Project Narrative (Mid-Phase)

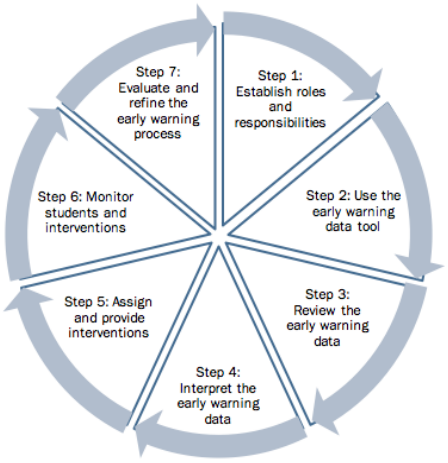
Contents

Exhibits

Introduction

The American Institutes for Research (AIR), in collaboration with BrightBytes, Abt Associates, Inc. (Abt), and four state education agencies (SEAs)—Georgia Department of Education, Illinois State Board of Education, Mississippi Department of Education, and South Carolina Department of Education (and districts within those SEAs), proposes a mid-phase grant focused on scaling and further testing an effective *Early Warning Intervention & Monitoring System (EWIMS)*. EWIMS, first developed by the National High School Center at AIR, is a systematic approach to using data to identify students who are at risk of not graduating on time, assigning students flagged as at risk to interventions, and monitoring responses to intervention. A recent randomized controlled trial (RCT) involving more than 70 schools across three states demonstrated positive impacts of EWIMS; after just one year of implementation, EWIMS reduced course failure and chronic absenteeism in Grades 9 and 10—two key early predictors of on-time graduation (Faria et al., 2017).

Exhibit 1. The Early Warning Intervention and Monitoring System 7-Step Implementation Process



To support EWIMS implementation, AIR provides schools with professional development (PD) and technical assistance to implement a 7-step process, supported by an early warning data tool. The 7-step EWIMS process (see Exhibit 1) guides educators to use data to identify students who show warning signs of falling off track toward on-time graduation and to monitor students' progress—with a focus on early high school (Grades 9 and 10). The seven steps compose a cyclical process as shown in Exhibit 1. The primary goal of this mid-

phase grant is to refine and test a strategy for scaling EWIMS in diverse settings serving high-need students. Our strategy to scale addresses prior barriers and improves efficiency of implementation by incorporating the following into EWIMS implementation: (1) a new, user-friendly data tool with improved functionality; (2) an adaptive coaching model to optimally support school-specific needs; (3) concrete implementation supports to facilitate translation of knowledge from training into actionable next steps for EWIMS teams; and (4) training for district staff to provide ongoing support to schools following completion of the grant.

To facilitate iterative refinement and optimization of the scaling strategy, AIR, BrightBytes and the SEA/LEA partners will implement the 2-year EWIMS implementation model in two successive cohorts. Approximately 60 Cohort 1 schools will begin in school year (SY) 2020–21, and 60 Cohort 2 schools will begin in SY 2022–23. In addition, because EWIMS is a cyclical, 7-step process that repeats multiple times each year, AIR will draw on rapid-cycle feedback throughout implementation from school-based EWIMS teams and AIR coaches. This quantitative and qualitative feedback will be used to continuously improve the strategy to scale through updates to the data tool, revisions to manuals and resources, and modifications to the PD and adaptive coaching model for future implementations.

Throughout the fall of 2019 and winter/spring of 2020, AIR will conduct formal outreach and recruitment of districts and schools within our partner SEAs. A final sample will represent diverse educational settings, including a mix of an estimated 120 urban, suburban, and rural schools serving high-need students in approximately 10 districts in four states (see initial letters of support from Clayton County Public Schools [Georgia], Charleston County School District [South Carolina], Moss Point School District [Mississippi], Hattiesburg Public School District [Mississippi], George County School District [Mississippi], and Springfield Public Schools

[Illinois]). Following receipt of signed district and school memoranda of understanding, the Abt independent evaluation team will randomly assign half of the schools to the treatment group (Cohort 1 starting SY 2020–21) and half to a delayed-treatment control group (Cohort 2 starting SY 2022–23). This evaluation is designed to examine policy-relevant impacts for a cohort of students in Grades 9 and 10 in SY 2020–21 through on-time graduation (SY 2022–23 for Grade 10 students, SY 2023–24 for Grade 9 students)—see Section E for details.

Absolute Priorities

This project addresses **Absolute Priority 1—Moderate Evidence**—by further scaling and testing EWIMS—an intervention with demonstrated positive impacts on short-term outcomes (i.e., reduced percentage of students at risk of not graduating on time due to chronic absence and course failure) and tested with a randomized controlled trial (RCT) that meets What Works Clearinghouse (WWC) standards for moderate evidence (see Evidence Form). This project also addresses **Absolute Priority 2—Field-Initiated Innovations—General**—by implementing, replicating, and scaling an evidence-based intervention to support attainment for high-need students—defined for this project as students at risk of not graduating from high school.

A. Significance

A.1. Increasing Knowledge of Effective Strategies to Prevent Dropout

The consequences of not graduating from high school are severe. When compared with graduating peers, students who drop out of high school are more likely to be unemployed or underemployed, live in poverty, have poor health, and become involved in criminal activities (Belfield & Levin, 2007; Christle, Jolivette, & Nelson, 2007; Hayes, Nelson, Tabin, Pearson, & Worthy, 2002). High school graduates earn approximately $[redacted] more over the course of a lifetime than do students who drop out (see Phillips, 2019), while students who drop out of high

school cost taxpayers more than $[redacted] on average in lower tax revenues, higher cash and in-kind transfer costs, and costs of incarceration (Sum, Khatiwada, McLaughlin, & Palma, 2009). Thus, helping schools improve on-time graduation rates benefits both individuals and society. In *The Make-or-Break Year: Solving the Dropout Crisis One Ninth Grader at a Time,* Emily Krone Phillips (2019, p. 3) explains, "In short, a high school diploma is the first line of defense against the corrosive effects of poverty."

High school dropout remains a stubborn problem nationally. Although graduation rates have improved in recent years (U.S. Department of Education, 2019), nearly one in five students do not leave school with a diploma. Risk of dropout is consistently higher among economically disadvantaged, rural, urban, and minority youth (e.g., Black, Hispanic, and American Indian). For example, the most recent national graduation statistics show that 22% of Black students and 20% of Hispanic students do not graduate from high school in four years, compared with only 11% of their White peers (U.S. Department of Education, 2019).

Using the most recent data available, the average graduation rates in Georgia, Illinois, Mississippi, and South Carolina, and in partnering LEAs[1]—the settings for this project—are below, or mirror, the national average of 84.6% (see Exhibit 2). There are persistent gaps between minority students and their White peers in each of our four partnering SEAs, and these gaps are notably larger in some of our partnering LEAs reporting graduation rates by

[1] Current LEA high school graduation rates: Clayton County Public Schools (Georgia)—72%, Charleston County School District (South Carolina)—84%, Moss Point School District (Mississippi)—70%, Hattiesburg Public School District (Mississippi)—70%, George County School District (Mississippi)—89%, Springfield Public Schools (Illinois)—74%.

race/ethnicity. For example, in Charleston County School District, White students (91%) are far more likely to graduate on time than their Black (76%) and Hispanic (75%) peers, and female students graduate at higher rates (89%) than males (79%); we see similar gaps in Springfield Public Schools (White—80%, Black—68%, Hispanic—70%; female—80%, male—68%).

Exhibit 2. Graduation Rates by Race/Ethnicity by State

State	Overall	White	Black	Hispanic	Asian/Pacific Islander	American Indian/Alaskan Native
Georgia	81%	84%	78%	74%	91%	79%
Illinois	87%	91%	79%	84%	95%	81%
Mississippi	83%	87%	79%	81%	91%	80%
South Carolina	84%	85%	81%	81%	93%	76%

Source. U.S. Department of Education (2019)

Synthesizing existing knowledge, the 2017 WWC practice guide, *Preventing Dropout in Secondary Schools*, offered four recommendations based on an expert panel review of the relevant research (Rumberger et al., 2017). The **first of four recommendations is to *monitor the progress of all students and proactively intervene when students show early signs of attendance, behavior, or academic problems.***[2] Reflecting this recommendation and responding to similar guidance from the 2008 practice guide on dropout prevention (Dynarski et al., 2008), early warning systems have emerged as a viable strategy for improving graduation rates (e.g., Heppen & Therriault, 2008; Kennelly & Monrad, 2007; Neild, Balfanz, & Herzog, 2007). Such

[2] The other recommendations include (2) providing intensive, individualized support to students who have fallen off track; (3) engaging students by offering curricula and programs that connect schoolwork with college and career success and that improve students' capacity to manage challenges in and out of school; and (4) for schools with many at-risk students, creating small, personalized communities to facilitate monitoring and support (Rumberger et al., 2017).

systems use research-based indicators to identify students at risk of not graduating and flag them to receive interventions, monitoring, and support. Some of the clearest predictors of the likelihood of graduating in 4 or 5 years are evident during the first year of high school. Through their research in Chicago Public Schools, Allensworth and Easton (2005; 2007) showed that the most powerful indicators of "on track" status are those related to student engagement (attendance) and course performance (grades, credit accumulation) in Grade 9.

Based on this foundational research, and responding to WWC practice recommendations for educators (Dynarski et al., 2008; Rumberger et al., 2017), the use of early warning systems has become widespread. Nationwide, approximately half (52%) of public high schools already report implementing some form of an early warning system (U.S. Department of Education, 2016) to help identify students at risk of not graduating on time. However, until recently there was little rigorous evidence of the impact of early warning systems on outcomes such as chronic absence, course failure, suspensions, progress in school, and, ultimately, on-time graduation.

Two recent experimental studies testing the short-term impacts of early warning interventions show promising results. The first study tested the impact of *Diplomas Now*, a comprehensive school reform strategy with targeted interventions for students who display early warning signs on indicators related to attendance, behavior, and course performance (Corrin, Sepanik, Rose, & Shane, 2016). The study focused on students in Grades 6 and 9 and found that *Diplomas Now* had a statistically significant, positive impact on the percentage of students flagged on any indicator but did not impact average attendance, discipline, or course passing rates.

The second experimental study tested the impact of EWIMS on student outcomes (Faria et al., 2017). As detailed in Section B.2, EWIMS—the focus of this mid-phase project—is a comprehensive early warning system supported by use of a data tool and a 7-step implementation

process for schools (Heppen & Therriault, 2008; O'Cummings, Heppen, Therriault, Johnson, & Fryer, 2010; Therriault, Heppen, O'Cummings, Fryer, & Johnson, 2010; Faria et al., 2017). Faria and colleagues (2017) randomly assigned 73 high schools in three Midwest states to implement the model during SY 2014–15 (37 EWIMS schools) or to continue their usual dropout prevention practices and to delay implementation of EWIMS until the following school year (36 control schools). The study, conducted through the Regional Educational Laboratory (REL) Midwest, included 37,671 students in their first or second years of high school, with 18,634 students in EWIMS schools and 19,037 students in control schools. EWIMS and control schools and students were similar on all background characteristics prior to random assignment.

Results showed that EWIMS reduced the percentage of students at risk of not graduating on time due to chronic absence and course failure. The percentage of students who were chronically absent (missed 10% or more of instructional time) was lower in EWIMS schools (10%) than in control schools (14%), and the percentage of students who failed one or more courses was lower in EWIMS schools (21%) than in control schools (26%).[3] In other words, as a result of EWIMS implementation, there were 745 fewer Grades 9 and 10 students in EWIMS schools at risk of not graduating on time because of chronic absence and 932 fewer Grades 9 and 10 students at risk because of course failure. EWIMS did not reduce the percentage of students with low cumulative GPAs of 2.0 or lower in the first year but did have a statistically significant positive impact on average cumulative GPA (2.98 versus 2.87, Hedges g = 0.07).

[3] Examining continuous data rather than gross indicators with a binary cutoff, students in Grades 9 and 10 in EWIMS schools, on average, had statistically significantly better attendance and fewer course failures than did their counterparts in control schools.

This study provides rigorous initial evidence that during the first year of adoption, using a comprehensive early warning system can reduce the percentage of students who are chronically absent or who fail one or more courses. These short-term results are promising because chronic absence and course failure in Grades 9 and 10 are two critical indicators that students are off track for on-time graduation. **If effects from this prior study replicate in districts and schools implementing EWIMS in this mid-phase project, we can expect to observe 1,716 fewer students at risk of not graduating because of chronic absence and 2,677 fewer students at risk because of course failure *within each cohort of Grade 9 students* among district and school partners.** Moreover, the highly promising results we observed in the REL Midwest study occurred after just the first year. By providing schools more time, and by implementing a strategy to scale that addresses prior barriers, we expect to see even better results.

A.2. Unmet Demand for Scalable, Comprehensive Early Warning Systems

Although educators are increasingly interested in implementing early warning systems, there is substantial variation in current practice, and some models fall short of addressing the needs of districts and schools. At minimum, early warning systems involve generating lists of students who may be at risk of not graduating on time because of attendance, behavior, and course performance. Although helpful, these lists can have limited utility. In some cases, lists are generated by SEAs, but identification can sometimes be too little, too late; by the time data are reported to the SEA, students are identified, and lists are shared with districts and schools, schools may miss their window to get students back on track before small problems escalate.

EWIMS is exceptional because it goes beyond mere identification of students in need of support by providing schools a comprehensive, systematic approach to data review. This approach focuses on helping educators to implement student supports that best align with

students' needs, monitor progress, and adapt an intervention strategy in real time for students as new data become available. Underlying the design of EWIMS is the recognition that student risk indicators are simply observable signs of disengagement from school, which, for many students, is a cumulative process that builds over many years (Fine, 1991; Orfield, 2004), often beginning as early as elementary school (Anderson, Christenson, Sinclair & Lehr, 2004). Our model emphasizes the use of risk indicators for initial identification, followed by deeper investigation of the actual reasons for student disengagement as part of the process of determining intervention options with the goal of helping students get back on track. EWIMS also helps schools iteratively improve alignment between the interventions and supports they offer and the identified needs of their students (Heppen & Therriault, 2008; O'Cummings et al., 2010; Therriault, Heppen et al., 2010).

Educators are increasingly eager to adopt comprehensive strategies that harness the power of predictive analytics for early identification and build capacity to support and monitor student progress. For example, following completion of the prior study (Faria et al., 2017), the Michigan Department of Education published an EWIMS implementation guide (https://www.michigan.gov/documents/mde/Michigan_EWIMS_Implementation_Guide_606186_7.pdf) that encouraged districts and schools to adopt these strategies to support at-risk students and four new SEAs (and districts within each state) enthusiastically support this project (see letters of support in Appendix C).

B. Quality of Project Design

At the outset of the grant in October 2019, AIR will begin district and school outreach, drawing on successful strategies we employed in prior large-scale evaluations (73 schools across three states) of EWIMS (Faria et al., 2017). To recruit additional LEAs beyond those that already provided letters of support, outreach will focus on districts within our four partner states,

followed by schools within interested districts. AIR will employ a mix of field-tested communication strategies including e-mail, phone calls, and mailings to schedule and conduct in-person or virtual meetings with district and school administrators to discuss EWIMS and the current opportunity and to demonstrate the functionality of the data tool. AIR will collect memoranda of understanding from interested districts and schools prior to random assignment.

AIR will recruit a mix of 80 rural, suburban and urban schools that serve Grades 9–12 with average 4-year graduation rates ranging from 50% to 90% (prioritizing selection of schools with lower graduation rates within this range). Although some schools may have graduation rates above the national average, increasing these rates remains a priority for schools where one in 10 students still does not graduate high school on time. Schools with extremely low graduation rates need to address more endemic challenges, and implementing EWIMS would identify too many students in need of supports to be helpful in targeting limited resources. Implementing EWIMS in schools with higher graduation rates may not be cost effective since there is limited room for growth in graduation rates. However, because AIR will partner with districts that may want to implement consistent dropout prevention strategies in all high schools, we anticipate providing EWIMS to 40 additional schools within partner districts that have graduation rates higher than 90% or lower than 50% (reflecting typical implementation with districts). Across four school years, EWIMS will be implemented in an estimated 120 high schools, supporting approximately 100,000 students in Grades 9 and 10. Although Abt's independent evaluation will focus on the 80 schools with graduation rates between 50% to 90%, Abt will separately randomly assign the additional 40 schools with lower or higher graduation rates to the treatment or delayed-treatment control groups, allowing the evaluation to examine implementation and outcomes across a sample of schools with greater diversity in dropout prevention needs.

B.1. Clearly Specified and Measurable Goals, Objectives, and Outcomes

Exhibit 3 specifies the four objectives of the project, along with the strategies to achieve and measure desired outcomes. **Objective 1** is to improve short-term, intermediate, and long-term academic outcomes for students. **Objective 2** is to implement the strategy to scale EWIMS while continuously using feedback and fidelity of implementation data for project improvement. **Objective 3** is to conduct an RCT to test the impact of EWIMS on student outcomes. Finally, **Objective 4** is to develop the network and infrastructure for continued scaling of EWIMS.

Exhibit 3. Objectives, Strategies, Outcomes, and Measures

Strategies	Outcomes	Measures
Objective 1. Improve academic outcomes for students including short-term outcomes (decreasing the percentage of students experiencing early risk indicators due to chronic absence, course failure, low cumulative GPA, suspension), intermediate outcomes (increasing the percentage of students progressing and persisting in school), and long-term outcomes (increasing on-time graduation rates).		
Strategy 1.1. Identify students who show signs of risk for not graduating on time.	School EWIMS teams use the data tool to identify students displaying short-term risk indicators.	Measure 1.1. Based on usage reports from data tool and self-assessments of implementation fidelity completed by EWIMS team leads, 100% of EWIMS teams use the data tool to identify students at risk.
Strategy 1.2. Use multiple data sources to identify student needs.	School EWIMS teams examine multiple data sources (e.g., information from parents or student, assessments) for each student displaying indicators of risk for not graduating on time to identify potential root causes of risk (e.g., transportation as a barrier to attendance).	Measure 1.2. Based on self-assessments of implementation fidelity completed by EWIMS team leads and coaches' logs, 100% of EWIMS teams use multiple data sources to examine the needs of 75% or more of students identified as at risk.
Strategy 1.3. Assign students to interventions.	School EWIMS teams develop a strategy or plan for intervention to address the needs of each student displaying indicators of risk for not graduating on time.	Measure 1.3. Based on usage reports from data tool and self-assessments of implementation fidelity completed by EWIMS team leads, 100% of EWIMS teams assigned interventions to 75% or more of students identified as at risk.
Strategy 1.4. Monitor student progress and revise strategy to support each student's needs.	School EWIMS teams monitor progress of students assigned to interventions and update strategy for students who continue to display early risk indicators.	Measure 1.4. Based on usage reports from data tool and self-assessments of implementation fidelity completed by EWIMS team leads, 100% of EWIMS teams monitored the progress of 75% or more of students assigned to interventions.

Strategies	Outcomes	Measures
Strategy 1.5. Conduct alignment analysis of each school's catalogue of interventions with needs of their student population.	Schools refine their catalogue of interventions to better fit their students' needs.	Measure 1.5. Based on self-assessments of implementation fidelity completed by EWIMS team leads, coaches' logs, Concerns-Based Adoption Model (CBAM) diagnostic assessments, and focus groups with EWIMS teams, 100% of EWIMS teams completed alignment analysis and 75% or more of EWIMS teams that identified a need for refinement changed their catalogue of interventions to better align with student needs.
Objective 2. Implement strategy to scale while continuously using feedback and fidelity of implementation data for project improvement.		
Strategy 2.1. Provide a usable data tool that supports EWIMS implementation.	School EWIMS teams have immediate access to data visualizations when implementing each step of the 7-step process with minimal to no technical challenges.	Measure 2.1. Based on usage reports from data tool, self-assessments of implementation fidelity and coaches' logs, and focus groups, 100% of EWIMS teams report use of the data tool and 75% report satisfaction with usability of the tool.
Strategy 2.2. Provide EWIMS teams with training to implement all steps of the EWIMS process with an emphasis on Steps 3–6.	School EWIMS teams receive 2 full days of training prior to the start of the school year to learn about the full EWIMS process. School teams practice using their own data in the data tool at the training.	Measure 2.2. Based on attendance records from training sessions, 100% of EWIMS teams have at least one member attend both days of the training, and 75% of EWIMS teams have at least three EWIMS team members present for both days.
Strategy 2.3. Provide in-person coaching at the first EWIMS school team meeting.	School teams implement initial steps of the EWIMS process with fidelity and build a strong relationship with their coach.	Measure 2.3. Based on coaches' logs and self-assessments of fidelity of implementation completed by EWIMS team leads, 75% of EWIMS teams implement initial steps with fidelity. Based on focus groups, 100% of EWIMS teams report building a good relationship with their coach.
Strategy 2.4. Monitor and provide tailored support to each school-based EWIMS team through monthly one-on-one teleconferences using GoToMeeting.	Coaches provide a tiered system of support for schools to optimize resources based on need and specific challenges. (Tier I: Coach strategizes with the champion and the champion implements; Tier II: Coach virtually joins EWIMS meetings via GoToMeeting; Tier III: Coach provides follow-up PD and joins EWIMS meetings in person.)	Measure 2.4. Based on focus groups with EWIMS teams, 75% or more implementing schools report high satisfaction with the level of support they received given their school's needs.
Strategy 2.5. Monitor and support EWIMS coaches through monthly teleconferences using GoToMeeting	Coaches receive support tailored to individual needs and support for needs that are common across coaches.	Measure 2.5. Based on coach support attendance records, 100% of coaches attend monthly meetings; and based on coach interviews, 75% or more coaches report high satisfaction with the support they receive to address their districts' and schools' needs.

Strategies	Outcomes	Measures
Strategy 2.6. Refine materials and procedures for each strategy under Objective 1.	Improved materials: implementation guides, step-by-step implementation manual; self-assessment of fidelity of implementation.	Measure 2.6. Based on focus groups with EWIMS teams, 100% of EWIMS teams receive updated materials as they become available; based on focus groups, 75% or more of EWIMS teams report that updated materials show improvements over prior versions.
Objective 3. Conduct an RCT to test the impact of EWIMS and the strategy to scale on student outcomes.		
Strategy 3.1. Identify and recruit eligible districts and schools.	80 Eligible schools interested in EWIMS and consent to random assignment.	Measure 3.1. AIR will collect signed memoranda of understanding (MOUs) from 80 eligible schools.
Strategy 3.2. Randomly assign schools to treatment and control groups.	Samples of treatment and control schools and students with equivalence at baseline.	Measure 3.2. Based on analyses of student baseline administrative records, the random assignment procedure will produce two statistically comparable groups of schools with standardized mean differences less than 0.25 per WWC standards.
Strategy 3.3. Measure and analyze fidelity of implementation.	Data on fidelity of implementation collected and analyzed.	Measure 3.3. Based on analyses of fidelity using the rubric in Exhibit H-2 (Appendix H), analyses of fidelity of implementation will be completed for 100% of implementing schools with 80% or greater interrater agreement between independent coders.
Strategy 3.4. Measure and analyze treatment–control contrast in use of early warning systems.	Data on use of early warning systems and related practices collected and analyzed.	Measure 3.4. At least 90% of participating schools will complete a survey assessing treatment-control contrasts in practices.
Strategy 3.5. Determine the impact of EWIMS on short-term, intermediate, and long-term student outcomes.	Data on outcome measures collected and analyzed.	Measure 3.5. Using student-level administrative data, complete analyses of all proposed student outcomes for 100% of participating schools using analytic procedures that meet WWC standards without reservations.
Strategy 3.6. Conduct a cost analysis of EWIMS implementation.	Data on implementation costs collected and analyzed to assess per-school and per-pupil costs.	Measure 3.6. Complete a per-pupil cost analysis using data collected from 75% or more of participating schools. If EWIMS has the hypothesized effects on student outcomes, calculate cost-effectiveness.
Objective 4. Develop network and infrastructure for continued scaling of EWIMS.		
Strategy 4.1. Establish and operate network to support and sustain work of participating districts and other districts with interest in EWIMS (Years 3, 4, 5).	A network that supports EWIMS users and potential users.	Measure 4.1. AIR will develop a network website, convening materials, and roster of network participants and will disseminate these resources to 100% of network participants.
Strategy 4.2. Develop and refine approach to help districts integrate EWIMS into existing systems of support.	Tools and procedures for implementing EWIMS as part of coherent system of student support.	Measure 4.2. Based on CBAM diagnostic assessments and focus groups with EWIMS team members, 75% or more of implementing schools report that they successfully integrated EWIMS into existing systems of support.

B.2. Conceptual Framework Underlying Proposed Research

Implementation of EWIMS involves a 7-step cyclical implementation process as summarized in Exhibit 1 and detailed in Exhibit 4. These steps are not designed to be implemented in isolation; rather, each step builds on the prior step and the full cyclical process provides a coherent, systematic approach to data review and decision making.

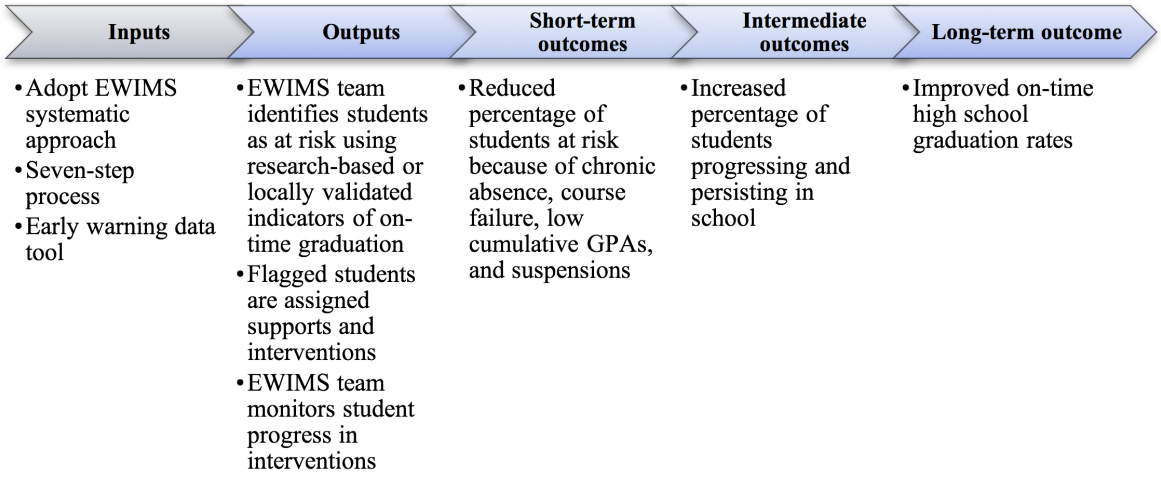
Exhibit 4. EWIMS 7-Step Process

Step	Description
Step 1—Establish roles and responsibilities.	Schools establish a team to lead and implement EWIMS. EWIMS teams may be newly established or may build on or be integrated into an existing team.
Step 2—Use the early warning data tool.	District and/or school staff import student demographic data and initial data on absences, course failure, grade point average (GPA), and behavior indicators into the early warning data tool and update administrative data as appropriate throughout the school year; EWIMS teams upload a list of available interventions.
Step 3—Review the early warning data.	EWIMS teams examine student- and school-level data, using research-based or locally validated indicators of risk. Step 3 is revisited as new data become available.
Step 4—Interpret the early warning data.	EWIMS teams seek out additional formal and informal data (beyond the indicators) to understand the underlying causes that might lead individual students to be identified as at risk.
Step 5—Assign and provide interventions.	EWIMS teams select interventions in the school, district, and community based on the individual needs of each student.
Step 6—Monitor students and interventions.	EWIMS teams examine student risk indicators on an ongoing basis to monitor the progress of students who have been assigned to interventions. If these students continue to be flagged as at risk, the EWIMS team may consider assigning them to different interventions; if some of these students are no longer at risk, the team may consider ramping down services. Over time, schools also may alter their catalog of interventions based on their effectiveness (adding new interventions and dropping those that do not help students get back on track).
Step 7—Evaluate and refine the early warning process.	Through active and structured reflection, EWIMS teams revise specific strategies or their general approach as needed and determine how best to allocate resources to support at-risk students. This step encourages EWIMS teams to make course corrections to any aspect of EWIMS implementation.

The theoretical framework in Exhibit 5 describes how EWIMS is expected to improve student outcomes. EWIMS is intended to focus and streamline data review by using research-based or locally validated early warning indicators to flag students who may be at risk of not graduating on time. This strategy allows schools to more systematically identify students who need support. A dedicated team to identify and support at-risk students (the EWIMS team) then

uses this information to better align the type of support needed for specific students. The effectiveness of EWIMS, therefore, depends, in part, on the quality of the support provided.

Exhibit 5. Theory of Action: How EWIMS Improves Student Outcomes



EWIMS is expected to have short-term impacts on students. Specifically, EWIMS should result in improved engagement and performance in school among students, consequently reducing the percentage of students at risk of not graduating because of chronic absence, course failure, low cumulative grade-point average, and suspension. These short-term reductions are expected to lead to improved intermediate outcomes, including students' progress in school (by earning sufficient credits to remain on track toward graduation) and persistence in school (by remaining continuously enrolled). In the long term, schools should see improved on-time graduation rates as a result of improvements in students' progress and persistence.

C. Strategy to Scale

C.1. Strategy to Scale That Addresses Past Barriers and Results in Efficient Allocation of Resources for Improved Implementation Fidelity and Outcomes

Our strategy to scale addresses three barriers to implementation that we encountered while working with the 73 schools in the REL Midwest study. First, schools found it difficult to use a

prior version of the data tool because it placed significant burden on school-based EWIMS teams to export data from their student information systems, manually reformat data, and then import the data into the tool. Compatibility challenges, low technical capacity, and limited time and resources were notable for all schools and created insurmountable barriers for some schools. Second, although staff who participated in EWIMS trainings provided positive feedback on their training experiences, some schools found it challenging to translate knowledge about the 7-step process into an actionable implementation strategy (e.g., knowing what to do at each monthly meeting). Third, turnover of key staff in schools (e.g., the EWIMS team lead, school leadership) undermined implementation fidelity in some schools and caused a few schools to stop implementing the EWIMS process. We also observed that the barriers that mattered most differed school to school, highlighting the need for differentiated support at the school level.

Through feedback from in-depth interviews, **AIR identified specific strategies to address these barriers that optimize usability, feasibility, fidelity, and sustainability of implementation and allow for more efficient allocation of resources (school personnel and AIR coaches) to support high-quality implementation**. Implementation of these strategies is expected to result in even larger impacts on student and school outcomes.

C.1.1 Provide New High-Quality, User-Friendly Data Tool

AIR **will employ a new high-quality, user-friendly data tool—the *Early Insights Suite*[4]—to support EWIMS implementation as part of our partnership with BrightBytes**. Encompassing both a *Student Success Module* and an *Intervention Module*, this tool continues to offer all of the functionality and features of the prior EWIMS tool, but with enhancements for

[4] http://www.brightbytes.net/suite-earlyinsights

improved functionality and compatibility with student information systems, an improved user interface, user-friendly data visualization and reporting features, and better technical support for users. A key advantage of the BrightBytes Early Insights Suite is that this Web-based tool **directly interfaces with district student information systems and is maintained and updated at the district level, thus reducing burden on school staff**. Another important feature to facilitate scalability in diverse educational settings is that it **will draw on historical data to compute locally validated thresholds of risk for each district**. The prior EWIMS tool employed research-based indicators of risk that may not optimally identify students at risk in different contexts. As data are added to the student information system, the predictive analytic models within the module will update thresholds. EWIMS teams access their data and identify students flagged as at risk using the locally validated risk indicators.

C.1.2. Implement Adaptive Coaching Model

AIR will implement an adaptive coaching model with the goal of optimizing allocation of resources to provide differentiated support for school-level implementation. In prior implementations, AIR provided summer PD on the 7-step process to EWIMS teams from each school and subsequently hosted "refresher" webinars throughout the school year to provide updated information on each step. In this mid-phase project, implementing schools will participate in the summer training (on site for each district) and will receive access to the content of the "refresher" webinars via prerecorded online videos but also will receive tailored support from AIR coaches. A coach will provide on-site support for the first team meeting at each school to ensure successful kickoff. The coach will then meet monthly with the team lead (Tier I support) to help her/him develop a school-specific implementation strategy, prepare for the next monthly meeting, troubleshoot challenges, and monitor progress related to the implementation

strategy—with a focus on building school capacity. If either the team lead or the AIR coach believe that the team may need additional support, the AIR coach will join a monthly team meeting virtually and provide refresher coaching (Tier II support). If teams continue to encounter challenges, an AIR coach will provide on-site support (training and coaching) to team members and school leadership (Tier III support). Because staff turnover (e.g., team lead, school leadership) poses the greatest risk to implementation, AIR will provide Tier III support to the team in the event of turnover of key staff.

C.1.3. Provide Concrete Supports for Implementation

AIR will provide concrete supports to school-based EWIMS team members to support both fidelity and sustainability of implementation including a **step-by-step implementation manual** and **self-assessment fidelity checklists**. In addition, **implementation and coaching will be supported by AIR's Concerns-Based Adoption Model** (CBAM),[5] a conceptual framework that provides diagnostic tools and techniques for facilitating and assessing the implementation of new initiatives. There are three components of CBAM for diagnostically assessing and guiding this process: (1) *innovation configurations*—an innovation configuration map which provides a clear picture of what constitutes high-quality implementation; (2) *stages of concern*—the stages of concern process includes a questionnaire, interview, and open-ended statements, and enables team leaders and coaches to identify staff members' attitudes and beliefs toward a new initiative; and (3) *levels of use*—an interview tool that helps determine how well staff, individually and collectively, are using a program. Employed at regular intervals, these diagnostic assessments help pinpoint the issues that staff encounter as they strive to master a new program. Team leaders and coaches then problem solve how best to help staff achieve high-quality implementation.

[5] https://www.air.org/resource/cbam-concerns-based-adoption-model

C.1.4. Build Capacity for District-Level Staff

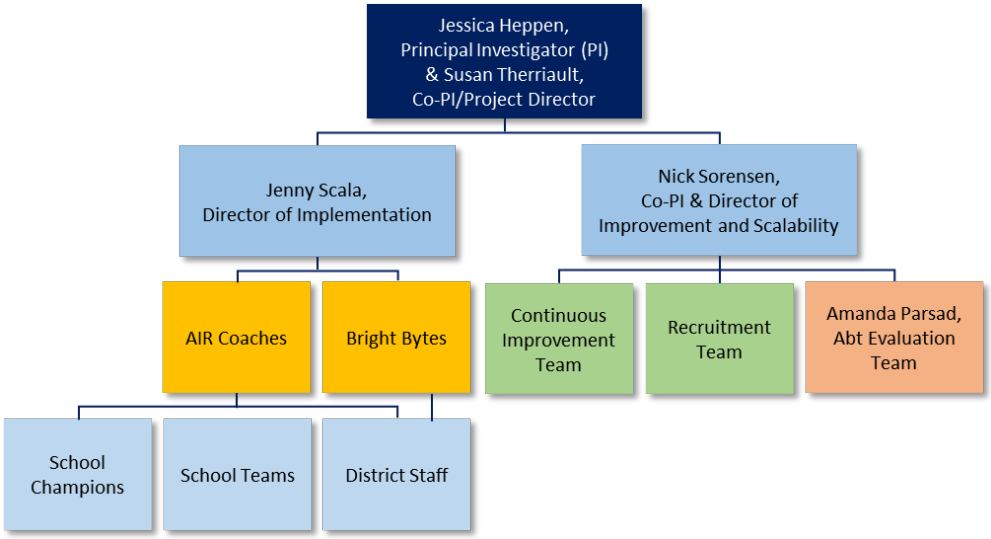
Finally, **AIR will train district-level staff members on the EWIMS implementation model so that they can provide ongoing support to schools following completion of the grant**. District staff will be trained along with EWIMS teams from delayed-treatment schools (Cohort 2) to eliminate the potential for these district staff to affect business-as-usual dropout prevention strategies in Cohort 2 schools (i.e., contamination) during the first 2 years of EWIMS implementation for Cohort 1—maintaining the integrity of Abt's independent impact study.

D. Adequacy of Resources and Quality of Management Plan

D.1. A Management Plan Defining Responsibilities, Timelines, and Milestones

The management plan establishes the reporting structure for the partner organizations (BrightBytes and Abt, see Exhibit 6) and key personnel (see Exhibit 7). Together, we will **successfully execute the strategies** (see Section B.1) **at each milestone on the project's 5-year timeline** (see Exhibit 8).

Exhibit 6. Organizational Chart



AIR will (1) oversee the subawards to Abt and BrightBytes, ensuring coordination across the partners to achieve the project objectives; (2) recruit school districts to participate in the RCT; (3) lead implementation of EWIMS, including the initial PD and ongoing coaching for school staff on how to implement the 7-step process; (4) lead continuous improvement of the implementation materials, (5) lead the strategy to scale EWIMS, and (6) report to the U.S. Department of Education (ED) on grant performance. The AIR implementation team will be separate from AIR's role overseeing the study partners and will have no role in the evaluation of EWIMS. **BrightBytes** will provide the data tool to support implementation of EWIMS. In 2017, BrightBytes and AIR formalized a partnership, integrating the BrightBytes data tool with AIR's implementation model. Powered by a team of top statisticians, analysts, engineers, design specialists, researchers, thought leaders, and practitioners (the majority of whom hold advanced degrees), BrightBytes has created systems that transform large data sets into actionable tools for educational leaders. **Abt** will lead the evaluation of EWIMS, including (1) randomly assigning schools, (2) collecting and analyzing data on baseline equivalence, implementation, and impact of EWIMS on student outcomes; and (3) reporting the impact of EWIMS to ED and audiencespractitioners and researchers.

Exhibit 7. Key Personnel, Roles and Responsibilities

Key Personnel
Jessica Heppen, PhD—Principal Investigator
Dr. Heppen is a vice president of research and evaluation at AIR and is a nationally recognized expert in early warning systems. She has published articles, briefs, and practical tools focused on high school improvement and increasing graduation rates by establishing early warning systems to identify, support, and monitor at-risk students. As PI, Dr. Heppen will dedicate 10% time in all years to oversee implementation of the EWIMS strategy to scale and ensure that all resources are aligned with the broader vision and objectives for the intervention and reflect existing knowledge and expertise about implementation.
Susan Therriault, EdD—Co-PI and Project Director
Dr. Therriault is a managing director at AIR and played a key role in the development of EWIMS. She is a nationally recognized expert in college and career readiness. As Co-PI and Project Director, Dr. Therriault will dedicate 20% time in all years to ensure the integrity of the proposed implementation while overseeing grant spending and project deliverables.

Key Personnel
Nicholas Sorensen, PhD—Co-PI and Director of Improvement and Scalability
Dr. Sorensen is a principal researcher at AIR and co-directed the prior impact study of EWIMS and led district and school recruitment. As Co-PI and Director of Improvement and Scalability, Dr. Sorensen will dedicate 20-27% time across all years to oversee recruitment in Year 1 and continuous improvement of EWIMS strategy to scale during all five years; he will also ensure successful coordination between the AIR implementation team and the Abt independent evaluation team.
Jenny Scala—Director of Implementation
Scala is a principal consultant at AIR, and directed all technical assistance activities for EWIMS implementation during the REL Midwest study. She is a coauthor of the current implementation manual. As Director of Implementation, Scala will dedicate 23-47% time in all years to oversee AIR coaches and collaborate with Dr. Sorensen to support improvement of the implementation materials and training model.
Amanda Parsad—Evaluation Lead
Parsad is a principal scientist at Abt and has more than 18 years of experience in conducting rigorous evaluations. She is also a certified WWC reviewer. As the independent evaluation lead, Parsad will dedicate 13-22% in all years, and oversee random assignment, data collection, analysis and reporting for evaluation.
Kristal Ayres, EdD—Early Insights Suite District Liaison
Dr. Ayres is the Chief Client Services Officer at BrightBytes and will oversee district and school training on the BrightBytes Early Insights Suite.

Exhibit 8. Organization Responsible, Time Frame, and Milestones for Each Strategy

		Project Year (Oct 1–Sept 30)				
Milestones	**Responsible**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Objective 1. Improve academic outcomes for students including short-term outcomes (decreasing the percentage of students experiencing early risk indicators due to chronic absence, course failure, low cumulative GPA, suspension), intermediate outcomes (increasing the percentage of students progressing and persisting in school), and long-term outcomes (increasing on-time graduation rates).						
Strategy 1.1	AIR (Heppen, Therriault, Scala)		✓	✓	✓	✓
Strategy 1.2	AIR (Heppen, Therriault, Scala)		✓	✓	✓	✓
Strategy 1.3	AIR (Heppen, Therriault, Scala)		✓	✓	✓	✓
Strategy 1.4	AIR (Heppen, Therriault, Scala)		✓	✓	✓	✓
Strategy 1.5	AIR (Heppen, Therriault, Scala)		✓	✓	✓	✓
Objective 2. Implement strategy to scale while continuously using feedback and fidelity of implementation data for project improvement.						
Strategy 2.1	BrightBytes (Ayres)	✓	✓	✓	✓	✓
Strategy 2.2	AIR (Heppen, Therriault, Scala)	✓		✓		
Strategy 2.3	AIR (Heppen, Therriault, Scala)	✓		✓		
Strategy 2.4	AIR (Heppen, Therriault, Scala)	✓	✓	✓	✓	✓
Strategy 2.5	AIR (Heppen, Therriault, Scala)	✓	✓	✓	✓	✓
Strategy 2.6	AIR (Sorensen, Scala)		✓	✓	✓	✓
Objective 3. Conduct an RCT to test the impact of EWIMS and the strategy to scale on student outcomes.						
Strategy 3.1	AIR (Sorensen)	✓				
Strategy 3.2	Abt Associates Inc. (Parsad)	✓				

		Project Year (Oct 1–Sept 30)				
Strategy 3.3	Abt Associates Inc. (Parsad)		✓	✓		
Strategy 3.4	Abt Associates Inc. (Parsad)	✓	✓	✓		
Strategy 3.5	Abt Associates Inc. (Parsad)		✓	✓	✓	✓
Strategy 3.6	AIR (Heppen, Therriault, Sorensen, Scala)		✓	✓		
Objective 4. Develop network and infrastructure for continued scaling of EWIMS.						
Strategy 4.1	AIR (Heppen, Therriault, Sorensen)			✓	✓	✓
Strategy 4.2	AIR (Heppen, Therriault, Sorensen, Scala)		✓	✓	✓	✓

D.2. Capacity to Bring the Project to Scale

AIR and proposed key personnel are qualified to bring this project to scale and have extensive experience leading other projects of similar size and scope that included coordinating across subcontracted organizations and several school districts (see Exhibit 9 for examples). For example, in the Faria et al. (2017) study, Drs. Heppen and Therriault oversaw the implementation of EWIMS in more than 70 schools across three states, and Dr. Sorensen directed outreach on a similar timeframe to secure participation of the districts and schools.

Exhibit 9. AIR Projects of Similar Size and Scope

Project	Description
Scaling and Testing of EWIMS	Large multi-site efficacy study of EWIMS—the proposed intervention for this project. Seventy-three schools across three states. AIR conducted all recruitment, implementation and testing. Funded by REL Midwest (Institute of Education Sciences [IES])
Scaling and Testing of Pathways to Success	Large experimental study of efficacy of *Pathways to Success*—a social psychological intervention for eighth graders designed to support student success across the transition to high schools. Seventy schools in Chicago, IL. AIR conducted all recruitment, monitoring of implementation and testing. Funded by IES.
Scaling and Testing of ASSISTments	Large, multisite effectiveness study of *ASSISTments*—a web-based program that provides feedback to students and teachers on mathematics homework. Eighty urban, rural, and suburban schools across five states. Funded by IES.
Scaling and Testing of Online Algebra for Eighth Graders	Large, multisite efficacy study of providing access to online Algebra I for eighth graders in rural schools. Sixty-eight schools across two states. AIR conducted all recruitment, monitoring of implementation and testing. Funded by REL Northeast and Islands (IES)
Scaling and Testing of Elementary Math PD	Large, multisite efficacy study of mathematics content PD program incorporating video feedback for teachers. Seventy-three schools across five states. Funded by IES.
Scaling and Testing of *Intensified Algebra*	Large, multisite efficacy study of *Intensified Algebra*—a blended, double-period algebra course for struggling students. Forty-eight schools across five states. Funded by the National Science Foundation.

D.3. Potential for Continued Support, Sustainability, and Future Work

This project will continue to yield sustainable benefits into the future for district partners. By the completion of the project, there will be approximately 120 additional high schools proficient in implementing EWIMS and that have successfully integrated EWIMS into existing practice to ensure sustainability. Each EWIMS team leader will have worked closely with an AIR coach to overcome implementation challenges. EWIMS teams, with support from district-trained staff, will have an impact on supporting success for each new cohort of ninth-grade students.

Both AIR and BrightBytes are committed to continuously optimizing the cost/benefit of EWIMS and improving school and district partners' experience using the EWIMS process and data tool. AIR wants its implementation model to be effective, affordable, feasible, and widely used. Similarly, BrightBytes also is committed to improving its data tool using the findings from this project so that it can deliver high-quality, user-friendly data visualization of complex analytics to drive decision making and student success. The materials produced by this grant will ensure successful expansion in future settings for three reasons: (1) detailed manuals and other materials will support training, coaching, and implementation of the 7-step process; (2) the final materials and training model will reflect lessons learned throughout the project, including specific challenges in supporting schools (and their students) in diverse settings; and (3) there will be a diverse and extensive network of support for new districts and schools interested in implementing EWIMS. All existing materials are currently accessible on AIR's website (http://www.earlywarningsystems.org/), and this website will be updated to include all newly developed and iteratively refined materials (e.g., training materials, step-by-step implementation manual, self-assessment fidelity checklists, links to CBAM resources, video supports for implementation) throughout the grant—a "one-stop shop" for EWIMS resources. With or

without future federal funding (e.g., an expansion grant), this refined scaling model and these resources will be used going forward to support SEAs and LEAs that frequently request support from AIR for implementation of effective, comprehensive early warning systems.

D.4. Reasonability of Cost in Relation to Project Objectives and Significance

The cost of this project is reasonable with respect to both project objectives and significance. This project will provide resources to implement EWIMS in an estimated 120 high schools supporting approximately 100,000 students in Grades 9 and 10 during the grant. Because these resources will support sustainable implementation through successful integration with existing practice in schools, the benefits will last long after the grant is completed. As noted earlier, if effects from the prior study replicate in districts and schools implementing EWIMS in this mid-phase project, we can expect to observe 1,716 fewer students at risk of not graduating because of chronic absence and 2,677 fewer students at risk because of course failure *within each cohort of Grade 9 students* among district and school partners. Given the potential longer-term outcomes for individuals and society of improving high school graduation rates and reducing dropout highlighted earlier (see Section A.1), the project's significance cannot be overstated.

E. Quality of the Project Evaluation

Abt will conduct an independent evaluation of EWIMS to answer eight research questions (RQs) about EWIMS's impact (RQs 1–3) and implementation (RQs 4–7). As shown in Exhibit 10, these research questions map to the EWIMS theory of action (see Exhibit 5). This evaluation is designed to assess impact and implementation of the complete EWIMS model including use of the data tool and 7-step cyclical implementation process using the current scaling model. None of the seven steps can be tested in isolation; rather, they build on one another and together provide a coherent, systematic approach to guide school data review and decision making.

Exhibit 10. Research Question Alignment With EWIMS Logic Model

Research Question	Component of EWIMS Theory of Action
1. What is the impact of EWIMS on the percentage of students with early indicators of risk of not graduating on time?	Short-term outcome: reduced percentage of students at risk due to chronic absences, course failure, low cumulative GPAs, and suspensions
2. What is the impact of EWIMS on student persistence and progress in school?	Intermediate outcome: increased percentage of students progressing and persisting in school
3. What is the impact of EWIMS on student on-time graduation?	Long-term outcome: Improved on-time high school graduation rates
4. To what extent is EWIMS implemented with fidelity across schools, and is fidelity sustained across project years?	Inputs and outputs: use of EWIMS 7-step process; use of early warning data tool; and identification of, support for, and monitoring students at risk
5. To what extent will EWIMS and control schools differ in their practices for identifying and supporting students at risk of not graduating on time?	Provides context for impact analyses and describes tools used by schools to identify and support students at risk of not graduating on time
6. What are the barriers to and supports for successful EWIMS implementation across schools?	Barriers and success factors in scaling EWIMS to a larger population
7. What is the cost of implementing EWIMS per school and per student?	Contextualizes cost effectiveness of implementing EWIMS

E.1 Evaluation Designed to Meet Evidence Standards Without Reservations

Random Assignment. The design for the impact evaluation is a blocked, cluster (school-level) RCT. Schools are the appropriate unit of assignment because EWIMS is implemented at the school level. The evaluation will assess impacts for 80 eligible high schools across approximately 10 districts in four states (Georgia, Illinois, Mississippi, South Carolina). Schools with graduation rates between 50% and 90% (see rationale, Section B) and that are not currently implementing an early warning system will be eligible for participation. As detailed previously (Section B), an additional 40 schools with higher or lower graduation rates within partnering districts may be included as well. In each participating district, Abt will group similar eligible schools into blocks based on their high school graduation rate (maintaining separate blocks for schools with graduation rates lower than 50% and higher than 90%). Within blocks, Abt will randomly assign schools in summer 2020 to implement EWIMS as part of Cohort 1 starting in SY 2020–21 (treatment group) or as part of Cohort 2 starting in SY 2022–23 (delayed-treatment

control group). During SY 2020–21 and SY 2021–22, control schools will continue business-as-usual data use and dropout prevention practices. During SY 2022–23, control schools will begin implementing EWIMS when students who were previously in Grades 9 and 10 will be in Grades 11 and 12, respectively. It is important to note that data for these Grades 11 and 12 students will not be available for visualization in the BrightBytes data tool. Consequently, EWIMS teams in control schools will not be able to use the data tool and locally validated thresholds of risk to identify students in need of supports within the student analytic sample. Although an EWIMS team in a control school could apply knowledge of EWIMS and interventions to support these Grades 11 and 12 students, the team would have been unable to use EWIMS for *early* identification and intervention with these students when they were in Grades 9 and 10. By restricting data visualization for these students in control schools, **the evaluation will preserve a strong treatment contrast for a cohort of Grades 9 and 10 students in treatment and control schools through Grade 12—allowing Abt to assess impacts on on-time graduation.**

This impact evaluation is designed to meet WWC standards without reservations. Students in study schools inherit their schools' assigned conditions. Abt will collect student rosters for Grades 9 and 10 at the beginning of SY 2020 for schools in the treatment and control groups. The evaluation sample will comprise all students listed on rosters. Students who enter schools later in the school year will be excluded from the analytic sample. Abt will examine outcomes for an additional ninth-grade cohort of student in fall 2021, although these analyses will be exploratory because these students will be considered "joiners" per WWC standards.

School attrition is expected to be low for two reasons. First, we will obtain outcome measures from district administrative data, allowing for intent-to-treat analyses of all students who remain in the districts, even if they leave study schools. Second, AIR has established strong

partnerships with states and districts and will stipulate that districts provide the administrative data needed for the study for both treatment and control schools. This approach will allow the study team to include all schools in the analysis, regardless of whether they implement EWIMS. The study team will work with districts to ensure that Abt receives data for all treatment and control schools. The evaluation team also will track attrition of students using fall rosters.

Study will ensure baseline equivalence in analytic sample. The study's blocked random assignment procedure will ensure the likelihood of baseline equivalence on the blocking variable (school graduation rate) between treatment and control schools. Also, to check for baseline equivalence on school and student characteristics, explain between-school variance in outcomes, and provide more precise estimates of the impacts of EWIMS, Abt will collect school-level and student-level baseline data. Establishing equivalence on students' prior academic performance, gender, race/ethnicity and social economic status is particularly important, as it is a key requirement for WWC review if attrition is high. Final impact estimates will control for baseline characteristics (including any baseline differences) to improve precision of the impact estimates.

Study sample size and power. The study's proposed sample size is 80 schools with a conservatively estimated 169 students in each of Grades 9 and 10. The study is designed to detect an effect size difference between the treatment and control group of 4 to 6 percentage points for binary outcomes and a difference of 0.14 to 0.16 standard deviations for continuous outcome measures (see Appendix H for additional details). These impacts are similar in size to those observed in the earlier REL Midwest impact evaluation of EWIMS (Faria et al., 2017).

E.2 Evaluation Will Provide Guidance About Strategies for Replication

The evaluation will generate guidance about effective strategies for implementing and scaling EWIMS in diverse settings in five ways. First, the **evaluation will include 80 high-need**

urban, suburban, and rural schools in approximately 10 districts in four states, as well as 40 additional schools with higher or lower graduation rates within partner districts.

Second**, we will examine whether impacts differ for various types of students and schools**. These analyses will provide valuable information to guide future scaling of EWIMS, as they may identify settings and populations that may benefit more or less from implementation. Potential school-level moderators include high school graduation rate; school size; demographic composition (e.g., percentage of students eligible for free/reduced lunch) and urbanicity. Potential student-level moderators include race/ethnicity, eligibility for free/reduced lunch, English learner status, special education status, prior achievement, and incoming risk status.

Third, **we will collect and analyze high-quality data on implementation fidelity (RQ4) from multiple sources.** Abt will adapt implementation fidelity measures from the REL Midwest study (see Appendix H, Exhibit H-2 for implementation fidelity rubric, including indicators to score implementation as low, moderate, or high on each of the seven steps, and overall), drawing on usage data from the data tool, semi-structured 60-minute focus group interviews with at least three members of each EWIMS team in treatment schools (see Exhibit H-1) using established protocols from Faria et al. (2017), coaching logs, and the school staff surveys collected to assess treatment contrast (detailed below). Quantitative implementation data will be summarized descriptively. Implementation fidelity (overall, and for each of the seven steps) for all treatment schools will be coded by two independent coders and we will assess interrater agreement (e.g., Cohen's kappa statistic; see Cohen, 1968) and follow best practices for qualitative data analysis (e.g., triangulation across data sources; see Creswell & Miller, 2000; Denzin & Lincoln, 2000; Marshall & Rossman, 1989). Across data sources, **Abt and AIR will identify factors that facilitate or are barriers to implementation of the EWIMS scaling strategy (RQ6).**

Fourth, **we will conduct descriptive analyses of practices in treatment and control schools to document the treatment contrast and contextualize impacts (RQ5)**. Abt will administer a web-based survey to a sample of school staff (e.g., school leaders, EWIMS team members, teachers) in EWIMS and control schools in the spring of 2020 (baseline), 2021 and 2022 using survey items with demonstrated validity and reliability (Faria et al., 2017), as well as new questions designed for this evaluation (any new items will be pilot tested). None of the implementation measures will be over-aligned with the intervention, and all data will be collected similarly for students in treatment and control schools.

Fifth, to **provide information on whether EWIMS is a cost-effective** investment and to identify ways to make it more cost-effective, AIR will conduct a cost analysis using the Resource Cost Model (RCM), which has been used extensively by AIR. Focusing on both personnel and nonpersonnel resources, we will populate the RCM using the *CostOut* tool and generate cost-effectiveness estimates based on the cost estimates and results from Abt's impact analyses.

E.3 Evaluation Will Provide Valid and Reliable Performance Data

Abt will collect outcome and implementation data that align with the logic model from several data sources (see Exhibit 5 for the theory of action, see Appendix H, Exhibit H-1 for a timeline for data collection activities and measures). **Student outcome measures will exhibit face validity and reliability as required by WWC standards.** The primary, confirmatory outcomes (RQ1–RQ3) will be standard student academic measures (e.g., attendance, persistence, and progress in school and discipline incidents) available from district administrative data.

Impacts on student outcomes will be estimated using a two-level regression (RQs 1, 2, and 3), adjusting for clustering of students within schools (see Appendix H for additional details). In addition, the model will adjust for randomization block, baseline student achievement, and other

student characteristics (e.g., eligibility for free or reduced-price lunch, gender, race/ethnicity). Separate models will be used to estimate impacts for students in Grades 9 and 10 starting in SY 2020–21, for outcomes in each school year as they progress through high school.

E.4 Clear Components, Mediators, Outcomes and Measurable Threshold

The design of the proposed evaluation is informed by clearly articulated key components, mediators, and outcomes of EWIMS as depicted in the theory of action (Exhibit 5). The central components of EWIMS implementation are adoption of EWIMS including the 7-step process, attendance at trainings and participation in coaching sessions, and use of the data tool. The theory of action also specifies short-term outcomes (i.e., percentage of students with early risk indicators); intermediate outcomes (i.e., student persistence and progress in school); and long-term outcomes (i.e., on-time graduation). The impact of EWIMS on on-time graduation is expected to be mediated by impacts on short-term and intermediate outcomes; short-term and intermediate outcomes are in turn mediated by outputs and practices.

Our evaluation establishes clear thresholds for acceptable implementation. For the scaling strategy, (1) at least three members of each school's EWIMS team must attend the 2-day training and the first monthly team meeting (kickoff onsite with AIR coach); (2) EWIMS team leads complete fidelity self-assessment and meet virtually at least five times with the AIR coach during each of two school years; (3) at least 75% of EWIMS team members at each school must attend virtual and on-site meetings or trainings with the AIR coach. For the EWIMS intervention, implementation will be classified as low, moderate, or high based on the aforementioned rubric developed for the Faria et al. (2017) study (see Exhibit H-2). Abt, in collaboration with AIR, will adapt the rubric as appropriate to accommodate the scaling strategy prior to implementation.

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