specifically look for core academic teachers who have multiple certifications or multiple areas of expertise. Seven of the nine Leading Edge Schools have more than 40 percent of their core academic teachers teaching multiple subjects. This is driven by instructional model requirements as well as by limitations of school size and resources.

Unlike many district teacher evaluation processes, performance reviews at Leading Edge Schools actively inform teacher development through individual support and schoolwide professional development priorities.

At five of the Leading Edge Schools, core academic teachers teach noncore academics. At MetWest, this is a function of its instructional model, while at Life Academy — one of the lowest-funded Leading Edge Schools — this is a function of available funding, eliminating the expense of a full noncore academic teaching staff. The smaller Leading Edge Schools, such as University Park, deliberately hire teachers with multiple certifications to allow for maximum scheduling flexibility. Multiple certifications are particularly important when schools offer one program of study with classes that include students with special needs, which may require teachers with special certifications.

Recruiting and interviewing

To identify candidates that are most suited to their instructional models, Leading Edge Schools employ a proactive and timely recruitment process. This is the case even though many of the schools receive far more applications than they have job openings. This timely process allows Leading Edge Schools to provide multiple opportunities for both the school and the candidate to learn about each other — facilitating the appropriateness of the match between teacher and school.

Leading Edge Schools get to know potential candidates through multiple interviews with various stakeholders — including teachers, parents, and students. Six of the nine schools also require the candidates to teach a lesson to students as part of the hiring process. At Noble Street, qualified candidates engage in three rounds of interviews, prepare a sample lesson, and teach the lesson to a group of students. Noble Street enlists student feedback on the quality of the lesson and their engagement, believing that the ultimate consumer should play a critical role in the hiring process.

This series of interactions between candidate and school also allows candidates to get to know a school's climate, culture, and expectations and assess their own fit with the school. To ensure that there is a mutual understanding of expectations, some of the schools, such as Boston Arts

and TechBoston, use a formal memorandum of understanding as the final piece of the hiring process. University Park ensures a match by creating its own pool of candidates from hosting Clark University students who are working toward their master's degrees in teaching and who often join the faculty full time once they graduate.

Rigorous evaluation system

The effort to ensure a high-quality teaching staff does not end with the hiring process. As detailed in the next common practice, each of the Leading Edge Schools makes a significant investment in developing the knowledge and skills of its staff. This investment begins with a comprehensive teacher review and evaluation system that includes both formal and informal methods of evaluating teacher performance. These review and evaluation processes are made even more powerful by the limited span of review at Leading Edge Schools.

Review and evaluation process

Unlike many district teacher evaluation processes, performance reviews at Leading Edge Schools actively inform teacher development through individual support and schoolwide professional development priorities. The headmaster of Boston Arts writes, "Evaluation and professional development of teachers are two sides of the same coin; they are the essential currency of improving teachers' practice and students' learning" (Nathan, 2005). Figure 5 shows the combination of formal and informal structures used at each of the nine high schools to review teachers' practice and performance.

In some instances, the review and evaluation process also informs continued employment. This is all the more important due to the small staff sizes at some of the Leading Edge Schools. As seen in Figure 5, all the Leading Edge charter schools have annual performance contracts that are closely linked to their evaluation systems. The district schools in our study do not have explicit authority to use this strategy, as they are constrained by district policies and union provisions. However, the autonomy in staffing at two of the schools (Boston Arts and TechBoston) gives them the freedom to hire and "excess," or remove, staff that does not meet the needs of the school. We refer to Boston Arts and TechBoston throughout the study as "pilot" schools because they have significant waivers from both union contract and administrative policies.

With and without formal authority to "evaluate out" teachers and staff, the culture of high expectations at Leading Edge Schools tends to create an environment in which peers unofficially hold each other accountable, resulting in a self-selection process with some teachers choosing not to stay. TechBoston principal Mary Skipper emphasizes this internal accountability and support: "Evaluation here is used as a tool and a process to help all teachers improve … . For teachers who aren't successful, it becomes everyone's responsibility, not just the principal's. The culture is strong here. There is a culture and ethic of hard work, and with the distributed leadership model, we all work together. … The accountability here can make for a tough environment for teachers who don't want to buy into that culture."

Review span

These dynamic evaluation and review systems, which inform both professional development and employment opportunities, are only possible because of the limited span of review at the Leading Edge Schools. At large district high schools, district policies and teacher union contract provisions often dictate the teacher evaluation system — the frequency, reviewer, content, and process. Typically, due to school size and competing responsibilities, teachers are not formally evaluated each year, and the administrative staff spends little time outside of the formal system observing classrooms and providing teachers meaningful and consistent feedback.

FIGURE 5

Evaluation systems at Leading Edge Schools

	Evaluator	Review span[i]	Number of formal teacher evaluations per year	System for regular review of teacher growth[ii]	Annual performance contract
Boston Arts	Principal Assistant principal	22	1	Yes	No
High Tech High	Principal	30	1	Yes	Yes
Life Academy	Principal Assistant principal	8	1	No	No
MetWest	Principal	9	1	Yes	No
Noble Street	Principal	34	1	No	Yes
Pacific Rim	Principal	12	2	Yes	Yes
Perspectives	Instructional leaders Dean of academics	4	2	Yes	Yes
TechBoston	Principal Assistant principal	8	1	Yes	No
University Park	Principal	17[iii]	2	No	No
Typical large high school	Principal Assistant principal(s)	35–130	1 every 3 years	No	No

[i] Number of teachers per evaluator.
[ii] A "yes" indicates that the school has adopted a system or structure in which the reviewer formally checks on teachers' growth more than once throughout the year outside of the regular evaluation process, and he or she provides feedback on areas of progress and improvement.
[iii] University Park's span of review includes the high school and middle school teachers that the principal is responsible for evaluating.

The last row of Figure 5 shows that in a typical large high school of 1,500 students, a principal and assistant principal(s) may be responsible for evaluating anywhere from 35–130 teachers each, depending on the number of assistant principals and their spheres of responsibility. Due to policy and contractual constraints, teacher evaluations typically only inform individual growth and development and not schoolwide professional development practices, limiting their use for schoolwide improvement.

As all small schools do, the Leading Edge Schools have small spans of review, ranging from four to 34 teachers. As a result, leaders at these schools are able to evaluate teachers at least once a year and with much more focus and knowledge of the teachers' practice and skills. Although principals generally serve as the instructional leaders responsible for teacher reviews, at some of the Leading Edge Schools principals share this responsibility with other administrators.

As we describe in more detail in Common Practice 3, Perspectives uses an innovative model in which the instructional leaders perform formative evaluations of four to five teachers. With this small span of review, they are able to conduct evaluations twice a year in addition to weekly informal observations. This allows for a more organic connection between the teachers' needs and the instructional leaders' support and professional development.

At Boston Arts, one of the Leading Edge Schools with a larger span of review, the school employs other means to check in on teacher learning and growth. Each staff member creates individual professional development plans connected to the school goals and his or her personal goals. Teachers submit written reflections on their progress toward their goals twice a year to administrators, who review the plans and meet with teachers. The principal follows a similar process, sharing his or her goals with and soliciting feedback from the board and staff.

The small span of review at Leading Edge Schools is achieved by devoting a larger percentage of the per-pupil budget to leadership than larger schools do (the cost of the principal and any additional leadership is spread over a fewer number of students). Even the very small Leading Edge Schools in our study chose to maintain — and in some cases increase — their investment in leadership. This investment in leadership compels Leading Edge Schools to make other trade-offs to achieve their instructional models, as will be discussed more fully (see section IV). Leading Edge Schools have organized the span of review in powerful ways to respond to individual teachers' needs and to inform schoolwide professional development.

FIGURE 6

Teacher time

		Boston Arts	High Tech High	Life Academy	Met West	Noble Street	Pacific Rim	Perspectives	Tech-Boston	University Park	Average
	District	Boston	San Diego	Oakland	Oakland	Chicago	Boston	Chicago	Boston	Worcester	
	Governance	Pilot	Charter	District	District	Charter	Charter	Charter	Pilot	District	
Total teacher time	Total district days per year	185	187	186	186	184	185	184	185	183	185
	Total district hours per year	1,234	1,324	1,302	1,302	1,288	1,234	1,288	1,234	1,211	1,280
	Total LES days per year	190	194	191	196	200	203	196	185	188	194
	Total LES hours per year	1,503	1,598	1,498	1,381	1,523	1,908	1,683	1,526	1,252	1,541
	Additional days per year above district	5	7	5	10	16	18	12	0	5	9
	Additional hours per year above district	269	274	196	79	235	674	395	292	41	262
	Teacher time above district	22%	21%	15%	6%	18%	55%	31%	24%	4%	22%
Teacher professional development time	Total district hours per year in PD/CPT	30	23	51	51	124	30	124	30	20	54
	LES total hours per year in PD/CPT	225	242	159	167	150	198	276	257	64	193
	LES teacher time spent in PD and CPT	15%	15%	11%	12%	10%	10%	16%	17%	5%	12%
	Additional PD and CPT hours above local district[i]	195	219	108	116	26	168	152	227	44	140

LES = Leading Edge School, PD = Professional development, CPT = Collaborative planning time

[i] Professional development time for the local district is calculated based on professional development time required by the teachers' union contract. It does not capture collaborative planning time or other professional development practices captured in district policies or undertaken by individual schools not reflected in the union contract.

Common Practice 2. *Devoting an average of five times more time to teacher professional development and collaboration than the local school district requires*

Teachers at Leading Edge Schools commit to working 262 hours more a year, on average, than local districts' teachers.[3] This means that they spend anywhere from 4 percent to 55 percent more time in school than their colleagues (see Figure 6). While many teachers in the local district schools spend multiple hours above and beyond those required fulfilling their responsibilities, the notable difference in annual hours between teachers at Leading Edge Schools and the local district reflects Leading Edge Schools' efforts to formally capture this "additional" time in school design and organization.

More professional development

Much of this extended teacher day and year is devoted to professional development activities (see Figure 6), comprising anywhere from 5 percent to 17 percent of the Leading Edge School teachers' total yearly time commitment. This commitment means that teachers at Leading Edge Schools are devoting an average of at least five times — and up to nine times — more time to professional development and collaboration than the local school district requires. Note, for this study, we have defined "collaborative planning time" as regularly scheduled time for strategically grouping teachers to meet in either grade-based or content teams. This can happen during the student day or outside of the student day.

Even the three Leading Edge Schools that are district high schools … and constrained by the negotiated length of teacher day and year devote an additional 116, 108, and 44 hours, respectively, to professional development and collaborative planning time than their districts require.

Even the three Leading Edge Schools that are district high schools — MetWest, Life Academy, and University Park — and constrained by the negotiated length of teacher day and year devote an additional 116, 108, and 44 hours, respectively, to professional development and collaborative planning time than their districts require.

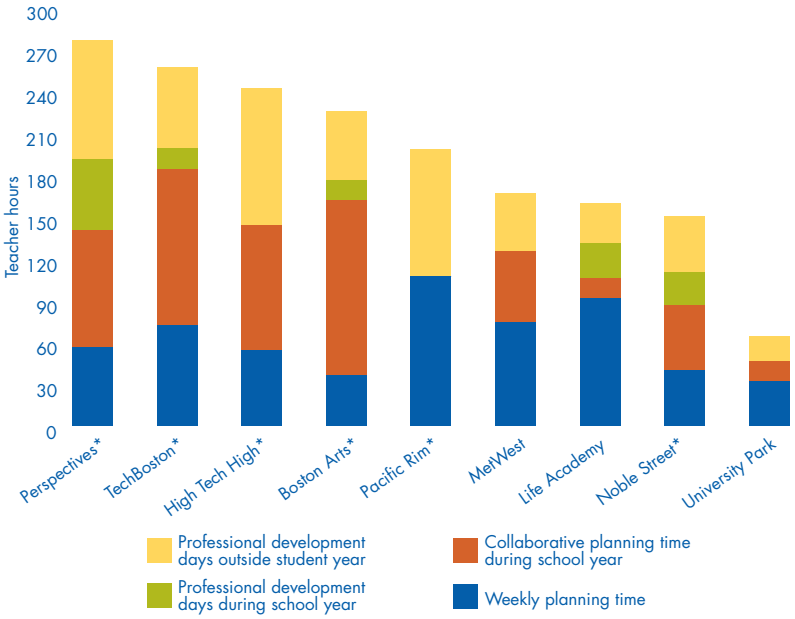
University Park provides stipends to its teachers for the extra professional development hours. Life Academy organizes the student schedule so that students have early release every Wednesday at 1:30 p.m., allowing teachers an uninterrupted two and a half hour block to meet each week. MetWest schedules faculty professional development every Tuesday morning before students arrive. Teachers apply to these schools understanding the additional commitment to professional development.

Strategic use of time

With this significant investment of teacher time, Leading Edge Schools have the opportunity to strategically allocate professional development time. The schools integrate professional development activities throughout the year and group teachers in multiple ways that allow them to focus on content, student needs, and schoolwide priorities. Professional development time in most of the schools is a mixture of weekly professional development and collaborative planning time embedded into teachers' schedules, as well as professional development days interspersed throughout the year, including before and after the student year (Figure 7).

FIGURE 7

Distribution of professional development time



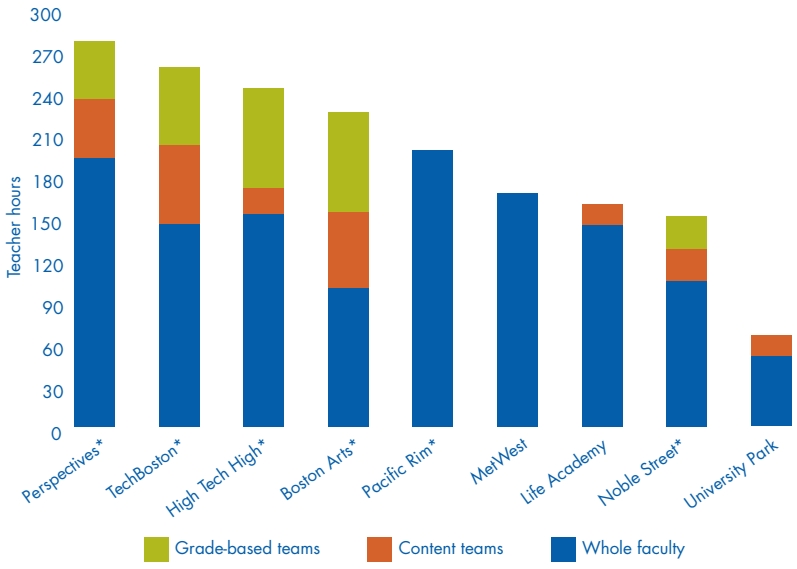
*Indicates charter or pilot school with flexibility over length of teacher day and year.

Although schools with limited time for professional development often face difficult choices in balancing time between content-based groups and grade-level teams, this is not the case for Leading Edge Schools. Figure 8 shows that many of the schools provide scheduled time for teachers to meet in content teams, in grade-level teams, and with the whole faculty. Boston Arts believes that scheduling both grade-level and content meetings ensures that teachers can discuss strategies about specific students they share as well as align the curriculum within a particular subject across the grades.

It is a challenge for small high schools to ensure quality regular professional development in content areas, given the limited number of teachers in each content area. At two of the three smallest schools in the study — Pacific Rim and MetWest — professional development is structured as whole-faculty meetings. At MetWest, all the teachers teach every subject, so dividing teachers by content does not make sense for its model.

FIGURE 8

Focus of professional development hours by school



*Indicates charter or pilot school with flexibility over length of teacher day and year.

Boston Art's schedule, shown in Figure 9, provides a powerful example of Leading Edge Schools' strategically organizing to create significant time for teachers. Boston Art's teachers have 205 minutes of collaborative planning time each week. They meet with their content teams for 90 minutes every Monday morning and with their grade-level teams for 60 minutes every Tuesday afternoon and 55 minutes every Friday afternoon. On Fridays, teachers also meet with the entire staff for an additional 55 minutes of professional development and 90 minutes of discussion of student needs and other issues.

Measures of time do not capture the full picture of professional development at the Leading Edge Schools. Teachers at these schools engage in other formal and informal professional development activities — such as performance reviews, peer observation programs, and new teacher mentoring support. For example, University Park employs a teacher collaboration model based on medical rounds.

University Park uses rounds to give teachers the opportunity to observe each other's classrooms, discuss lessons learned, and provide feedback in a safe and supportive environment. Sometimes the principal will arrange a round so that teachers can see a particular strategy. Rounds begin with the host teacher preparing the group for the lesson, sharing strategies and objectives, and preparing the observers for what they will see. After the lesson is over, the group discusses the experience and provides feedback to the host teachers. The role of these professional communities in supporting teacher growth will be discussed in greater length in the next common practice.

FIGURE 9

Sample teacher schedule at Boston Arts

Period	Monday	Tuesday	Wednesday	Thursday	Friday
7:55–8:40	Content-based CPT (7:55–9:30)	Science support	Planning and development period	Science support	Planning and development period
8:45–10:10	Science (9:30–10:45)	Science	Science	Science	Science
10:15–11:40	Science (10:50–11:05)	Science	Science	Science	Science
11:40–12:10	Lunch (11:05–11:30)	Lunch	Lunch	Lunch	Lunch
12:10–12:25	Advisory (11:35–12:50)	Advisory	Advisory	Advisory	Planning and development period
12:30–1:20	Writing (12:55–1:45)	Writing	Writing	Writing	Grade-level CPT
1:25–2:50	Planning and development period	Planning and development period	Planning and development period	Planning and development period	Faculty meeting
2:50–4:00	Science support	Planning and development period	Science support	Planning and development period	Faculty meeting
4:00–5:00		Grade-level CPT			Faculty meeting

CPT = Collaborative planning time

Common Practice 3. *Relying on internal professional communities to deliver professional development instead of outside experts and more formal structures*

Unlike low-performing schools that have low teacher capacity and rely on external expertise, Leading Edge Schools rely predominately on internal professional communities to deliver professional development. This strategy is only possible because the Leading Edge Schools carefully select and retain a teaching and administrative staff that meets their specific needs. The small size of the faculty in these schools also creates a culture of support and accountability that allows the professional communities to flourish in ways not possible in larger schools.

The principal of Life Academy commented, "This is the best [professional development] experience I've ever been part of. It is being delivered by us, not an outside person. It requires capacity, but the staff is energized by the work and willing to bring things for everyone to learn from." This reliance on internal expertise is particularly noteworthy because at five of the Leading Edge Schools, more than one-third of the faculty has three or fewer years' teaching experience.

Peer support

These professional communities support teacher learning formally during the significant time dedicated to professional development and collaborative planning time; they also do so informally through peer collaboration and support during the course of the regular school day. During formal professional development activities, teachers and administrators take on leadership roles as expertise allows.

For example, Noble Street requires teachers to participate in collaborative planning time with grade-level and content teams a minimum of five times a month, and it gives teachers the freedom to plan their own schedules. This scheduling freedom is coupled with accountability — grade and department chairs must regularly report to the principal on meeting goals and deliverables. The principal views his job as ensuring teachers have the time to collaborate with and learn from fellow teachers. He notes, "Our general philosophy around professional development is that we're professionals, and we know how to develop ourselves."

These professional communities support teacher learning formally during the significant time dedicated to professional development and collaborative planning time; they also do so informally through peer collaboration and support during the course of the regular school day.

At Pacific Rim, much of the professional collaboration occurs organically. Teacher collaboration around students and curriculum is a constant activity in the large teacher room where each teacher keeps a desk. Opportunities for this informal collaboration are enhanced by the significant amount of time set aside in the day for individual teacher planning, with an average teacher class load of three of five classes.

Some of the Leading Edge Schools have employed some formal structures to support teacher development — mainly though peer coaching and new teacher mentor programs. High Tech High, MetWest, and Pacific Rim have formal peer coaching programs, and High Tech High, Pacific Rim, and TechBoston have formal new teacher mentor programs. High Tech High's program supports new teachers with a teacher credentialing program that includes a 120-hour preservice program and a 15-month teacher preparation program during the first two years of teaching. More than half of the new teachers at High Tech High are in the credentialing program, which provides them an opportunity to share successful teaching practices and learn from each other. Four mentor teachers each earn a stipend of $750 to support a teacher credentialing program participant.

Perspectives is the only Leading Edge School that has a formal school-based coaching program with dedicated staff responsible for teacher development. At Perspectives, three master teachers — "instructional leaders" — serve as instructional coaches for the school's high school teachers. These instructional leaders carry a 50 percent teaching load, maintaining their connection to the students and curriculum. Each instructional leader supports the work of four or five teachers, observing them once a week and holding pre- and post-conferences in which they plan and debrief the observed lesson. They also meet with the teachers individually to set and review 60-day goals.

Because they observe multiple teachers, instructional leaders are able to extract common themes across classrooms. This allows them to plan and facilitate, with the dean of academic affairs, professional development throughout the school year, as well as to facilitate the grade- and content-based collaborative planning time meetings. The instructional leaders also participate in professional development for effective school-based coaching strategies. Instructional leaders are chosen based on the principal's observation of their ability to improve student achievement, develop effective and engaging lessons, support school culture and goals, and contribute to parent satisfaction.

Leadership support

In addition to teacher leaders, principals and administrators play an important role in providing professional development for teachers. In Common Practice 1, we highlight the role of principals and administrators in the professional development of individual teachers through the review and evaluation process. In addition, all principals play some leadership role in guiding the development and direction of schoolwide professional development. Four of the Leading Edge Schools report that principals or other administrative staff spend a minimum of 20 percent of their time directly providing professional development and instructional support to teachers.

For example, at Pacific Rim, the high school principal estimates that he spends at least 50 percent of his day in direct contact with teachers — either in one-on-one conversations or through classroom observation. He visits each classroom twice a week for one 20-minute observation and one five-minute "drive by." The principal accesses lesson plans on the computer, and then he reviews the scope and sequence implementation during classroom visits.

In addition to classroom observations, the principal is the primary architect of teacher professional development opportunities based on the needs he sees during those observations. To enhance the principal's role in teacher development, Pacific Rim specifically expanded its administrative staff to include separate principals for the middle school and high school grades.

Common Practice 4. *Using school mission and professional community rather than compensation and career structures to attract, retain, and reward expert teachers*

Rather than using a compensation structure, Leading Edge Schools tend to attract, retain, and reward teachers in more intangible ways, including opportunities to fill informal leadership roles, collaborate with like-minded colleagues, and know students well and feel they are making a difference in students' lives. All of the Leading Edge Schools structure teacher salaries based on years of experience and credentials rather than systematically paying more for content area expertise, leadership roles, or other additional areas of responsibility. And most Leading Edge Schools use the local district salary schedules, even when not required, such as in the charter schools, and even though their teachers work many more hours each year.

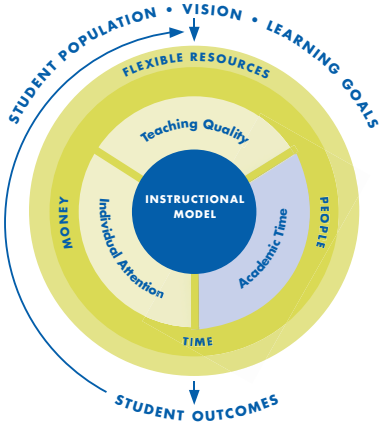
Rather than using a compensation structure, Leading Edge Schools tend to attract, retain, and reward teachers in more intangible ways, including opportunities to fill informal leadership roles, collaborate with like-minded colleagues, and know students well and feel they are making a difference in students' lives.

In several schools, however, principals informally reward teachers for additional responsibilities and effectiveness through stipends or bonuses. At University Park, teachers have several opportunities to receive stipends. They can receive them for serving in leadership roles or for working on a nationally recognized professional development institute, held on the school campus during the summer, and a structured "visit program," conducted throughout the school year. Through the visit program, outside educators come and observe classes and participate in training and workshops led by University Park faculty during 10 days of the school year. The principal cites these opportunities as "ways to reward people for staying in the classroom."

Only two schools vary compensation based on individual performance. Both of these schools, Pacific Rim and Noble Street, also have annual performance contracts. At Pacific Rim, teachers and administrators receive a bonus based 50 percent on schoolwide performance measures (state test results and a parent survey) and 50 percent on individual performance measures. Although in theory the bonuses would vary, in the study year, all staff members received the same $1,500 bonus.

At Noble Street, the bonus structure is similar but with greater possible rewards — a total possible bonus of $4,000 in 2005–06. Like Pacific Rim, half of the bonus was based on student performance on the state exam and half of the bonus varied by individual teacher performance measures, which included both administrative duties and additional student outcomes.

More than half of the Leading Edge Schools have a high percentage of new teachers, ranging from 34 percent to 57 percent of the teaching staff. They are willing to work, on average, 262 hours more a year than their local district counterparts because the leaders of these schools have created a culture and professional community that they want to be a part of. However, given these generally young staff members, it will be important to track whether the practice of relying on a school's mission and culture rather than differentiated compensation structures is a sustainable way to keep the best teachers at these schools.



B. Use student time strategically

Leading Edge Schools invest in and use student time differently from traditional comprehensive high schools (see Figure 10). We found that the schools in our study use student time strategically by:

5. **Increasing the overall amount of time students spend in school** by an average of 20 percent more than local district schools, largely by lengthening the school day.

6. Devoting an average of 233 equivalent days **more to core academics** than traditional district schools, primarily by expanding and extending core academic expectations throughout students' school careers, while also supplementing this time through targeted individual and small group academic support.

7. Building a **school schedule** that strategically advances the school's instructional model and addresses student needs.

FIGURE 10

How student time is classified

Core academics	• English language arts • Math • Social studies • Science • Foreign language
Noncore academics	• Art • Physical education • ROTC • Health • Career internships • Computer/technology, vocational, other
Academic support	• Tutoring • Test preparation • Acceleration and remediation
Social and emotional support	• Advisory • Town hall/school meetings • College counseling
Maintenance	• Lunch, passing time, study hall, homeroom, etc.

Common Practice 5. *Increasing the overall amount of time students spend in school by an average of 20 percent more than local district schools, largely by lengthening the school day*

Leading Edge School students spend between six and 68 *more days* per year in school — or 3 percent to 38 percent more time — than their local school district requires, largely because of a lengthened school day (Figure 11). Although this finding is consistent across charter and district schools with different levels of control over student time, *student time in charter schools far surpasses that of the schools in their respective local districts.*

FIGURE 11

Length of student day and year

	Boston Arts	High Tech High	Life Academy	Met West	Noble Street	Pacific Rim	Perspectives	Tech-Boston	University Park	Average
Local district	Boston	San Diego	Oakland	Oakland	Chicago	Boston	Chicago	Boston	Worcester	
Governance	Pilot	Charter	District	District	Charter	Charter	Charter	Pilot	District	
Local district days per year	180	181	180	180	174	180	174	180	180	179
Local district hours per day	6.33	6.1	6.0	6.0	5.3	6.33	5.3	6.33	6.4	6.0
Local district total hours per year	1,140	1,101	1,080	1,080	914	1,140	914	1,140	1,149	1,073
LES total days per year	180	181	180	180	182	190	174	180	180	181
LES total hours per day	7.2	7.0	7.3	6.8	7.0	8.3	6.5	7.2	7.3	7.2
LES total hours per year	1,278	1,260	1,306	1,224	1,244	1,571	1,115	1,304	1,185	1,276
Additional days above district calendar	0	0	0	0	8	10	0	0	0	2
Additional hours per day above district day	0.9	0.9	1.3	0.8	1.7	2.0	1.3	0.9	0.9	1.2
Total additional hours	138	159	226	144	331	431	202	164	36	203
Added full-day equivalents[i]	22	26	38	24	63	68	38	26	6	34
Time above local district	12%	14%	21%	13%	36%	38%	22%	14%	3%	20%

LES = Leading Edge School
Note: Due to rounding, some calculations may be off by a variance of +/– 1.
[i] Full-day equivalents are calculated by dividing the total additional hours Leading Edge School students are in school above the local district average by the average length of the school day in each local district.

All nine Leading Edge Schools lengthened the school day one to two hours each day, and only two schools extended the school year. Pacific Rim and Noble Street, two charter schools, top the list with the equivalent of 68 and 63 days of extra school time, respectively. In addition to a lengthened school day, these two schools added full days to the beginning or end of their districts' standard yearlong calendar. The additional days do not extend the standard school year but, instead, add academic time structured differently to support each school's respective instructional model. Noble Street requires a weeklong orientation in August for incoming ninth grade students to ease the transition to high school.[4] Pacific Rim adds 10 school days to the end of the student year to provide students additional academic support.

Working within district and union contractual constraints, the three noncharter district schools in our study — Life Academy, MetWest, and University Park — also found ways to create additional time for their students. Life Academy and MetWest students spend the equivalent of 38 and 24 more days, respectively, in school than other Oakland, CA, students. University Park students spend the equivalent of six more days in school than students elsewhere in Worcester, MA.

University Park and Life Academy create this time by providing tutoring to students outside of the student day. Although the schools make this time voluntary for students, both schools have created cultures of achievement in which the majority of students seek help on a regular basis.[5] University Park pays its teachers hourly stipends to facilitate the homework centers, whereas Life Academy uses volunteers to tutor students. MetWest adds time outside of the local district average largely through twice-weekly full-day internships that are longer than the typical Oakland school day.

Common Practice 6. *Devoting an average of 233 equivalent days more to core academics than traditional district schools, primarily by expanding and extending core academic expectations throughout students' school careers, while also supplementing this time through targeted individual and small group academic support*

Core academic courses

All Leading Edge Schools extend student time on core academics by increasing the number of required core academic classes students take during their four years. Figure 12 compares the graduation expectations of the nine schools in our study to the requirements of each local district. Eight of the nine schools require more core courses than their districts, and all require more hours in core academics than their districts, giving these students the equivalent of between 43 and 322 more days in core academic classes during their four years.

FIGURE 12

Graduation expectations and time in core academics

	Total core courses above district over four years[ii]	Total core hours above district over four years	Total additional day equivalents[iii] in core above district over four years
Boston Arts[i]	2	459	72
High Tech High[i]	5	1,564	257
Life Academy	4	1,860	310
MetWest	0	260	43
Noble Street[i]	10	1,483	282
Pacific Rim[i]	5	2,040	322
Perspectives[i]	8	1,587	302
TechBoston[i]	2	1,387	219
University Park	3	1,831	287

[i] Indicates charter or pilot school with flexibility over length of day and year.
[ii] Boston Public Schools, Worcester Public Schools, and Chicago Public Schools all require 15 core academic courses for graduation. San Diego Unified School District and Oakland Unified School District require 14 core academic courses for graduation.
[iii] A "day equivalent" is a school day as measured by the length of the school day in the local district (see Figure 11).

A report released by the National Commission on the High School Senior Year indicates that the senior year is often "a lost opportunity during which time many students let one-quarter of their high school learning time slip through their fingers" (2001). But for Leading Edge School students, the high expectations translate into a senior year that is not just a countdown to graduation — an accumulation of the minimum required credits — but a rich and rigorous experience that prepares the students for college and beyond.

In all nine schools, students take at least four years of math and English language arts, and in eight of the nine schools, a fourth year of coursework is expected in science or social studies. Three of the Leading Edge Schools — TechBoston, Pacific Rim, and University Park — require students to take four years of English language arts, math, science, and social studies.

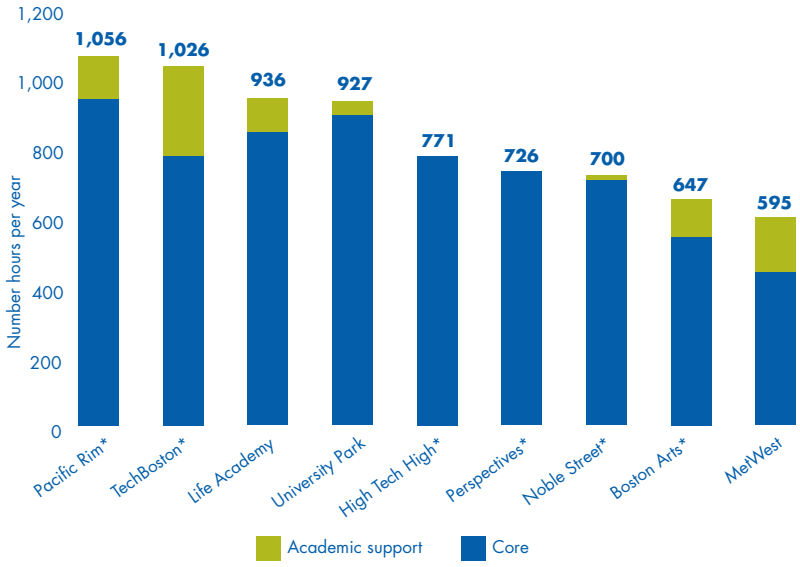
A number of the Leading Edge Schools also require multiple core academic courses within each grade. Noble Street students in ninth and 10th grades take three English language arts or reading courses, helping students reach grade-level proficiency before the ACT exam and the Prairie State Achievement Examination administered in the 11th grade. Life Academy students double up on science courses, providing fuller study in the school's science theme.

The amount of additional time schools spend in core academics depends, in part, on the school's instructional model emphasis. Students at Pacific Rim, with a core academic emphasis, spend the equivalent of more than 322 additional days studying core academics than students at a traditional Boston public school because Pacific Rim requires four years of English, math, science, history, and Mandarin Chinese. Life Academy increases time in core academics through its science theme, substituting noncore time with additional science-based courses.

Although they offer significantly more core academic courses than the local district, Boston Arts and MetWest add less extra time for core academics than other Leading Edge Schools. This is primarily because their instructional models incorporate large blocks of time for noncore activities — the arts at Boston Arts and student internships at MetWest. Leading Edge Schools with less flexibility over student time, such as University Park, achieve this significant investment in core academics by reducing time in traditional high school activities, including noncore academics.

FIGURE 13

Total average yearly student hours in core subjects and academic support



	Pacific Rim	Tech-Boston	Life Academy	University Park	High Tech High	Perspectives	Noble Street	Boston Arts	Met West
Total academic support hours	122	255	99	41	0	0	0	108	158

*Indicates charter or pilot school with flexibility over length of day and year.

Academic support

A majority of the Leading Edge Schools devote additional time to core academics through blocks of regularly scheduled time for academic support. Distinct from core academic courses, academic support provides students with opportunities to receive one-on-one or small-group teacher support in core academic subjects. This time is very different than the traditional study hall found in many high schools, in which students can use the time as they choose without teacher support. Leading Edge Schools typically structure academic support time to help struggling students with particular concepts or support acceleration in specific areas. Across schools, six Leading Edge Schools increase overall student time in core academics by using this academic support strategy.

Figure 13 shows students' total time in core subjects, including academic support. As noted earlier, both Boston Arts and MetWest are on the low end of total time spent in core academics due to each of their unique instructional models. When including time in academic support, though, the total hours the schools spent in core subjects is much closer to those of Perspectives, Noble Street, and High Tech High.

How and whether Leading Edge Schools incorporate academic support are functions of both instructional model and the schools' flexibility to organize and extend student time. For example, TechBoston devotes the largest amount and percentage of time to academic support, as it is an integral part of its model of tailoring instruction to individual student needs. Project Rooms — described in more detail, along with the student schedule, in Figure 14 — are TechBoston's main structure for academic support. Academic support increases TechBoston's total core academic time spent by approximately 33 percent. And although Life Academy and University Park are limited by teacher union contract provisions in their abilities to extend the student day, these schools structure voluntary academic support either before or after school and create a culture of achievement in which students choose to seek extra help when needed.

Noble Street, Perspectives, and High Tech High do not integrate formal academic support time into the school day but, instead, have implemented other structures that allow them to address students' individual academic needs. High Tech High provides the opportunity for extra support in its X-block period and through small class sizes and teacher loads.[6] Perspectives schedules time with tutors outside the school day for students who need help. Noble Street supports struggling students outside the school day and in summer school, as needed. In addition, Noble Street is the one school in our study that does not organize its students in heterogeneous classes but, rather, in homogeneous, flexible skill-based groupings. Noble Street models its student schedule so that students can move fluidly among levels as their skills improve throughout the year.

FIGURE 14

Sample ninth grade student schedule at TechBoston

Period	Monday	Tuesday	Wednesday	Thursday	Friday
8:00–8:15	Homeroom	Homeroom	Homeroom	Homeroom	Homeroom
8:20–9:17	Digital Art	IT Essentials	Freshman Seminar	Learning Center	Web Development
9:20–10:17	World History	Physics	English Language Arts	Algebra	World History
10:20–11:17	Algebra	World History	Physics	English Language Arts	Algebra
11:20–12:17	Project Room	Project Room	Project Room	Project Room	Project Room
12:20–12:57	Lunch	Lunch	Lunch	Lunch	Lunch
1:02–1:57	English Language Arts	Algebra	World History	Physics	English Language Arts
2:00–2:57	Physics	English Language Arts	Algebra	World History	Physics
3:00–4:00	MCAS Prep	MCAS Prep		MCAS Prep	

IT = Information technology, MCAS = Massachusetts Comprehensive Assessment System

Academic support at TechBoston

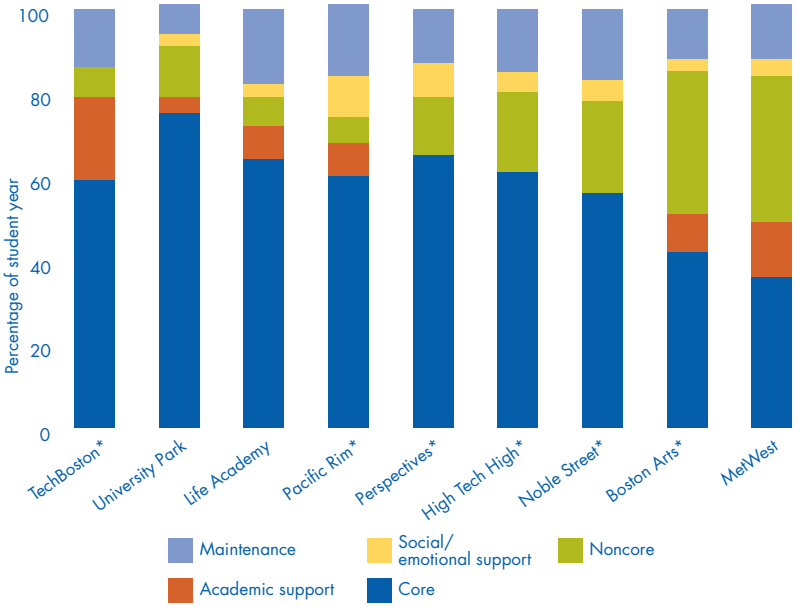
TechBoston responds directly to students' needs by structuring multiple opportunities within students' schedules for academic support (shaded light blue above). Students have daily Project Room periods in which teachers work with small groups or individual students in identified areas of need. The amount of time each student has in Project Room varies based on his or her need, with the average student scheduled for Project Room for 45 minutes each day.

TechBoston assesses students at various points during the year to identify students' needs and to be proactive about getting them the academic support they need. Students who are identified from their performance on the state exam — Massachusetts Comprehensive Assessment System (MCAS) — also are scheduled for learning center, where they receive targeted tutoring in English language arts and/or math concepts. Three days each week, ninth and 10th grade students also are required to stay for an extended period of MCAS preparation after school. Students in the upper grades earn the right to leave at 3 p.m. on these days, but those 11th and 12th grade students who are struggling academically or not completing their homework are required to stay until 4 p.m. for academic support. Additionally, TechBoston uses the Homeroom period each day as time when teachers can check with students about their progress, homework, and so on.

Because these three schools — Noble Street, Perspectives, and High Tech High — have not devoted time in the school day to academic support activities, they also tend to have more student time, as a percentage of total student time, allocated to noncore academics and social and emotional support activities than other Leading Edge Schools, as seen in Figure 15.[7]

FIGURE 15

Percentage of student year by use of time



* Indicates charter or pilot school with flexibility over length of day and year.
Note: "Maintenance" covers typical activities taken as a given in most urban high schools, such as homeroom, passing periods, and lunch.

Academic support blocks are distinguished by a number of features that potentially enhance their effectiveness. For the most part, this academic support time is (1) facilitated by classroom teachers, not outside tutors; (2) integrated into the regular school-day schedule; (3) mandatory; and (4) organized in a manner that can adapt to students' changing needs. How Leading Edge Schools organize each aspect depends on the school's instructional model and its available funding and flexibility over resources.

- **Facilitated by classroom teachers.** The use of classroom teachers rather than other adults or outside tutors is potentially the most powerful distinguishing feature of the academic support time in Leading Edge Schools. Eight of nine Leading Edge Schools use classroom teachers to ensure that support time is aligned with classroom

instruction. This way, teachers already know the individual students' learning needs, can build on the school curriculum and assignments, and are invested in the success of each individual student and the school as a whole.

Outside tutors often are used when the time is voluntary and when it is structured before or after school. Tutors also can be a cost-effective way to leverage expertise outside the school. However, outside tutors are not used by any of the Leading Edge Schools as the primary vehicle for academic support, rather they are used to supplement and enhance existing structures.

- **Integrated into the regular school day and year.** Integrating this time into the school schedule ensures that students will receive academic support on a regular basis in a proactive manner, rather than waiting until students are on the edge of failure. Integration into the school day also guarantees student attendance. After-school support is sometimes subject to the availability of transportation and the competing demands of part-time jobs and family obligations that many urban students have.

  Boston Arts structures academic support blocks for each core academic course twice a week at the beginning and end of each day. As it is a structured part of when students are in school, teachers can guarantee students' attendance when they need additional academic support. Students also can use the time to seek honors credit for courses.

- **Participation mandated.** Seven of nine schools require students to attend academic support sessions, but the time is structured to fit student needs. For example, Pacific Rim has a minimum of an hour at the end of each student day when students are required to attend a tutoring period. Mandatory participation ensures that students' needs are identified and addressed proactively, as opposed to through remediation. The two schools that do not require individual support — Life Academy and University Park — offer voluntary support blocks before or after school.

- **Fluidly organized to respond to students' changing needs.** A student's time in academic support at most of the Leading Edge Schools is fluid — content and time are targeted to the student's need at that moment. For example, although all students at TechBoston are scheduled for at least one Project Room (see Figure 14), some students will be scheduled for more than one based on their academic needs.

Figure 16 shows how the structure of academic support varies across schools.

FIGURE 16

Academic support structures

	Facilitated by teacher or tutor	Structure	Integrated or outside school day	Mandatory or voluntary	Student participation
Boston Arts	Teacher	First and last period of day	Integrated	Mandatory	By student performance
High Tech High	Teacher	Tutoring in X block	Integrated	Mandatory	By student performance
Life Academy	Teacher	Literacy advisories twice a week	Integrated	Mandatory	All students
	Tutor	After-school tutoring	Outside	Voluntary	By student performance
MetWest	Teacher	Individualized schedule and support through advisory	Integrated	Mandatory	All students
Noble Street	Teacher	Math support before school	Integrated	Mandatory	By student performance
	Tutor	Tutoring	Outside	Voluntary	By student performance
	Teacher	Summer school	Outside	Mandatory[i]	By student performance
Pacific Rim	Teacher	Tutoring	Integrated	Mandatory	All students
Perspectives	Tutor	Tutoring	Outside	Voluntary	By student performance
TechBoston	Teacher	Individual Project Room	Integrated	Mandatory	All students
	Teacher	Learning center	Integrated	Mandatory	By student performance
	Teacher	MCAS tutoring	Outside	Mandatory	All ninth and 10th graders
University Park	Teacher	Homework center	Outside	Voluntary	By student performance

MCAS = Massachusetts Comprehensive Assessment System

[i] Summer school is only mandatory for those students who have not passed a core academic course. For students interested in accelerating, it is voluntary.

Common Practice 7. *Building a school schedule that strategically advances the school's instructional model and addresses student needs*

All of the Leading Edge Schools deliberately build their student schedules to align with the schools' instructional models and student needs. These school leaders consider the school schedule to be a reflection of the school's mission and priorities. The principal of Boston Arts explains: "One of our most complex and intense processes for checking in involves our process for building our school schedule. Although this may seem like a mundane kind of thing for an entire faculty to engage in, the schedule is code for our most scare resource: time" (Nathan, 2001).

Leading Edge Schools use a variety of scheduling tactics that prioritize time by subject and create time blocks of different lengths to fit instructional needs. This is in stark contrast to a traditional school day, which is divided into six or seven equal blocks of time with every subject meeting every day.

Strategic time allocation

To maximize this precious resource, Leading Edge Schools allocate student time very specifically to advance their particular instructional model emphasis — core academics, relevance, or personalization. At University Park, a school with a core academic emphasis, students spend a significant portion of their time in core academic courses — 75 percent of their school year, the highest of all the Leading Edge Schools by more than 10 percent, or on average about 886 hours per year for all grades.

In contrast, at Boston Arts, a school that emphasizes the arts as a theme, students spend almost an equal percentage of time in art pursuits as they do in core academic classes — 35 percent of time in arts versus 42 percent in core academics. Meanwhile, at MetWest, a school with a personalization emphasis, students only spend about 36 percent of their time in core academic activities and 35 percent of their time in noncore academic activities. This is not surprising, as MetWest's instructional model is founded on individualized programs of study derived from individual student interest. As student interests drive the program of study — manifested in two full days of the week in an internship — they also drive to some extent the amount of time spent in core and noncore activities.

Leading Edge Schools consider every minute ripe to support their instructional models. Structures taken as a given in most urban high schools, such as homeroom, passing periods, and lunch, are reconceptualized and aligned with the priorities of each Leading Edge School. These typical activities, which we have coded "maintenance," account for 17 percent of a typical high school student's year.[8] Leading Edge Schools spend, on average, 14 percent of time on these activities. Although not a significant difference in magnitude from traditional schools, the use of time can differ significantly. Only three Leading Edge Schools include a homeroom period, and even this time is used to advance each school's instructional model.

For example, Noble Street, one of the larger Leading Edge Schools, builds a 10-minute homeroom into ninth grade students' schedules. This time allows these students to check in with their advisors at the beginning of each day. Rather than homeroom periods, Leading Edge Schools also tend to extend student lunch periods, which can range from 40- to 45-minutes long. Pacific Rim students spend the most time in maintenance activities of all Leading Edge Schools and more time per year on them than most typical high school students. However, Pacific Rim students also experience the longest school day of the Leading Edge Schools. This maintenance time includes scheduled breaks throughout the long, rigorous day that allow students down time. Pacific Rim's maintenance time also includes daily time for students to clean hallways, advancing a piece of the school's mission.

Scheduling tactics

To achieve a strategic allocation of time, Leading Edge Schools use a variety of scheduling tactics that prioritize time by subject and create time blocks of different lengths to fit instructional needs. This is in stark contrast to a traditional school day, which is divided into six or seven equal blocks of time with every subject meeting every day.

Figure 17 shows the different ways the Leading Edge Schools combine scheduling tactics to create schedules that support their instructional models and student needs. (For school bell schedules and more details on how Leading Edge Schools use these scheduling tactics, see

FIGURE 17

Scheduling techniques of Leading Edge Schools

Scheduling characteristics	Boston Arts	High Tech High	Life Academy	MetWest	Noble Street	Pacific Rim	Perspectives	Tech-Boston	University Park
Humanities or math-science blocks	✓	✓	✓						
Semesterized courses	✓								
Rotating schedule	✓				✓		✓	✓	
Varying blocks of time for core and noncore courses	✓	✓		✓	✓		✓		
Additional time in high-need areas	✓		✓	✓	✓		✓		✓
Individualized student schedules				✓	✓			✓	

Appendix IV: School Schedules at www.educationresourcestrategies.org.) The first two techniques listed have the added benefit of reducing teacher load, which will be discussed in greater detail in the "Create individual attention" section.

1. **Humanities or math-science blocks:** Combine two subjects into a longer block, giving teachers flexibility to use the blocks for seminar discussions or laboratory experiments.
2. **Semesterized courses:** Rather than yearlong courses, each semester offer a smaller number of courses for longer blocks of time. For example, a student may take social studies for several hours a day in the first semester to cover the yearlong curriculum and do the same with science in the second semester. This technique has the benefit of reducing student course load.
3. **Amount of time varies by subject**
    - **Rotating or varying daily schedule:** Structure the schedule so that one day is organized differently from the next. This could be through an A/B day schedule or a schedule that is organized differently each day of the week. A rotating schedule can help balance different school objectives or meet schoolwide student performance needs.
    - **Varying blocks of time for core and noncore classes:** Vary the length of core and noncore blocks based on the instructional needs of each course and the priorities of the school.
    - **Additional time in high-need areas:** Vary the schedule so that students spend more time relative to other subjects in high-need areas, such as English/literacy and math. Schools often integrate the teaching of some skills, such as literacy, throughout the curriculum.
4. **Individualized student schedules:** Build schedules that accommodate individual students' changing needs so that if a student needs intense academic support, there would be an opportunity for him or her to gain that help within the regular schedule.

Leading Edge Schools integrate and combine scheduling techniques and student time allocation to create a student year that advances their instructional models and meets student needs. For example, Perspectives purposefully organizes the student schedule to align with its emphasis on relevance. School leaders believe that teaching and learning best take place through an interdisciplinary theme that focuses on developing the whole individual through connections to the real world, student interests, and what students need to know and be able to do to be successful in life. As shown in light blue in Figure 18, the school devotes considerable time within the school day for students to be engaged in "relevant" experiences, averaging 29 percent of a student's year and up to 46 percent of students' time during senior year.

FIGURE 18

Sample student schedule at Perspectives

Period	Monday	Tuesday	Wednesday (A week)	Wednesday (B week)	Thursday	Friday
8:30–9:00	DEAR	DEAR	DEAR	DEAR	DEAR	DEAR
9:00–9:50	Spanish	Elective	Field studies	Social Justice/ Internship/ College preparation	Math	Spanish
9:52–10:42	Science	Elective			Spanish	Science
10:44–11:34	Math	Math			English	Math
11:36–12:26	History	Spanish		(Early dismissal for students not at internships)	English	History
12:28–1:06	Lunch	Lunch			Lunch	Lunch
1:08–1:48	ADL	ADL			ADL	ADL
1:50–2:40	Elective	History		(Professional development for teachers)	Science	Elective
2:42–3:32	English	History			Science	English

DEAR = Drop Everything and Read, ADL = A Disciplined Life

Although some of this time is dedicated specifically to theme-related activities, such as A Disciplined Life advisory, because of the nature of the theme, much of this time is integrated into the core and noncore academic curriculum, specifically through a field studies/internship component every Wednesday. The integration of its theme throughout the curriculum results in Perspectives' students still spending 65 percent of their year in core academic classes — second only to University Park — which is critical to supporting the school's college-preparatory mission.

Perspectives also uses some scheduling techniques to address student needs and its instructional model. For classes such as English, history, science, and art, students have a 50-minute period two days a week and a double block of 102 minutes once a week to allow for longer uninterrupted learning time and project-based learning. Classes such as math and Spanish meet every day (with the exception of Wednesday) because the material calls for daily repetition rather than meeting less often for longer blocks of time.

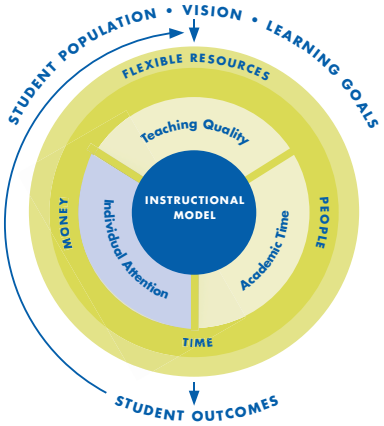
Because Leading Edge Schools understand the strategic power of the student schedule, they review and adjust it from year to year to incorporate lessons learned and reflect changing student needs and teacher capacity. For example, in its eight years of operating, Boston Arts has only twice had the same schedule because the staff is always thinking about how to most effectively use student time. Headmaster Linda Nathan notes that the creation of the schedule is a feat because of the different demands various arts programs require.

Originally, Boston Arts students were required to take four academic classes each semester in addition to pursuing an art major in theater, dance, music, or visual arts. Overwhelmed by the competing demands on their time, many students felt forced to choose which core academic course to fail each semester. In response to this identified student need, Boston Arts revised students' schedules so students only take two of the four core academic courses each semester, allowing them to focus deeply on two core subjects in addition to their arts major. As Boston Arts is accustomed to doing, the school might revisit this schedule in the future, as the six- to nine-month gap in math and foreign language instruction makes it especially difficult for students to pick up where they left off the previous year.

C. Create individual attention

Leading Edge Schools create individual attention by:

8. Using **multiple data sources** to assess student needs both at school entry and through graduation.
9. Creating **small class sizes and teacher loads** that combine students across programs and performance levels, and offering targeted support outside standard academic courses.
10. Weaving into school models multiple ways of **fostering personal relationships between teachers and students,** rather than relying solely on an advisory structure.



Common Practice 8. *Using multiple data sources to assess student needs both at school entry and through graduation*

Leading Edge Schools recognize that although their small size helps teachers know students, size by itself does not ensure deep understanding of student needs or guarantee effective response. Leading Edge Schools mine the information provided by state standardized tests, but they also collect other timely quantitative and qualitative information on student needs, through methods such as organizing parent meetings, assessing classroom performance through grades, and holding public student exhibitions. What is important is they have structures, systems, and schoolwide expectations in place to adjust instruction and support based on this information.

Entry-level assessment

Leading Edge Schools get a head start on understanding the needs of incoming students by making a concentrated effort to supplement school records across multiple dimensions prior to the beginning of the school year, as well as during the first month of school. As shown in Figure 19, seven

of the nine schools supplement district or state standardized test information with additional information for incoming students in the critical areas of math and literacy.[9] Five of the schools administer other standardized assessments, and at least one school — High Tech High — uses formal school-developed assessments at entry.

FIGURE 19

Assessing student needs[i]

	Assessments for incoming students			Ongoing assessments[ii]			
Schools (small to large)	**Standardized tests[iii]**	**School-developed tests**	**Family and student input**	**Additional standardized tests[iv]**	**School-developed tests**	**Portfolios/ exhibitions**	**Family and student input**
MetWest		Informal writing samples	*Students:* One-day summer orientation *Families:* Home visits			Exhibitions four times a year (multidisciplinary)	*Students:* Advisory, Individual Learning Plans *Families:* Participate in quarterly exhibitions
Pacific Rim	Stanford 10: English language arts and math		*Students:* Orientation	Formative assessments English language arts and math (middle grades)	Gateway exams (all subjects)		*Students:* Advisory *Families:* Gradebook goes home for signature every two weeks
University Park	Measures of Academic Progress (MAP): English language arts and math (district required)		*Students:* Three-week summer academy	MAP three times a year: English language arts and math (district)		Portfolios: English language arts (seniors)	*Students:* Goal setting on MAP *Families:* Data discussed at parent meetings, communication with parents
Perspectives	Stanford 10: English language arts and math		*Students:* One-week orientation *Families:* Survey			Passages eighth and 12th grades (Habits of Mind — A Disciplined Life)	*Students:* Individual Learning Plans *Families:* Parent quarterly meetings
Life Academy			*Students:* Survey; orientation		Reading diagnostic (year end)	Senior exhibition; junior gauntlet (math and science performance)	

(continued)

(continued)

	Assessments for incoming students			Ongoing assessments[ii]			
Schools (small to large)	**Standardized tests[iii]**	**School-developed tests**	**Family and student input**	**Additional standardized tests[iv]**	**School-developed tests**	**Portfolios/ exhibitions**	**Family and student input**
TechBoston	Progress Toward Standards (PTS): English language arts and math		*Students:* Orientation *Families:* Conferences (limited based on student risk factors)	PTS: English language arts and math		Digital portfolio (quarterly); exhibitions; graduation portfolio	*Students:* Individual Learning Plans
Boston Arts	Gates McGinnity: reading, diagnostic assessment of reading (for low-performing students)	Math, Spanish, wellness survey, arts audition	*Students:* Orientation	Gates McGinnity: reading (beginning/end of ninth and 10th)	Benchmarks: reading (ninth); math (end of Math 1); writing (11th); arts (10th)	Exhibitions (Habits of the Graduate) (yearly); arts: juried performances one to two times a year; art grant benchmark (including public presentation) (12th); arts exit requirement (12th)	*Students:* Advisory; reflection on Boston Arts Habits of Mind *Families:* Annual review of Boston Arts Habits of Mind
Noble Street	ACT Explore: reading, English, math, science		*Students:* One-week orientation	ACT Explore: reading, English, math, science (ninth) ACT Plan (fall and spring 10th) ACT: practice exam (11th)	Interim assessments every eight weeks in core subjects (ninth)[v]	Writing portfolios (all grades)	*Students:* Advisory *Families:* Quarterly report card conferences
High Tech High		Math and English language arts	*Students:* Summer orientation *Families:* Home visit			Twice a year Presenations of Learning (content and Habits of Mind); formal exhibition night once a year	*Students:* Advisory *Families and Students:* Online grade system access

i. This table includes supplemental information gathered from the schools in the 2006–07 school year.
ii. This table does not include classroom grades or semester or year-end course tests used by the schools.
iii. All study schools have some standardized test data from state tests for incoming students, usually in math and English language arts. We note here if schools administer additional standardized tests before the school year or within the first month of school.
iv. This is in addition to standardized tests required by the state.
v. Being developed for the 10th grade this year.

To provide insight into the whole student, Leading Edge Schools collect information on entering students beyond their academic knowledge and skills, such as Habits of Mind and student interests. Such data are rarely found in district-supplied school records, which mostly include information on student deficits, such as suspensions, expulsions, or other behavioral issues. To collect richer data, Leading Edge Schools reach out to parents and families, as well as to the students.

Although seven of the Leading Edge Schools reach out to parents or families prior to school entrance — a distinguishing practice in itself — four of these schools go beyond expectation-setting and orientation to specifically create a more complete student profile. Both MetWest and High Tech High conduct home visits, and Perspectives administers a parent survey. TechBoston conducts conferences with the families of incoming students they deem at risk to proactively support their unique needs.

All of the Leading Edge Schools have orientation programs before the school year for incoming students, which allow teachers and staff to obtain additional student information through observation and group activities. Four of the schools — University Park, Perspectives, Noble Street, and High Tech High — have orientation programs that last one week or longer, giving teachers a significant head start in becoming familiar with the incoming class, both as a group and individually.

The schools' instructional model emphasis often drives the type and scope of information gathered on incoming students. All of the Leading Edge Schools whose primary instructional model focus is core academic — University Park, Pacific Rim, and Noble Street — supplement school records with additional school- or district-administered tests in math and literacy; they spend less time formally gathering information about Habits of Mind and student interests. This additional information is critical to the implementation of Noble Street's student schedule, which differentiates based on student skill levels in ways described more fully in Appendix IV: School Schedules, available at www.educationresourcestrategies.org.

Ongoing assessment

Once students are through the door and on a path toward graduation, Leading Edge Schools add to the mix of data sources. They include classroom assessments, grades, year-end benchmarks, and, in some cases, additional reading diagnostics (see Figure 19). Many of the Leading Edge Schools use portfolios and exhibitions as either formative or summative assessments. Two schools — MetWest and High Tech High — use portfolios and/or exhibitions as a primary means of gauging student progress. Some of the Leading Edge Schools — Boston Arts and Perspectives, for example — supplement traditional student progress instruments with portfolios and exhibitions to measure student progress against skills not measured by traditional instruments — including Habits of Mind and, in the case of Boston Arts, art performance. Other schools — such as Life Academy and University Park — use exhibitions or portfolios as graduation expectations.

Leading Edge Schools also continue to actively engage parents, families, and students as participants in the assessment process. At least five of the Leading Edge Schools have incorporated parents and families into the process through multiple parent conferences each year, the sharing of grades and student progress through regular and frequent reports, increasing online Web access, or participation in exhibitions of learning. Students at all schools actively participate in assessing their own progress. In most of the schools, teachers and students work together during an advisory period to understand and monitor progress and determine appropriate support. Portfolios and exhibitions allow students to reflect on their own progress against established school standards. Three schools — MetWest, Perspectives, and Life Academy — use formal individual student learning plans.

What distinguishes Leading Edge Schools from other schools is the deliberate and active use of multiple data sources to inform school-based academic support, family and external support, and student self-monitoring. The abundant collaboration opportunities at Leading Edge Schools for teachers allow them to continually monitor student progress against content benchmarks and other essential skills and to appropriately target support based on student needs.

The systems that schools use to monitor student progress reflect the Leading Edge Schools instructional models. High Tech High provides a good example of this. At High Tech High, which has a project-based focus, teachers and students assess progress using student portfolios and Presentations of Learning (POL) — formal presentations by students to a panel of peers, community members, administrators, teachers, and parents that demonstrates the students' reflection on High Tech High's learning goals. Students create a digital portfolio in the ninth grade and update it as they progress through each subsequent grade. The portfolios include students' personal statements, projects, resource papers from core academic courses, résumés, and reflections on internships. In addition, students complete two POLs each year. At the end of the year, the POL helps determine whether or not the student has progressed enough to move to the next grade.

What distinguishes Leading Edge Schools from other schools is the deliberate and active use of multiple data sources to inform school-based academic support, family and external support, and student self-monitoring. The abundant collaboration opportunities at Leading Edge Schools for teachers allow them to continually monitor student progress against content benchmarks and other essential skills and to appropriately target support based on student needs (see Common Practice 2). As discussed more fully in Common Practice 6, Leading Edge Schools differentiate academic support based on student needs. They typically do this through individual and small-group support outside the standard academic courses.

Teachers at Leading Edge Schools also have the advantage of using their personal knowledge of students to give additional meaning to their discussions and the data. A number of resource-based decisions affect the quality of that student contact, including small average class size and sometimes small teacher load (as discussed more fully in the next common practice); extended class periods; small student-to-teacher ratios; and additional organizational structures, such as advisory, that foster personal relationships between teachers and students.

Common Practice 9. *Creating small class sizes and teacher loads that combine students across programs and performance levels, and offering targeted support outside standard academic courses*

Small average class size

Leading Edge Schools' instructional models prioritize the teacher-student classroom relationship through smaller average class sizes (17–23 students) (see Figure 20) than the national average for secondary schools (25 students).[10] The difference between Leading Edge Schools' and traditional schools' overall average class size does not appear large for some schools, but it hides important differences in priorities. At many traditional comprehensive high schools, the smallest classes are found in a variety of specialized core and noncore elective courses and

FIGURE 20

Average class size

Schools (smallest to largest)	Average class size, all classes[i]	Average class size, core classes	Average class size, ELA, all grades	Average class size, ELA, ninth grade	Average class size, math, all grades	Average class size, math, ninth grade
Typical large high school	25[ii]	N/A	N/A	N/A	N/A	N/A
MetWest	17	17	8	8	7	7
Pacific Rim	22	22	22	25	22	25
University Park	21	20	17	23	21	23
Perspectives	22	21	15	13	15	13
Life Academy	23	24	27	32	19	23
TechBoston	19	19	19	25	19	25
Boston Arts	20	16	13	16	19	21
Noble Street	20	18	17	19	16	19
High Tech High	21	22	23	26	22	26

ELA = English language arts
Note: Green highlight indicates areas in which the average class size is significantly below the overall average class size.
i. Class sizes referred to in Figure 20 are regular education classes. (At many study schools, regular education classes include students with disabilities; the average class size number does not include classes that only have students with disabilities.)
ii. U.S. Department of Education, 2004.

special program classes. Class sizes of the required core academic courses that most students take, however, are significantly larger than the average. This means that most students spend their academic time and the majority of their day in class sizes closer to 30.[11]

At Leading Edge Schools, the average class size for core academic courses and noncore academic courses is virtually identical, and special program students or students with different skill levels are not educated in separate settings.[12] This means that *all* students spend their day in class sizes nearing 20. Average class size at Leading Edge Schools captures a prioritized investment in core academics as well as overall student experience.

Leading Edge Schools create overall small class sizes by hiring more classroom teachers and using more cost-effective means for providing noncore courses. Figure 21 shows that six of nine Leading Edge Schools have significantly lower student-teacher ratios than the local district large high school and they prioritize investment in core academic teachers. Leading Edge Schools focus teaching resources on core academic classes by providing limited on-campus noncore offerings. They do this through strategic partnerships and off-campus experiences, part-time teachers, and core academic teachers who also teach noncore academic courses. They very rarely have full-time noncore academic teachers. These limited noncore offerings have similar class sizes as core academic courses, and they allow Leading Edge Schools to achieve a relatively small overall class size.

FIGURE 21

How do schools get smaller class sizes?

Schools (smallest to largest)	Average class size	Hire more teachers (student-to-teacher ratio)		Focus on core (classroom teachers that are core)	
		Leading Edge School	Comparison high school	Leading Edge School	Comparison high school
MetWest	17	15:1	21:1	100%	78%
Pacific Rim	22	11:1	18:1	87%	63%
University Park	21	18:1	15:1	94%	50–70%
Perspectives	22	12:1	15:1	84%	57–65%
Life Academy	23	20:1	21:1	99%	78%
TechBoston	19	13:1	18:1	86%	63%
Boston Arts	20	9:1	18:1	54%	63%
Noble Street	20	14:1	15:1	89%	57–65%
High Tech High	21	17:1	29:1	88%	N/A

Small class sizes allow teachers to diagnose and respond to individual and group performance needs more effectively. Only four Leading Edge Schools reduce class sizes in targeted subjects or grades — a tactic of large high-performing schools we have studied. Instead, five of nine schools reduce overall class size, often using student assessments to balance the heterogeneity of the classes. They then provide targeted attention for student needs by setting aside time for individual or small group support outside the standard academic courses. We describe this student support strategy in more detail in the "Use student time strategically" section of this report.

Four Leading Edge Schools — Boston Arts, MetWest, Life Academy, and University Park — strategically reduce class size in high-need content areas (see Figure 20). Boston Arts specifically targets literacy skills with a yearlong writing course that students take all four years. The course is co-taught by pairs of core academic and arts teachers, resulting in an average class size of 10 students and bringing down the overall average class size for English language arts to 13 students.[13] MetWest provides more intensive personalization for math and English language arts by using part-time faculty to create small literacy circles and math groups. The part-time math faculty also supplements advisors' expertise in this foundational content area.

In keeping with its math and science focus, Life Academy invests in smaller math classes, trading off those smaller class sizes (19) with larger class sizes in humanities (27). University Park splits 10th grade English language arts classes in half, resulting in class sizes of approximately 10 students. This allows for more intensive English language arts attention during the year that the state administers the high-stakes assessment.

Figure 20 indicates that Perspectives reduces class size in math, English language arts, and ninth grade and Noble Street reduces class size in math and English language arts. This is a result, however, of their special-education inclusion practices, in which special education and regular education teachers co-teach core courses together, serving all students in the classroom regardless of program. This is not necessarily a systematic reduction in class size, as only students in classrooms that include special education students receive the additional co-teacher.

Small teacher loads

In addition to smaller class size, teachers in eight of nine Leading Edge Schools have significantly smaller weekly student loads in core academics than teachers in most large high schools — who on average have 125 students.[14] Weekly teacher load varies from 17 students at MetWest to 124 students at Perspectives, and it averages 75 students (see Figure 22).[15] In five schools, reduced teaching load results from smaller class size and the requirement that teachers teach fewer classes — or a lower percentage of time each day — than teachers in traditional high schools. In a typical high school, teachers often instruct students for five of seven periods a day, or 71 percent of the day. At Pacific Rim, teachers teach three of five classes (61 percent) per day, and at TechBoston, University Park, and Perspectives, teachers teach four of six periods (66 percent) per day.

FIGURE 22

Average teacher load

Schools (smallest to largest)	Average teacher load, core academics	Average teacher load, core ninth grade	Average teacher load, ELA	Average teacher load, math
MetWest	17	17	N/A	N/A
Pacific Rim	65	73	66	66
University Park	82	91	68	79
Perspectives	124	141	140	115
Life Academy	101	100	106	88
TechBoston	75	81	69	58
Boston Arts	46	52	35	37
Noble Street	118	140	120	133
High Tech High	53	51	51	55

ELA = English language arts

Four Leading Edge Schools go beyond reducing class size and instructional periods to reduce teacher load; they are able to do this dramatically through scheduling strategies linked closely to the schools' instructional models. MetWest's advisory structure, in which one adult advisor is responsible for the instructional needs of a group of students for two years, creates the elementary-like load of 17 students per teacher. High Tech High creates double blocks that combine subject matter — humanities and math/science — to support its project-based instructional approach. Life Academy and Boston Arts both offer longer humanities periods, and Boston Arts also semesterizes courses.

By semesterizing courses, Boston Arts creates the second-smallest weekly teacher loads (46) of the Leading Edge Schools because teachers teach fewer students during that semester. On an annual basis, though, teaching loads double (approximately 92) because teachers must teach two separate groups of students. Boston Arts chose this approach to reduce the content students must cover during a semester, thus allowing them to focus more fully on a limited number of subjects.

At Leading Edge Schools, teachers assume more student responsibilities than just academic course load, such as advisories and academic support. When considering teacher load in the context of getting to know students well, it is important to include these additional responsibilities. Seven of the high-impact schools have advisories formally built into the schedule (see the next common practice), and as described in the Common Practice 6 section, many of the Lead-

ing Edge Schools also build time into the student day for academic support, provided mostly by academic teachers. The impact on teacher load will vary depending on the structure and use of advisory and academic support time.

Leading Edge Schools with larger teacher loads employ other personalization strategies to individualize around core academics. For example, Perspectives uses a practice known as looping, in which students stay with the same teacher and classmates for two years. Looping allows teachers to get to know their students over a longer period of time, and it eliminates the loss of teaching time at the beginning of the school year when teachers are familiarizing themselves with their students and their learning needs.

In a typical school, teachers would have a new group of 125 students each year, resulting in a two-year teacher load of 250 students.[16] At Perspectives with looping, the two-year teacher load remains 124 students. Perspectives also provides more administration and preparation time than any school in the study — at 40 percent of total teacher time — potentially allowing its teachers to accommodate this larger weekly teaching load.

Common Practice 10. *Weaving into school models multiple ways of fostering personal relationships between teachers and students, rather than relying solely on an advisory structure*

Although many high schools use the advisory structure as a stand-alone practice for fostering personal relationships between teachers and students, Leading Edge Schools view advisory as one strand of a web of structures, processes, pedagogies, beliefs, and attitudes that combine to do this work. This web includes strategies explicitly aimed at relationship building, as well as those that may not have relationship building as their primary purpose but which contribute to an overall culture in which teachers and students know each other well. These latter strategies include those that allow teachers to:

Although many high schools use the advisory structure as a stand-alone practice for fostering personal relationships between teachers and students, Leading Edge Schools view advisory as one strand of a web of structures, processes, pedagogies, beliefs, and attitudes that combine to do this work.

- Understand student needs on an individual basis, through individual learning plans, formative assessments, and portfolio exhibitions;
- Address individual student academic needs, through reduced class size and teacher load and integrated individual and small-group support and enrichment time; and
- Provide extended or additional time for teachers and students to spend together, through block periods, project-based learning, senior projects, and noncore and extracurricular activities taught by core teachers.

In addition to the indirect strategies listed above, Leading Edge Schools employ three strategies whose primary purpose is to foster relationships between students and staff (Figure 23). These are:

- **Individual** practices that emphasize knowing students more deeply through individual relationships.
- **Community** practices in which relationships are developed through belonging to an established group that shares norms and time.
- **Multiyear** practices that group students and teachers to extend relationships across grades.

How Leading Edge Schools choose to create these relationships depends in part on their instructional models.

FIGURE 23

Structures for fostering personal relationships

		Individual	Community		Multiyear
Schools (smallest to largest)	**Student time in social and emotional support[i]**	**Advisory**	**Community activities[ii]**	**Student or teacher teams**	**Looping**
MetWest	3.7%	✓	✓		✓
Pacific Rim	9.8%	✓	✓		
University Park	3.0%		✓		✓
Perspectives	8.0%	✓	✓		✓
Life Academy	2.9%	✓	✓		
TechBoston	0.0%		✓		✓
Boston Arts	2.8%	✓	✓		✓
Noble Street	5.4%	✓	✓		✓
High Tech High	5.2%	✓	✓	✓	

[i] These percentages do not necessarily represent only the activities here; there can be other support and enrichment — activities, such as a college-preparatory seminar, whose primary focus is not relationship building.

[ii] In this table, "community activities" only include time officially set aside in the student day for community activities on a regular basis.

Individual practices

Seven of the nine Leading Edge Schools use advisory as one of their strategies for promoting individual relationships between students and staff. Only TechBoston and University Park, two of the smallest Leading Edge Schools, do not include advisory in their portfolio of strategies to personalize relationships. TechBoston, the only Leading Edge School that does not devote any formal time in the daily schedule to relationship-building activities, views relationship building as the responsibility of every adult in the school. The dean of students at TechBoston — a personnel investment on the part of the school to support a positive climate — says "advising and student support happens all day long from 8:30 a.m. to 4:30 p.m. It happens from the moment kids are greeted at the door to when they are working with a teacher in Project Room [academic support and enrichment] to being in class."

Leading Edge Schools deliberately structure the curriculum, focus, and student composition of advisories to align with their instructional models. For example, Perspectives has created an advisory curriculum they call "A Disciplined Life" that communicates the foundation of the school's core values and beliefs.

Community practices

Community practices foster personal relationships by creating small or strategic groups in which students and teachers know each other and share interests, norms, and values. For large schools, creating smaller schools or "houses" can promote this sense of belonging. Leading Edge Schools are already small, so they rarely use student- or teacher-teaming or small learning communities. However, the largest of the Leading Edge Schools, High Tech High with 500 students, is the only one to employ such a strategy, creating teacher and student teams. At High Tech High, in the ninth and 10th grades, 40–50 students are assigned to teaching teams of one humanities teacher and one math-science teacher. In 11th grade, there are teams of 50–70 students that are assigned to a math teacher, science teacher, and humanities teacher.

Other formal community activities that require a time commitment from both students and adults include orientation for incoming students, which all nine schools have, and regular schoolwide meetings or "town halls" that bring together all members of the school for team- or culture-building activities. MetWest, Pacific Rim, Noble Street, and High Tech High all have regular schoolwide meetings or town halls.

As part of relationship building, all Leading Edge Schools emphasize schoolwide responsibility and attention to culture and climate. These strategies can be both formal, through stated values and codes of behavior and practices, and informal, through attitudes, beliefs, and respectful interpersonal relationships. These strategies, although not included in Figure 23 because there is minimal tangible resource commitment, can be the heart and soul of the school culture — the foundation and validity for all other personalization strategies.

Multiyear practices

Leading Edge Schools, perhaps because of their small size, rarely use multiyear strategies or looping (see Common Practice 9) in academic courses to foster relationships between students and adults. Only Perspectives and MetWest do. At MetWest, students stay with the advisor responsible for their program of study for two years. At Perspectives, students loop in core academics from ninth to 10th grade and from 11th to 12th grade. This is particularly notable, as Perspectives has the highest teacher load of all Leading Edge Schools. This looping strategy to some extent lessens the negative impact of a high teaching load, allowing the teachers to get to know and understand students over a longer period of time.

And notably, two of the larger Leading Edge Schools, Noble Street and Boston Arts, have enhanced the relationship-building quality of the advisory by organizing students to be with the same teacher for all four years from ninth to 12th grade.

IV. How Leading Edge Schools Make Trade-Offs To Prioritize Academics and Professional Community within Funding and School Size Constraints

Finding 3: Leading Edge Schools work within small school size and funding-level constraints to prioritize core academics and professional community over program diversity.

Although Leading Edge Schools implement common high-performing strategies to align with their instructional models, budget and staffing patterns look different across schools, even those with similar models and priorities. These variances are due in part because each Leading Edge School operates in a different resource context, which include funding levels and the flexibility to use people, time, and money in desired ways. Even the relative size of the Leading Edge Schools contributes to these variances. Small school size constrains resource use because there simply are less total resources to work with and the per-pupil cost of schoolwide positions, such as the principal, is higher as it is spread across a smaller number of students. The smaller the school, the more exacerbated the size constraint.

Each of the Leading Edge Schools balances the use of people, time, and money within their own resource context to support their instructional models. This balancing requires the schools to make trade-offs among priorities and results in different organizational structures. As we will describe, Leading Edge Schools work largely within public funding levels that vary widely across districts. However, *regardless of funding levels or size, Leading Edge Schools invest first to assemble high-quality core academic teachers and school leadership to facilitate the creation of professional learning communities. At the lowest spending and size levels, this means that virtually all teachers in Leading Edge Schools teach core academics.*

Funding and school size constraints

Per-pupil spending

Leading Edge Schools spend widely varying amounts per general education pupil on operating costs,[17] with the difference in local funding levels explaining much of the variation.[18] Figure 24 shows that spending per general education student ranges from $5,500 per pupil — High Tech High in San Diego — to almost three times that amount — $15,200 at Boston Arts. The average Leading Edge School spends $9,300 per general education student on operations. The spending levels cluster neatly in district categories, with the highest-spending schools located in Boston and the lowest-spending schools in California.[19]

Regardless of funding level, most Leading Edge Schools implement their instructional models within the public funding dollars they receive. Many of the Leading Edge Schools use private funding or community resources to support operations, but this usually totals less than 10 percent of the budget.[20] When they do raise private funds or tap community resources, it is mostly

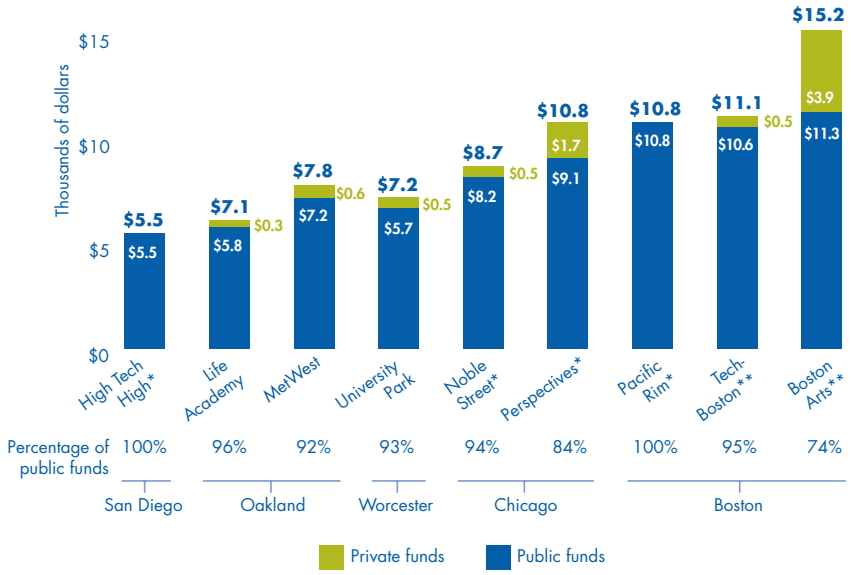
at the edges to support extra model needs. However, two of the lowest-funded schools, Life Academy and MetWest, rely on community resources to provide more essential services, such as college and guidance counseling and, in the case of MetWest, some core academic instruction.[21]

Boston Arts, the highest-spending school, receives the most public funds but also raises about $3,500 per general education student for operations (26 percent of total spending). However, much of this additional spending goes to supporting a mission beyond that of a typical high school — the operation of a full-scale professional arts school as part of its 8:30 a.m. to 4:30 p.m. day. Not surprising, it takes significant time and effort to raise this level of funding and maintain the necessary partnerships, and Boston Arts devotes two full-time positions specifically to development.

Although Leading Edge Schools work largely within public funding levels, most also appear to spend more per general education pupil than large high schools in their districts.[22] Figure 25 shows the ratio of Leading Edge Schools' general education spending compared to a local district large high school with similar demographics and performance levels. Four of the schools in the study that operate as part of a traditional district system average 30 percent more

FIGURE 24

Fully allocated general education spending per pupil



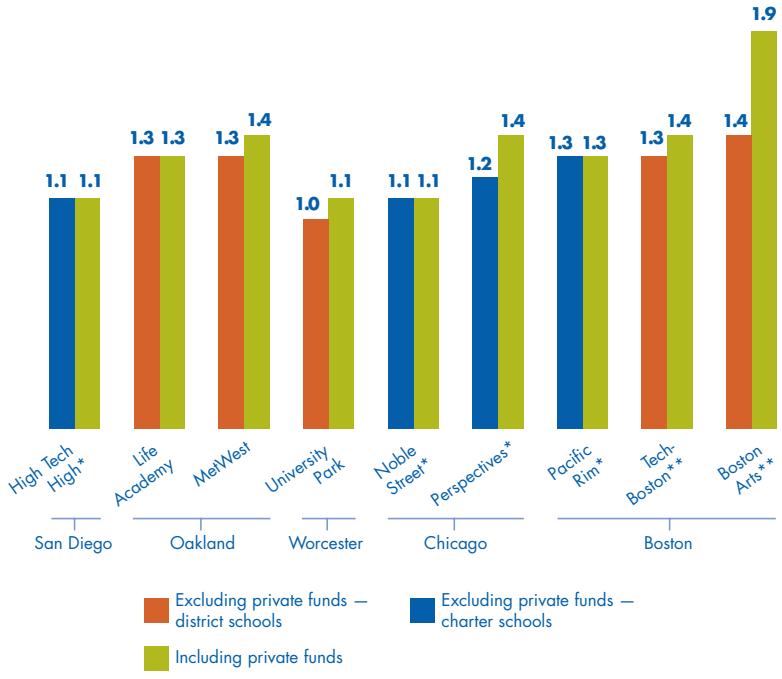
* Charter school
** Pilot school
Note: Fully allocated general education spending per pupil includes all school-level and district-level management and leadership resources. For more detailed information on how this was calculated, see Appendix I: Detailed Methodology at www.educationresourcestrategies.org.

public funds for each general education pupil. Only University Park receives the same amount for each general education student as the local large district high school. The charter schools spend closer to their local traditional large schools, with the four charter schools averaging 10 percent more in public funds than a comparable district high school.[23] Including privately raised funds, the additional spending in the Leading Edge Schools ranges from 10 percent to 90 percent more for each general education student (see Figure 25).

Although generalizing based on nine case studies is inappropriate, these findings are consistent with a more detailed study of school district spending across all high schools in Boston, Chicago, and Baltimore conducted as part of this project (Frank, 2008). The study found that two of three districts spend more on their small high schools than on similarly situated large high schools.

FIGURE 25

Ratio of fully allocated general education spending per pupil, Leading Edge Schools to large comprehensive schools



* Charter school
** Pilot school
Note: Fully allocated general education spending per pupil includes all school-level and district-level management and leadership resources. For more detailed information on how this was calculated, see Appendix I: Detailed Methodology at www.educationresourcestrategies.org.

Some of this additional public funding results from the vagaries of the local funding systems for both district and charter schools. And small schools face unique resource challenges that combine with funding levels to constrain model choices. Because most schools receive resources based on the number of students they serve, smaller schools have fewer total dollars to pay for the services they require to support the schools' instructional models, such as leadership, academic, college counseling, and social and emotional services. That also translates to fewer dollars to comply with federal, state, and local mandates, including graduation requirements and certification requirements. Only four of the Leading Edge Schools receive additional staff or dollars from the district to compensate them for the constraints of small size on total resources.[24]

This smaller pool of resources also must provide other nonacademic or student support services, including administration and operations and maintenance. Leading Edge Schools range in size from 128 students at MetWest to 508 students at High Tech High. At the lowest size and spending levels, even the basic leadership and student support positions can consume a significant percentage of resources. On the other hand, even though High Tech High receives the lowest funding per general education student in our sample, the larger pool of funds created by having 508 students when combined with charter school flexibility allows leaders to make trade-offs and balance resources to achieve the school's Strategic Design.

Spending on leadership

Regardless of funding level or school size, all Leading Edge Schools maintain or expand traditional leadership and student support positions, even though most have the flexibility to eliminate them. Figure 26 shows that schools chose to keep principal, assistant principal, and guidance counselor positions. There are some exceptions to this decision, in part based on size and funding levels. Two of the smallest Leading Edge Schools — MetWest with 128 students and University Park with 149 — do not have assistant principal positions. And two of the lowest-funded schools — MetWest and Life Academy — provide some counseling functions through external partnerships rather than investing in full- or part-time school positions.

Pacific Rim spends the highest percentage of its budget (28 percent) on leadership and pupil services (Figure 26) of all the Leading Edge Schools. It is one of three Leading Edge Schools to include the middle grades, and is the only one to have a separate full-time principal for the high school grades. This decision, which contributes to this high percentage, was based on the need to provide additional instructional leadership and support to the teaching staff. The principal spends a significant portion of his time visiting classrooms on a regular basis as well as serving as support for new teachers.

Boston Arts, the highest-spending school, has added positions that the other Leading Edge Schools generally chose not to include, such as a parent liaison, wellness coordinator, and community field coordinator. Figure 26 also illustrates that some Leading Edge Schools also chose to invest in additional administrative positions to support their specific instructional model needs. Although Leading Edge Schools have the same titles for traditional positions, the

individuals filling them may have different responsibilities. For example, because Leading Edge Schools are smaller and offer one program of study for all students (as discussed further on), guidance counselors are relieved of some traditional tasks, such as scheduling, and can focus more intensely on college and career counseling than at traditional large high schools.

Providing this level of leadership and student support means that Leading Edge Schools spend a larger percentage of their per-pupil budgets on these services than the large comparison high schools in the same districts. Figure 26 shows that eight of the nine schools spend between 4 and 11 percentage points more on leadership and pupil support positions. The single exception — Boston Arts — also is the highest-spending school. This is consistent with a more detailed study of school district spending across all high schools in Boston, Chicago, and Baltimore

FIGURE 26

Leadership and pupil and ancillary services positions[i]

Leading Edge Schools (smallest to largest)	Enrollment grades 9–12	Spending per pupil on leadership and pupil services	Per-pupil budget on leadership and pupil services	Percentage point difference from large comparison school	Principal	Assistant principal/ dean[ii]	Guidance/ college counselor	Instructional model positions
MetWest[iii]	128	$1,566	20%	9%	✓		(in-kind services)	Internship
Pacific Rim	130	$3,011	28%	10%	✓	✓	✓	
University Park[iii]	149	$1,116	15%	1%	✓[iv]		✓	
Perspectives	186	$2,248	21%	11%	✓[iv]	✓[v]	✓	Academic, community
TechBoston	227	$2,434	22%	4%	✓	✓		Technology
Life Academy[iii]	255	$1,272	18%	7%	✓	✓	(in-kind services)	
Boston Arts	395	$1,759	12%	(6%)	✓	✓	✓	
Noble Street[iii]	482	$1,382	16%	6%	✓	✓	✓[vi]	
High Tech High[iii]	507	$976	18%	7%	✓	✓	✓	Internship

i. Positions that are associated with leadership include administration and clerical support positions. Pupil services refer to the direct costs of providing noninstructional services to students and the "direct" costs of managing these services (administrative support and contracted services for these programs).
ii. This includes position titles assistant principal, dean of students, dean of discipline.
iii. Schools with low average per-pupil spending.
iv. Principal serves grades 6–12.
v. Assistant principal serves grades 6–12.
vi. The dean of students serves part of this role.

conducted as part of this project (Frank, 2008). It is significant that Leading Edge Schools spend more on leadership and pupil services because, except for University Park, in which the district mandates these positions, they had the choice not to spend resources in this way.

Spending on teachers

As leadership and pupil services consume a larger portion of most Leading Edge Schools' budgets, it follows that they have a smaller piece of the pie to devote to all other traditional high school functions. Leading Edge Schools strategically maximize resource use by offering a single common program of courses for all students with very limited elective choices, especially in noncore subjects, instead of the diversity of options available at most comprehensive high schools.[25] *They do this by hiring a cadre of high-capacity and flexible core academic teachers and adding everything else around this team as resources allow.*

As Figure 27 shows, in typical large high schools, about two-thirds of classroom teachers teach core academic subjects. In Leading Edge Schools, core academic teachers make up more than 85 percent of classroom teachers in all but one case: Boston Arts. Boston Arts splits teaching staff between core subjects and the arts, as it creates "two schools in one." At the three lowest-spending schools that also are smaller than 250 students — University Park, MetWest, and Life Academy — core academic teachers comprise 94 percent or more of all teachers.

Leading Edge Schools still are able to offer their limited required noncore program by having core academic staff teach these courses and using part-time and adjunct teachers. For example, at Life Academy, core academic teachers teach almost all noncore courses in a post-session at the end of the school year. Although students take some physical education throughout the school year, most of the noncore education happens in the last 10 days of the year. During post-session, teachers work in teams of two to develop and teach courses and activities (e.g., team and community building). Figure 27 shows that as spending levels or size increase, schools are able to add full-time staff to teach noncore subjects.

Many of the Leading Edge Schools leverage community resources, including local colleges, universities, and community agencies, to expand opportunities outside the required noncore courses. At Noble Street, half of the noncore courses are provided during the school day, while the other half happen outside the school day and year. During the school day, students have limited options from which to choose: art, chorus, band, or Reserve Officer Training Corps. Outside the school day or year, students must participate in an additional two credits of enrichment courses during their four years of high school. They can fulfill this requirement through courses offered after school (e.g., ceramics, Stock Market Game, Rocket Club), by AmeriCorps tutors and other volunteers, or through approved courses at local colleges and community centers. This arrangement allows students opportunities to pursue a variety of interests at little or no cost to Noble Street in staff or time. Internships, which are an element of a number of the Leading Edge Schools' instructional models, also provide added diversity to the student curriculum.

FIGURE 27

Noncore course offerings

			On campus				Off campus
			What	Who			What
School (lowest to highest spending per pupil)	Leading Edge Schools classroom teachers who are core academic	Estimated comparison large school classroom teachers who are core academic	Noncore offerings	Core teachers	Full-time noncore teachers	Part-time/ adjunct teachers	Noncore required or electives
High Tech High[i]	88%	N/A	Medium	✓	✓		Internships
Life Academy[i]	99%	78%	Limited	✓			Internships
MetWest[i]	100%	78%	Limited	✓			Electives Internships
University Park[i]	94%	60%	Limited			✓	Electives
Noble Street[i]	89%	60%	Limited		✓		Electives
Perspectives	84%	60%	Limited		✓		Internships
Pacific Rim	87%	60%	Limited	✓	✓		
TechBoston	86%	60%	Limited	✓	✓		Electives
Boston Arts	54%	60%	Expansive		✓	✓	

[i] Schools with low average per-pupil spending.

Figure 28 illustrates that core academic teachers in Leading Edge Schools not only teach other subjects but also serve multiple roles that may draw on skills and knowledge outside their area of core expertise that are critical to the actualization of the school mission and instructional model. By focusing first on assembling a talented, flexible teaching staff, Leading Edge Schools also create the foundation for a vibrant professional community.

As discussed earlier in Common Practice 3, Leading Edge Schools rely mostly on internal professional communities to deliver professional development instead of outside experts and more formal structures. This can be accomplished only because Leading Edge Schools control the level and combination of expertise they hire. Without this flexibility, these schools might need to devote additional resources — either dedicated staff or funds for outside consultants — for school-based expertise to support the continuous development of the knowledge and skills of its teaching staff. Additional resources devoted to professional development would require Leading Edge Schools to make other trade-offs in organizational design.

One Leading Edge School devotes significant internal resources outside its teaching staff to support professional development. Perspectives uses instructional leaders — part-time teachers — as well as an academic dean to provide professional development. Dedicating resources to professional development means fewer resources available for other functions, including teaching. Perspectives devotes only 53 percent of its staff to teaching, the smallest percentage of all Leading Edge Schools, which results in teaching loads of 124 students, the highest of all Leading Edge Schools.

FIGURE 28

Additional roles and responsibilities of core academic teachers[i]

School (smallest to largest)	Noncore academics	Student support through advisory	Formal student academic support	Professional development community[ii]	Governance
MetWest	✓	✓	✓	✓	
Pacific Rim	✓	✓	✓	✓	
University Park			✓	✓	
Perspectives		✓		✓	
Life Academy	✓	✓		✓	
TechBoston	✓		✓	✓	
Boston Arts		✓	✓	✓	✓
Noble Street		✓		✓	
High Tech High	✓	✓	✓	✓	✓

[i] For a school to be coded in the following categories, the time for each activity had to be specifically set aside during the formal teacher day on a regular basis.
[ii] Time during the day for professional development and collaboration.

V. Why Strategic Designs Require Flexibility from Traditional District and Union Constraints around Hiring, Staffing, and Time

Finding 4: Leading Edge Schools require flexibility from traditional administrative practices and union contracts around hiring, staffing, and time to implement their Strategic Designs.

One of the primary reasons Leading Edge Schools can make the trade-offs that support their instructional models so effectively within small school size and given funding levels is they have *flexibility* in both the amount and use of their other resources — people and time. Although funding levels are mostly inelastic, Leading Edge Schools push the edges of staffing and time to make their instructional models come alive. Figure 29 describes the key "dimensions of flexibility" for each school resource — people, time, and money — and highlights the primary legal or administrative source of constraints to a school's freedom to use these resources. How much flexibility a school has depends on whether it can determine the amount of people, time, and money it has AND how these resources are used. For example, although a school may not have the freedom to extend or reduce the student day without special waivers, it may have some flexibility to organize the time *during* the school day to fit student needs and its instructional model.

How much control schools have over resource use depends on whether they are located in a state or district that dictates staffing, time requirements, and salary schedules and whether they are explicitly freed from many of these traditional guidelines, like many charter schools are. Figure 30 rates resource flexibility along each dimension for Leading Edge Schools, indicating high and low levels of school discretion. Overall, Leading Edge Schools have a high degree of flexibility over staffing and time dimensions and predictably less control over funding-level components. As expected, the five schools in traditional districts have less flexibility than the charter schools in all areas. But even these schools have more flexibility than most typical district schools.

People

Leading Edge Schools' *ability to choose their staff members and structure the roles they play to fit their instructional models* enables their Strategic Designs. As shown in Figure 30, the four charter schools in our study exercise significant freedom over staffing. The remaining district schools operate under some teacher union constraints in the selection or removal of individuals, but they all have more freedom than most district schools. First, all five district schools hired their teachers explicitly to fit their schools' specific needs, and as described above, they actively review each member of their teaching staff to ensure continued fit and performance. Second, four of five of our district schools have special conditions that enable more flexibility than usual. Life Academy and MetWest, as part of the Oakland Unified School District that allocates dollars

instead of specific staff positions to schools, have significant control over staff composition, as do TechBoston and Boston Arts, the two pilot schools. Only University Park is subject to its district staffing allocation formula and, as a result, must host positions that may or may not suit model or student needs.

FIGURE 29

Flexibility dimensions for school-level resources

Flexibility dimensions	Characteristics	Primary sources of opportunities and constraints
People		
Hiring and firing	Select and remove individuals for specific positions	• District practice and policy • Union contracts
Staffing composition	Define positions and responsibilities	• Teacher union contracts • Class size maximums • District staffing allocation formulas • State certification requirements • State accreditation requirements
Use of outside contractors	Use of nonschool or district employee to provide required or extra services	• Teacher union contracts • Administrative policies • State certification requirements
Time		
Teacher time	Length and composition of teacher day and year, including planning and professional development time, teacher course preparations	• Teacher union contracts
Student time	Length and composition of student day and year	• Teacher union contracts • State and district graduation and testing requirements
Money		
Total public funding	Federal, state, and local funding	• Federal, state, and district funding formulas
Portion of total dollars at school level	Ability to get dollarized amounts for district services, rather than receive service, and to purchase services from outside vendors or apply to other purpose	• Legal status (e.g., charter, district) • Administrative policies
Teacher compensation	Define salary levels and structure of salary	• State, union contract, or district mandates on salary structure and class size
Nonsalary budget	Nonsalary budget is in lump-sum amount or can be transferred freely across line items	• Administrative policies

Time

All Leading Edge Schools — even those within traditional districts — aggressively maximize flexibility over the amount and use of teacher and student time. Teacher union contracts, generally the primary constraints in this area, play no role for the charter schools and little role for the pilot schools in the study. Union contracts typically tightly constrain the organization of the high school and teacher day. For example, the Boston Teacher's Union contract limits the number of minutes teachers can be required to teach in a row, and it restricts the number of periods per week that teachers can be required to engage in professional development or collaborative or school-defined activities during nonteaching time.

FIGURE 30

Rating the dimensions of flexibility for Leading Edge Schools

	Boston Arts	High Tech High	Life Academy	MetWest	Noble Street	Pacific Rim	Perspec-tives	Tech-Boston	University Park
	Pilot	Charter	District	District	Charter	Charter	Charter	Pilot	District
People									
Hiring and firing	Medium	High	Medium	Medium	High	High	High	Medium	Medium
Staff composition[i]	High	High	Medium	Medium	High/ medium	High	High/ medium	High	Low
Use of outside contractors	Medium	High	Medium	Medium	High	High	High	Medium	Low
Time									
Teacher time	High	High	Medium	Medium	High	High	High	High	Low
Student time	High	High	Medium	Medium	High	High	High	High	Medium
Money									
Total public funding	Low	Low	Low	Low	Low	Low	Low	Low	Low
Portion of total dollars at school level	Medium	High	Medium	Medium	High	High	High	Medium	Low
Teacher compen-sation	Low	High	Low	Low	High	High	High	Low	Low
Nonsalary budget	High	High	High	High	High	High	High	High	High

[i] Noble Street and Perspectives are coded as high/medium because, although they are charter schools, they receive special education positions from the district.

These contract provisions, written in the context of standard seven-period days, can make it difficult to design a schedule that varies the use of time and includes enough collaborative time for teachers to work — especially in a small school. Four of five of our district schools have explicit freedom from many of these provisions. The fifth, University Park, operates a traditional school schedule but extends the teacher workday to gain collaborative time for teachers.

All Leading Edge Schools — even those within traditional districts — aggressively maximize flexibility over the amount and use of teacher and student time.

All Leading Edge Schools invest in professional community by requiring more teacher hours than their local districts. Teachers at Leading Edge Schools are willing to work an additional 273 hours a year, on average, than teachers in their local districts because the leaders of these schools have created a culture and professional community that teachers are eager to be part of.

Most Leading Edge Schools do not pay teachers extra for this time. The schools that are more constrained by union contracts can extend time but must compensate teachers and make other resource trade-offs. These schools — University Park, MetWest, and Life Academy — spend, on average, less time in professional development than the other Leading Edge Schools, but they push the edges as far as possible. More than half of the Leading Edge Schools have a high percentage of new teachers, ranging from 34 percent to 57 percent of the teaching staff, raising the question of sustainability of this practice for all Leading Edge Schools.

Money

Leading Edge Schools have no influence over their public funding levels and, for the most part, work within these funding levels to create their Strategic Designs. This is true across both charter and district schools. But charter schools have much more discretion over how they allocate those dollars because they control a larger portion of school resources and can set teacher compensation levels. Charter schools typically receive the full per-pupil amount allocated to their schools and must figure out how to pay for all services on their own, including special education and other learning needs, facilities, accounting, insurance, operations, food services, and the like.

Although this can create some difficulties, it also allows the charter schools the opportunity to hone resources across all services and functions to fit their instructional models. For example, Perspectives aligns its food services function with its instructional model, serving only healthy, balanced meals in its cafeteria. In addition, it uses its food service staff to teach one nutrition class each quarter during students' advisory time and to offer after-school cooking activities. In a traditional district system, districts keep a portion of a school's total per-pupil spending to pay for these functions and for district leaders that supervise and support schools; the individual schools have no discretion over the types of services or the amounts allocated to provide for them.[26]

Leading Edge charter schools have more control than district schools over teacher compensation — the largest component of a school's budget. Unlike the Leading Edge district schools, the charter schools in the study may set their own compensation levels. Despite this flexibility, most of these schools use their districts' salary scale as the basis for setting salaries and, for the most part, are not using salaries as a means to differentiate expertise or teacher leadership roles (see Common Practice 4).

VI. Implications and Conclusion

As these Leading Edge Schools demonstrate, creating small schools is about so much more than smallness. It is about the way schools create Strategic Designs by taking advantage of size and rethinking the high school experience for urban students. These designs include clearly defined instructional models, and they organize resources — people, time, and money — in high-performing ways to invest in teaching quality, use student time strategically, and create individual attention. Although we still need good academic performance growth measures for these schools, early returns suggest that many of them have attendance and graduation rates that rival the best suburban schools.

How can we use these findings to create more schools with similar results when we know that these schools had the advantages of experienced, talented leaders; hand-picked teachers; and flexibility that most urban high schools do not have? Which findings pertain to small high schools in particular, and which have relevance for large high schools and schools of all kinds? We address these questions by reflecting on each of our four sets of findings.

Finding 1: Leading Edge Schools create customized Strategic Designs that organize resources — people, time, and money — to advance a clearly defined instructional model.

Although Leading Edge Schools created their Strategic Designs from the ground up, there is no need for all schools to begin with a blank slate. Just as schools and districts draw on existing curriculum frameworks, lesson plans, and textbooks to develop programs of study, they might also build on organizational examples such as these. The problem has been that secondary schools have so few variations in instructional models and organizational designs to consider. Through this summary report and the accompanying individual case studies, we provide nine potential ways of organizing small schools that could serve as starting points for creating new designs.

But, as the principals of Leading Edge Schools are quick to point out, what makes these designs strategic is that they align with their instructional models in the context of their specific resource levels and constraints at a *particular moment in time*. Leading Edge School leaders understand that the inputs and outputs of schools are a collection of moving parts, some more predictable than others. They also understand that even when informed by evidence and experience, not every resource decision will hit the mark.

These insights suggest a new paradigm for supervising and supporting schools — especially as schools are outlining their improvement plans, budgets, and staffing needs each year. In this new paradigm, supervision would be less about *enforcing* a specific use of resources and much more about *enabling* schools to more effectively match their hiring, staff assignment, student grouping, and schedules to their particular challenges.

The Leading Edge School leaders did not necessarily use a systematic approach to aligning resources to their designs. However, the research framework and quantitative measures we used to understand their designs could serve as powerful tools for assessing resource use and promoting discussion and problem solving among school leaders and those who support and supervise them. With this in mind, we created a set of diagnostic indicators that describe the most important ways schools use people, time, and money to improve student performance. These *diagnostic indicators* have been used throughout this report to describe resource use at the schools, and Appendices C and D provide a full list of the indicators, including the results for all the Leading Edge Schools.[27]

These insights suggest a new paradigm for supervising and supporting schools ... [that] would be less about enforcing *a specific use of resources and much more about* enabling *schools to more effectively match their hiring, staff assignment, student grouping, and schedules to their particular challenges.*

Many of these, such as instructional hours, percentage of time, teacher load, and class size by subject, are not typically measured or reported. These indicators cannot determine whether a particular resource use is "right" or "wrong." Instead, they can serve as a basis for understanding and reflecting on how schools organize resources to support instructional models and ultimately ensure student learning. To fully understand a school's resource use, the indicators should be viewed collectively because people, time, and money are limited assets and schools must make trade-offs and choices. These diagnostic indicators would be especially powerful if schools could compare their resource use against other schools in their state or district with similar characteristics, resource flexibilities, and instructional models.

Finding 2: Leading Edge Schools share a common set of high-performance practices — investing in teaching quality, using student time strategically, and creating individual attention — that advance their instructional models.

Although their staffing, schedules, and budgets look different from each other, Leading Edge Schools share a set of resource practices that are striking in their consistency and in the magnitude of difference from traditional high schools. We address the most important common practices below, but the most important finding based on those common practices is that *effective resource use is not about a single strategy but about how strategies combine to support a well-defined instructional model and highly capable teachers.*

Teaching quality and student time

Although traditional district practice and teacher contracts must evolve to enable more effective teacher hiring, in the meantime school leaders can improve practices in these areas on their own. Leaders of high-performing schools of all shapes and sizes pay close attention to individual

teacher learning needs. They also devote enormous attention to teacher hiring and assignment — which they then use to assemble effective teams of teachers who collectively possess the needed skills and attitudes (Miles & Frank, 2008).

The *way* Leading Edge Schools invest in teacher professional development has important implications as well — although their approaches cannot be applied across all schools. In schools that begin with high-quality teachers, some of whom have significant expertise and experience, the investment in professional development and collaboration is not lower than for underperforming schools, but it is different in nature.

Instead of dollars going toward outside coaches, it goes to pay the salaries of teachers inside the school, who share their expertise and experience with their colleagues. All teachers have more time to work together, and in many schools, they teach a lower percentage of the student day and have opportunites for playing leadership roles. Although this is not a strategy for supporting low-performing schools, it does suggest an end game in which teaching jobs in continuously improving schools all include significant time to hone teachers' skills and improve instruction together.

Most Leading Edge Schools have not pushed hard at the lever of compensation. Part of the reason for this may be that they have been able to recruit effective teachers, support new ones, and retain them relatively effectively in informal ways. But it also may be that tackling compensation as an individual school simply is not worth it given the potential for internal strife and the already strong teacher applicant pools and teacher retention.

In contrast, school districts that face low teacher capacity and teacher shortage areas cannot rely on a few maverick school leaders to solve the problem of recruiting and retaining high-quality teachers across all of their schools. Instead, school districts will need creative solutions around compensation that can be implemented on a systemic level. These creative solutions will, in turn, benefit small schools that could not take this on individually.

On average, teachers in Leading Edge Schools formally work 273 more hours a year to spend more time with students and to work together — translated as a seven-hour day, this totals 39 more days in a year, or as hours per school day, 1.5 hours more each day.

Leading Edge Schools extended required teacher and student time consistently and — where possible — dramatically. We use the word "required" deliberately because few teachers in any school work only during the hours defined in school schedules or the contracted teacher workday. On average, teachers in Leading Edge Schools formally work 273 more hours a year to spend more time with students and to work together — translated as a seven-hour day, this totals 39 more days in a year, or as hours per school day, 1.5 hours more each day. In most cases, they received little if any extra pay for these hours. They did have vibrant professional communities and, in most cases, lower student loads, smaller class sizes, and closer

relationships with each other and with students. More than half of the Leading Edge Schools have a high percentage of new teachers, ranging from 34 percent to 57 percent of the teaching staff. Given these generally young staff members, it will be important to track whether the practice of relying on a school's mission and culture instead of differentiated compensation structures will be a sustainable way to keep the best teachers at these schools.

Extending required teacher time at scale has huge implications for union negotiation and district budgets — especially in districts where required teacher time is already low. So the question of how many hours schools and systems can require and how much teachers should receive for this formal time will become a huge challenge as districts and schools seek to replicate Leading Edge School practices and capture teacher time more formally for collaboration and instruction.

Individual attention

Importantly, these Leading Edge Schools go beyond small size to implement a wide range of strategies that combine to ensure that individual *student learning needs are known in an everyday, ongoing way.* Even in the absence of effective standardized secondary school assessment tools, these schools make sure to gather a rich set of data on each student. Most important, they act on this information: They collaborate and designate time and resources so that core academic teachers can provide targeted student support.

Leading Edge Schools place focus on core academic teachers and the relationships they create with students. This contrasts starkly with many large schools, where students often receive special help from teachers or tutors who may not know them or their work well. These findings suggest the need for a continued emphasis on finding ways to support schools in collecting information that supports them in understanding student needs. They also suggest a rethinking of strategies for *who* provides individual attention and the need to create conditions such as lower teaching loads, structure support blocks, internships, and other structures in which students come to know their academic teachers.

Although small school size makes it easier for students to be known well by faculty and not slip through the cracks, size limits alternatives for differentiating and individualizing attention. We have learned through the Leading Edge Schools that having a small staff makes it harder to group students with the same needs and provide them intensive group support. This is particularly true for the smallest of the schools, with only one cadre of students.

Only Noble Street, one of the larger Leading Edge Schools, does this in a systematic way in core academic courses. Most other schools offer this intensive support outside the course structure and through integrated academic support time. This may mean that larger schools have some advantages in providing support to students with specialized learning needs. Further research will be important to understanding the strategies that both small and large high schools use to address segments of the population with common learning challenges, as well as those students with unusual learning needs.

Finding 3: Leading Edge Schools work within small school size and funding-level constraints to prioritize core academics and professional community over program diversity.

Small size creates its own set of opportunities and constraints. Throughout this paper, we explore the many opportunities to create vibrant professional and personalized learning communities. But small size limits resources in two ways. In particular, the smallest schools — those with fewer than 250 students — spend a significantly larger portion of their dollars on leadership and pupil support. In addition, the smaller size of staff in small schools makes it harder to hire full-time teachers to play highly specialized roles teaching special subjects or serving unique student needs.

> [T]eachers are not interchangeable parts. *High-performing schools are made up of teaching teams that possess a collective set of skills and share an approach and attitude.*

The Leading Edge Schools had three non-negotiable conditions that enabled them to make trade-offs that worked for their instructional models. First, they were able to select core academic teachers with the expertise and desire to play the range of roles their small school designs required. Recall that in eight of the nine Leading Edge Schools, 84 percent or more of all classroom teachers are core academic teachers. This contrasts starkly to the typical high school, in which 60 percent or less of the teaching staff play these roles. Second, they were able to determine the roles those teachers played — assigning teachers multiple roles to fit the schools' instructional models. Most union contracts restrict schools from having teachers play these multiple roles, but most Leading Edge Schools either did not have such limitations or were able to work around them. Third, they had the flexibility to limit program diversity — focusing on depth rather than breadth of offerings. Course and program requirements, coupled with teacher certification requirements, can limit organizational flexibility.

Clearly creating more small schools will require systems to rethink the way they hire and assign teachers as well as the skills they look for. Schools will need far more math, science, history, and English teachers and fewer who teach only nonacademic subjects. And, in assigning teachers to schools, the lesson is that *teachers are not interchangeable parts.* High-performing schools are made up of teaching teams that possess a collective set of skills and share an approach and attitude. Leading Edge Schools select each teacher to fit these needs.

Supporting schools in finding the right teachers will mean changing district and union hiring procedures that emphasize seniority over skills and fit and aggressively hiring more core academic teachers with broader skill sets. Further, as the Leading Edge Schools did, states and systems must find more cost-effective ways to deliver noncore subject matter. This will require changing certification and staffing rules for these subjects, recruiting teachers willing to work part time, and changing rules about the use of student time.

Although finding flexible teachers with a unique skill set is more important for small high schools, all schools need to create high-performing teaching teams that, together, possess the skills the school needs. And all urban schools must find ways to increase the resources they devote to high-quality core academic teaching. Though Leading Edge Schools did not reduce time spent in noncore activities, they did find creative, less costly ways to offer them. They limited student choice for onsite offerings and used partnerships, internships, extended time, and untraditional staff.

Finding 4: Leading Edge Schools require flexibility from traditional administrative practices and union contracts around hiring, staffing, and time to implement their Strategic Designs.

We have discussed in depth the kinds of flexibility that Leading Edge School leaders need to enact their Strategic Designs. The important idea here is that it is not about creating flexibility purely for the sake of freedom. The goal of allowing more school leader discretion in hiring, staffing composition, and the scheduling of student and teacher time is to enable more effective school organizational designs and to empower high-capacity leaders to make adjustments — adjustments that balance limited and always-changing resources to fit school needs. Not all principals have the high level of expertise and experience that Leading Edge School principals have.

Those opposed to changing the rigid district and union practices that surround hiring, staffing allocation, and use of time often argue that school leaders lack the capacity to make effective resource decisions. But these Leading Edge Schools show that effective high school designs for urban students will require changes in the old practices and contracts. Further, as long as we allow districts and unions to enact systems that are designed to safeguard against inept principals but that make it impossible to create effective schools, we make it harder to attract and keep effective leaders.

Concluding thoughts

The findings reviewed here add to the limited existing research on resource use in secondary schools (Miles, Shields, & City, 2007). Three factors help explain why so little research explores the link between the two. First, secondary school organization has been so similar that it has been difficult to find significant variation to test. With the explosion of new designs for secondary schools, this condition is changing.

Second, this work shows that it matters *how* resources are used more than how *much* money is spent. Data on secondary school resource use have been difficult to gather because it required school-specific information that until recently was not easily accessible. That information, such as collecting bell schedules and class lists, is now often available in computerized form.

Third and last, it is hard to measure the impact of single strategies when the set of strategies and how they fit together matter much more. These findings from Leading Edge Schools suggest that effective resource use depends first on having a clearly defined instructional model and high-quality teachers who match it. Structures, such as smaller class sizes, more student time, or advisory, do not make sense without plans for how they will work together and teachers who know what to do with them. Class size may be less important if there are other features of the Strategic Design that compensate for it.

The lesson for both research and practice is that we must begin to measure how schools organize people, time, and money. Then we can engage in a discussion around the strategic use of these resources, as well as sophisticated research, to test which combinations and levels work best. In the meantime, although there are no simple solutions, we can draw on a powerful set of resource strategies and invest to recruit, develop, and support strategic school leaders as they combine them in ways that align with a clear instructional model and goals for student learning.

Endnotes

1 http://nces.ed.gov/nationsreportcard/nde/viewresults.asp

2 www.essentialschools.org/cs/resources/view/ces_res/332

3 Professional development time for the local district is calculated based on the professional development time required by the teachers' union contract in effect at the time of the study. It captures collaborative planning time only when directly specified in the contract. Boston Teachers Union contract 2003–06 p. 44; Chicago Teachers Union contract p. 35; Oakland Education Association contract p. 18; San Diego Teachers Union contract p. 19; Worcester Educational Association contract 2005–06 p. 42.

4 Noble Street also runs an eight-week summer academy for students who fail courses during the school year or who choose to accelerate course levels. This time is not included in the student year calculation, as less than 50 percent of the student population attends.

5 When schools demonstrated that more than 50 percent of students attend these tutoring sessions on a regular basis, we included this time in the calculation of total student hours.

6 High Tech High uses the X block as a period during the school day when students either participate in noncore classes or receive additional academic support as needed. As more than 50 percent of students do not use this time regularly for academic support activities, it is not included in the calculation of yearly time in academic support. Instead it is included as noncore time, as most students use this time to pursue noncore classes.

7 MetWest and Boston Arts have more noncore classes than these three schools due to the strong noncore focus of the instructional models of these schools.

8 This assumes six periods in a 6½-hour day, with six passing periods of five minutes each, homeroom for 15 minutes, and lunch for 20 minutes.

9 Throughout this report, we have primarily focused on the strategies these schools have implemented in grades 9–12, but for the purpose of reviewing assessment practices for incoming students, we focused on the year of entrance. For example, University Park students enter in grade 6.

10 http://nces.ed.gov/programs/digest/d06/tables/dt06_064.asp

11 www.educationresourcestrategies.org/clients_lausd.htm#resource

12 Leading Edge Schools have a very small number of special education students, and few of these students are in substantially separate settings (see demographics).

13 At Boston Arts, English language arts average class size reflects a writing class size of 10 (20 students for two teachers) and a humanities class size of 21.

14 As used here, student load refers to the absolute number of students that teachers see on a weekly basis. This calculation does not take into account that some of these students may be the same (taking two courses with the same teacher). Individual student course data were not available to determine the teacher "student count." This number represents courses that the teacher has been formally assigned in the course schedule data and does not include advisory periods or academic support classes. The 125-student figure is based on an average class size of 25 and teachers teaching five of seven periods.

15 The increased teacher load in English language arts at Perspectives is due to the English language arts teachers teaching Drop Everything and Read (DEAR). All teachers at the school are responsible for teaching DEAR or A Disciplined Life (ADL). ADL is treated as an advisory, not an academic subject. So, although English language arts teachers increase their core academic load, teachers will have similar loads across all responsibilities in the school.

16 Based on an average class size of 25 and teachers teaching five of seven periods.

17 For the purpose of this comparison, we have looked at a "modified operating" cost. All typical capital expenditures are excluded, as are the operating costs associated with rent and transportation. Transportation costs vary widely across districts and schools resulting from district size and assignment policies and tend to distort comparisons.

18 Though comparing spending across schools might seem a simple task, doing so in different cities with different funding and management structures and varying mixes of student needs creates enormous analytical challenges. This difficulty means that little research exists that reliably compares spending on small high schools of different models or in contrast to large high schools (Miles, Shields, & City, 2007). Ultimately, accurately capturing spending levels must be a key piece of evaluating the effectiveness and feasibility of any school model. Adjustments and detailed methodology for these calculations are included in Appendix I: Detailed Methodology at www.educationresourcestrategies.org.

19 Though the numbers change slightly when adjusted for geographic cost of living, the relationships between district spending levels do not change significantly because all of the Leading Edge Schools are located in high-cost urban areas. Because we want the numbers to be recognizable to those in the local district, local numbers are used here and in the remainder of the report. All numbers are for the 2005–06 school year, except Boston schools, which are for the 2004–05 school year and have been adjusted for inflation.

20 It is important to note that many of the charter schools receive more private support than reflected here because we have only included dollars to support ongoing operations. Many charter schools, including those in our sample, raise private funds to support long-term capital projects, such as buildings. In addition, three of the Leading Edge charter schools — Noble Street, Perspectives, and High Tech High — raise private funds to support their charter management organizations' efforts to replicate and expand their models.

21 Where schools receive donations of equipment or time, we have converted these donations to dollar values where possible if they are part of the ongoing school offerings. Many community resources and contributions across all schools have not been dollarized, including community support in hosting internships and providing elective course opportunities.

22 For details on how the comparison schools were selected and the way spending was calculated, see Appendix I: Detailed Methodology at www.educationresourcestrategies.org.

23 It is important to note that we have NOT included the cost of renting facilities, as this can be a source of huge variation between charter and district-run schools. Although understanding these facilities' funding differences is a critical public policy issue, it is not relevant to this study of how schools organize resources for instruction.

24 Life Academy and MetWest in Oakland received an additional $75 per student, and Perspectives and Noble Street in Chicago received an additional $300 per student for being small schools.

25 A notable exception to this is Boston Arts, which offers extensive and varied performing and visual arts opportunities in keeping with its emphasis.

26 Two of the Boston district Leading Edge Schools have more flexibility in this area than other schools in Boston Public Schools. As pilot schools, they have the option of buying certain prescribed services from the district or taking a per-pupil dollar amount for these services. In the year of study, both schools took the per-pupil dollar amount of approximately $320 rather than using district services.

27 The calculation method for all diagnostic indicators used in the report can be found in Appendix I: Detailed Methodology at www.educationresourcestrategies.org.

Appendix A

Project Description: Rethinking the Cost of Small High Schools

The Bill & Melinda Gates Foundation supported Education Resource Strategies in a three-year effort aimed at building understanding and tools that would support districts in creating cost-effective systems of high-performing urban high schools. The following is a description of the components of this project. More information can be found on our Web site at www.educationresourcestrategies.org.

"The Cost of Small High Schools: A Literature Review" considers the limited research on small high school costs, resource use, and constraints to understand the key questions surrounding the topic and identify further areas for investigation. Specifically, it reviews the available research to examine the following questions:

1. How much do districts and charter schools spend to operate small urban high schools?
2. How do high-impact small urban high schools organize their resources?
3. How do school *systems* need to change to support a portfolio of high schools, including small schools, in organizing for high performance?

"Strategic Designs: Lessons from Leading Edge Small Urban High Schools" summarizes findings from detailed case studies of nine high-impact "Leading Edge" small high schools. The report describes the common trends and models for organizing resources that distinguish these Leading Edge Schools from typical large urban high schools. It reveals that leaders of Leading Edge Schools create strategic designs through which they deliberately organize people, time, and money to advance their respective schools' specific instructional model. Although these schools spend varying amounts per pupil and organize resources in unique ways, they share common strategies for taking advantage of their smallness to improve student performance.

"Case Studies of Leading Edge Small Urban High Schools" is a companion to the "Strategic Designs" report. It contains the complete case studies for each of the nine schools analyzed in "Strategic Designs," including bell schedules and staffing lists.

"District Spending in Small and Large High Schools: Lessons from Boston, Baltimore, and Chicago" examines how these three urban districts created a large number of small high schools. The report looks at how much money each district spent on their respective small schools and how the schools used the additional resources they received. Patterns found in these districts' small schools are contrasted with those seen in the Leading Edge Schools presented in the "Strategic Designs" report. The paper also examines the differences in spending across the districts and between small and large high schools. It discusses several ways to spend less on small schools, the perils of doing so, and the importance of considering how many small schools to create and where to place them. The conclusion: Only through careful planning can districts develop small high schools in an equitable and sustainable way.

Going to Scale Tool. When districts implement new small high schools using "large high school rules" — the staffing and budget allocation policies used for large high schools — they typically spend more per pupil both as the small high schools ramp up and once they reach full enrollment. The Going to Scale Tool is a planning and teaching tool to help district leaders and those who support them understand, quantify, and more strategically deploy the typical sources of additional small high school spending in their own district contexts. Accompanying this tool is a brief that quantifies and describes the typical sources of additional spending for small high schools and explores when and how the extra investment might contribute to higher student performance.

Small Secondary School Design Tool is a Web-based tool that assists school leaders in using available people, time, and money to implement high-performing school organizations that support student achievement. The School Design Tool allows leaders to engage in the school design process using frameworks and concrete models for organizing resources, as well as allowing them to test the budgetary and strategic effects of different design choices. The tool is designed for a broad spectrum of users, from those who are in the initial stages of design and have limited information on staff, schedules, and budgets, to those with established school designs who may be engaged in continuous improvement efforts.

District Assessment Tool. This tool is intended to provide a foundation for determining district resource planning and setting strategic direction. The District Assessment Tool allows district leaders to assess their resources against essential district roles using both quantitative and qualitative diagnostic indicators to understand their stengths and challenges.

Appendix B
Introduction to the "Big 3" Framework

Education Resource Strategies' ongoing study of the role of resources in student learning shows that high-performing schools use their resources of people, time, and money in very consistent ways (Miles & Frank, 2008). Although their specific approaches vary to reflect differences in context, instructional approach, or staff, each school organizes its resources around three Guiding Resource Strategies. High-performing schools organize to:

1. Invest to continuously improve teaching quality through hiring, professional development, job structure, and collaborative planning time.
2. Use student time strategically, linking it to student learning needs.
3. Create individual attention and personal learning environments.

Teaching quality

Research supports the importance of teaching quality, noting that it influences all other reform efforts in schools and has the greatest effect on student learning (Rice, 2002a, 2002b; Halbach et al., 2001; Greenwald, Hedges, & Laine, 1996). In high-performing schools, leaders factor teaching quality into every decision they make: hiring, staff assignment, teacher and student scheduling, and budget resource allocation. Recognizing the unparalleled impact it has on school success, **high-performing schools strategically invest in teaching quality** in several key ways:

- **Hiring and organizing staff to fit school needs in terms of expertise, philosophy, and schedule.** Leaders of high-performing schools hire strategically to ensure new staff brings the expertise, philosophy, and work schedule that best supports the schools' needs. They go to extraordinary lengths to attract the highest-quality pool of job candidates, and they create detailed job descriptions that include not only the requisite knowledge and skills for the classroom but also the expectations for roles outside the classroom, including committee participation, mentoring, or tutoring.

  High-performing schools use several components in the interviewing process, including interviews with multiple stakeholders and demonstration lessons from those candidates they are most interested in hiring. School leaders and teacher teams devote significant energy and time to discussing potential candidates, often soliciting student input into the process, to ensure the candidate is the best fit with the schools' culture and instructional vision.

- **Integrating significant resources for well-designed professional development that provides expert support to implement the schools' instructional models.** Continuously improving schools view professional development as a way of life, and they embed it into the school culture and teacher schedules. In these schools, professional development is relevant to the specific curriculum and instructional materials that teachers use each day (Cohen & Hill, 2000; Holland, 2005) and to the specific learning needs their students demonstrate. High-performing schools strategically leverage experts both on-staff and from outside the school to provide the support that addresses particular teacher needs and affects student learning.

- **Designing teacher teams and schedules to include blocks of collaborative planning time effectively used to improve classroom practice.** Teachers need at least three hours of collaborative planning time each week to focus on improving classroom practice (Bodilly, 1998; Raywid, 1993; Swaim & Swaim, 1999). High-performing schools use this time for teachers to work on lesson plans together, dig through assessment data to understand what teaching strategies worked and did not, and discuss how to help individual students. Recognizing the large investment of this time, school leaders ensure it is well used by specifying clear expectations and standards and providing teachers rubrics or protocols as tools.

- **Enacting systems that promote individual teacher growth through induction, leadership opportunities, professional development planning, evaluation, and compensation.** High-performing schools recognize that teachers need ongoing opportunities and support as they move through different stages of their careers. They systematically develop teacher leaders who can share their expertise with the entire school, and they often use individual professional development plans for each teacher to ensure they get the support they need for ongoing improvement.

  These schools view evaluation as part of the capacity building process rather than as paperwork that must be filed, and they find ways to reward strong performance and higher contribution (Miles & Frank, 2008). Some high-performing schools connect compensation to a teacher's development, level of responsibilities, and effectiveness in improving student achievement.

Strategic use of time

Time affects all activities within a school — teaching, learning, collaborating, conducting assessments, and reviewing student work — yet most high school leaders do not feel that they have enough of this critical resource. Some want more time to work with students in laboratories, provide more support in literacy and math, or explore subjects through field studies, while others want to spend time addressing students' social needs through character education and community involvement activities.

Research supports the importance of student time, noting that it is not simply the quantity, but the quality, of time that affects student learning. Elena Silva's recent review of the literature on this subject notes that "the addition of high-quality teaching time is of particular benefit to certain groups of students, such as low-income students and others who have little opportunity for learning outside of school" (2007).

Education Resource Strategies' research of school-level resource use suggests that **high-performing schools use student time strategically, linking it to student learning needs by:**

- **Purposefully aligning the schools' schedules with their instructional models and student needs.** Leaders of high-performing schools examine the total time available and deliberately create a schedule that reflects their schools' instructional vision and strategies for meeting student needs. These schedules serve as a key tool for student success, and they support the schools' curricular, pedagogical, and professional development approaches. For example, a school focused on science and technology may build a schedule that includes longer blocks of time for laboratory work. Schools with a high percentage of underperforming students may add more instructional time in subjects where students are struggling.

- **Maximizing time on academic subjects, including longer blocks of uninterrupted time.** Our research shows that many students in urban secondary schools spend less than half of their time in core academic classes.* However, high-performing schools purposefully allocate significant time to core academics as it relates to student learning needs, and they build longer blocks of time to support learning in these subjects.

  These schools use various strategies to achieve this goal, including varying the lengths of classes for different subjects, staggering start times for different cohorts of students (and teachers), adopting block schedules, rotating bell schedules across multiple days and weeks, and offering noncore activities outside the school day.

- **Varying individual student time when necessary to ensure all students meet rigorous standards.** Silva continues, "Research shows that extending the right kind of time to the students who need it most can increase student learning and effectively close the achievement gaps between poor and minority students and their more affluent peers" (2007). By continuously measuring student learning, teachers at high-performing schools are able to identify specific student needs and vary time and program specifics to support each student successfully. Depending on student needs and school resources, schools provide this extra time in different ways, including tutoring, small group instruction, and customization of student schedules.

* ERS defines core academic classes as English, math, social studies, science, and foreign language.

Individual attention

Parents, teachers, legislatures, and the general public intuitively grasp the importance of individual attention. The most popular method of providing individual attention to students is to reduce class size — a costly reform that often does not achieve the intended effect when not strategically structured. High-performing schools recognize that no one program or policy will be sufficient, but rather having students be known well hinges on the interaction of many practices, programs, and choices.

High-performing schools **create individual attention and personal learning environments for *all* students by:**

- **Assessing student learning on an ongoing basis and adjusting instruction and support accordingly.** Teachers gather a variety of information about their students: They conduct exams and quizzes; they grade homework and writing assignments; they ask questions, listen to class discussions, and observe student interactions. Whether it is a formal, standardized measure or an informal checking-in, each of these data points represents a formative assessment of students' abilities and deficits related to a specific unit or curriculum. Teachers at high-performing schools conduct both formal and informal formative assessments, and most important, they use the data to inform their instruction. They provide students targeted support based on a demonstrated need.
- **Creating smaller group sizes and reduced teacher loads for targeted purposes.** Although parents and teachers routinely focus on reducing class size as a way to improve student performance, the research tells us that reducing class sizes for all students in all subjects does not guarantee improved student achievement (Mosteller, 1995; Hanushek, 1997). Instead, high-performing schools create smaller group sizes or reduced teacher loads in high-need subjects and grades (e.g., a teacher load of 55 students for a ninth grade math teacher, or a small group of 15 students for literacy).
- **Organizing structures that foster personal relationships between students and teachers.** High-performing schools use three categories of structures to create deeper relationships between students and teachers: advocates and advisories, in-school community structures, and looping. These structures organize student and teacher time so they have small group meeting times (advisory), weekly school meetings (community), or structured relationships that extend across multiple years (looping).

Appendix C

Comparative Leading Edge School Data on Diagnostic Resource Indicators (Average, Range)

Resource strategy 1: Invest to continuously improve teaching quality through hiring, professional development, job structure, and collaborative planning time.

Design principles	Diagnostic indicators	Range	Average
Hiring and organizing staff to fit school needs in terms of expertise, philosophy, and schedule	Use of a rigorous, strategic hiring process	–	–
	Core academic teachers with three or fewer years' experience	0–57%	23%
	Core academic teachers proficient in area of expertise	N/A	N/A
	Core academic teachers teaching more than one subject	0–100%	54%
	Leverage outside experts	–	–
Integrating significant resources for well-designed professional development that provides expert support to implement the schools' instructional models	Dollars per teacher spent on professional development (not including teacher time)	$734–$12,818	$3,753
	Staff with instructional leadership roles (not full-time equivalent)	3.3–30%	12%
Designing teacher teams and schedules to include blocks of collaborative planning time effectively used to improve classroom practice	Teacher year in PD (w/collaborative planning time)	10–17%	12%
	Total yearly teacher PD hours (w/collaborative planning time)	133–276	193
	Minutes of collaborative planning time per week	0–210	100
	PD in content-based activities	0–24%	12%
Enacting systems that promote individual teacher growth through induction, leadership opportunities, professional development planning, evaluation, and compensation	Span of review	4–34	16
	Regular review of teacher performance and growth that informs employment, support, and PD	–	–
	Teacher compensation for leadership roles	0–12%	1%

PD = Professional development

Resource strategy 2: Use student time strategically, linking it to student learning needs.

Design principles	Diagnostic indicators	Range	Average
Purposefully aligning the schools' schedules with their instructional models and student needs	Total yearly hours in noncore courses	89–440	216
	Student year in noncore courses	6–35%	17.3%
	Student year in theme-based activities	7–37%	23%
Maximizing time on academic subjects, including longer blocks of uninterrupted time	Total average yearly student hours	1,115–1,571	1,276
	Total average yearly core academic hours: All grades 9–12	437–934	733
	Total average yearly core academic hours: ninth grade 12th grade	 437–934 437–934	 744 645
	Total core academic hours over four years	2,156–3,737	2,934
	Average student year spent in core academic courses	36–75%	58%
	Use of block schedules, i.e., class periods longer than 70 minutes	–	–
Varying individual student time when necessary to ensure all students meet rigorous standards	Student time in academic support and enrichment	0–20%	6.6%
	Total yearly hours in academic support and enrichment	0–255	87
	Consistent graduation requirements for all students	–	–
	• Ratio of time in ninth grade math to average time in math • Ratio of time in ninth grade ELA to average time in ELA	0.92–1.08 0.91–1.13	0.99 1.03

ELA = English language arts

Resource strategy 3: Create individual attention and personal learning environments.

Design principles	Diagnostic indicators	Range	Average
Assessing student learning on an ongoing basis and adjusting instruction and support accordingly	Systems for tracking and reviewing individual student progress	–	–
Creating smaller group sizes and reduced teacher loads for targeted purposes	• Average overall class size • Average core class size • Average ninth grade core class size • Average math class size • Average ELA class size	17–23 16–24 17–28 7–22 8–27	21 20 22 18 18
	• Average overall teacher load (point in time) • Average core teacher load (point in time) • Average teacher load ninth grade core • Average teacher load math • Average teacher load ELA	17–135 17–124 17–141 37–133 35–140	82 76 83 79 82
Organizing structures that foster personal relationships between students and teachers	Average number of students assigned to an adult advocate/advisor providing academic and/or personal support	10–27	16
	Student to core academic teacher ratio	12–19	16
	Total yearly teacher hours spent in support and enrichment (other)	0–151	60
	Looping practices around strategically grouped students	–	–
	• Size of school (enrollment) • Size of student group in strategic core academic teacher teams	128–507 –	273 –

ELA = English language arts

Appendix D

Comparative Leading Edge School Data on Diagnostic Resource Indicators (by School)

Resource strategy 1: Invest to continuously improve teaching quality through hiring, professional development, job structure, and collaborative planning time.

Design principles	Diagnostic indicators	Range	Average	Boston Arts	High Tech High	Life Academy	MetWest	Noble Street	Pacific Rim	Perspectives	Tech-Boston	University Park
Hiring and organizing staff to fit school needs in terms of expertise, philosophy, and schedule	Use of a rigorous, strategic hiring process	–	–	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Core academic teachers with three or fewer years' experience	0–57%	23%	13%	N/A	38%	57%	9%	30%	30%	38%	0%
	Core academic teachers proficient in area of expertise	–	–	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Core academic teachers teaching more than one subject	0–100%	54%	48%	87%	76%	100%	49%	0%	67%	20%	39%
	Leverage outside experts	–	–	Noncore	Noncore	Core, Noncore	Core, Noncore	Noncore	–	Noncore	Noncore	Noncore
Integrating significant resources for well-designed professional development that provides expert support to implement the schools' instructional models	Dollars per teacher spent on PD (not including teacher time)	$734–$12,818	$3,753	$2,759	$298	$786	$2,386	$1,884	$734	$12,818	$6,940	$5,175
	Staff with instructional leadership roles (not full-time equivalent)	3.3–30%	12%	5.6%	1.6%	10%	18.8%	3.3%	30%	13%	15%	7.7%

(continued)

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Design principles	Diagnostic indicators	Range	Average	Boston Arts	High Tech High	Life Academy	MetWest	Noble Street	Pacific Rim	Perspectives	Tech-Boston	University Park
Designing teacher teams and schedules to include blocks of collaborative planning time effectively used to improve classroom practice	Teacher year in PD (w/collaborative planning time)	10–17%	12%	15%	15%	11%	12%	10%	10%	16%	17%	11%
	Total yearly teacher PD hours (w/collaborative planning time)	133–276	193	225	242	159	167	150	198	276	257	133
	Minutes of collaborative planning time per week	0–210	100	210	150	25	60	75	0	145	180	45
	PD in content-based activities	0–24%	12%	24%	7%	10%	0%	15%	0%	15%	22%	21%
Enacting systems that promote individual teacher growth through induction, leadership opportunities, professional development planning, evaluation, and compensation	Span of review	4–34	16	21.8	30	8	8.8	33.5	12	4	8.3	16.5
	Regular review of teacher performance and growth that informs employment, support, and PD	–	–	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Teacher compensation for leadership roles	0–12%	1%	0%	0%	0%	1.4%	0%	0%	12%	0%	0%

N/A = data not available, PD = Professional development

Resource strategy 2: Use student time strategically, linking it to student learning needs.

Design principles	Diagnostic indicators	Range	Average	Boston Arts	High Tech High	Life Academy	MetWest	Noble Street	Pacific Rim	Perspectives	Tech-Boston	University Park
Purposefully aligning the schools' schedules with their instructional models and student needs	Total yearly hours in noncore courses	89–440	216	440	240	94	432	268	89	152	90	137
	Student year in noncore courses	6–35%	17.3%	34.4%	19%	7.2%	35.3%	21.5%	5.7%	14%	6.9%	11.6%
	Student year in theme-based activities	7–37%	23%	37%	Integrated	24%	N/A	N/A	N/A	24%	7%	N/A
	Articulated instructional model	–	–	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maximizing time on academic subjects, including longer blocks of uninterrupted time	Total average yearly student hours	1,115–1,571	1,276	1,278	1,260	1,306	1,224	1,244	1,571	1,115	1,304	1,185
	Total average yearly core academic hours: all grades 9–12	437–934	733	539	771	837	437	700	934	726	771	886
	Total average yearly core academic hours: ninth grade 12th grade	437–934 437–934	744 645	606 460	885 621	766 766	437 437	653 693	934 934	789 536	735 N/A	888 712
	Total core academic hours over four years	2,156–3,737	2,934	2,156	3,084	3,348	1,748	2,800	3,737	2,904	3,084	3,544
	Average student year spent in core academic courses	36–75%	58%	42.2%	61.2%	64.1%	35.7%	56.3%	59.5%	65%	59.1%	74.8%
	Use of block schedules, i.e., class periods longer than 70 minutes	–	–	Yes	Yes	Yes	Yes	Yes	No*	Yes	No	No

(continued)

(continued)

Design principles	Diagnostic indicators	Range	Average	Boston Arts	High Tech High	Life Academy	MetWest	Noble Street	Pacific Rim	Perspectives	Tech-Boston	University Park
Varying individual student time when necessary to ensure all students meet rigorous standards	Student time in academic support and enrichment	0–20%	6.6%	8.5%	0%	7.6%	12.9%	0%	7.8%	0%	19.6%	3.5%
	Total yearly hours spend in academic support and enrichment	0–255	87	108	0	99	158	0	122	0	255	41
	Consistent graduation requirements for all students	–	–	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	• Ratio of time in ninth grade math to average time in math	0.92–1.08	0.99	1.02	1.00	1.00	1.00	0.93	1.00	1.08	1.00	0.92
	• Ratio of time in ninth grade ELA to average time in ELA	0.91–1.13	1.03	1.02	1.13	0.91	1.00	1.12	1.01	1.10	0.99	0.96

N/A = data not available, PD = Professional development, ELA = English language arts
* Pacific Rim uses a block schedule for 12th grade students, with 100-minute or 120-minute blocks.

Resource strategy 3: Create individual attention and personal learning environments.

Design principles	Diagnostic indicators	Range	Average	Boston Arts	High Tech High	Life Academy	MetWest	Noble Street	Pacific Rim	Perspectives	Tech-Boston	University Park
Assessing student learning on an ongoing basis and adjusting instruction and support accordingly	Systems for tracking and reviewing individual student progress	–	–	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	• Average overall class size	17–23	21	19.6	21	23	17	20	22	22	19	21
	• Average core class size	16–24	20	16	22	24	17	18	22	21	19	20
	• Average ninth grade core class size	17–28	22	17	25	28	17	21	24	20	18	23
	• Average math class size	7–22	18	19	22	19	7*	16	22	15	19	21
	• Average ELA class size	8–27	18	13	23	27	8*	17	22	15	19	17
Creating smaller group sizes and reduced teacher loads for targeted purposes	• Average overall teacher load (point in time)	17–135	82	71	53	104	17	135	65	113	87	90
	• Average core teacher load (point in time)	17–124	76	46	53	101	17	118	65	124	75	82
	• Average teacher load ninth grade core	17–141	83	52	51	100	17	140	73	141	81	91
	• Average teacher load math	37–133	79	37	55	88	N/A	133	66	115	58	79
	• Average teacher load ELA	35–140	82	35	51	106	N/A	120	66	140	69	68

(continued)

(continued)

Design principles	Diagnostic indicators	Range	Average	Boston Arts	High Tech High	Life Academy	MetWest	Noble Street	Pacific Rim	Perspectives	Tech-Boston	University Park
Organizing structures that foster personal relationships between students and teachers	Average number of students assigned to an adult advocate/ advisor providing academic and/or personal support	10–27	16	10	15	17	17	15	10–12	27	N/A	N/A
	Student to core academic teacher ratio	12–19	16	17	19	16	14	18	12	16	15	19
	Total yearly teacher hours spent in support and enrichment (S&E) (other)	0–151	60	36	24	40	151	88	139	63	0	0
	Looping practices around strategically grouped students	–	–	Yes (S&E)	Yes (Core, S&E)	Yes (S&E)	Yes (All)	Yes (S&E)	Yes (S&E)	Yes (Core)	Yes (Core)	Yes (Core)
	• Size of school (enrollment) • Size of student group in strategic core academic teacher teams	128–507 –	273 –	395 –	507 50	255 –	128 –	482 –	130 –	186 54	227* –	149 –

N/A = data not available, PD = Professional development, ELA = English language arts
* In SY2004–05, TechBoston only had ninth through 11th grades; it expanded to have ninth through 12th grades in SY2005–06.

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Rethinking the Cost of Small High Schools Project

The Bill & Melinda Gates Foundation supported Education Resource Strategies in a three-year effort aimed at building understanding and tools that would support districts in creating cost-effective systems of high-performing urban high schools.

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