On Track for Success

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The Use of Early Warning Indicator and Intervention Systems to Build a Grad Nation

CIVIC ENTERPRISES

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Introduction

Many of America's children are on track for success, but far too many are falling behind. While some of our nation's most precious resources—our future doctors, teachers, and engineers—are reading above grade level, solving complex algebra equations, and applying what they learn in the classroom beyond the schoolhouse walls, many are struggling to keep up. Some have simply stopped trying. Too many have difficult life circumstances. Others do not see the connection between school and their dreams. In America today, one in four children fails to graduate from high school on time. Even fewer finish college.

A student's decision to drop out of high school is not a sudden act, but a slow process of disengagement over a period of years. With good research in recent years, it is clear that warning signs of dropping out are apparent well before students actually leave school, signaling the gathering storm of trouble for some as early as the elementary or initial middle grades. Research also shows that most students at risk of falling off track could graduate if they were provided with the appropriate supports early enough and those supports were sustained.

Over the past decade, schools, districts, and states have become increasingly savvy with data collection and analysis to drive student outcomes. The development and use of Early Warning Indicator and Intervention Systems (EWS) are at the cutting edge of the data-driven, outcomes-focused, high-impact education movement. These systems can increase educators' effectiveness by helping them use data to identify those students who are on track to graduate, and those who are falling behind, far enough in advance to provide appropriate interventions.

The stakes are high. Dropping out has significant consequences to individuals, communities, and the nation. The dropout crisis costs individuals millions of dollars in lost income over their lifetimes. Communities with high dropout rates also tend to have the most unforgiving labor markets, making it difficult to find work without the necessary credentials. Dropouts tend to be missing from the civic lives of their communities, with much lower rates of volunteering, voting, and other indicators of civic health. The U.S. economy loses billions of dollars in revenue from a lack of productive workers and increased social services. At a time when America suffers a serious skills gap and U.S. companies struggle to find enough qualified workers, the dropout crisis threatens U.S. global competitiveness.

For too long, educators have lacked important data on key signs of early challenges for students. As a result, students with needs are sometimes ignored altogether or supports are provided to large numbers of students who are not at risk of dropping out, or not provided to those who need it most. This misallocates educators' efforts and precious educational dollars. Now, EWS can help change that. Leaders in education reform, including those championing the Civic Marshall Plan to build a Grad Nation, have identified EWS as a key tool to promote student achievement and a benchmark against which the nation can chart its early progress in stemming the dropout tide.

This report represents the first national assessment of EWS at the district, state, and national levels.[1] It shares evidence from the latest research and best practices from the field so that parents, educators, administrators, business leaders, and legislators can be better equipped to keep children on track to graduate high school, prepared for college and career success.

Executive Summary

Early Warning Indicator and Intervention Systems (EWS) are an evolving strategic response to one of our nation's most pressing challenges: enabling all students to stay on track to graduate from high school ready for college and career. In an era of data-driven education reform, EWS are at the cutting edge. Their rapid development is a harbinger of how schools, students, educators, and communities can be empowered to use data to help children achieve their dreams for generations to come.

EWS use "real time" or "near real time" data to identify students who are off track, so that educators can appropriately support them in advancing from grade to grade, and eventually in graduating from high school with their class. These systems grew out of a simple premise that disengagement from school is a gradual process and that students send identifiable signals that they are on the path to dropping out. As a result, data could be used to identify trends among students, enabling educators to intervene with those who are likely to leave the education system unless they are effectively supported.[2] From an initial focus on dropout prevention, EWS are rapidly evolving toward even broader usage, with emergent efforts underway to examine and ultimately integrate both school readiness indicators at the start of student's schooling, and college and career readiness indicators during K-12 schooling.

What is an Early Warning Indicator and Intervention System (EWS)?

Early Warning Indicator and Intervention Systems represent a collaborative approach among educators, administrators, parents, and communities to using data effectively to keep students on the pathway to graduation. The best EWS are characterized by a combination of features that enable rapid identification of students who are in trouble; rapid interventions that are targeted to students' immediate and longer-term need for support, redirection and greater success; the frequent monitoring of the success of interventions; a rapid modification of interventions that are not working; and shared learning from outcomes.

Nearly a decade of research supports the predictive power of EWS, and education leaders who champion the Civic Marshall Plan (CMP) to build a Grad Nation identified EWS early on as a key strategy to help drive student achievement. The CMP calls for EWS implementation and integration into schools across the country—especially the over 1,600 "drop out factory high schools" that struggle to graduate a majority of their students on time, the 3,000 high schools in which 61 to 75 percent of students don't graduate on time, and their feeder middle and elementary schools.[3] (Please see Appendix 1 or visit **www.civicenterprises.net/reports** for additional information on the Civic Marshall Plan to Build a Grad Nation, which has two goals: 90 percent high school graduation rate by the Class of 2020—those starting fourth grade this year—and later years, and the highest college attainment rate in the world.)

Though research-based, EWS are an evolving practice still at the vanguard of data usage. As a result, a need exists to share leading research, to document best practices, and to capture lessons learned from the field. That is why Civic Enterprises and the Everyone Graduates Center at Johns Hopkins University have come together to produce the first national assessment of EWS at the local, state, and national levels. Over the last year, we conducted site visits and interviews in 16 selected districts and communities and in seven states. These visits were informed by a research review of hundreds of scholarly articles.

From Detroit to Dallas, and Massachusetts to California, common trends and cautionary tales emerged about EWS design and implementation. This report provides an overview of the research informed by conversations with teachers working on the front lines, district and state officials in the process of building EWS, nonprofits working with school systems to implement EWS, and leading researchers working to refine and extend early warning indicators. We then outline emerging best practices and policy recommendations, so that advocates for children from the schoolhouse to the White House can apply the best in data innovation to their work, with the hope of accelerating high school graduation rates, improving college and work readiness, and ultimately strengthening American competitiveness in an increasingly global economy.

LESSONS FROM THE RESEARCH

The development of predictive early warning indicator data systems has occurred rapidly over the past decade. In the early 2000s, researchers from the Consortium on Chicago School Research, the Center for Social Organization of Schools at Johns Hopkins University, and the Philadelphia Education Fund set out to identify the most highly predictive factors of dropping out. They identified three key factors—the ABCs—that were better predictors of student outcomes than demographics or test scores: Attendance, Behavior, and Course passing/ performance.[4 5] In the last five years, their initial findings have been validated many times with state and large district longitudinal studies in Arkansas, Boston, Colorado, Florida, Indianapolis, Metropolitan Nashville Public Schools, and Tennessee.[6] Research has also identified consistent thresholds for these indicators, though they should be assessed prior to implementation based both on local goals and policies. They indicators and their thresholds are:

- **Attendance:** Missing 20 days or being absent 10 percent of school days;
- **Behavior:** Two or more mild or more serious behavior infractions; and
- **Course performance:** An inability to read at grade level by the end of third grade; failure in English or math in sixth through ninth grade; a GPA of less than 2.0; two or more failures in ninth grade courses; and failure to earn on-time promotion to the tenth grade.

LESSONS FROM THE FIELD

The EWS field is dynamic. The early adopters of EWS at the state, district, and local levels have implemented EWS in a variety of ways. With few "one size fits all" prescriptions, in the conversations and site visits with 16 selected districts and communities and in seven states, common threads tied together the creation, design, and implementation of EWS. We found that to be successful: 1) vision and mission matter; 2) technical components must be strong; and 3) resources must be assembled and maximized, fully engaging stakeholders to use data to guide intervention at the scale and intensity required.

States, Districts, and Schools Collect and Use Data in a Variety of Ways

States vary in how much, and how frequently, data are collected and redistributed to users. A third of the states currently have all the information for an EWS in their state longitudinal data systems, while a third have no plans to collect it. Only a few states explicitly consider EWS as a part of the state accountability system. Others recommend an opt-in approach. Some states collect district and school data weekly and daily, in "near real time" or "real time." Others collect this information once a year. A few states and districts redistribute data to the schools in "near real time." Others have yet to do so. Locally, some schools have created systems independently, without district or state support or mandate. Some EWS are highly technical. Others are done by hand. In sum, data are being collected and used differently across the country—and we can learn from these lessons.

- 18 states collect discipline data daily, 17 states collect enrollment data daily (which students are supposed to be in school), 12 states collect attendance data daily (which students are actually in school), and 11 states collect enrollment, attendance, and discipline data daily. Five states—California, Colorado, Illinois, New Jersey, and New York—do not collect student-level attendance at all.
- 16 states produce early warning reports while another 16 states report that they have no plans or have no set date for doing so.[7] Of those producing the reports, only four states report that they distribute them to educators on a weekly or daily basis.[8] Such early results in the use of state systems for early warning reports show some of the challenges of aggregating data in a timely fashion at the state level and sharing that data with educators and other stakeholders who can take appropriate action.

Vision and Mission Matter

The site visits showed that Early Warning Systems are, almost by definition, promoted in places that have been able to make their commitment to educational improvement explicit—and for the long haul. EWS reflect a belief that every student can succeed with the appropriate support. Barriers also exist to the full and

successful implementation of EWS. To be able to effectively use attendance, behavior and course-performance data, school-level leadership must share a collective vision that graduation rates can be improved through the timely and data-driven identification of students who require additional supports paired with an organized system to provide them. School-based personnel must buy into the concept of the expanded data-driven culture. Leadership from superintendents and principals matters, with engagement of teachers, counselors, parents, and community stakeholders.

- Louisiana and Virginia have set high standards for vision and mission by explicitly considering EWS as part of the state accountability systems.
- Several other states including South Carolina, Tennessee, and Texas, have demonstrated their commitment to building EWS capabilities and using them to support on-going graduation rate and school improvement efforts.
- Other states, including California, Massachusetts, and Washington, have launched pilot or model programs with the goal of later expansion.

Technical Components Must Be Strong

Data, data usage, and system design can promote student achievement. Before an educator can deploy resources effectively to the students who need them, he or she must be able to accurately identify which students are on track and which are off track to graduate with indicators that research tells us are, in fact, predictive. The issues of data usage, by whom, and for what purposes, while protecting privacy and ensuring compliance with existing regulations, can combine to either overwhelm users or streamline interventions.

- Inaccurate data produce incorrect recommendations for intervention, citing too many, too few, or misidentified students as "off track" and for the wrong reasons. The ad-hoc organization of data entry can reduce accuracy. To address this challenge, some early warning data systems, such as the Metro Nashville system, have built in validation levers with an opportunity for data correction.
- Too much information can reduce buy-in and ownership at the school level. Several solutions have emerged to reduce the burden of too much information including a focus on reporting around a few key research-based predictive indicators. In some schools, color-coded "support lists" are provided for teams of educators that outline which students are struggling to show up, which students misbehave, which students are struggling academically, and who is receiving which intervention with what result

Resources Must Be Assembled and Maximized

Data points alone are not sufficient. To turn data into results, appropriate interventions must be assembled and human capital must be available. Building intervention systems that meet the scale and scope of the identified needs are essential to the long-term success of EWS.

- EWS need to inform, and be integrated into, school improvement efforts. Ultimately, the goal of EWS is to ensure that students have the support needed to succeed in school. This will involve both increased and more tailored individual supports, and practice and policy improvements at the classroom, school, district, and state levels. If EWS are just viewed as stand-alone, add-ons for high-needs students, their full power and impact will not be realized.
- Resources to support effective EWS exist, both inside and beyond the schoolhouse walls. Teachers can be organized into more effective teaching teams; educators can make better use of existing support personnel; and community organizations can provide wrap-around services like mentoring and tutoring or refer students for more intensive supports. Public-private-nonprofit partnerships can be key to maximizing existing resources and identifying new ones.
- Stakeholders can share knowledge, needs, and ideas. They can serve as mutual resources, from initial design through refinement of EWS to meet needs in cost-effective ways. For the last five years, educators and EWS developers have been constantly learning from each other—across state, district, and school boundaries—exchanging information that assists each organization in improvement.

PATHS FORWARD

Stakeholders from all sectors, including parents, educators, administrators, legislators, business leaders, and funders, can apply the lessons learned about EWS to the content of their work.

To inform this work, we outline emerging best practices, highlight areas of needed research, **and make policy recommendations at the local, state, and national levels.**

Emerging Best Practices: Four Key Questions Were Identified, and Recommendations Made, for Successful EWS Planning and Implementation.

- **Key Question 1:** What Types of Data Will Be Recorded? When implementing or updating an EWS, stakeholders must determine what data can—and should—be recorded.
    - Put the student first. Data helps to identify students and craft interventions, but the success of the student is the ultimate goal.
    - Use research-based indicators and thresholds and respond to student behavior well before triggers for more intensive interventions are reached.
- **Key Question 2:** How Will Data Be Recorded? Stakeholders must consider what data will be kept, and by whom, when implementing or updating an EWS.
    - EWS can be implemented as early as the later elementary school years and should cover key transitions (i.e. sixth and ninth grade).
    - Record data from the simplest and most direct source possible.
    - Ensure data are entered by appropriately trained personnel following well-designed protocols. The quality and utility of a data system depends on the accuracy of the data stored within the system. Data must be consistently coded and coding protocols followed daily.
- **Key Question 3:** How Will EWS Data Be Used? Once data are in a system, they must be converted into actionable reports—and these reports should inform the work of educators.
    - Use the advantages of technology to compile information into easy-to-understand data presentations. Transparency and usability should be the goals for these reports.
    - Explore issues of privacy. Ensure that children's privacy is protected while also leveraging data to effectively promote their success.
    - Teach people how to understand and use data and provide follow-up coaching for data use. Provide training and professional development to help educators and administrators learn how to leverage the power of data effectively. Compose a "support list" of students, revise it every few weeks, and act on that data.
- **Key Question 4:** Who Should Be Consulted in the Planning and Implementation Phases of EWS and What Are Their Roles? Stakeholders from the education, private, public, and nonprofit communities can do more to promote student achievement together than they can alone.
    - Provide local leadership for EWS. Every early warning indicator and intervention system needs a champion who will advocate for it constantly at the school, district or higher level.
    - Have a development and implementation plan and timeline.
    - Listen to the end-users and find out what they want before going too far. Convene focus groups and build up from a pilot.

- Integrate EWS into instructional improvement efforts and other student support services. High performing EWS link efforts to keep students on the graduation path with school-wide efforts to improve instruction.
- Engage stakeholders beyond the school system. EWS are only effective when paired with research-based interventions. Partnerships matter—from design of data systems to collaborations on interventions.

Needed Research to Enhance the National Knowledge Base

Much is known about early warning indicators, but much less is known about the complex set of conditions and policies that underlie the most effective implementation and outcomes. Three actions are recommended to advance the knowledge in the field:

- **Create federal, state, and district-level workgroups to study and guide dropout prevention and graduation improvement efforts with a specific focus on policies that may contribute to or distract from increasing high school and college and career readiness rates, on a state-by-state basis.** Substantial differences exist surrounding the conditions of education in the different states. These policies are worthy of reexamination in light of the renewed U.S. commitment to graduating greater percentages of students who are better prepared.
- **Conduct state and district surveys.** Determine the extent to which early warning indicator and intervention systems are being implemented in districts and schools, and the characteristics of the districts that have implemented these compared with the characteristics of those that have not.
- **Conduct design studies, multi-site implementation analyses, and random control trials to determine the characteristics of the most effective early warning indicator and intervention systems.** Despite the fact that early warning indicator and intervention systems are based on research and appeal to common sense, a well-controlled study that examines impact has not yet been conducted. As part of the scale up of EWS, sound research on their effectiveness, under different conditions, should be conducted as soon as possible.

Policy Recommendations to Accelerate the Effective Use of EWS for Local, District, State, and Federal Stakeholders.

Policymakers can significantly advance this ground-level work by enacting high-impact levers at the district, state, and federal levels. Highlights of these recommendations, which are organized around the Civic Marshall Plan's three key recommendation areas, are listed here.

Take Action within Low Graduation Rate Communities.

- **Engage all stakeholders, including nonprofits and corporations.** Nonprofit organizations have much to offer schools as bases for research, as sources of experienced planners, and as providers of interventions when schools require additional capacity and resources. The business community has much to contribute to the successful design and implementation of EWS, especially in terms of human capital and technical expertise.
- **Link EWS to the ABCs.** Research has consistently shown that Attendance, Behavior, and Course Performance are the strongest predictors of whether a student is on-track to graduate. Require the use of data-driven and research-based criteria to define each of these three dropout indicators. Tie these ABC indicators, and the research-based cut points, to EWS and high school completion efforts.
- **Build the infrastructure to support the development of EWS at all grade levels.** Align graduation acceleration efforts with college and career readiness efforts through the Common Core Standards initiative. Drive attention to the later elementary, middle, and ninth grades.
- **Ensure that federal funds, especially Title I dollars, are targeted to the highest need schools.** This can be accomplished by providing additional financial support to schools in which 75 percent or less of the senior class graduates.
    - **Target funds and attention to districts and schools most in need, expanding the focus from urban districts to rural districts and schools that may not have technical or personnel capacity for EWS.** Rural schools looking for resources can also turn to Rural Development State Offices for support as well as to The Rural Education Achievement Program (REAP) Rural and Low-Income School Grant Program for funds.

Build and Enable State and District Capacity to Improve Graduation and College Readiness Rates.

- **Invigorate existing policies that encourage graduation and implement best practices.** Examine policies that may act as a disincentive to graduate, including double jeopardy policies that react to one negative indicator (e.g. poor attendance) by enacting another (e.g. suspension).
- **Ensure that investments in developing the data systems needed for EWS are consistently paired with efforts to build intervention systems and policy reviews, particularly at the state and federal levels.** Public and private grant makers should encourage the integration of early warning indicator and intervention systems with related indicator and data-driven improvement efforts.
    - **Require EWS for federal education funds.** Require states, districts, and schools with less than 75 percent cohort graduation rates, and which receive federal or state school improvement grants of any kind, to implement an early warning indicator and intervention system based on longitudinal data analysis.
    - **Use funding streams to support efforts on the ground,** such as Title I Section 1003(g) of ESEA, Title I Part A of Elementary and Secondary Education Act (ESEA), and Title I Section 613 of Individuals with Disabilities Education Act (IDEA).
    - **Amend federal regulations involving the Supplemental Educational Services section of Title I** to encourage and enable EWS either through re-authorization of ESEA or the emerging waiver process.
- **Collect and share data and best practices by convening a summit of early adopters of EWS,** including school, district, and state representatives, as well as community-based organizations and legislators, to share best practices and accelerate effective EWS usage.
- **Improve data collection.**
    - Collect information on the status and challenges of EWS implementation at the state level through the addition of EWS-focused questions in the annual Data Quality Campaign survey. Carry out similar efforts with districts through the National Center for Education Statistics (NCES) or other organizations.
    - Require states to collect information from school districts on chronic absenteeism and require school districts with high levels of chronic absenteeism to develop district-wide plans to reduce it. The re-authorization of ESEA Title I, Part A, Section 1111 should be amended to ensure that student attendance and chronic absenteeism are effectively tracked and those students with attendance rates less than 90 percent are accurately identified as at risk of dropping out.

Accelerate Graduation Rates by Strengthening the Public Education System.

- **Keep data-based dropout prevention and recovery in the forefront of public attention, particularly because of the economic downturn.** For minimal up front costs EWS can help nonprofits, schools, districts, and states better target their resources to students at risk of dropping out. EWS can minimize the costs of sweeping programming and help provide interventions to those most in need.
- **Update state and federal accountability systems to leverage the highest-impact data.** This can be done initially through waivers, and permanently through the reauthorization of ESEA. Any states that receive relief from the current accountability systems should be held accountable for having a strong EWS. The reauthorization of ESEA, Title I, Part A should then ensure that states, districts, and schools have the resources they need to have strong EWS.
- **Clarify and better communicate the implications of Family Educational Rights and Privacy Act (FERPA) to stakeholders.** The protection of children's privacy must be balanced with the need for stakeholders' support. When issuing new rules surrounding FERPA before the end of 2011, the Department of Education should make clear that data systems can be tailored to ensure that parents, nonprofits, professional providers, and other state and local agencies only have access to the data they require to support the students they serve.

Part I: The Purpose, Current Design, and Potential of EWS

Early Warning Indicator and Intervention Systems (EWS) are an evolving strategic response to one of our nation's most pressing problems: the high school dropout crisis and the need to graduate high school students who are ready for college and career success. More broadly, EWS are also part of a wider evolution of an education system that is re-inventing itself, and using data along with other tools to move from simply setting standards and hoping students succeed to providing clear pathways to success. To support students and ensure they have the skills necessary to fully participate in the 21st century workforce, educators, parents, and communities need tools to rapidly identify and successfully support students—as soon as they show signs of being off-track. The last 20 years have seen an increase in the use of data to drive educational improvement in states, districts, schools, classrooms, and at the individual student level, from kindergarten through college. Our investigation indicates that EWS are among the most promising of next generation strategies for using data to increase educational outcomes, as they provide educators with the predictive tools and response systems they need to guide decisions and support student success. The value of using EWS is just beginning to be recognized as a key to how schools, students, educators, and communities can use data to help children achieve their dreams.

THE NEED – THE DROPOUT CRISIS IN HIGH SCHOOL AND COLLEGE

While the nation has made progress in boosting high school completion rates in some states and communities, the rate of progress is too slow to meet national goals.[9] With a national graduation rate of 75 percent in 2008 (up from 72 percent in 2001),[10] one-fourth of all public high school students and 40 percent of minorities still fail to graduate on time.[11] Further, the dropout rate exceeds 50 percent in many of the nation's most challenged urban and rural schools. Nationally, the high school dropout crisis claims more than one million students each year.[12] Of the students who do complete high school, only 70 percent enroll in a postsecondary institution.[13] [14] Of this 70 percent, only 57 percent complete a bachelor's degree within six years,[15] and only 28 percent complete an associate's degree within three years.[16] In some high poverty urban schools, the college graduation rate is often in the single digits.[17]

The dropout rate exceeds 50 percent in many of the nation's most challenged urban and rural schools. The cost of our nation's education achievement gap is equivalent to two to four percent of GDP and imposes the "economic equivalent of a permanent national recession."[18]

The stakes for improving the U.S. educational system and reducing the dropout rate are high. A labor market skills gap accompanies the crisis in high school and college completion. The majority of job openings in the next decade will require at least some postsecondary education.[19] Experts estimate that American businesses are in need of 97 million middle- and high-skill workers, yet only 45 million Americans possess the necessary education and skills to qualify for these positions.[20] The lagging rates of high school completion are linked to broader societal and economic impacts including lost wages, taxes, and productivity, along with the financial stability of individuals and their quality of life, the economic health of our rural areas, towns, cities, states, nation, and U.S. global competitiveness. A high school dropout earns, on average, about $260,000 less than a high school graduate over a lifetime.[21] Lost wages and accompanying social costs accumulate. In fact, a 2009 report estimates that the cost of our nation's education achievement gap is equivalent to two to four percent of GDP and imposes the "economic equivalent of a permanent national recession."[22]

THE RESPONSE TO THE NEED – THE CIVIC MARSHALL PLAN TO BUILD A GRAD NATION

Accelerating high school and college completion rates will help to secure the future of individual Americans, households, and the nation. Beginning in 2010, education, policy and community leaders, including the America's Promise Alliance, Civic Enterprises, the Everyone Graduates Center at Johns Hopkins University, and the Alliance for Excellent Education came together around Grad Nation, a 10-year campaign to end the high school dropout crisis.[23] The engine of the Grad Nation initiative is the Civic Marshall Plan (CMP),[24] a plan of action to meet the Grad Nation goal of a 90 percent high school graduation rate nationwide for the Class of 2020 (those in fourth grade during the 2011-2012 school year) and beyond, with all graduates ready for college and the 21st century workforce.

Raising the national graduation rate 15 percentage points in nine years, and by 30 percentage points in states with current graduation rates hovering at 60 percent, is a formidable, but not insurmountable challenge. Statistics and case studies presented in *Grad Nation: Progress and Challenges (2010)*[26] and *Grad Nation: Progress and Challenges, Annual Report 2011*,[27] demonstrate that sustained increases in graduation rates of three percentage points per year have occurred in several states and districts over the last six years. These successes resulted from clear goals, high expectations, smart education policies, good use of data, supports for educators and students, and multi-sector collaboration. Continued success will be possible as the lessons learned, which are documented in these publications, are adopted and refined.

The Civic Marshall Plan and Early Warning Indicator and Intervention Systems

The Civic Marshall Plan (CMP) focuses on using the main, evidence-based levers for addressing the dropout problem, improving the graduation rate, and increasing college attainment. It emphasizes a multi-sector approach that engages national, state, and community stakeholders in different roles to affect individual, community, state, and national outcomes. Spearheaded by four convening partners, the effort is also guided by a CMP Leadership Council that grew out of 2010 roundtable discussions among three key constituencies: 1) policymaking institutions, such as the National Governors Association and the National Conference of State Legislatures; 2) associations representing educators, such as the National Association of Secondary School Principals, the American Association of School Administrators, the American Federation of Teachers, and the National Education Association; and 3) community-based organizations, including City Year, Communities In Schools, United Way, Big Brothers and Big Sisters, and the Boys & Girls Clubs, as well as key national foundations and

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corporations. This group is a highly-focused, targeted collaboration committed to transforming the lowest-performing schools and providing pathways to postsecondary success for students. They are aligning mission-focused efforts with the CMP framework and benchmarks, executing these efforts, and supporting strong, cohesive national and state policies that advance the CMP. The CMP framework includes 16 research-based strategies[28] for improving the graduation rate by 2020, coupled with indicators and annual reports for tracking and reporting progress.[29] EWS were identified early in this campaign as a key strategy to help drive student achievement. The CMP calls for EWS implementation in the nearly 1,700 high schools with 60 percent or lower graduation rates ("dropout factories," found in 49 states) and their feeder middle schools by the beginning of the 2012-2013 academic year,[30 31] and the more than 3,000 high schools with marginally better graduation rates (61 to 75 percent) that are still below the national average. (For additional information on the Civic Marshall Plan to Build a Grad Nation, please see Appendix 1 and visit **www.civicenterprises.net/reports.php.**)

A Note to Educators

Children's lives change in classrooms and America's educators are preparing the next generation of our nation's leaders. Teachers are under increasing pressure to produce results—and prove their effectiveness. We believe, based on conversations with educators across the country, that well-implemented EWS can make educators' jobs more manageable and more influential. EWS are not meant to be another reporting mechanism or complex data protocol. Rather, EWS are meant to be an easy-to-use tool to make teaching, counseling, and coaching more effective by providing data that enables educators to pinpoint a student's specific challenges and align resources to address them.

WHAT IS AN EARLY WARNING INDICATOR AND INTERVENTION SYSTEM (EWS)?

Early Warning Indicator and Intervention Systems represent a collaborative approach among educators, administrators, parents, and communities to using data effectively to keep students on the pathway to graduation. The best EWS are characterized by a combination of features that enable rapid identification of students who are in trouble; rapid interventions that are targeted to students' immediate and longer-term need for support, redirection and greater success; the frequent monitoring of the success of interventions; a rapid modification of interventions that are not working; and shared learning from outcomes. These systems are implemented at the school level, sometimes in conjunction with community partners, and are sometimes supported with data supports and analysis from districts and/or states. In some emerging cases, these systems are also being used at the district level to organize and allocate resources and monitor the effectiveness of interventions.

EWS Premise, Promise, and Collective Approach

EWS grew out of a simple premise that data could be used to identify trends among students, enabling educators to intervene with those who are likely to leave the education system unless they are effectively supported. For generations, highly competent teachers, counselors, and administrators have understood and acted on the construct that early intervention matters. They designed interventions for individual students by evaluating information from day-to-day status reports in grade books, attendance, and other school records, coupled with anecdotal information gained in the hallways. EWS seek to bring this approach to scale and build it around evidence-based practices. EWS refine, systematize, and redirect data to educators, identifying students who would be likely to either dropout or graduate unprepared to succeed in college and career. Even more importantly, they help guide educators toward the most efficient and effective responses, which include not only student-level interventions but also classroom, school, and even district and statewide actions. EWS are premised on a body of well-documented research that a student's decision to drop out is not a sudden act, but a slow process of disengagement over a period of years, with clear warning signs apparent well before students actually leave school.[32]

Definitions

Early warning systems are an emerging practice that lack standard definitions. The following definitions, which we use in the report, are based on our analysis of current usage. Our goal is to generate discussions that lead to standard definitions.

Off-Track Indicators are measures of student behavior and/or performance linked to empirically derived thresholds, *below which* students have strong probabilities of not achieving essential educational outcomes like graduation from high school—unless effective interventions are applied. At a minimum, students below the identified threshold should have a less than a 50 percent probability of achieving the desired outcome and some argue for setting a higher bar at 66 percent or even 75 percent to produce greater efficiencies. Off-track indicators should also be based on readily available data that is typically measured continuously over time to enable tracking of both improvement and further decline. Off-track indicators should have a statistically significant independent effect on predicting the desired educational outcome. In the most robust efforts, potential indicators are tested against each other and examined in concert to establish the most parsimonious set of indicators with the highest yield (e.g. total number of all dropouts predicted). Indicators that are highly predictive, but only identify a small percent of students who fail to achieve the desired outcomes, should not be used. Students with off-track indicators are in need of interventions.

On-Track Indicators are measures of student behavior and/or performance linked to empirically derived thresholds *above which* students have strong possibilities of achieving essential educational outcomes like enrolling in college. They have the same other properties as off-track indicators, except it is the absence of the indicator which suggests that interventions are required. Students with on-track indicators are not in need of focused interventions like off-track students; but their progress should still be monitored to enable rapid response if they begin to slip, as well as to track efforts to accelerate their success.

Early Warning Flags identify students who are moving towards thresholds of behavior or performance that indicate they are off track, or away from thresholds that indicate they are on track. These can be empirically derived but are also sometimes based on educator knowledge and common sense. For example, students who have missed 10 percent or more of school over several months, or students who have failed two major tests, and/or have sudden downward shifts in attendance, behavior, or course performance should be flagged. Early warning flags are designed to say: "take notice, monitor, investigate, talk with the student, problem solve, and provide opportunities for rapid recovery." Flags can prevent students from ever achieving an off-track indicator, as well as help students stay on track.

Early Warning Systems (EWS) are organized efforts at the school, district, or state level to provide data systems that can identify students with off- and/or on-track indicators combined with systematic and tailored intervention. This data can be shared with stakeholders including administrators, teachers, guidance counselors, coaches, nonprofit partners, parents, and students. Increasingly, early warning system flags are combined with a systematic approach to diagnosis, enhancing educators' ability to provide the appropriate interventions or supports to the identified students. The highest standard EWS also organize district-, school-, and/or classroom-wide prevention activities to keep students from falling off track; monitor and track the effectiveness of interventions; link use of on- and off-track indicators to efforts to improve classroom instruction, schools and school systems; and analyze and reform policies and practices which explicitly or implicitly work against the desired outcome.

Data-Driven School Improvement includes efforts to use data and data analysis to improve student outcomes. EWS are one example of data-driven school improvement, as is the practice of using benchmark assessments. Both strategies benefit from discussions by educators organized into professional learning communities, enabling improved classroom practice and developing more efficient and effective means to support students by allocating resources at the classroom, school, district, and state level. Coaches—master educators with time allocated to guide their colleagues in the use and interpretation of and reflection on data—have proven to be important assets in making data driven school improvement work.

Over a decade of research supports the development of EWS. Key early warning indicators and their thresholds are:

- ***Attendance: Missing 20 days or being absent 10 percent of school days;***
- ***Behavior: Two or more mild or more serious behavior infractions; and***
- ***Course performance: An inability to read at grade level by the end of third grade; failure in English or math in sixth through ninth grade; a GPA of less than 2.0; two or more failures in ninth grade courses; and failure to earn on-time promotion to the tenth grade.***

THE ABCS – PRIMARY, PREDICTIVE INDICATORS ARE AT THE HEART OF EWS

Teachers have long remarked, "I can teach them if they will only come to school." Others have amended that statement to include "on time." Still others add, "if they pay attention and stay out of trouble." Research corroborates these anecdotes and demonstrates that there are certain highly predictive indicators.[33] These are the ABCs of EWS:

- **Attendance**,
- **Behavior**, and
- **Course performance**.[34]

Why the ABCs? Detailed Lessons from the Research Base

The development of predictive early warning indicator data systems has occurred rapidly over the past decade. Prior attempts to identify potential dropouts and intervene effectively often relied on data from a fixed point in time, including a student's social background, educational experiences, and school characteristics. In the early 2000s, researchers set out to investigate accurate predictors of dropouts. The Consortium on Chicago School Research and the Center for Social Organization of Schools at Johns Hopkins University, working with the Philadelphia Education Fund, assembled retrospective data on multiple longitudinal cohorts that enabled researchers to follow students over time and study how a student's behavior at one point in time impacted later outcomes. The Chicago research followed students beginning in the eighth and ninth grade forward; Philadelphia's from the sixth grade. Both demonstrated that indicators of student behavior—the extent to which students attended school regularly and succeeded in their courses—could accurately identify the vast majority of students who did not graduate.[35] [36] The Philadelphia research also showed that sustained mild misbehavior, which earned middle grade students poor behavior marks, also had strong predictive power. These analyses found key factors—the ABCs—were much more predictive of student outcomes than demographics or test scores. By extrapolation, the data led to identification of thresholds and flags that could predict warning signals for future students.

In addition to identifying the predictive power of the ABCs, the Chicago and Philadelphia research showed the importance of students having successful transition years in sixth and ninth grades. These two major research investigations were then followed by analysis from other leading research centers, states, and school districts, which independently confirmed the predictive power and importance of the ABCs. This work also extended and refined the understanding of how early warning indicator systems operate across the grade spans. Retrospective studies helped to identify the thresholds that predicted whether students were on track or off track for high school graduation. Projective studies, which followed students out of high school and into the future, linked high school performance with post-secondary outcomes.[37]

The emerging work regarding on- and off- track indicators shows that in order for all students to graduate college and career ready, several key transitions must be navigated and students who struggle with them are thrown off the graduation path. In the elementary grades, it is critical for students to master key academic skills that provide the foundation for future learning. The emerging evidence indicates that chronic absenteeism in the early grades inhibits this, and hence consistently attending school from kindergarten forward

Warning signs of dropping out are apparent well before students actually leave school, signaling the gathering storm trouble for some as early as the elementary or initial middle grades.

matters. The evidence is also clear that grade-level reading by at least the end of third grade matters. Further, by early adolescence it is critical that students firmly believe that doing well in school is important and that they come to school regularly, and engage positively in their classes. The existing evidence indicates that from the fourth grade on these behaviors begin to shape graduation outcomes. In high school, skills and behaviors continue to matter but credit accrual is the currency of advancement, and passing courses becomes paramount. Our understanding of what it takes to successfully make the transition to college and career training is just emerging, but existing evidence suggests that good grades and strong attendance signal the possession of key attributes.

Early Grades Indicators

The predictive power of the ABCs holds true for the early years. A longitudinal study of more than 20,000 children in kindergarten through the fifth grade in 900 schools across the country found high rates of chronic absenteeism and a strong link between early absenteeism and later struggles in school.[38] Chronically absent kindergartners living in poverty were at the lowest level of achievement among their peers by fifth grade.[39] A study of San Diego Unified School District fourth-graders followed students through their performance seven years later on the eleventh grade California High School Exit Exam (CAHSEE), required for graduation since 2006.[40] For this group of students, academic grade point average (GPA) and classroom behavior (beginning work promptly and following directions in the early years, as noted in teachers' records) were the strongest predictors of eventual success or failure on the CAHSEE.

Another longitudinal study of nearly 4,000 students found that those who could not read proficiently by third grade were four times more likely to leave school without graduating than were proficient readers.[41] For the least proficient readers, those unable to master basic skills by third grade, the rate was almost six times greater.[42] The evidence is clear that reading on grade level matters. This indicator alone, however, does not always capture the majority of future dropouts. In other words, some students who read well in the fourth grade still drop out, highlighting the need to build indicator systems that span grade and school levels.

Middle Grades Indicators

Longitudinal studies by the Baltimore Educational Research Consortium (BERC) confirmed the Philadelphia findings that large percentages of future dropouts could be identified as early as the sixth grade.[43] The research showed that sixth-graders with one of four high-yield early warning indicators had half the graduation rate of those who did not.[44] These indicators were chronic absenteeism of 20 days or more; failing English and/or math; or a failing average for English, math, social studies and science combined. A Boston study found that extremely low test scores in the middle grades were, together with the ABCs, predictive of high school dropout in a state that requires students to pass high school exit exams in order to graduate.[45] The Philadelphia and Boston studies also showed that in the sixth grade, students who eventually dropped out typically failed math or English, not both subjects, and that course failure often, but not always, had an attendance and behavior covariate. Finally, there was some evidence in the Boston study that the earlier a student developed an off-track indicator in the middle grades, the greater his or her odds of not graduating.

High School Indicators

Studies by the Consortium on Chicago School Research determined that ninth-graders who earn five full-year course credits and receive no more than one semester grade of F are three and a half times more likely to graduate from high school than their peers who do not. They also found a strong link between attendance and course passing.[46] BERC researchers found similar outcomes in Baltimore, as did studies across multiple school districts in Colorado.[47] Chicago and Philadelphia studies found significant percentages of ninth-graders who had not shown risk factors in middle grades, yet slid off track in ninth grade, demonstrating the key significance of transition grades and that indicators are needed along the educational continuum.[48]

Validity of the ABCs

The initial studies described above identified the ABCs as the primary predictive indicators. In the last five years, these findings have been validated many times, including state and large district longitudinal studies in Arkansas, Colorado, Florida, Indianapolis, Metropolitan Nashville Public Schools, Tennessee, Texas, and Virginia.[49]

EWS Thresholds for the ABCs

Accurate thresholds are required to successfully use the ABC indicators to create actionable reports. The predictive thresholds or "cut points" for the ABCs at which students are unlikely to graduate without interventions can vary by locale. For instance, some studies find that 80 percent attendance is the cut point (which in a 180-day school year means that students are missing 36 days of school), and others 90 percent. This variance occurs as a trade-off between yield (identifying a large percent of future dropouts) and accuracy (high odds that the students identified will not graduate without effective intervention). In different studies,

different choices between yield and accuracy have been made. Cut points may also vary based on desired outcome: high school graduation versus college readiness and enrollment.

Local factors and policies also play a role in determining the cut points. A few examples of these often confounding factors are below, and suggest future research studies.

- At the state level, are policies reasonable and are they enforced equitably or arbitrarily? For example, studies in both Massachusetts[50] and Texas[51] show large classroom-by-classroom, school-by-school, and district-by-district variations in application of state-legislated discipline policies for non-violent behaviors, with consequences for graduation.
- At the district and school levels, do behavior policies and attendance policies interact? For example, if a student is suspended are they also counted as absent? Are students suspended for being truant? Does attendance factor into course passing? If students are absent, are they allowed to make up work? If they miss a certain number of days do they fail the course?
- How do local, non-educational policies affect students? For example, at the district level, do all students ride metropolitan transit or do they get on the school bus, making it much more difficult to skip school?
- At the district or school level, what is a failing grade? Is it a D or an F, a 55 or a 69? To ensure the highest impact, local longitudinal data and stakeholder input concerning local factors should be considered, possibly modifying cut points.

Despite these variations, research-based thresholds for the ABCs have been identified, and can be used as a starting point when creating an EWS. In summary, they are:

- **Attendance:** Missing 20 days or being absent 10 percent of school days;
- **Behavior:** Two or more mild or more serious behavior infractions;
- **Course performance:** An inability to read at grade level by the end of third grade; failure in English or math in sixth through ninth grade; a GPA of less than 2.0; two or more failures in ninth grade courses; and failure to earn on-time promotion to the tenth grade.

Educators should use knowledge of cut points to trigger significant interventions much earlier, before the cut points are reached. In the best emerging EWS and most highly effective schools, diagnostic and preventive actions are instigated at a few days of absence, one behavior infraction, or one slide in grades.[52]

Beyond the ABCs – Secondary and Tertiary Indicators

While the ABCs have been repeatedly shown to be the most important indicators, some EWS include other factors. These secondary and tertiary indicators are often based on state and local expectations. State assessment scores, whether for NCLB or state accountability systems, are typically less predictive, but are often included and can provide important contextual information

Test Scores and Grades as Indicators

Grades, in particular course failures, are better predictors of a student's likelihood of graduating on time than achievement test scores. There are several reasons for this. For example, achievement tests are given at one point in time, and for a single individual can be influenced by a wide assortment of non-academic factors on a given day. Course grades, on the other hand, represent a summative judgment of a semester's or year's worth of work, capturing student performance, effort, motivation, and attendance over time. At the high school level, course passing is directly tied to credit attainment, which in turn is linked to grade promotion and high school graduation.

Grades, moreover, are continuously available, and hence can be used to monitor progress or decline, whereas tests are often given only once a year, and even less frequently in high school. Some have argued that test scores should have greater weight than grades because test scores are less arbitrary than grades, even if they are weaker predictors. This concern, however, at some level is comparing apples to oranges. Both are important. Test scores, are important for accountability and to see if students and schools s are achieving at desired standards. Grades, however, can help tell us if a student is on track to graduate high school, prepared for college and career success.

The Common Core State Standards provide a means to address some of these concerns. They provide a "consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them," as such, they can facilitate standards based grading, and the use of common grading rubrics.[55]

to guide interventions.[53] The addition of these indicators can lead to the identification of students who have strong academic skills but are still failing courses, often because of attendance or behavior variables. Overage for grade by 21 months or more is often included, identifying a sub-set of students who need acceleration opportunities to rejoin their peers.[54] Life situations such as homelessness, foster care, pregnancy, involvement with the juvenile justice system, and the necessity of taking care of a relative, are considered by many to be important tertiary indicators. These situations are often captured indirectly by attendance data, but data that indicate students are involved with agencies (including social, judicial, and medical) can provide important context to guide interventions, as well as enable inter-agency collaboration in support of the students. The trade-off is that the inclusion of social service agency data in an EWS can raise questions of confidentiality.

THE RELATIONSHIP OF EWS TO STATE, DISTRICT, AND SCHOOL-LEVEL DATA SYSTEMS AND COLLECTION

EWS are fundamentally a school-based approach to improving student achievement. In essence, these systems come down to a seemingly simple action: making a list of the students who are predicted to need support, and acting on the list. All of the fundamental data needed for an EWS originates at the school-level, from the attendance taken, the disciplinary forms written, and the grades given. It is typically, however, not organized or analyzed to identify students who are falling off track. Technology can be critical to a more effective system, but in some cases they need not be technology-dependent. One Louisiana educator remarked, "when

EWS are fundamentally a school-based approach. All of the data needed for an EWS originates at the school-level, from the attendance taken, the disciplinary forms written, and the grades given.

The Data Quality Campaign, a national nonprofit that supports state policymakers' efforts to use data to improve student achievement, has captured the progress of statewide longitudinal data systems.

I go into a small school, and the principal has a scratch pad with names of the students who are getting into trouble, well then, he's doing his job. And when I go into a big school, say 1,000 or 2,000 students, and the principal has one of our bi-weekly state early warning system reports on her desk, flagging the ones who need help, well then, she's doing her job."[56]

Increasingly sophisticated state and district data systems have evolved over the last 25 years, however, and their advancement has accelerated recently through an infusion of federal funding. These systems offer opportunities to consolidate and integrate rich data from multiple sources with great potential for action driving early warning indicator data analyses and reports. At the same time, increasing complexity requires compatibility of hardware and software at many levels. This brings with it its own set of challenges.

State Longitudinal Data Systems (SLDS)

Since 2005, states have made significant progress building and using statewide longitudinal data systems. The Data Quality Campaign, a national nonprofit that supports state policymakers' efforts to use data to improve student achievement, has captured this progress. According to DQC's annual survey of states, every state now has in place the basic infrastructure of a statewide longitudinal data system.

While the Education Sciences Reform Act of 2002 prohibited the U. S. Department of Education from creating a national student unit record system, federal policy has played a significant role in advancing state and local efforts. That same law authorized the U.S. Department of Education to determine voluntary data standards and established a federal grant program to assist states in designing and using their SLDS. Forty-one states and the District of Columbia have received such grants since 2005 and are in varying stages of development and enactment.[57] Moreover, in exchange for federal stimulus dollars in 2009, every governor and chief state school officer committed to having a SLDS in place by September 30, 2011.

From the EWS perspective, the virtue of SLDS is that because SLDS are centered on unique student identifiers, accurate longitudinal research studies can establish the characteristics and trajectories of potential dropouts. Similarly, profiles of high school graduates can be established and their outcomes followed to extend EWS to college readiness. As SLDS begin to encompass early childhood, as well as post-high school information, there is the potential to construct a systematic approach to providing the supports needed for all students to be college and career ready.

State longitudinal data systems, however, are only beginning to be used to support early warning efforts. Only a minority of states has all the information required by EWS in their state longitudinal data systems and these states vary in how much, and how frequently, data are collected and redistributed to users. According to DQC's 2010 survey, only 18 states collect discipline data daily, 17 states collect enrollment data daily (which students are supposed to be in school), 12 states collect attendance data daily (which students are actually in school) and 11 states collect enrollment, attendance, and discipline data daily. Five states, California, Colorado, Illinois, New Jersey, and New York, do not collect student level attendance at all. Updated information from DQC's 2011 survey will be released in late 2011.

Sixteen states responded that they use this information to produce early warning reports while another 16 states report that they have no plans or have no set date for doing so.[59] Of those currently producing the reports, only four states report that they distribute them to educators on a weekly or daily basis.[60] Such early results in the use of state systems for early warning reports shows some of the challenges both of aggregating data in a timely fashion at the state level and of sharing that data with educators and other stakeholders who can take appropriate action.

Sixteen states responded that they use this information to produce early warning reports while another 16 states report that they have no plans or have no set date for doing so.[58]

Data Confusion

The integration of data from student information systems with that from other information systems is among the chief challenges in successful EWS implementation.

Education technology capacities have expanded dramatically in the last 20 years. States, districts, and schools have frequently had to make hardware and software plans, decisions, and purchases without being able to foresee the possibilities that technology innovations would bring. They often do so without the funds to adapt nimbly, as businesses might. Currently, varying by state, district, and school, the location of data and the ease of integration and feedback are highly variable. Some states and large districts are making advances in creating data warehouses, which store data from many different sources over time, and which with the appropriate programming can integrate data in response to queries. Generally, compliance, assessment, and regulatory reporting, tracking, and feedback are largely carried out at the state and district level, yet most ABC data needed for an EWS is generated at the school-level.

On the bright side, technology transfer from the business sector has facilitated the development and adoption of better education technology systems. Lessons learned from the business sector enable better capture data from multiple "silos" maintained in different state, district and school divisions, by different people, for different purposes, with different collection and report-generating schedules, with initially incompatible software and sometimes different hardware and operating systems. In some cases, users, designers, and vendors are increasingly collaborating to generate solutions, test those solutions, evaluate, and redevelop the systems. In others, a concentrated effort is still required to get data originally collected by schools back to educators into an actionable, EWS-supported format.

Some states are moving to reduce the challenge. In Alabama, the student information system (SIS) is state-provided, and the vendor recently incorporated an EWS at no charge to sites. Texas districts have in the past used over 60 SIS, but in a move toward simplifying the interface between local SIS and an improved state data system, the state in August of 2011 identified as preferred vendors two vendors that already served approximately half of its districts, and offered to support these SIS without cost to sites. In Washington state and Wisconsin, members of district collaboratives have worked to organize their SIS within the context of state requirements. In other states, for instance North and South Carolina, SIS are state-designed, mitigating the challenge of interfacing district systems.

Good Data In. Good Data Out.

Beyond the technological challenges, for EWS to be a useful tool requires that data based on common definitions be accurately recorded. There is wide variety across schools, districts, and states in how terms like "absent," "tardy," and "enrolled" are defined. Efforts are underway to help standardize basic definitions. For example, the Common Education Data Standards (CEDS) Initiative, sponsored by the National Center for Education Statistics (NCES) and a voluntary group of stakeholders from multiple states, seeks to define a common vocabulary of standard definitions, code sets, business rules, and technical specifications that increase data operability and portability. A second version of the voluntary standards is scheduled to be released in early 2012.

THEORY OF ACTION: HOW CAN EWS IMPROVE GRADUATION RATES?

EWS represent a systematic use of data that can provide educators with tools to significantly accelerate graduation rates. The prospect of predicting off-track students as early as the late elementary and early middle grades would provide schools with significant advantages in identifying those students needing the most help and supporting them early and intensively enough to avoid paths that lead to dropping out. Reducing negative student transitions at the elementary to middle school and middle school to high school levels can increase high school completion. These early prediction models would allow schools to support students well before they enter high school—dramatically improving the likelihood that students enter high school prepared for success. Such efforts preserve the gains made from investments in early childhood education, as well as lay a foundation for success after graduation.

Identifying off-track students, however, is only half of the purpose of these systems. Students must then receive appropriate support to ensure they remain on-track.[61] [62] [63] Schools using these systems have been able to more effectively identify students who will benefit from services, and avoid focusing dropout prevention resources on students who have previously been misidentified as at-risk, often because of socioeconomic or demographic factors. Such efforts ensure that limited federal, state, and local resources are used efficiently and maximize returns on investment. EWS allow schools to monitor the effectiveness of interventions and continually modify the supports provided until students are back on track to high school graduation. Dropout trends identified by data systems can help schools and districts to identify systemic weaknesses, policies, or practices that may be increasing the likelihood of student dropouts, while also enabling schools and districts to more effectively target their limited dollars.[64]

Identifying off-track and on-track students, however, is only half of the purpose of EWS. Students must then receive appropriate support to ensure they remain on-track.

Part 2: Lessons from the Field

WHAT IS THE CURRENT STATE OF EWS?

Over the last year, representatives of Civic Enterprises and the Everyone Graduates Center at Johns Hopkins University conducted site visits, interviews, and conversations with educators and/or community representatives in seven states: Alabama, California, Louisiana, Massachusetts, South Carolina, Texas, and Virginia and 16 communities: Boston, Chattanooga, Chicago, Columbia, Dallas, Detroit, Houston, Knoxville, Memphis, Minneapolis, Nashville, New Orleans, Philadelphia, San Antonio, Seattle, and St. Louis.

The team heard from teachers, administrators, district, and state leaders in research, assessment and information technology divisions, nonprofit and corporate partners, and policymakers to determine what trends are evident, what barriers to effectiveness exist, and what opportunities presented themselves for new developments. From this work, lessons were learned, challenges were identified, and recommendations were noted. Other schools, districts, and states can learn from these lessons as they work to develop or accelerate implementation and use of such systems to boost student success and high school graduation rates.

This report represents the first national assessment of EWS at the district, state, and national levels, including site visits and interviews in 16 selected districts and communities in seven states. To be successful, we found that vision and mission matter; technical components must be strong; and resources must be assembled and maximized, fully engaging stakeholders to use data to guide interventions at the scale and intensity required.

Site visits and interviews with educators and other stakeholders across the country made it clear that EWS are in a phase of dynamic growth and on an upward trajectory. Outreach efforts by the Chicago Consortium for School Research, the Everyone Graduates Center at Johns Hopkins University, Jobs for the

Future, the National Governors Association Best Practice Office, the National High School Center, and others, helped to share initial research findings among a diverse set of stakeholders. This in turn enabled a wave of early adopters of EWS across the nation, at the state, district, school, and community level. These collaborations in turn are advancing EWS and demonstrate their potential power to improve educational outcomes.

In addition to state and district efforts, we noted that nonprofits, community groups, and corporations are the champions of EWS, working in collaboration with schools and districts. We also saw that across the country, the education landscape has been in a constant state of change: states are adopting new graduation rate calculations on different timelines in order to comply with the uniform federal calculations required for 2010-2011; state assessments have been changing to meet new standards of rigor; the relationship among state longitudinal data systems, other state systems, EWS and district data systems have been unpredictable and in many cases conditioned on previous hardware and software choices made for different purposes; and the economic downturn has meant an increased focus on cost constraints, often accompanied by the closing of programs. These complexities mean that the time and costs of developing and implementing an EWS can vary dramatically.

Although there are few "one size fits all" prescriptions, common threads tied together the creation, design, and implementation of EWS across the country. We learned that EWS are consistently the products of vision and teamwork, sometimes among unconventional partners. With just a few exceptions, participation by districts or schools is voluntary, the result of driven individuals seeking something greater for their students. We confirmed that EWS are an emerging tool, with most EWS design starting no earlier than 2006. Though the field's nascence translates to a lack of formal impact studies, we saw that many EWS are frequently re-developed, generally increasing technical sophistication while simplifying usability.

From the policy perspective, several pieces of federal legislation with implications for the growth of EWS have been introduced or considered by Congress such as the Secondary School Reform Act. EWS are also likely to be included in ESEA reauthorization.

Furthermore, state and federal legislators are prioritizing high school graduation in their policy agendas. For example, in 2008, the U.S. Department of Education took executive action that requires all states to report their graduation rates using a consistent formula, and set benchmarks for improvement. Some states are considering using on-track measures as part of their next generation or school accountability frameworks.[65]

Through these conversations and site visits, we also learned valuable lessons about successful implementation of EWS. In the best cases, teachers said they felt more effective and equipped with better information about which students needed which interventions at what time. Educators within school walls and nonprofit partners shared they were more targeted in their interventions and produced stronger results. District leaders felt they had better information about students, so they could better allocate precious resources. In some locales, however, technological glitches stalled progress. Inaccurate data entry produced misinformation. Communications with stakeholders was infrequent or non-existent. **In summary, we found that to be successful: vision and mission matter; technical components must be strong; and resources must be assembled and maximized, fully engaging stakeholders to use data to guide intervention at the scale and intensity required.** The following provides an overview of our findings from our 23 site visits and case studies along these three major themes.

The Core of Most Effective EWS

A rich set of knowledge has accrued from local experience over the last seven years. Features at the core of the most effective EWS include:

- Someone or some organization believed EWS were needed and became its champion and shepherd.
- A leadership team shared the champion's view.
- End-users had an important role in shaping the EWS.
- Decisions were made about goals for the EWS both in terms of what it would achieve, and, as a system, it would do.
- Perfection was not attained in one swipe. EWS evolved over time as roadblocks of many kinds were overcome. Two and three years can be necessary.
- Many EWS began small and learned lessons from pilot efforts before expanding. In other cases, EWS were a separate component of larger state or district data systems initially developed for other purposes. They have evolved, building on the increasing technical sophistication of the larger data system and the evolving ability to reduce complex information to simple presentations.
- Thresholds and flags were determined based on the ABCs, and a few additional, locally relevant indicators included based on local analysis.
- Student records were flagged when school adults recognized that one or more thresholds were being reached, and those students were placed on a support list. Some support lists have 10 students while others may have hundreds.
- Schools determined their capacity for helping support list students. The size of the list, and availability of help and time, forced choices and often caused new partners to be sought, both internally within school buildings and externally from the community.
- Teams of educators and others responsible for support list students matched available interventions with needs—or designed new ones.
- Student records are reviewed frequently—often bi-weekly. In the best cases, teams of educators who share the same students shared pertinent knowledge about the students, monitored the effect of interventions, and created new assistance plans.
- As technology improved and data systems integrated, short, simple analytical reports and data dashboards were being created that were easy to view, understand, and act on.
- Educators and other users were supported in understanding and using data, with tools ranging from web-based manuals to professional development. Often the most effective support came from coaches.
- Data was kept and shared about the success of interventions. New efforts focus on understanding the efficacy of and determining the best intervention for different students in different situations.

1) A COMMITMENT TO SUCCESS

Sharing the Vision that All Children Should Graduate High School, College and Career Ready

Early Warning Systems are, almost by definition, promoted by strong leaders and advocates in places that have been able to make their commitment to educational improvement explicit—and for the long haul.

Early Warning Systems are, almost by definition, promoted by strong leaders and advocates in places that have been able to make their commitment to educational improvement explicit—and for the long haul. EWS are not encountered in places where dropping out is still considered an acceptable part of the landscape. Barriers also exist to the full and successful implementation of EWS. Educators may initially perceive EWS analysis as an added burden rather than a complementary approach augmenting instruction. Counselors and social workers may be overwhelmed by difficult caseloads. New technologies present a learning curve for many. Financial resources constrain needed coaching and professional development. To be able to effectively use attendance, behavior, and course-performance data, school-level leadership must share a collective vision that graduation rates can be improved through the timely and data-driven identification of students who require additional supports paired with an organized system to provide them. School-based personnel must buy into the concept of the expanded data-driven culture. There must be resources to build capacity, and the technology systems must be in place to provide complex integrated data in short, highly useable, readable, and digestible formats. To overcome these obstacles a strong commitment to enable all students to succeed is required.

State, District and School-Level Commitments

Two states have set a high standard for vision and mission by explicitly considering EWS as part of the state accountability system. In Louisiana, the Dropout Early Warning System (DEWS) pioneered in 2004, is the nation's oldest state-level EWS. DEWS is attached to the state accountability system through the school performance-scoring rubric that encourages improving attendance and graduation rates and reducing dropout rates. Districts and schools are required to have the DEWS in place. Although they are not required to use it, estimates show that 70 percent of Louisiana's 70 districts use DEWS, and 35 percent of the schools are rated as using it well. (Additional information is available in the Louisiana Case Study.)

Two states, Louisiana and Virginia, have set a high standard for vision and mission by explicitly considering EWS as part of the state accountability system.

In Virginia, a commitment to "graduation for all" was demonstrated through a strong partnership among the Governor, the General Assembly, the State Board of Education, and the State Department of Education. Through their collaborative efforts, Virginia put measures in place to hold schools accountable for meeting graduation benchmarks with a Graduation Completion Index, legislated using the State Standards of Learning (SOL) accountability and accreditation system. (The No Child Left Behind sanctions and supports apply only to Title I schools, and most Virginia high schools did not receive Title I.) Now, both Title I and non-Title I high schools that do not meet an 85 percent graduation rate will be accredited "with warning" or "provisionally accredited." These schools must use the state-developed Virginia Early Warning System (VEWS) or a similarly structured, equivalent system. These schools must also organize an improvement team, submit a three-year improvement plan to the state, and implement it. Virginia anticipates that 40 out of approximately 700 high schools will receive accreditation with warning/provisionally accredited due to the Graduation Completion Index beginning in 2011-2012 and thus be required to use VEWS or its equivalent.

Several other states have demonstrated their commitment to building EWS capabilities and using them to support on-going graduation rate and school improvement efforts. South Carolina designed a statewide EWS supporting the graduation rate improvement goals outlined in the Economic and Educational Development Act of 2005 and is moving to a late 2011 launch after overcoming technical challenges. The effort will be supported with web-based tools and web-based roadmap. Tennessee is also moving towards statewide EWS efforts. Texas has not explicitly created an EWS, but is moving toward creating the conditions under which local districts are empowered to do so. This is

especially important in Texas where more than 80 percent of its 1,000 school districts are small (serving less than 5,000 students) and often have limited personnel or technical capacity to design such systems on their own. It has recently announced free access to two student information systems, which are currently used in about half the state's schools. Texas is also re-tooling its 25-year old state performance education information management system (PEIMS); the new PEIMS will build in features enabling districts to upload data and receive reports of their choice, in a timeframe of their choosing.

Other states have launched pilot programs with the goal of later expansion. In 2007, the Washington legislature directed the state education department to convene the Building Bridges Workgroup (a state workgroup around EWS), initiated a pilot, and developed a strong web-based guidebook for EWS teams (please see Appendix 2 for additional information). In Massachusetts, a dropout prevention commission investigated and reported on policies that may contribute to dropout rates. The state is now in the process of implementing the commission's recommendation to expand the state's EWS to all districts and to earlier grade levels.

In the fall of 2011, the California Department of Education (CDE) launched a model program in nine volunteer districts and 20 schools, using the National High School Center's (NHSC) Early Warning and Intervention Monitoring System (EWIMS) analysis tool, and a similar tool being developed by the NHSC for the middle grades. Ten offices across different divisions within the CDE contribute to this effort, initially organized by the middle grades office as part of dropout prevention efforts. The American Institute of Research (AIR) and WestEd are documenting the process as the basis for informing expansion to 50 or more districts in coming years. High school, middle school, and district personnel have been trained by NHSC and CDE representatives on the tool. Schools are provided coaching by state representatives, county offices, district offices, and school peers through Communities of Practice, regional meetings, and one to one support. The CDE plans to further assess how many of California's districts and schools already have early warning systems and what they have learned during implementation. They also plan to promote the correct use of terms like "truant," "habitual truant," "chronic truant," and "chronic absentee" which are defined in California's *Education Code*. By using these terms in the same way it is possible to share lessons learned in attendance data analysis. It is also possible to deepen understanding about the influence of state and local board policies on attendance improvement and dropout reduction, including how the legislatively mandated School Attendance Review Boards (SARBs) can most effectively contribute to improving graduation rates.

Within districts and schools, the site visits gave evidence of the importance of mission building within the context of clear communications and relationships. In Minneapolis, mission-building work with the students themselves was core to their success. The District's Check and Connect monitors emphasized that educators have to get to know students "outside the context of the data." While the attendance and course performance data were important in identifying students, monitors found building trusting relationships to be essential to moving students forward in their studies. "You have to see what their motivations are and move from there," one Check and Connect monitor said. Mentors focus on positive aspects of a student's record and build confidence through encouragement before discussing shortcomings. So far, data show that the Check and Connect system has improved student retention, attendance, and completion rates. On a national level, Check and Connect is highlighted as a successful effort in the U.S. Department of Education's What Works Clearinghouse. A similar emphasis on building a sense of mission around EWS through establishing relationships and building trust was evident in the work of Big Brothers Big Sisters of Eastern Missouri with Cape Girardeau and St. Louis students and schools and in the Diplomas Now secondary school transformation efforts in 14 school districts across the nation. (Please see case studies on each for additional information.)

An emphasis on building a sense of mission around EWS through establishing relationships and building trust was key to success.

Big Brothers Big Sisters of Eastern Missouri – A Focus on the ABCs

Big Brothers Big Sisters of Eastern Missouri (BBBSEMO) and their local school districts have created a unique, replicable and outcomes-oriented partnership that leveraged an early warning system (EWS) to improve the lives of children. Following an intense strategic planning process in 2005, BBBSEMO revised its vision and mission statements and set out to turn their big vision into meaningful, measurable and tangible outcomes for local children.[66]

Focusing on the ABCs

BBBSEMO began by identifying a partner who was willing to innovate: Cape Girardeau Public Schools, where one of four students failed to graduate on time.[67] BBBSEMO asked, "What results must we deliver in order to be considered a high value partner?" Over nine months, BBBSEMO, the superintendent, principals, and Southeast Missouri State University educators developed ABC Today!, a program focused on tracking students' **Attendance**, **Behavior**, and **Classroom success** as the first step in returning them to the graduation path. The agency planned to devote one year with the school district collecting this information—manually—and identifying patterns, policies, and interventions to guide their later work. Long-standing relationships enabled BBBSEMO to design data access procedures and obtain parent or guardian consent to meet FERPA and district requirements.

Workers began to quickly uncover unnerving new information about the children they had served for years: a second grade girl had been absent for 28 days due to chronic head lice and had failing grades in reading and math; a fifth grade boy had missed 38 days and had accumulated 13 discipline referrals that began after his father returned from prison. The organization decided 12 months was too long to wait for fine-tuning a process, and began "refueling in mid-air." BBBSEMO targeted students who were flagged for increased interventions and soon saw results: attendance and course performance improved, and the number of tardies and behavior infractions decreased. Stakeholders are convinced that data helped—"We don't have to fight over ABC; we know these are key performance indicators so we just have to work together to improve them."

Replicating and Improving What Works

After the successes of the first year of data-driven interventions in Cape Girardeau, BBBSEMO was invited to replicate the model in St. Louis Public Schools. A Director of Impact was placed in the five schools and meetings were held—monthly with principals and quarterly with district leaders—to review data, identify trends, create intervention plans and examine outcomes. The BBBSEMO staff met weekly to identify successful interventions and retool less successful efforts, and to set incremental, school-specific goals, regularly holding "blow it up" conversations—to "inflate" a good idea or "pop" a strategy that was not producing results. Partners learned to balance the frequency with which data was examined against the time needed to see results.

Partnerships Build Even Better Results: Within four years, BBBSEMO's work was endorsed by Civic Progress, an organization of St. Louis CEOs and leading executives. Wells Fargo Advisors stepped in with financial, technical, and human resources, greatly advancing the agency's capacity by building systems to electronically transfer data between district and BBBSEMO databases, while retaining the early emphasis on easy, fast, and convenient processes.

Widening the Circle of Engagement: One result of the attention on outcomes has been a focus on results for all. When BBBSEMO first began using student data, staff looked only at red flags and acted on problems. But, as one staff member remembered, "it occurred to us that we should do something with every piece of data." The staff decided to broaden attention

to students who had no early warning indicators, enabling active reinforcement of good behavior and student performance across the board. As an unforeseen result, relationships were built with the parents of well-performing students and the number of volunteers and positive influences engaged with the school expanded. Now, according to BBBSEMO, "We celebrate or intervene on every piece of data we have." Even that requires work. BBBSEMO is working with the school districts to develop standards around celebrations, including agreement on what qualifies as success and how to identify it. This collaboration and partnership is helping to make the culture of intervention and celebration a broader part of district and school culture. According to one district leader, "If our students are going to succeed we must create connections with the community and foster long-term commitments that provide support and encouragement to our families. Our school district is deeply committed to expanding our partnership with BBBSEMO and strengthening ABC Today! because it puts good hearts and data side-by-side."

Lessons Learned

Relationships Matter in Effective Partnerships: According to one district leader, "we have seen first-hand how… collaboration can improve the educational opportunities and outcomes for our kids." The pre-existing relationship with the community eased concerns around data privacy and access, and made parents comfortable with the role the organization was playing in their schools. The close relationships between BBBSEMO, the Cape Girardeau and St. Louis School Districts enabled educators and BBBSEMO workers to more effectively identify the causes of absenteeism and problem behavior, and craft effective interventions.

Keep it Simple: The flexibility of all parties in adapting the data system and re-evaluating student trends enabled an effective system. The constant quest to keep things simple and the traffic-light warning system created a reminder of the importance of usability when presenting educators and volunteers with complex data.

Moving Forward: Continuing its organic evolution, the BBBSEMO is considering replication opportunities locally and nationally, finalizing the development of a new web-based ABC Today! Intelligence Tool and launching a whole-school pilot reform model called ABC Today! School. Reflecting on past successes and guideposts for the future, BBBSEMO's CEO remarks that the most effective change agents of all were school administrators—accountable, adaptable, individuals who provided a vision and supported a culture of high performance that enabled the agency's efforts to thrive. The CEO also shares: "Collecting the data was really not the hardest part, it was building the cultures of trust, accountability, discipline, innovation, and adaptation that drive the positive change."

2) TECHNICAL COMPONENTS MUST BE STRONG

Data and System Design Can Promote—or Hinder—Student Success

In conversations with EWS implementers and users across the county, it became clear that the design of EWS, and the data within, mattered. Before an educator can deploy resources effectively to the students who need them, he or she must be able to accurately identify which students are on track and which are off track to graduate. In order to appropriately leverage the utility of data, data must first be collected accurately, then analyzed into usable and actionable information—and educational entities must know how to do so. Schools and districts at the vanguard have created easy-to-understand dashboards and "stoplights" for this purpose, simplifying data from multiple, often complex sources into resources teachers and other school-based adults can use.

The issues of data usage, by whom, and for what purposes, while protecting privacy and ensuring compliance with existing

Before an educator can deploy resources effectively to the students who need them, he or she must be able to accurately identify which students are on track and which are off track to graduate.

regulations, can combine to either overwhelm users or streamline interventions. Here, conversations with education leaders illuminate both the best practices and the cautionary tales about how to leverage data and system design to promote student success at the state, district, and local level. (Please see Appendix 2 of this report for a listing of publications related to privacy issues in an education setting.)

Ensuring Accuracy at All Levels of Educational Organization

Misinformation can stall progress. Inaccurate data produces incorrect recommendations for intervention, citing too many, too few, or incorrect students as "off track" and for the wrong reasons. Accuracy is necessary at all levels of the data chain, and most often this falls on the shoulders of school-level data clerks, data operators, attendance specialists, registrars, teachers, counselors, and social workers at the student or classroom level, and assistant principals, deans, and academy leaders within the school. In South Carolina, for example, while teachers enter grade-book data, schools have a state-funded data clerk who enters free- and reduced-price lunch data, discipline data, career and technical information, out-of-school and extended time program enrollment, at-risk status, and interventions. State funding that defines responsibilities for the data clerk position places a premium on correct data being entered in a timely fashion, and provides an accountability avenue when there are inaccuracies.

In most locales, reporting positions are determined by local leaders and local allocation, particularly for reporting of behavior infractions, participation in interventions, outcomes of interventions, and out-of-school-time data. This ad-hoc organization of data entry can lead to less accountability and accuracy. To address this challenge, some early warning data systems, such as the Metro Nashville system, have built in validation levers with an opportunity for data correction.

Lessons from Nashville: Make it manageable. Make it meaningful. Make it matter.

Metropolitan Nashville Public Schools (MNPS) is a large, diverse city/county school system serving 78,000 middle Tennessee students, 70 percent of whom are eligible for free- or reduced-price lunch. The District is a blend of both low-performing and high-performing schools. Its efforts to build and implement an EWS system are situated in a multi-year improvement effort called Nashville Achieves, which involves broad-based community participation, including the Mayor's Office, City Council, business and nonprofit organizations and input from over 200 community leaders involved in transformational leadership groups advising the direction and content of reforms. In designing and implementing their EWS, MNPS exercised leadership and identified help where needed. They invested heavily in rollout and implementation of their system, integrating it thoughtfully with instructional reforms. Their system is one manifestation of the district's cultural shift toward data-driven improvement and grew out of the superintendent's advice for a data system: "Make it manageable. Make it meaningful. Make it matter."

Getting the System Right

MNPS received technical support from the Everyone Graduates Center at Johns Hopkins University to develop their EWS triggers. Together, they analyzed longitudinal district data in the context of state and local policies, practices, and conditions. Currently, attendance, behavior, and course performance are flagged, with thresholds of less than 85 percent attendance, more than five offenses for behavior, such as suspensions, or less than a 70 percent average in core classes. Absence reports (including excused, unexcused, in- or out-of-school suspension) are differentiated in the reporting system. These triggers will be reviewed each summer to make sure that they accommodate most recent trends in data. Previous years can be viewed so that individual student trajectories are evident over time.

Lessons Learned

- **Use Existing Resources:** MNPS' EWS was designed in-house and has grown organically over the last two years as a tool for instructional improvement, combining increases in technical complexity with user friendliness and implementation support for leaders and teachers.
- **Keep It Simple:** Sophisticated navigability means that the Director of Schools (Tennessee's term for Superintendent) can, with only three clicks, see each school's overview. The easy-to-use educational data warehouse is refreshed nightly and the system itself is accessible.
- **Provide Training and Support:** As the EWS fully moves out to the schools, a new unit is being formed within the central office to guide EWS implementation at a granular level. Previously principals and leadership teams became acquainted with system features in a gradual two-year process that created knowledgeable site-based mentors and advocates. By 2010-2011, observers perceived that most principals were comfortable interpreting the data now available in increasingly clear, clean dashboards and over 130 reports. Beginning in 2011-12, twelve central office data coaches and one oversight coordinator were made possible by Race to the Top funding. They will be deployed to each of the 12 school clusters, with priority given to high-needs schools. The data coaches are charged to build a culture among teachers and counselors for understanding student-, classroom-, and school-level EWS data, and using it to guide intervention efforts. They also augment a sizable corps of instructional coaches and reflect a district-wide investment to build human capital through professional development and coaching.

Challenges

Challenges remain and will be addressed in the same way that the system was developed with ingenuity, creativity, and patience. Some schools are more welcoming of data coaches than others. There is not yet an easy interface with state data systems. Teachers do not uniformly use the electronic grade-book. The data system does not currently identify overage or under-credited students effectively. Interface with transportation and financial systems will help the district understand and improve student mobility and cost issues. A FERPA compliant interface with external community agencies will help MNPS assist its students with a wider range of interventions.

Finding a Common Language at All Levels of Educational Organization

As states work to build and strengthen state longitudinal data systems and EWS, they must work to integrate existing systems from technological and semantic perspectives. However, there is an almost pervasive and unresolved tension at all levels between "local control" and the standardization that is necessary for good data systems. Many are working in good faith to find acceptable solutions. Nationally, several groups are working to evolve frameworks of technology standards for database compatibility, interface, and data transport. These frameworks include:

- Schools Interoperability Frameworks (SIF), an industry initiative working toward a set of rules and definitions to enable software programs from different companies to share information across platforms.[68]
- The NCES Handbooks, a set of guides that provide standardized business definitions and coding schemes that are necessary if systems are to be developed that draw from and compare multiple sources.
- Ed-Fi, a free data standard system developed by the Michael and Susan Dell Foundation, aimed at K-12, is vendor-neutral, modifiable and capable of connecting multiple databases while keeping operational systems, compliance reporting systems, and budget systems separate as desired. Five pioneering states—Colorado, Delaware, Louisiana, Tennessee, and Texas—were the first to implement. A developing Ed-Fi Alliance of users is anticipated to provide input into future improvements.

EWS designers often encounter unexpected challenges unrelated to information technology systems per se. In work that began in 2006-2007, through the Statewide Tools for Teaching Excellence

(STTE) initiative funded by the Michael and Susan Dell Foundation, and building on other Texas efforts that began as early as 2003,[69] collaborators from five Texas districts and researchers from the regional education laboratory, REL Southwest at Edvance Research encountered a key stumbling block in designing an EWS that worked for all: different coding systems were in place in the different districts. Three used a pass/fail code for courses on a semester basis; one used both a pass/fail code and numeric grades on a semester basis; and one district used a pass/fail code but recorded credits on a yearly rather than semester basis. As one Edvance leader commented, "it was quite a process to come up with a common coding structure across the five districts due to tremendous variability in coding, weak data quality, and lack of local familiarity with data." Dialogue led to solutions that were later applied in the larger Texas Consortium on School Research (TCSR)[70] which now engages the original five and 28 other Texas districts (together serving 37 percent of the state's students) in examining and refining the applicability of the Chicago On-Track indicators in settings far-removed from the urban Midwest. (See Case Study on Chicago for more information.) In the 2011-2012 school year, TCSR districts will move to a similar reporting format using course grades, and for similar time periods. Common understandings developed through long-term collaboration are fruitful for the success of EWS. Boston Public Schools and its EWS partners encountered similar challenges. Schools had no common criteria for courses with common names. Some had the same content; others did not. A district course catalogue with standardized names and content descriptors was necessary to enable accurate analysis of students' transcripts, GPAs, course passing, and credit accrual.

Reducing the Burden of Too Much Information

As the technical interfaces among different databases have improved, more information has become accessible for different constituencies within a state, district, or school. In some cases, EWS that used excel spreadsheets five years ago can now produce voluminous reports extracted from data warehouses. This can be overwhelming to inexperienced data users, or those for whom data analysis was not previously a priority or need. Too much information can reduce buy-in and ownership at the school level.

A number of solutions have emerged to reduce the burden of too much information. In Houston, designers of the Dropout Prevention Early Warning System (DPEWS) used the centering question, "How, in an environment of data-driven decision making, can we reduce 'analysis paralysis?" As a result, they were able to produce reports around a few key research-based predictive indicators, in which end-users could be confident. In Louisiana, the DEWS now automatically delivers timely reports over email to administrators and teachers, eliminating the need for end-users to query the system. When Massachusetts designed its original state system, it intentionally attempted to keep the number of indicators minimal. In districts such as Nashville, where over 130 customized reports can be available, designers are considering producing a smaller, standardized set of those that have been found to be most useful. In Memphis City Schools, in the early stages of developing an EWS, the superintendent sends out a monthly two-page report, "From 30,000 Feet" which brings to principals' attention relevant district-specific findings produced by the Research and Assessment Department.

Across the country, role-specific data captured in EWS is increasingly presented for principals, teachers, students, and parents in web-based dashboards and portals. Color-coded "support lists" are provided for teams of educators that outline which students are struggling to show up, which students misbehave, which students are struggling academically, and who is receiving which intervention with what result. In many cases, data systems can produce short individual profiles of on- and off-track students with contextual detail and/or summaries of in-coming students sorted by their level and type of off-trackness, as in Chicago, Dallas, and Philadelphia. A number of commercial systems are also available as part of student information systems or as add-ons that can enable individual schools or districts to pull together existing data and create actionable EWS data reports at the student, teacher, classroom, and school level.

"How, in an environment of data-driven decision making, can we reduce 'analysis paralysis'?" In many districts, color-coded "support lists" are the answer.

Achieving Buy-In through Local Input at All Levels of Educational Organization

The three most important indicators—attendance, behavior, and course-performance—are well established, along with widely applicable thresholds. Nonetheless, sometimes there is resistance to adopting EWS developed by others. EWS designers have found that enabling local customization, while maintaining core research-based components, can increase both buy in and utility. For example, in Texas Diplomas Now sites, Franklin City, Virginia, and Knoxville, Tennessee, EWS designers perceive that it was the inclusion and ready access to the results of formative assessments that spurred teachers' buy-in to the EWS. The relevance of the system to daily instructional work became immediately evident.

EWS designers have found that enabling local customization, while maintaining core research-based components, can increase both buy in and utility.

In Knoxville, Chattanooga, and Nashville, EWS designers found that EWS support increased when focus group input was sought from administrators and teachers during the development and refinement stages. In Chattanooga, for instance, the Division of Accountability and Testing developed the early warning system relying on feedback from internal stakeholders. "Data meetings" with educators were held in 2005-2006, first with high schools, then by regions, and eventually including elementary schools. Existing data was shared and discussed. Central office supervisors, principals, Exemplary Educators (state-assigned veteran principal coaches), and leadership teams were asked, "What would be helpful to you in raising student achievement? What would be helpful in improving the graduation rate?" Tennessee, in designing its statewide system, sought input and recommendations for design specifications from a diverse set of school districts. They later asked them to serve as pilot sites.

Participation in setting thresholds can also increase user buy-in. In Texas, district collaborators and Edvance researchers defined a three-step process similar to that used in Chicago: create a support list of students from eighth grade records; monitor students' progress on indicators at each grading period; and establish a ninth grade On Track indicator. Because they had little empirical data on the best absolute value of the cut-offs in their own setting, they established defaults that can be reset if local districts believe this is appropriate. Researchers and district participants asked the question, "What should the thresholds be in our situation? When we review data, are we reviewing data that indicates student problems, or does it indicate system problems in recording data?" In Virginia, sites that use the VEWS will be enabled to set thresholds–if they are more stringent than the state designated and validated ones. The state recommends that sites have a year's experience with VEWS before working on this nuance.

Keeping Freshman and Others On Track in Chicago

Behind the Scenes

Chicago Public Schools (CPS) is the nation's third-largest school district, with 407,000 students and a long-standing and serious graduation challenge: in the mid-1990s, as in many urban districts at the time, the graduation rate was 46 percent. Numerous reforms have been implemented by superintendents since then, with the net effect that by 2010 the graduation rate had risen 20 percentage points,[71] a great improvement but still far below goals.

In a strong partnership with CPS, the Consortium on Chicago School Research (CCSR) began analyzing longitudinal CPS data in the late 1990's. In 2005, CCSR released a report identifying the major factors that predict CPS ninth-graders' high school completion: failing no more than one class per semester and completing sufficient credits to be on track for grade-level promotion. These factors were combined into the "Freshman On-Track" rate, and proved more accurate at predicting at-risk students than standardized test scores or student demographics. In 2007, the CCSR confirmed that using the Freshman On-Track rate, along with GPA and number of course failures could accurately predict a student's graduation or dropout status 80 percent of the time. On-Track freshmen were almost four times more likely to graduate within four years than off-track freshmen.

Getting Started

In 2008-2009, CPS implemented a two-pronged initiative translating research into action. District-wide, high schools were informed at school opening by their Area Instructional Officers and by memos that actionable data for incoming ninth-graders was available electronically in a "watch list" that included eighth grade attendance and course performance. Later in the year, "success reports," distributed every five weeks at the end of a marking period, flagged students with attendance issues or a D or lower in core courses. Principals were urged to organize their schools to use this data to identify and intervene with students who needed extra help, a recommendation given clout by the inclusion of "On Track" indicators for ninth graders in the framework for principals' accountability.

In the same time period, a one-year grant from the Bill and Melinda Gates Foundation enabled creation of intensively-supported pilot Freshman On-Track labs in six high schools, with the district's intention of taking lessons learned to scale. Two paid coordinators were hired for each lab school, and they, with support, training and protocols from the area offices, assisted school administrators, teachers and counselors in understanding the data, using it, and designing and implementing innovative intervention plans for students.

While all six of the labs received equal resources, there were varying degrees of success. Collaboration among administrators, teachers, and researchers was crucial to the use of data. Schools in which there was little support from administrators, or in which resources were spread too thinly over too many students did not achieve the success of other schools. Schools with high teacher involvement yielded the most success. At the end of the school year, lessons learned were compiled and analyzed, resulting in "*Freshmen on Track: A Guidebook to Help You Keep Your Freshmen on Track to Graduation*."

Keep Moving, 2009 and Forward

In school year 2009-2010, the Freshmen on Track guidebook was provided to all high schools, over the web, and on CD. Schools continued to receive watch lists and success lists. Misconduct data, both aggregated and student-level, was available in a separate report, the "Student Profile," and the level of detail about what should be accessible to whom continued to be under discussion. End-of-semester reports were added, focusing on credit accrual and need for placement in credit recovery to get back on track. Work on using the On Track indicators became more intentional; some area offices implemented coaching systems to provide targeted supports to schools; some had monthly meetings; and all held performance management sessions in which interventions to keep students on track were discussed. Teachers utilized lists to shape their classroom activities, and schools used them to manage extracurricular participation and wraparound service provision. Some schools put in extra effort; those in which data (other than attendance)[72] were inputted daily were able to extract information and reports on a daily or weekly basis. Recognizing the value of additional support for using data and guiding interventions, some of the principals of the On Track lab schools were able to allocate funds to continue to support a coordinator even though grant funding had ceased.

By 2010-2011, the On Track system, although still variably implemented, had become institutionalized in the district and expanded to include tenth graders, based on a set of tenth-grader specific indicators; accountability for their On-Trackness was added to the High School Score Card. As the school system reorganized in 2011-2012, with networks rather than area offices, the work of providing help to schools shifted; schools that are part of external networks (for instance, the CCSR's College Success Network) are further supported and coached in data use and interventions by external partners, just as some internal networks also provide help.

Impact

By several calculation methods, the On Track system has been successful. CPS data show that the freshmen On-Track lab schools have a 76.1 percent "on track" rate, exceeding rates before implementation and higher than the district average of 63.9 percent. District wide, with data from CCSR, the On-Track rate has risen approximately 10 percentage points, from a baseline of 56 to 59 percent in 2004-2007 to 69 percent in 2010.[73]

Moving Forward During Tight Fiscal Times

Although recent cuts to data personnel and other services have reduced the degree to which CPS can support schools, providing student data is continuing. CPS believes that in the long run, investment in the On-Track system saves money, as it enables educators to aid at-risk students earlier and to avoid costly supports later. The On-Track system was scaled to serve 60,500 ninth and tenth grade students at 107 high schools, and is slated for expansion to the middle school level and possibly eleventh grade during 2012-2013. The first cohort of students monitored through the On-Track system will graduate in 2011-2012, enabling impact studies. The district also plans to analyze different elements of data and effectiveness, including: which interventions are working best for students; how, longitudinally, students move on and off track; what grade distribution looks like, and how this affects student performance. With clearly documented rising graduation rates, the challenge ahead is to make sure that more high school graduates graduate well-prepared for college and work. ACT scores, a benchmark for college readiness, have risen one percentage point in the last decade while participation has increased 10 percentage points.[74] The goal is to achieve even higher levels.

3) RESOURCES MUST BE ASSEMBLED AND MAXIMIZED

In our site visits, we found that data alone are not sufficient. To turn data into results, appropriate interventions had to be assembled and human capital had to be available to provide these interventions. Further, states, districts, and schools are under pressure to produce substantive performance growth, while, in this economy, resource constraints are all too real. In the face of the need to simultaneously maximize education dollars and student performance, states, districts, and schools are being creative with leveraging and efficiently using resources inside and beyond the schoolhouse and district walls. In some instances, improved internal alignment has capitalized previously under-utilized or misdirected resources. In certain resource-constrained instances, external partnerships were essential to success.

In our conversations with education leaders across the country, we found that these resources exist, both inside and beyond the schoolhouse walls. Conversations with EWS leaders revealed that partnerships of all kinds offer new perspectives and produce results at the state, local, and community levels. Design and data teams brought in unlikely partners to provide fresh ideas. Teachers were organized into more effective teaching teams; educators made better use of existing support personnel like counselors and deans of discipline; and community organizations provided services like mentoring and tutoring or more intensive wrap around supports for a range of high needs students at all levels. Nonprofits helped solve the scale problem by supplying a second shift of adults when schools find that they have hundreds of students with off-track indicators in need of additional supports. Supportive professional development, coaching, and networking were key to the process. Below, we share a few examples we encountered of resources that were critical to EWS implementation and how to best leverage all available resources to keep students on track for success.

Data alone are not sufficient. To turn data into results, appropriate interventions must be assembled and human capital must be available to provide these interventions.

Share Knowledge, Needs, and Ideas

EWS users are learning from each other across state, district, and school boundaries. In Diplomas Now schools, teacher teams meet weekly or bi-weekly to review and discuss EWS "support lists" assembled by a coordinator. Once student-by-student, group, and whole school challenges were identified, team members put their heads together to arrive at suggested interventions, designate a responsible team member, and assess progress two weeks later. Teams of near-peer mentors and tutors from City Year (a national service organization), social workers/site coordinators from Communities in Schools (an integrated student services organization) and a school transformation facilitator from the Johns Hopkins Talent Development Secondary School reform program, complement the teachers and other school personnel on the team. They provided both insight into the challenges students face, and additional person power to help implement and monitor the proposed solutions. Early adopting EWS states and districts are also sharing their experiences with others. The Nashville EWS team, for example, presented what they had learned about EWS design at several meetings, including a statewide focus group meeting for the design of the state system, a national data meeting sponsored by

National Center for Education Statistics (NCES), and in a visit to Memphis City Public Schools.

Resources exist, both inside and beyond the schoolhouse walls. Local and national nonprofits can contribute essential wraparound services. Educators and technical experts can serve as mutual resources. Corporate partners can contribute technical expertise. Research institutions can guide system design.

Educators and technical experts also serve as mutual resources, first developing and then fine-tuning EWS to most effectively meet local needs in cost effective ways. In districts, regions, and states, EWS have been designed by a variety of technical experts. These include state and district programmers and IT experts, technical experts in regional education service agencies and regional education labs, software entrepreneurs, corporate partners, and sources such as the National High School Center. In Columbus, Ohio, Nationwide Insurance enrolled executives and technical staff to help spearhead district efforts to build an EWS. They then spun-off a nonprofit organization to help other districts do the same. In Cape Girardeau and St. Louis, Missouri, Wells Fargo Advisors contributed financial, technical, and human resources to fine-tune and implement the technical aspects of the Big Brothers Big Sisters of Eastern Missouri scale up from manual to electronic data collection. In Knoxville, Tennessee, after the Board of Education articulated visionary goals for student outcomes, the Chamber, which sought to have the best workforce in the country, spearheaded formation of a joint business/school district team and, with foundation support, secured an experienced executive to develop a district data system that would answer the questions related to return on investment and resource allocation. With the core of the data system built in the first two years, EWS functions will be added in 2011-2012.

In Virginia, when educators faced capacity constraints in developing the Virginia Early Warning System (VEWS) technology tool, they reached out to the National High School Center, with whom they had previously collaborated. As a result of this partnership, Virginia transformed simple spreadsheets for single districts

Lessons from Knoxville: Big Vision. Big Results. When Schools and Businesses Align

Knox County Schools (KCS) serves 57,000 students, 40 percent of whom are eligible for free- or-reduced-price lunch. This district has some of the state's best, as well as lower performing schools. Through its five-year strategic plan, entitled *Excellence for All Children*, Knox County Schools set ambitious goals to prepare its students for college, for careers and for life. To address educational disparities, the Knox County Board of Education set a tough challenge for their community: 100 percent of entering ninth graders will complete high school in four years, 90 percent of those will graduate with the regular diploma, 90 percent of those who graduate with a regular diploma will have taken the ACT exam, and 90 of those who have taken the ACT will achieve a composite 21 or higher.

A Perfectly Aligned Partnership

The Knoxville Chamber, which in the summer of 2011 was named national Chamber of Commerce of the Year, set the challenge that Knox County and adjoining Oak Ridge would have the best workforce in the country as well as be a beacon for new business. To reach this goal, they asked KCS what was needed to achieve the high goals that had been set. Their answer was simple: funding. The business community responded to the call, asking questions like: "What should we fund? How will we know what is working? How will investment outcomes be measured?" They also got to work. With the district's permission, MBA interns discovered these questions couldn't be answered because there were 20 separate data repositories. They found that KCS had a great deal of raw data insufficiently integrated to answer tough questions about strategic investments.

The conditions were right for a partnership. The new superintendent was familiar with the value of good data systems from a previous role. The business community knew the value of education and possessed strong technical expertise to help with solutions. Mutual commitment grew to build a basic integrated data warehouse. A retired CEO stepped in to oversee system design. Local

philanthropies committed funds. A technology system from a college bookstore supplier that had powerful querying tools which were not operating-system dependent, (necessary because KCS had many different makes of computer) was identified for use and later purchased with school system funds.

Getting to Work

The superintendent determined that the system should enable viewing student progress longitudinally. Elementary and middle school teachers and administrators should be able to look at middle and high school data on elementary school graduates. Their high school counterparts should be able to look backwards at students' performance in middle and elementary school. Focus groups of principals, teachers, and counselors were convened to advise on what was needed and in what format. From there, the education and business community designed a comprehensive and flexible system that combined a vast amount of historical information. This included financial, academic and demographic profiles, state assessments and ACT scores, daily grades, daily and period attendance and tardies, daily discipline, enrollments, and mobility among schools. In December 2009, just 18 months after inception, the first Education Management Information System (EMIS) was unveiled in Knox County. By mid-year 2011, six years of data had been loaded.

Lessons Learned

They Needed to Learn More. Cost-benefit analysis showed that the lowest performing schools were receiving the most resources but needed help in choosing and targeting interventions to help the right students most effectively. Educators requested more instructional data. In 2011, outcomes of a district-designed formative assessment were added. Interest in these results was viewed as critical to developing educator ownership and use. Later that same year, a new reporting tool was released to all teachers and principals that assisted them in navigating through the data maze to an individual student profile. With just three clicks of a mouse, easily readable, color-coded, two-page profiles appeared.

The Partnership Continues. The Chamber has not strayed from its original goals. It has continued to press forward with the local school district to grow the best-prepared workforce in the country. Through its Workforce Development group:

- A gap analysis was carried out of present and future workforce needs and how area schools and institutions of higher education are meeting those needs;
- 100 community leaders committed to spreading the word about education and workforce needs with an "Education is a Community Issue" campaign and presentations. Materials and a video were developed to support these efforts;
- 10 or more companies support 100 teachers per summer in once-a-week summer lunch and learns, especially in science and math related occupations, giving educators the opportunity to internalize workforce expectations for both soft and hard skills and take these back to the classroom; and
- The business community joined with the superintendent to write a new strategic plan. A Chamber executive also joined the KCS implementation team, serving on the superintendent's leadership team and often spending a day a week in the district.

Moving Forward

Latest results from the Tennessee assessment system (from the 2010-2011 school year) show that district scores have continued to rise. But the work is not over. In the 2011-2012 school year, there are plans to add an EWS component with fifth and eighth grade flags, and ninth grade indicators. Improvements will also enable data for transfer students to be accessed within a day of registering and fuel a study of school feeder patterns and their costs. Partners will continue to load longitudinal data until 15 years of data are in the system, making it possible to understand historical trends.

In several large districts including Boston, Chattanooga, Chicago, Jacksonville, and Philadelphia, teamwork between public education funds, philanthropists, local educators, and researchers were essential to EWS development.

into a complete, consistent system that would merge state and local data. This system imported and exported data back to the schools without duplication and made it useable by even the most resource-constrained districts. Diplomas Now is working with SchoolLoop to develop a portable plug-and-play EWS for schools in districts where one is not available.

Strategic Partnerships Maximize Impact

Leveraging resources helps everyone to produce results. In several large districts including Boston, Chattanooga, Chicago, Jacksonville, and Philadelphia, teamwork between public education funds, philanthropists, local educators, and researchers undergirded EWS development. In Philadelphia, the Philadelphia Education Fund, the School District of Philadelphia, the William Penn Foundation, and Johns Hopkins University researchers combined efforts to conduct some of the pioneering research on early warning indicators and integrate the indicators into the school district's student information system. As a result, teachers and parents could have access to their student's early warning indicator data, and then pilot and develop comprehensive intervention systems at the school level. The Boston Public School System collaborated with the Boston Plan for Excellence (BPE), Johns Hopkins researchers, ACHIEVE, and later the Parthenon Group, to analyze Boston Public Schools (BPS) longitudinal data, and establish "at risk" thresholds for the 52,000 students in BPS.

In Chattanooga, the successful implementation of EWS was part of an overall, decade long improvement effort made possible through the strong superintendent, a committed public education fund, a dedicated local business and philanthropic community, investment funding from the Carnegie Foundation, and the hard work of principals and teachers. In Chicago, the Consortium for Chicago School Research, working with the school district, conducted research on high school early warning indicators. They developed an on-track measure for ninth graders, which was subsequently incorporated into high school accountability indexes by the school district and became part of principals' annual review by their supervisors. This practice was later spread to Dallas. With funding from the Gates Foundation, the Chicago school district then developed data reports for high schools that provided early warning indicators for incoming freshmen and piloted response systems. In Dallas, support institutions including the Michael and Susan Dell Foundation, the Gates Foundation, the Community Foundation of Texas, and local corporate and nonprofit partners, assisted Dallas Independent School District (ISD) in moving beyond its first phase on-track indicator system to initiating a second phase College Readiness Indicator System (CRIS), as part of a new five-district network supported by the Annenberg Institute at Brown University and the John W. Gardner Center at Stanford University.

The Franklin City, Virginia school district (a "division" in Virginia terms) served as one of four districts in which the state department not only piloted the EWS developed by the National High School Center, but also the state improvement process organized around the EWS. Franklin City is a small urban district with a high poverty rate, 57 percent graduation rate, and two of three schools already in sanction. Education consultants from the Virginia Department of Education and the Mid-Atlantic Equity Center worked with the district to establish a team and create and implement the required improvement plan. The team focused on building the EWS locally, using the technology tools provided along with locally designed triggers. For attendance, the trigger was the fourth absence; for discipline, it was either the fourth in-school suspension or the second out-of-school suspension; and for academics, the trigger was failing (a D or F) in one or more courses at the six-week interim grading period. Students were divided into three tiers, with one, two, or three indicators. Thirty-day plans were written for each student with an indicator. Those with three indicators were required to attend a meeting with the associate superintendent as well as weekly meetings with the school team to review their "I Can Do It" plan to get back on the graduation path. Franklin City will use the EWS and the process laid out in the improvement plan beginning 2011-2012, as the state will at the same time move the EWS process into additional sanctioned districts.

Lessons from Philadelphia: A Leading Education Fund Helps Shape School Improvement

Urban nonprofit education funds—Philadelphia, Boston, and Chattanooga, to name just a few—have been leaders and partners in data-driven educational improvement efforts. Several have taken their locally developed knowledge to the national level. The Philadelphia Education Fund (the Ed Fund) has worked to advance student outcomes in Philadelphia for the last 25 years. A research endeavor is fundamental to its mission, informing and supporting actions, and contributing to building the local knowledge, skills, and relationships necessary to work in partnership with the community. In 2004, researchers from Johns Hopkins and the Ed Fund and with the support of the William Penn Foundation, partnered to identify early reliable signals of students falling off the path to graduation. The seminal research led to middle school indicators that were disseminated in peer-reviewed papers, public forums, and became the basis for middle grades work in many other cities.

The Power of Partnerships

Knowing the relevant indicators, the Ed Fund partnered with the School District of Philadelphia to build the indicators into the school district's student information system, enabling teachers, students, and parents, to access middle grade early warning indicator data. The Ed Fund and Johns Hopkins researchers also began a two-year pilot with a high poverty middle school to begin to learn how early warning indicators could be used to support more effective interventions. During this time, early versions of additional useful tools were developed. For example, a grid with attendance, behavior, and course performance on one axis and whole-school, targeted, and intensive interventions on the other axis helped schools take stock of their existing interventions and identified areas where they were lacking. This initial work also demonstrated that teachers would buy into and could quickly see the utility of early warning indicators as long as preliminary efforts were undertaken to explain how and why the indicators worked and attention was paid to building a sense of mission among the staff. It was also important to put processes into place to provide staff ready access to the data and time to analyze and discuss it. However, a key finding from this initial pilot was that the number of students identified with early warning indicators could become overwhelming. In high-needs schools with hundreds of students demonstrating off track indicators, there were not enough adults to meet all the needs of the students.

These findings led the Ed Fund to partner with City Year of Greater Philadelphia and Communities in Schools of Philadelphia, as well as adopt the Johns Hopkins University Talent Development Whole School reform model (which in earlier years the Ed Fund

had helped support in Philadelphia). Ultimately, three north Philadelphia schools field-tested a whole-school intervention, which combined an EWS with a second shift of adults, integrated into the school fabric through an on-site facilitator. These efforts led to Diplomas Now (please see Diplomas Now case study for more information).

Success Prevailed

In the three pilot schools, by 2009-2010, 56 percent fewer of the students were off-track in attendance, 53 percent fewer were off track in behavior, 82 percent fewer were off track in math, and 78 percent fewer were off track in literacy. After the U.S. Department of Education's i3 award of a $30 million validation grant to the Diplomas Now model, based on the recommendations of a national review panel of other experts, the Ed Fund's role expanded. It now serves as national technical-assistance consultant to Diplomas Now effort. The Ed Fund continues to analyze Diplomas Now data, together with Johns Hopkins, City Year, and Communities in Schools. The Ed Fund's efforts provide an example of the role external partners can lay in complementing district resources, particularly when districts and schools recognize the need for data but are too under-resourced to analyze it. A current focus is on the effectiveness of interventions, the applicability of different interventions to different situations, and the reasons underlying effectiveness of particular interventions in schools. What policy and practice factors influence intervention outcomes positively and less positively? When districts and partners deepen understanding of these factors, schools will be enabled and empowered to address the dropout challenge even more effectively than current models allow.

Professional Development, Coaching, and Networking

Almost all EWS implementers identify professional development, coaching, and networking as a top strategy to guide hands-on use. In Louisiana, interviews with education leaders indicated that, with hindsight, deploying a group of well-trained staff into the field would have helped operationalize the seven-year old system more rapidly and effectively. In response, the State Department of Education, through the Division of College and Career Readiness, plans to commit 16 graduation coordinators statewide to improve graduation rates. Coordinators will spend 75 percent of their time coaching school personnel to effectively diagnose need and assign and track efficiency of interventions. Every school has been assigned a coordinator as a condition of the accountability system. The coordinators will target their work to assist high schools in the "red and yellow" alert categories. State and regional summits and conferences will enable educators to share best practices and what they have learned in the course of undertaking school improvement.

In Alabama, the State Department of Education recently made the Alabama Graduation Tracking System, (AGTS) available to all its schools at no cost, to address the ABCs of increasing the graduation rate and reducing the number of students leaving K-12 schools. The process is systematic, timely and directive, and involves six steps for full implementation. To spur usage, Alabama has tied the AGTS process into the state-level system of professional learning credit for educators. Teams are currently being trained statewide in the implementation and use of the tool through regional workshops; participants practice downloading their own district or school's data, and develop a plan to get their district or school organized in using AGTS. Additional workshops will be held for school registrars to practice protocols for coding, inputting, and uploading. Once back in the schoolhouse, the AGTS team is expected to work with colleagues to set local parameters and triggers that reflect local experience, and to reconsider policies. Triggers relate to attendance, discipline, grading, course-performance, how these factors and related policies influence graduation positively or negatively, and what refinements could be made to keep more students engaged in learning. Additionally, 25 state-trained and supported coaches for the "high need" schools identified by the accountability system will add early warning system coaching to their "to do" list. Other districts and

Almost all EWS implementers identify professional development, coaching, and networking as a top strategy to guide hands-on use.

schools will largely rely on nearly 250 local personnel who have, at least once in the last four years, attended state workshops on coaching for graduation improvement.

Comprehensive efforts are necessary in these high-needs schools, combining whole-school reforms, EWS, and a second shift of adults recruited from nonprofits and the community.

Meeting the Scale and Scope of the Identified Need

The majority of states and districts that are at the leading edge of EWS are still in the early development and initial implementation stages. One key, yet unanswered question emerged from those that have been at it the longest: when early warning indicator data reveals large numbers and high concentrations of students in need of additional supports, how do you effectively respond? In the most challenged schools, hundreds of students can be off-track for graduation. Without adequate supports, a common reaction of front-line educators and student support personnel is to adjust down threshold levels to focus on a smaller, and presumably more manageable number of the highest needs students. This, while understandable, is not always the most productive strategy. Rather, students who are just at the indicator threshold or are moving in that direction are those who can most likely be put back on track to graduation with existing school personnel. Comprehensive efforts are necessary in these high-needs schools, combining whole school reforms, EWS, and a second shift of adults recruited from nonprofits and the community. These efforts should be tied together in an integrated school improvement and student support system that enables all students, no matter their numbers, to receive the supports they need to stay on track. (See pullout box on Diplomas Now for additional information on how to address these capacity challenges.)

Diplomas Now: Whole-School Improvement with EWS

Diplomas Now (DN) is one of the first whole-school improvement models to explicitly incorporate an EWS. It is designed to help the most challenged schools in America's largest cities succeed in helping every student graduate ready for college and career. The initiative blends a system of early warning indicators paired with enhanced student supports and interventions into the larger context of comprehensive whole school reform. Diplomas Now was the only secondary turnaround group with national reach to win a $30 million federal Investing in Innovation (i3) validation award (plus a $6 million matching grant from the PepsiCo Foundation). Partners are Talent Development Secondary Schools, Communities in Schools, and City Year. Current sites include middle and high schools in California, the District of Columbia, Florida, Illinois, Louisiana, Massachusetts, Michigan, New York, Pennsylvania, and Washington. Overall, the initiative will expand to 60 middle and high schools in 10 districts over the next five years.[75]

The model is simple but powerful: Diplomas Now "sets goals based on students' attendance, behavior, and course performance. They develop a strategic plan, implement an early warning system to identify struggling students, and regularly review the data. Teachers and the Diplomas Now team craft individual student plans that include more math and English time and teacher teams with shared planning time. For the neediest students, Diplomas Now helps form support groups and connects them with community resources, such as counseling, health care, housing, food, and clothing."[76] Translating the model into reality requires strong leadership from the principal, a DN site team supporting teams of teachers, early warning indicator data, and often, local community agencies. The DN approach is infectious and successful. It not only helps schools implement an integrated set of evidence-based school improvements, it also provides people to help put them in place and respond to what can be an overwhelming number of students in need of targeted supports.

The DN site team includes a school transformation facilitator from the Talent Development Secondary Schools program. This facilitator acts as a key aide to the principal, supports teacher teams, helps to operate the EWS, and analyzes data to deduce which

types of supports are needed and are being effective. The DN site team also typically includes a team of 10 to 12 City Year corps members, who are doing a year of national service supported by AmeriCorps. Each corps member is assigned to a homeroom of students and within it a focus list of students who have exhibited an off-track indicator. Corps members help these students throughout the school day, serving as a near-peer role model. Finally, the DN site team has a Communities In School site coordinator who leads and organizes the case managed supports required by students facing significant out of school challenges.

Examples of DN in Action at the School Level

- **A 1000-student middle school in which 95 percent of the students are eligible for free- or reduced price lunch.** The principal and DN administrator are passionate that their students succeed. Watchful and encouraging administrators at every intersection and the cafeteria keep students moving to class on time. Everyone learns the rules because every adult is on the same page. Teachers are focused on instruction; vertical teams met within departments to discuss student performance in the content areas, and persuaded the district to incorporate outcomes of teacher-made benchmark tests into EWS. The DN administrator keeps DN team meetings moving along smartly, with two-minute discussions of "watch list" students prepared in advance by the DN facilitator, from district- and school-provided data. Questions come from all directions. Is the student slipping or improving in attendance, behavior, and coursework? What interventions did the math teacher try? Does anyone know why Student B missed school for several days, and who spoke with that student's parents? DN team members—teachers, one counselor, the Communities In Schools representative, and six City Year mentors—bring their professional understandings to the table and quickly reach agreement about next steps to try in the next two weeks. The school recently made Adequate Yearly Progress; reading scores are rising, and math scores, though not yet at the desired level, are also doing so.

- **A small K-8 urban school in which there are 150 students in sixth through eighth grade.** More than 80 percent of the students are "on track" in attendance, but overall, math, literacy, and behavior are a challenge. Close to 40 percent of the students "off track" in the first two, and half are "off track" in behavior. The principal is deeply supportive of her staff and they return her support with respectful candor about difficult topics. The DN team considers charts of student progress on the different indicators, prepared within the school and posted in the DN team meeting room. The local education fund re-analyzes the data by marking periods to determine improvement in response to different types of interventions. Emerging data suggests that classroom-based problem solving is most effective in math classes while individualized tutoring works best in English language arts.

- **A 400-student high school serving students who are 97 percent African American and 78 percent free- or reduced-price lunch eligible.** In the previous few years, enrollment has declined precipitously, as have state assessment scores, and a new principal and administrative team are working to turn the school around using DN as the driver. The Talent Development/DN model of a ninth grade academy was implemented as was a summer "boot camp" for rising ninth graders; students take math and literacy proficiency tests as well as state assessments to augment teachers' understanding of their needs, the DN facilitator prepared a sheet for each ninth grader showing progress on course-passing required for promotion in this state, and active City Year mentors are evident throughout the ninth grade classrooms. Each member of the City Year DN team assumes responsibility for a set of students from the watch list, although in the end, they work with all—as a student reported, "I imagine in the end they have touched the lives of most of these kids." Working with the DN Communities in Schools site coordinator, the school's parent coordinator (supported by Title I funds) created an ambitious involvement and literacy program that fosters communication and competition among parents, and has brought more than 130 parents to school once a month over the school year for a reading program.

Overall, DN has been able to reduce the number of students showing off-track in attendance and behavior by half and the percent of students failing courses by three-fourths, with some variation by site, and implementation conditions.

Louisiana: Accountability Pulls Up a State Education System

One in three children in the Bayou state live in poverty—one of the highest rates in the nation. To complicate the struggle, six years ago, the state was confronted with one of the country's worst disasters in recent years. Despite these obstacles, policymakers and educators in Louisiana have spent more than a decade crafting a data-based educational accountability system as a framework for helping schools improve student outcomes. Initial state feedback of data to districts began in the late 1990's. Refinements have continued, first with growth of the state longitudinal data system—one of 11 deemed by the Data Quality Campaign (2010) to have the 10 essential elements for functionality—and then with development of the Louisiana statewide Dropout Early Warning System, or DEWS, arguably the first among the state EWS.

Recognizing early on the leveraging power of attendance, graduation rates, and diplomas, Louisiana factored K-8 grade attendance, high school graduation rates and type of high school diplomas awarded into the performance score used to reward and sanction schools, beginning in 2003. When the Graduation Index counts for 30 percent of a school's score, and schools are incentivized with additional points for the type of diplomas awarded, they begin to pay attention. Gradually, the state cohort graduation rate has risen: for 2009-2010 it is 67.2 percent, up nearly six percentage points over the last 10 years. On-lookers attribute gains to cleaning up the data, using data, policy changes, and dedicated education professionals fully committed to improving student outcomes.

Data In. Data Out.

DEWS began in 2004, inspired in part by the success of a high school principal and his leadership team in using data to identify students at risk of failing. As with most EWS, DEWS has continued to develop since its inception, more recently in partnership with the EDGEAR/JPAMs student information system collaborative at Louisiana State University. Technical aspects of the DEWS system reflect some used in other EWS along with some innovations.

- After extensive analysis, 200 possible factors influencing graduation were reduced to the three most important indicators—attendance, behavior, and course passing.
- Time was factored into indicators and triggers. Special attention was paid to the first 30 days of schools, as students with significant absences during this period had severely impacted grades. Students whose GPA dropped .5 were flagged, as were students with Ds.
- Other thresholds were set based on percentages rather than absolute cut points.

- Flexibility is allowed in schools and districts. They have the option of raising the bar higher for thresholds, just as they have the option of using or not using the system.
- Various individuals carry out data input, depending on school and district organization. This includes classroom teachers, attendance clerks, and disciplinarians.
- DEWS was first piloted in 20 rural and urban schools, with input gathered about effectiveness. Later, state grants to approximately 175 middle and high schools fostered review of data, early and often, targeted to support students.
- Initially, DEWS provided superintendents, principals, and leadership teams with lists of students slipping into trouble on the first and fifteenth of every month. Others in the school received role-specific reports and counselors now both receive a daily report of students who have moved into "at risk status" and are able to track the effectiveness of interventions. Reports are delivered automatically over email, reducing the burden on educators. Schools continue to use student information systems of their choice, although approximately 75 percent go through the LSU EDGEAR system. Those which do not can receive real-time data and run their own reports.

What They Learned and Where They Went

With hindsight, these educators know that making the system easy to use is key, and that deploying a cadre of people in the field would have helped to rapidly and effectively operationalize use. Now:

- Schools will receive a Graduation Support Profile for each incoming ninth grader, covering age, and eighth grade mathematics and English language arts scores on the LEAP (Louisiana Educational Assessment Program test), discipline, mobility, and attendance.
- The State Department of Education, through the Division of College and Career Readiness, will commit 16 graduation coordinators statewide to improving graduation rates. Coordinators will spend 75 percent of their time coaching school personnel to effectively diagnose need and assign and track efficacy of interventions. Every school has been assigned a coordinator and a condition based on the accountability system; the coordinators will especially assist high schools in the "red and yellow alert" categories, vertical teams of middle and high school personnel, and middle schools when these are recipients of federal improvement grants.
- State and regional summits and conferences will enable educators to share best practices and what they have learned in the course of undertaking school improvement.

Part 3: Paths Forward

Now more than ever, education systems must harness the power of data to effectively serve students and society. Our investigation shows that EWS are at the cutting edge of high-impact education improvement initiatives. Their synthesized data, when appropriately leveraged, can not only help sustain the investments made in early education, but also accelerate gains in academic performance for students at all levels. EWS based on the pairing of research-based indicators and evidence-based interventions have the potential to be a game-changer for our nation's struggling schools. Even schools with limited resources can implement EWS and use these systems to help all students graduate from high school prepared for postsecondary success.

Stakeholders from all sectors, including parents, educators, administrators, legislators, business leaders, and funders, can apply the lessons learned from the early adopters of EWS to the content of their work. This section focuses on emerging best practices, needed research, and policy recommendations.

EMERGING BEST PRACTICES: FOUR KEY QUESTIONS FOR SUCCESSFUL EWS PLANNING AND IMPLEMENTATION

A number of guidebooks and tools supporting the use of EWS are freely available over the web or for purchase (see Appendix 2 for additional information). A resource gap still exists. In order to help close this gap, four key planning and implementation questions and subsequent recommendations are outlined below for parents, educators, administrators, district leaders, state Department of Education officials, and policymakers to consider.

The Four Key Questions to Guide EWS Implementation Are:

- ***What Types of Data Will Be Recorded?***
- ***How Will Data Be Recorded?***
- ***How Will Recorded Data Be Used?***
- ***Who Should Be Consulted in the Planning and Implementation Phases of EWS and What Are Their Roles?***

Key Question 1: What Types of Data Will Be Recorded?

Put the student first.

Data and students must both be treated as important components of an EWS. Data help to identify students and craft interventions, but the success of the student is the ultimate goal. So, while it is important to rapidly identify students who are falling off track, it is also important to identify and build on their strengths.

Use empirically created indicators.

Powerful indicators can be identified based on the analysis of longitudinal data that tracks individual student progress over time. In essence, examining the behaviors associated with dropout among previous cohorts of students will help to determine which indicators ought to be included in the EWS and which interventions ought to be paired with the selected indicators.

Be selective in the set of indicators.

As technological systems have advanced, and the capacity to integrate data from multiple sources has improved, it is possible to generate a dizzying variety of data so that people are information rich and knowledge poor. A few key variables are easier for teachers to monitor than a large set of predictors. They can reduce the burden of extra work and help inform instruction. K-12 analyses have demonstrated that although the underlying issues that produce the poor grades or weak attendance may be complex and may vary from student to student, there are a small number of behaviors that alert educators to students potentially falling off track. By extension, a good indicator system also identifies variables that are not the strongest predictors of eventual dropout, and does not depend on them.

Focus on "high yield" indicators to capture the majority of students who eventually become dropouts, rather than identify small minorities of students with uncommon manifestations.

A good indicator system avoids the "one percent problem"—indicators that are highly predictive but that only identify a small percentage of dropouts. The most highly predictive high yield predictors are: 20 days of absence (one month of school), failing two or more courses, and sustained mild misbehavior. Additional research, time markers, and local nuance strengthen the predictive accuracy of these indicators.

Begin to respond to student behavior well before triggers for more intensive interventions are reached.

Twenty missed days may signify that the danger zone for attendance has been crossed into, but students should never be allowed to reach this level of absence. Successful schools keep a watchful eye on all students in the first 20 days of school and begin to intervene as soon as several absences not associated with an illness occur. The same vigilance is required regarding academic performance and behavior.

Determine policies for sharing information with and collecting data from sources beyond the schoolhouse to enhance knowledge of students and to target interventions most effectively.

There are many sources of helpful information in youth-serving community agencies external to schools or the district. For example, local health and welfare agencies, nonprofits that offer extended learning time, mentoring and tutoring, and the juvenile justice system may have data and information that could help to increase knowledge of students and to determine the interventions that would best meet student needs. Determine how this contextual information can be used to guide students back onto the graduation path. This data can also be used at the school and district levels to adjust resource allocations and to share resources across agencies. Schools with very high populations of agency-involved youth that are demonstrating off-track indicators should be supplied with the resources required to address the unique challenges these young people face.

Recognize there will be state-by-state and district-by-district variability in data availability, data system capacity, and support for interventions.

Different states have different philosophies and policies about what is appropriate to collect from districts and schools, and how often the information should be collected. States and districts also vary in terms of financial, human, and technological capital that can be applied to building and sustaining EWS. As a result, in some states it will be possible to have strong state supported EWS efforts, while in others, districts, community organizations, nonprofits, and/or schools will have to take primary responsibility for implementing these systems. Federal and state efforts to incentivize the spread of EWS should allow for their growth whether system implementation is led by the state, district, community organizations, nonprofits, or corporate partners.

Key Question 2: How Will EWS Data Be Recorded?

Record data from the simplest and most direct source possible.

EWS can be implemented as early as the later elementary school years and should cover key transitions (i.e. sixth and ninth grade). The running record found in a teacher's grade book, whether on paper or electronically, is the most important data for EWS. Grade books show, by period in middle and high school, who was present, who came late, who turned in work, who received what grade, and how they behaved in class. Records in the registrar's or data clerk's offices, and those of the counselor's, assistant principal's, or dean's augment teachers' records. Data collection does not need to be overcomplicated, but it does need to be accurate. As EWS become refined, data collection may be increasingly automated.

Ensure data are entered by appropriately trained personnel and according to well-designed protocols.

The quality and utility of a data system depends on the accuracy of the data stored within. Data must be consistently coded and coding protocols must be followed daily. Adequate staffing of data entry initiatives, with a mindfulness of current staff caseloads, is essential for success.

Key Question 3: How Will EWS Data Be Used?

Explore issues of privacy.

Ensure that children's privacy is protected while also leveraging data to most effectively promote their success. Ensure adult stakeholders are comfortable using data with respect to privacy regulations by broadly communicating how they are allowed to use what types of data. It will be important at the federal level to provide a range of examples of how EWS data can be effectively used within existing privacy laws, as some districts are reluctant to proceed for fear of violating laws and regulations they do not fully understand. To address these issues, EWS can be structured to provide role-specific access tailored to each adult's specific interactions with students.

Use the advantages of technology to reduce information into easy-to-understand data presentations.

Convert student-level data reported by teachers, counselors, and administrators into simplified reports requested by these users, showing patterns and progress, with dashboards or stoplights and clear flags. Transparency and usability should be the goals for these reports.

Teach people how to understand and use data.

Provide training and professional development to help educators and administrators learn how to effectively leverage the power of data and to collaboratively work to keep students on track to graduate from high school prepared for college and a career. Invest in mission building efforts so teachers and other school staff can learn how attendance, behavior, and course performance not only impact student's academic success within their classrooms, but also shape their educational trajectory for years to come. Additional support can be provided and learning communities fostered via webinars, videos, and conference calls.

Provide follow-up coaching for data use.

Initial training is important. Experience has shown, however, that not all individuals are equally comfortable using data. When coaches are available to support their colleagues on a frequent basis, data are used most effectively. These coaches can be drawn from the ranks of master teachers, other instructional leaders, and school personnel who appreciate numbers and patterns Weekly meetings have proven most effective.

Compose a "support list" of students and revise it every few weeks based on the indicators.

Track student data over time. Some students will improve. Others will slide. Data analysis needs to be an ongoing process.

Act on the data shown in the "support list" and associated reports.

Get educators to analyze and discuss individual student-level data frequently, asking the question, "What next steps can we as adults take to better understand and then help change this student's situation?"

Build EWS meeting time into the school schedule and guard this meeting time zealously against intrusions.
As educators begin to see results, they will no longer perceive EWS as burdensome time, but as valuable opportunity for collegial discourse that informs their understanding of their students and their instruction. When students succeed, teachers succeed. That positive reward drives many educators.

Make decisions about actions and interventions as a team.
Hold student-level discussions among teams of teachers and other adults who interact with the same students whenever possible. Having a discussion leader and a protocol to facilitate the conversation and keep it on track is extremely useful. Two-minute discussions every two weeks per "support list" student are in most cases sufficient, manageable, and highly productive.

Look for and act upon patterns that emerge from the data.
In many cases, the number of students demonstrating off-track indicators will be greater than the school has the capacity to respond to with individually tailored interventions. It will be important to implement school-wide prevention activities when large numbers of students are chronically absent, getting in trouble, or failing courses. If students who are signaling that they are falling off the graduation path are heavily concentrated in a sub-set or a few classrooms, the most judicious intervention might be to work directly with the teachers in those classrooms, providing them additional support and professional development.

Know your school and students when choosing interventions.
A school with 600 ninth graders, 40 percent of whom are not coming to school and are failing English or math, and a school with 300 ninth graders, 10 percent of whom are failing two or more courses, have quite different situations. The solutions are equally variable. In the first case, principal and leadership team vision coupled with school-wide prevention strategies and external support from community agencies and nonprofits may be essential to improving outcomes for the 240 struggling students. In the second case, an analysis of instructional practice and curriculum supports may go a long way towards improving the achievement of the 30 struggling students.

Practice intervention discipline.
A human reaction is to focus time and effort on the neediest students. Often, however, a professional case manager best serves these students. The students who have just fallen off track, or are heading in that direction, can be most easily guided back onto the graduation path through the collective efforts of their teachers or nonprofit partners. Thus it is important to reserve time and energy and resources for these students, while making sure that the highest need students get the more intensive supports they need. The latter can often be helped by augmenting social workers and counselors with individuals from wrap-around support agencies. Especially in schools with large volumes of off-track students, it is important to form partnerships with nonprofits that can provide the human capital at the scale and intensity required to support moderate intensity or "Tier 2" interventions, like attendance monitoring, positive behavior reinforcement, and help with assignment completion.

Engage stakeholders from various backgrounds in data usage.
Parents, teachers, administrators, nonprofit partners, and even students should be incorporated into EWS usage. With technology, various levels of access can be established so that, for example, parents can access only their own child's portfolio or nonprofit partners can communicate with teachers and parents about the students they serve.

Track outcomes of interventions frequently.

The purpose of the team meetings to discuss students on the "support list" shifts over the course of the year. Throughout the process, keep the discussions short, frequent, and focused. In the beginning, team meetings help adults decide which interventions to apply. As the year progresses, team members will want to analyze whether the interventions are working. For meetings among community agencies and school personnel, outcomes of interventions may be assessed over longer periods, bi-weekly, monthly, and quarterly for formative purposes, and/or by semester and annually for summative and reporting purposes.

Keep the goal in mind: the primary objective of EWS should be to keep students on track to graduate high school, college and be career ready.

The highest impact EWS focus on two sets of students: students who ended the prior year with an off-track indicator, and students who did not exhibit an off-track indicator in the prior year, but in the current year are sliding towards one. Increasingly, districts are providing schools lists of incoming students who may be falling off track. Typically, these are sixth and ninth graders, who in the fifth grade or eighth grade had poor attendance, behavioral troubles, or failed courses. The goal of providing this information is both to ensure off track students start the new year on track and stay there, and to provide students who are sliding off the tracks targeted supports to keep them from falling off track. Finally, schools with large numbers of students can develop off-track indicators to identify the need early for school-wide preventive efforts like attendance campaigns, positive behavior modeling and recognition systems, and polices and supports to enable rapid academic recovery.

Key Question 4: Who Should Be Consulted in the Planning and Implementation Phases of EWS and What Are Their Roles?

Provide local leadership for early warning and indicator systems.

Every early warning indicator and intervention system needs a "champion" who will advocate for it constantly at the school, district, or higher level. Champions come from varied sectors—superintendents, associate superintendents, directors of research and assessment or technology, principals, teachers, community leaders, nonprofit directors, and business personnel. But "champions" can't succeed alone. At whatever level it is relevant, an advisory team offers important support and contributes knowledge from different perspectives within the community that cares about student outcomes. This team may be composed of an administrator, an instructional representative, a counseling or social work representative, and a data-savvy person such as a science teacher who loves numbers and patterns.

Have a development and implementation plan and timeline.

The champion and advisory team's first step is to come up with a development plan, followed by an implementation plan, recognizing that timelines may shift as opportunities and challenges arise. A development plan will include costs, which are highly variable because they are determined by pre-existing hard and operating system platforms, data systems, the potential for the data system to be modified, etc.

Listen to the end-users and find out what they want before going too far.

Designers of early warning indicator and intervention systems should convene focus groups of end-users–administrators, teachers, counselors, social workers and others–to find out the format in which short data reports and longer analyses are most useful.

Build up from a pilot.

Start with a manageable group of implementers. Depending on capacity constraints, this could be a cohort of students, a single grade level, a whole school, or even a district. Take the lessons learned from this pilot and apply them when scaling.

Encourage schools to share outcomes of interventions and learning about early warning indicators with schools and districts with similar demographics and constraints—as well as those that are dissimilar.

Solutions can be found in many places. Collaboration leads to better results and new ideas for changing cultures. When teachers, community partners, and administrators receive and discuss data and interventions in ways that are appropriate to their roles, early warning systems and data analysis become part of the culture of the school and community and lead to more informed decision-making and actions.

Integrate EWS into instructional improvement efforts and other student support services.

High performing EWS link efforts to keep students on the graduation path with school-wide efforts to improve instruction. The link with instruction also helps with teacher buy-in, as they see how making sure students attend regularly and fully participate creates classroom conditions which enable more effective instruction. EWS can also be integrated with growing efforts to infuse data-driven decision making into instructional improvement efforts by having teams of teachers analyze student work and benchmark assessments to improve classroom practice, curricular design, and pedagogy. As typically there is only one teacher team meeting in the schedule, it is essential that EWS and data-driven instructional improvement efforts be thoughtfully linked. Finally, many schools have Student Support Teams (a team of composed of an administrator, teachers, counselors, and other student support personnel) who meet regularly to review students who are struggling and design interventions. These teams can function as a natural leadership group to introduce, support, and leverage EWS.

Engage stakeholders beyond the school system.

EWS are only effective when paired with research-based interventions. Teachers and counselors are often well equipped to provide these supports but others may be bound by capacity constraints. Educators can contact local and national nonprofits to help meet the need of the students and families served.

What are the financial costs to an EWS?

Cost projections are part of the early planning stages for an EWS. Resources, funding, staff, or external consultant time will need to be devoted both to identifying the indicators and thresholds to be used by that locale or district, and the degree of flexibility that, depending on the organizational level, is permitted for schools and districts. The functionality of the student information system and the existence or potential for creating or accessing a data warehouse must be evaluated. Methods of data synthesis and redistribution need examination and decision. Will distribution be simple, through an excel spreadsheet, will it occur through a complex data-aggregator that automatically produces pre-selected reports judged to be most useful, with different privacy settings for different users, or will there be flexibility in querying?

Costs associated with these investigations and discussions vary depending on circumstance, but are not huge, as they primarily involve staff time or consulting contracts of limited duration. Modest and slightly longer lasting costs are associated with proving implementation supports for the adults using EWS including initial training, follow-up coaching, and technical assistance. Larger costs are involved in providing student interventions at the scale, duration, and intensity required. Here, however, existing revenue streams like Title 1, School Improvement Grants, and state compensatory funding can be tapped and more effectively directed.

NEEDED RESEARCH TO ENHANCE THE NATIONAL KNOWLEDGE BASE

Much is known about early warning indicators, but much less is known about the complex set of conditions and policies that underlie the most effective implementation and outcomes. Three actions are recommended to advance the knowledge in the field:

Create federal, state, and district-level workgroups to study and guide dropout prevention and graduation improvement efforts with a specific focus on policies that may contribute to or distract from increasing high school and college and career readiness rates, on a state-by-state basis.

Substantial differences exist surrounding the conditions of education in the different states. The list of policies which influence graduation is long: graduation requirements, course and credit requirements, pupil progression policies (promotion policies grade to grade), retention policies, diploma types, opportunities for exemptions, policies related to double jeopardy for absence and suspension, or absence and grades, opportunities for suspended and/or expelled students to re-enter educational settings and resume their education, the age at which states are no longer required to offer free high school education to their students. These policies are worthy of reexamination in light of the renewed U.S. commitment to graduating greater percentages of students who are better prepared.

Conduct state and district-level surveys.

Determine the extent to which early warning indicator and intervention systems are being implemented in districts and schools, and the characteristics of the districts which have implemented these compared with the characteristics of those which have not.

Conduct design studies, multi-site implementation analyses, and random control trials to determine the characteristics of the most effective early warning indicator and intervention systems.

Despite the fact that early warning indicator and intervention systems are based on sound research and appeal to common sense, a well-controlled study that examines impact has not yet been conducted. As part of the scale up of EWS, sound research on their effectiveness, under different conditions, should be conducted as soon as possible.

POLICY RECOMMENDATIONS PERTINENT TO THE CIVIC MARSHALL PLAN AND INCREASING THE GRADUATION RATE

The work of the Alliance for Excellent Education projects just how much the dropout crisis costs each state in terms of lost revenues and new costs.[77] Families, teachers, counselors, administrators, and nonprofits are hard at work to help children achieve. Policymakers can significantly advance this ground-level work by enacting high-impact levers at the district, state, and federal levels.

The Civic Marshall Plan (CMP), part of the larger Grad Nation campaign, strives to ensure that 90 percent of the Class of 2020 will graduate from high school prepared for college and a career. EWS are identified as a key lever in the CMP. The recommendations that follow are organized around the Plan's three key recommendation areas. For a complete list of CMP benchmarks, please visit **www.civicenterprises.net/reports.php**

1) Take Action within Low Graduation Rate Communities

Fifty percent of America's dropouts come from just 15 percent of schools. These "dropout factories" can be targeted for intervention, dramatically accelerating the high school graduation rate. EWS can be strategically leveraged in these schools to target interventions to meet the needs of students at risk of dropping out through the following actions:

At the Local Level

Harness the Power of Nonprofits.

Nonprofit organizations have much to offer schools as bases for research, as sources of experienced planners, and as providers of interventions when schools require additional capacity and resources. For example, the successful pairing of EWS with nonprofit collaborators in Baltimore, Boston, Chattanooga, Chicago, Colorado, and Jacksonville, to name just a few, offers insights as to what can be achieved through partnerships. Proven interventions such as Big Brothers and Big Sisters, Boys and Girls Club, City Year, Citizen Schools, Communities In Schools, Diplomas Now, and EWS efforts launched by the United Way, have proven their worth with innovative, highly-targeted and high-impact efforts that produce results around the country. These collaborations are especially important for students who are involved with other agencies (e.g. juvenile justice and foster care), who may require specialized support.

Harness the Power of Corporations.
The business community has much to contribute to the successful design and implementation of EWS. For example, the Knoxville Chamber's work to adapt business acumen into the design and implementation of an educational technology system that addressed not only student progress but the cost-effectiveness of the district's resource allocations and educational investment is a community-based example of corporate contributions to education redesign. Likewise, Nationwide Insurance in Columbus, Ohio helped their local district build its EWS system and then created a nonprofit to help spread it to other communities. These business investments should be celebrated and best practices should be shared. To learn more, please see "Education as a Data-Driven Enterprise: A Primer for Leaders in Business, Philanthropy, and Education" available at **www.civicenterprises.net/reports.php**

At the Local and State Level

Link EWS to the ABCs.
Research has consistently shown that Attendance, Behavior, and Course Performance are the strongest predictors of whether a student is on-track to graduate. Require the use of data-driven and research-based criteria to define each of these three dropout indicators. Utilize research-based cut points, including 20 absent days, two or more course failures, and sustained mild misbehavior, which are highly predictive measures of a student's risk of dropping out. Tie these ABC indicators, and the research-based cut points, to EWS and high school completion efforts.

At the District, State, and Federal Level

Align graduation acceleration efforts with college and career readiness efforts through the Common Core.
Our nation is facing not just a high school dropout crisis, but also an accompanying college completion crisis and labor market skills gap. School, district, and state initiatives related to dropout prevention, graduation acceleration, and college and career readiness should be aligned with EWS, including funding streams, policies, and regulating offices. Specifically:

- **At the School and District Level,** provide technical assistance to educators so that they understand the use and efficacy of Common Core Standards. In addition, benchmark assessments linked to the Common Core, as well as emerging college readiness indicators, need to be integrated with EWS to create a unified and streamlined approach to using data to improve student outcomes. This will help to ensure that educators can view and act upon these data sets in unison so that the strongest outcomes will be achieved.
- **At the State Level,** adopt Common Core Standards and create dedicated offices or inter-departmental efforts in state Departments of Education and in larger districts to guide school improvement efforts centered on dropout prevention and graduation improvement, connected to college and career readiness. Ensure the work of these offices is integrated with school improvement, reform, and turnaround work.
- **At the Federal Level,** Congress should encourage states to adopt college and career ready standards through the reauthorization of the Elementary and Secondary Education Act.

Drive attention to the middle years. Build the infrastructure to support the development of EWS as all grade levels.
Habits are formed, and knowledge and skills built, prekindergarten through first grade as well as later. Additional research is needed to identify which indicators and interventions are most effective in the early grades. The research base is clear that the early years of adolescence are a critical time when students are launched on a path towards high school graduation and college readiness or begin to disengage from school and start the downward spiral that often ends in dropping out.

At the Federal Level

Ensure that federal funds, especially Title I dollars, are targeted to the highest need schools.
This can be accomplished by providing additional financial support to schools in which 75 percent or less of the senior class graduates from secondary school. It is particularly important that funds disbursed to support School Improvement (authorized by Title I of ESEA) and the High School Graduation Initiative (as authorized by Title I Part H of ESEA) be disbursed to schools in which 75 percent or less of the senior class graduates on time from secondary school.

- **Target funds and attention to districts and schools most in need, particularly in rural districts and schools.** The technology and the human capital required to implement an EWS may be lacking in under staffed rural districts where there is a low tax base and/or adults are already responsible for filling a variety of roles. EWS can make struggling districts' jobs easier, enabling them to target work earlier, when lighter, less expensive, interventions are effective. State-sponsored EWS solutions and interventions will go a long way toward alleviating rural graduation challenges. Rural schools looking for resources can also turn to Rural Development state offices for support as well as to The Rural Education

Achievement Program (REAP) Rural and Low-Income School Grant Program for funds. REAP provides grants to build and utilize educational technology, including EWS.

2) Build and Enable State and District Capacity to Improve Graduation and College Readiness Rates

At the District and State Level

Invigorate existing policies that encourage graduation and implement best practices.

Many states have "achieve to drive" policies and "pass and play" requirements for athletes. Others have laws linking dropping out to driving license suspension. In the past few years, with the encouragement of the Civic Marshall Plan Leadership Council, 20 additional states have increased their compulsory school age law to 18, but this is not enough.[78] Ensure these best practices are fully implemented, and replicated in other states and districts. Examine policies that may discourage graduation, such as double jeopardy policies that react to one negative indicator (e.g. poor attendance) by enacting another (e.g. suspension), or polices which mandate course failure if students miss a certain number of days.

Convene a summit of early adopters of EWS.

Include school, district, and state-level representatives, as well as community-based organizations and legislators, to share best practices and accelerate effective EWS usage.

Utilize funding streams that can support efforts on the ground.

State Departments of Education can leverage federal dollars to support the development and implementation of EWS. Federal funding sources that states and districts may consider are: Title I Section 1003(g) of Elementary and Secondary Education Act (ESEA), Title I Part A of ESEA, and Title I Section 613 of The Individuals with Disabilities Education Act (*IDEA*).

Collect information on the status and challenges of EWS implementation.

At the state level, through the addition of EWS-focused questions in the annual Data Quality Campaign (DQC) survey. The DQC conducts an annual state analysis of state data systems that measures progress towards building and implementing the 10 Essential Elements of Statewide Longitudinal Data Systems and the 10 State Actions to Ensure Effective Data Use; EWS-focused questions could be added into these annual surveys. Carry out similar efforts with districts through the National Center for Education Statistics (NCES) or other organizations.

At the State and Federal Level

Ensure that investments in developing the data systems needed for EWS are consistently paired with efforts to build intervention systems and policy reviews, particularly at the state and federal level.

Early warning data has enormous potential to improve educational outcomes that will only be realized if EWS efforts go beyond student identification. Early warning data enables smarter, more effective, timely, and cost-efficient interventions, but these benefits are only realized when schools have the capacity to meet the identified student needs.

At the Federal Level

Require EWS for federal education funds.

Incentivize states, districts, and schools around graduation rate improvement. Require states, districts, and schools with less than 75 percent graduation rates, and which receive federal or state school improvement grants of any kind (including Title 1, School Improvement Grants, Perkins funds, compensatory funding, etc.) to implement an early warning indicator and intervention system based on longitudinal data analysis. States, districts, and schools with a 10 percentage point gap between overall and sub-group graduation rates should also be required to implement an early warning indicator and intervention system in order to receive funds.

- **Amend federal regulations involving the Supplemental Educational Services (SES) section of Title 1 to encourage and enable EWS.** This change could happen either through re-authorization of ESEA or the emerging waiver process. SES was originally designed in 2001 to provide tutoring supports primarily to elementary students. Since then, the EWS research has shown the importance of supporting students later in their academic career and keeping students on track to graduate from school college- and career-ready. The supports required include tutoring, but also involve attendance monitoring, behavioral supports, and assistance with assignment completion, among others. The SES provision of Title 1 needs to be re-fashioned so that schools and districts can strategically partner with proven national and community nonprofit organizations that implement evidence-based programs and have a demonstrated record of helping schools to improve student outcomes. Organizations like the Boys and Girls Clubs, City Year, Communities In Schools, Big Brothers, Big Sisters, the United Way, Citizen Schools, College Summit, and growing numbers of after-school providers are highly effective at supporting the implementation of early warning systems. It would be beneficial to students if school districts and these effective organizations could utilize SES funds to support EWS.

Use grant making to incentivize the integration of early warning indicator and intervention systems with related indicator and data driven improvement efforts.

Federal and philanthropic grants should be aligned to reward effective best practices in data, particularly through Invest in Innovation, Race to the Top, and School Improvement Grants. This should include supporting the integration of EWS with student information systems and state longitudinal data systems. It is also important that EWS are integrated into efforts aimed at improving student readiness at entry to school and increasing post-secondary attainment. It is critical that grant-making efforts do not inadvertently create serial and/or unconnected parallel efforts at the state and district level as these entities pursue available funding opportunities, resulting in data systems and school improvement efforts that do not integrate easily with each other, even though they are pursuing related goals. For example, some states are closing or renaming dropout prevention offices, as college and career readiness offices. If this results in an integrated approach to keep students in school and prepare them to succeed in post-secondary schooling and training, it is an advantage. If it just switches focus and resources from one section of the pipeline to another, it is not. Finally, early warning indicator analysis should be paired with an examination of the characteristics of the most recent year's dropouts, so data-driven recovery opportunities can be provided for the students who—even with the enhanced supports provided by EWS—dropout.

Require states to collect information from school districts on chronic absenteeism and school districts with high levels of chronic absenteeism to develop district-wide plans to reduce it.

In high poverty school districts the number and percent of students who miss a month or more of school can be staggering. Yet, it is often unknown because states and districts are not asked to report this data. Some states, like California, cannot require districts to report this information because it is not federally required and hence would be viewed as an unfunded mandate. The re-authorization of ESEA Title I, Part A, Section 1111 should be amended to ensure that chronic absenteeism is effectively tracked and those students with attendance rates less than 90 percent are

accurately identified as at risk of dropping out. Moreover, districts with high levels of chronic absenteeism should be required to develop district-level intervention plans. States which tie funding to attendance should make sure that schools that effectively decrease chronic absenteeism see an appropriate increase in funding.

3) Accelerate Graduation Rates by Strengthening the Public Education System

At the Local and State Level

Keep data-based dropout prevention and recovery in the forefront of public attention, particularly because of the economic downturn.

For minimal up front costs EWS can help nonprofits, schools, districts, and states better target their resources to students at risk of dropping out. EWS can minimize the costs of sweeping programming and help provide interventions to those most in need.

At the State and Federal Level

Update State and Federal accountability systems to leverage the highest-impact data.

For minimal up front costs EWS can help nonprofits, schools, districts, and states better target their resources to students at risk of dropping out. EWS can minimize the costs of sweeping programming and help provide interventions to those most in need.

At the Federal Level

Update state and federal accountability systems to leverage the highest-impact data.

This can be done initially through waivers, and permanently through the reauthorization of ESEA. Any states that receive relief from the current accountability systems should be held accountable for having a strong EWS. The reauthorization of ESEA, Title I, Part A should then ensure that states, districts, and schools have the resources they need to have strong EWS.

- Further, the percent of students who earn on-time promotion from ninth to tenth grade (or fail one or fewer credit bearing courses) and the percent of students who are chronically absent should be added to emerging next generation state and federal accountability systems. As they emerge, the percentage of students meeting college- and career-ready benchmarks should also be added to these systems. To inform state and district improvement efforts and resource allocation, states should track the number and percent of students with off-track indicators and the number and percent of students being retained in grade at the school level.

Clarify and better communicate the implications of Family Educational Rights and Privacy Act (FERPA) to stakeholders.

The protection of children's privacy must be balanced with the need for stakeholders' support. When issuing new rules surrounding FERPA before the end of 2011, the Department of Education should make clear that data systems can be tailored to ensure that parents, nonprofits, professional providers, and other state and local agencies only have access to the data they require to support the students they serve. By providing examples of steps states districts and schools can take to share the data that is appropriate to share, but protect the data that ought not to be shared, the Department of Education will help all education stakeholders understand the rules surrounding data, and help external organizations better support students.

Conclusion

Early Warning Indicator and Interventions Systems can become powerful tools in school systems and states across America to keep students on track to graduate from high school prepared for college and the workforce. Research shows we can identify which students, absent effective supports, have very low odds of graduating, early enough in their educational experience that we have sufficient time to intervene. It also shows that effective supports exist and that the challenge is organizing these supports in the most impactful and efficient means possible. This at its heart is what EWS are designed to do. With one in four of our nation's public school students, and forty percent of minorities failing to graduate from high school, the development and implementation of EWS should become an urgent national priority.

Although these systems are still in their early stages of development and testing, this period of rapid growth and innovation provides a laboratory for learning and gives schools, districts, and states the opportunity to accelerate their progress in providing meaningful data to educators. As a result, we can more effectively mobilize the supports students need to succeed in school and in life. The stakes are high for our children, school improvement efforts, states, and nation. In an increasingly competitive global workforce, we need all the tools available—including Early Warning Indicator and Intervention Systems—to keep students on track for success.

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Civic Enterprises is a public policy development firm dedicated to informing discussions of issues important to the nation. For more information, please visit **www.civicenterprises.net**

The Everyone Graduate Center at Johns Hopkins University seeks to identify the barriers that stand in the way of all students graduating from high school prepared for adult success, to develop strategic solutions to overcome the barriers, and to build local capacity to implement and sustain them. For more information, please visit **www.every1graduates.org**

Appendices

GRADNATION
MOBILIZING AMERICA TO END THE DROPOUT CRISIS

APPENDIX 1: THE CIVIC MARSHALL PLAN TO BUILD A GRAD NATION

In the aftermath of World War II, Secretary of State George C. Marshall instructed George Kennan and his policy planning staff to "avoid trivia" in developing their plan to help rebuild Europe. A coalition of leading institutions has adopted this same approach in developing a "Civic Marshall Plan" to end the dropout epidemic and reach the national goal of having 90 percent of our students graduating from high school and obtaining at least one year of postsecondary schooling or training by 2020. We believe that ending the dropout epidemic is possible because we now know which students are likely to drop out, absent effective interventions, and where these students go to school. We also know that evidence-based solutions exist. Thus, we are left with an engineering problem of getting the right supports to the right students in a timely fashion at the scale and intensity required. To meet this challenge, we need to take a targeted and phased approach, driven by our understanding of where the challenge is greatest and where concerted efforts can have the largest impact.

Take Action within Low Graduation Rate Communities	Start with Early Reading
	Focus on the Middle Grades
	Turn Around or Replace the Nation's Dropout Factoris
	Harness the Power of Nonprofits to Provide Expanded Student Supports
	Link Researchers to Practitioners and Policy
Build and Enable State and District Capacity to Improve Graduation and College Readiness Rates	Build Early Warning and Intervention Systems
	Create a Multi-Sector and Community-Based Effort
	Enhance High School and College Graduation Rate Data
	Develop New Education Options based on Student and Community Needs and Interests
	Develop Parent and Family Engagement Strategies
	Elicit Perspectives of Students, Educators, and Parents
	Reauthorize the Elementary and Secondary Education Act
Accelerate Graduation Rates by Strengthening the Public Education System	Build Linked, Common Data Systems and Enhance Data-Driven Decision Making
	Set High Expectations and Provide Engaging Coursework
	Train and Support Highly Effective and Accountable Teachers
	Train and Support Highly Effective and Accountable Principals
	Connect the Post Secondary Completion Agenda with High School Graduation

Strategic, Tiered Approach

Dropout Factory and Related Schools

We will first target and help build the capacity of the states and school districts to transform or replace the remaining 1,634 dropout factories and their feeder elementary and middle schools that account for half of the nation's dropouts, and the high schools with graduation rates between 61 and 75 percent. If the nation's dropout factories and the high schools with graduation rates between 61 and 75 percent collectively increase their graduation rates by 20 percentage-points by 2020, amounting to an average of a two percentage-point increase per year, the nation will achieve its 90 percent graduation rate goal.

Initial Benchmarks

The Class of 2020 needs to earn 600,000 more high school diplomas than the Class of 2008 holding population growth constant). To ensure this happens, we will use a phased approach with clear goals.

For 2012:

Substantially increase the number of struggling students reading at grade level by fifth grade; reduce chronic absenteeism; and conduct needs and capacity assessments of targeted schools.

For 2013:

Establish early warning and intervention systems in every targeted school district and state; re-design the middle grades as necessary to foster high student engagement and preparation for rigorous high school courses; and place a trained nonprofit school success mentor for every 15-20 students with off-track indicators.

For 2016:

Transform or replace the nation's dropout factories and provide transition supports for struggling students in grades eight through 10 in all schools with graduation rates below 75 percent; provide all students (including those who have dropped out) with clear pathways from high school to career training and college; and raise compulsory school age to 18 in all states.

Next Steps

Ending the dropout crisis will take a concerted effort by leaders and citizens at all levels of our communities, states, and nation. Progress over the last decade gives us confidence that good research can continue to guide our efforts, accurate data can prompt appropriate responses, and a targeted approach can help us reach our goals. The futures of millions of children are at stake, as are the health and vibrancy of our communities, economy, and nation. We should redouble our efforts to keep the high school dropout challenge a top national priority; mobilize the will, people, and resources to meet the challenge; and equip next generations with the knowledge and skills they need to find productive work and participate actively in American life. We have created a "Civic Marshall Plan Index" and will provide annual updates to keep track of our progress and challenges in ending the dropout crisis and building a grad nation.

APPENDIX 2: ADDITIONAL RESOURCES ON DATA USAGE AND EARLY WARNING INDICATOR AND INTERVENTION SYSTEMS

Resources with a Focus on EWS

Alliance for Excellent Education, Civic Enterprises, and the Data Quality Campaign for AT&T, March 2011. Education as a Data-Driven Enterprise: A Primer for Leaders in Business, Philanthropy, and Education available at: **www.civicenterprises.net/reports.php**

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Additional Resources on Longitudinal Data and Data Systems

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Laird, E. (2008). Developing and Supporting P-20 Education Data Systems: Different States, Different Models. Data Quality Campaign.

Taveras, B., Douwes, C. & Johnson, K. (2010). New Visions for Public Schools: Using Data to Engage Families. Harvard Family Research Project.

Resources on Privacy and FERPA Guidelines

The Department of Education will be issuing new guidance on privacy, scheduled for the end of the 2011 calendar year. Though slightly out of date, the National Forum on Education Statistics has developed three publications related to privacy issues in education settings available at: **http://nces.ed.gov/forum/ferpa_links.asp**

Additional information is available from the Thomas B. Fordham Institute including, "Getting FERPA Right: Encouraging Data Use While Protecting Student Privacy," a chapter in the report: Byte at the Apple: Rethinking Education Data for the Post-NCLB Era, available at: **www.edexcellence.net/publications-issues/publications/a-byte-at-the-apple.html**

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Endnotes

1. This report represents the most recent information available at the time the research was conducted. The majority of field research was completed by April 2011.

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