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May 2009

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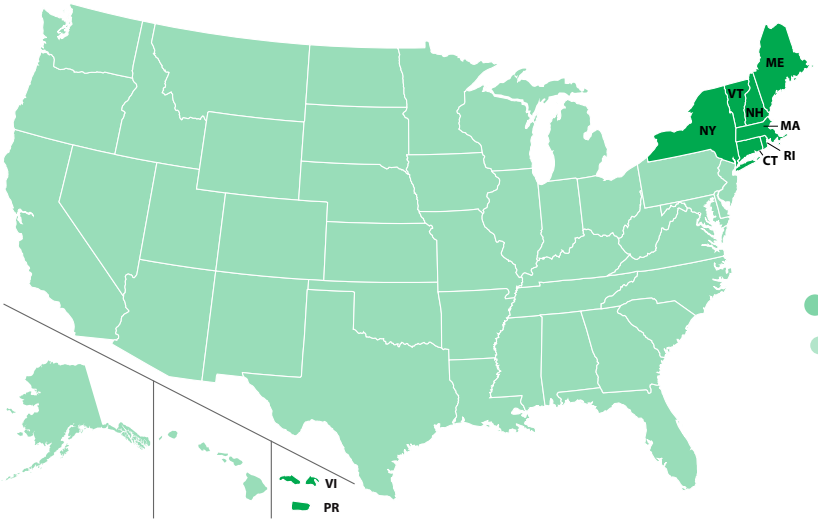

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Summary

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How state education agencies in the Northeast and Islands Region support data-driven decisionmaking in districts and schools

The report examines the initiatives of state education agencies in the Northeast and Islands Region to support data-driven decisionmaking in districts and schools and describes the service providers hired to support this work. Identifying four components of data-driven decisionmaking initiatives, it finds that not all initiatives include all four.

Data-driven decisionmaking is receiving increasing attention from the education community because of federal and state accountability requirements; the enhanced capacity of states and school districts to collect, manage, and distribute data; and a better understanding of the importance of data-driven decisionmaking in improving instruction and student achievement. The report responds to a request by the Rhode Island Department of Elementary and Secondary Education for information about how other state education agencies in the Northeast and Islands Region support districts and schools in effectively using data to inform a range of education decisions.

Two research questions guided this study:

- What state education agency initiatives support data-driven decisionmaking by districts and schools in the Northeast and Islands Region? What are their similarities and differences?
- What service providers do the state education agencies work with to support educators in using data to inform education decisions, and what services do they provide? What are their similarities and differences?

The descriptions of initiatives by state education agencies in the Northeast and Islands Region to support data-driven decisionmaking in districts and schools are based on examinations of state education agency web sites, interviews with agency officials, and a review of the documents they provided. State education agency officials also identified the service providers they have hired to support this work. Three providers were selected for more in-depth profiles. Descriptions of the three service providers are based on interviews with service provider staff, observations of professional development activities, and additional materials provided by the service providers. Appendixes to the report include profiles of each state education agency initiative, a catalogue of nine service providers identified by the state education agency officials,

and profiles of three service providers. This study has several limitations, including the small number of respondents interviewed, the focus on state education agency data-driven decisionmaking supports for districts and schools rather than on district and school implementation of data-driven decisionmaking, and a lack of information about the decisions made by state education agency officials.

Analysis of the state education agency data-driven decisionmaking initiatives across the region revealed that state agencies have implemented one or more of four components to support data use by schools and districts:

- *Centralized data system/warehouse.* A centralized data system/warehouse combines data from multiple sources into a centralized repository. Data can include a range of evidence, such as classroom assessment data, school-level information on students and staff, demographic data, and state test scores.

- *Tools for data analysis and reporting.* Data tools allow users to collect, organize, and analyze data for use in decisionmaking.

- *Training on data systems/warehouses and tools.* Training helps educators learn to effectively and efficiently use the data analysis tools to better understand the available data.

- *Professional development in using data for decisionmaking.* Teachers and administrators require extensive professional development to build their expertise in identifying and analyzing relevant data and adjusting instructional practices and school processes in response to such data.

Each state education agency's initiatives were reviewed within the framework of these components. Only New Hampshire appears to provide all four components to every school in the state. Maine and Vermont provide all four components but target only specific schools. New York provides a data system, data tools, and professional development, but as separate initiatives with little overlap. Massachusetts, Rhode Island, and the Virgin Islands are creating a longitudinal data system and data tools and developing training in their use. Connecticut focuses solely on the process of using data for decisionmaking and targets that support to low-performing districts.

Despite a dearth of comprehensive initiatives, state education agency officials across the region mentioned the importance of providing a range of data-driven decisionmaking supports to schools. But they noted that limited funding and a lack of capacity force them to make choices about which components to provide.

Analysis of the four components across the state education agency initiatives revealed that implementation is affected in part by available funding and capacity:

- *Funding.* State education agency data-driven decisionmaking initiatives were shaped by the funding available. External funds (such as Title I) may restrict who can receive services or prescribe the types of services that can be offered. State funding must be stretched to cover a range of education services, and support for data-driven decisionmaking must

compete with teacher salaries and book and supply purchases.

- *Capacity.* State education agency staff may lack the capacity to support their data-driven decisionmaking initiatives because of time or expertise. To help provide needed services to schools and districts, state education agencies have contracted with external service providers.

State education agency officials identified the following providers of support for data-driven decisionmaking initiatives in the region: Center for Assessment, Cognos, the Connecticut Regional Educational Service Centers Alliance (RESC Alliance), ESP Solutions Group, Measured Progress, the New York Board of Cooperative Educational Services (BOCES), Pearson School Systems, Performance Pathways, and TetraData. Three of these nine service providers were selected for in-depth profiles: the Connecticut RESC Alliance, Measured Progress, and Performance Pathways.

These three service providers assist state education agencies in implementing the four key data-driven decisionmaking components identified in this study:

- *Centralized data system/warehouse.* Performance Pathways and Measured Progress support state education agencies in creating a central repository for storing data.

- *Tools for data analysis and reporting.* All three service providers use various tools to support data analysis and reporting, ranging from paper and pencil to computer-based spreadsheet software and online programs capable of generating customized reports from the centralized data system.

- *Training in data systems/warehouses and tools.* Performance Pathways and Measured Progress not only support the creation of a data warehouse system but also provide training in using the system and its tools. To reach a broader audience, both providers use a "train the trainer" model, training groups of educators who are then responsible for training colleagues.

- *Professional development in using data for decisionmaking.* All three providers offer some professional development in using data to guide decisionmaking. Offerings vary, depending on the organization's focus on creating a data-driven culture, using assessment data, or developing software tools. Providers work with teams from districts or schools who are expected to train their colleagues in the process.

This study outlines several considerations for education decisionmakers and researchers on the potential benefits of implementing additional components of a data-driven decisionmaking system, sources of funding, and strategies to enhance their capacity to support teachers and administrators. Ideas are proposed for further research, including examining how state education agencies scale up their data-driven decisionmaking initiatives; exploring how state education agencies, schools, and districts implement data-driven decisionmaking; and analyzing the impacts of data-driven decisionmaking on student and school outcomes.

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WHY THIS STUDY?

Use of data is recognized as a major component of school improvement. No Child Left Behind (NCLB) legislation stipulates that low-performing Title I schools use data to support school improvement plans submitted to the state education agency (NCLB section 1116). Such data could include test scores, classroom assessments, attendance and discipline records, school or district staffing patterns (teachers' and principals' years of experience, areas of expertise, and levels of education), and classroom information gathered systematically by teachers (Wayman 2005). The increased pressure for data-driven decisionmaking comes not only from external accountability requirements, such as the NCLB Act and state legislation, but also from an increased understanding that school improvement efforts benefit from systematically gathering and analyzing information about the school, its students, and the school's capacity to meet students' needs (Finnigan, O'Day, and Wakelyn 2003; Marsh et al. 2005; Ikemoto and Marsh 2007).

Data-driven decisionmaking is neither new nor limited to education decisionmakers (see box 1 for a description of data-driven decisionmaking and definitions of key terms). Analyzing data to assess organizational effectiveness and to craft improvement strategies has long been important for managers in the public and private sectors (Feigenbaum 1951; Deming 1982; Barzelay 1992). Although educators have a long tradition of using test scores and other information to shape instructional decisions, until recently the use of data to inform education decisions has not been systematic (Abelman et al. 1999). With external accountability pressures and the availability of new technology to access data, there is now a push by state education agencies for more uniform and rigorous use of data to improve instruction outcomes (see, for example, Abbott 2008; New Hampshire Department of Education 2006).

Importance to the region

Officials at the Rhode Island Department of Elementary and Secondary Education expressed

BOX 1

What is data-driven decisionmaking?

Key terms related to data-driven decisionmaking include the following (for more detail see appendix A):

Data-driven decisionmaking in education refers to "teachers, principals, and administrators systematically collecting and analyzing various types of data . . . to guide a range of decisions to help improve the success of students and schools" (Marsh, Pane, and Hamilton 2006, p. 1). It can include the relatively simple process of disaggregating state test scores to identify and support struggling students (Ikemoto and Marsh 2007) and the more complex process in which faculty develop a school environment that supports the use of evidence to "reshape the central practices and cultures of their schools to react intentionally to the new kinds of data" (Halverson et al. 2007, p. 4). Strategies include forming data teams to guide the data-driven decisionmaking process (Love et al. 2008) and implementing new instruction approaches and the associated professional development (Moody, Russo, and Casey 2005).

Culture of inquiry is a type of data-driven decisionmaking in which faculty create an organizational culture focused on using data and other evidence to shape instructional practices.

Data collected about students, teachers, and their schools and districts can include scores from large-scale assessments, classroom assessments, attendance and discipline records, and statistics on school or district staffing patterns (such as teachers' and principals' years of experience, areas of expertise, and level of education).

State data-driven decisionmaking initiatives are initiatives that have been conceptualized at the state level to support data use by local educators; have a set of comprehensive goals, objectives, and purposes; and have designated resources (financial and personnel) to support their development and implementation. In addition, state education agency leaders must communicate their policies to districts in the state and offer them support.

interest in research that describes how state education agencies can support data-driven decisionmaking in districts and schools. The department is designing a comprehensive data system to provide educators—from classroom teachers to district and state administrators—with access to data. This effort prompted Rhode Island Department of Elementary and Secondary Education officials to request the Regional Educational Laboratory Northeast and Islands to profile how other jurisdictions in the region support systematic data-driven decisionmaking in districts and schools. Officials at state education agencies in Massachusetts, New Hampshire, and New York also expressed interest in the project.

Extensive research on data-driven decisionmaking at the district and school levels reveals the variety of practices teachers and administrators used to support both classroom practices and school improvement efforts (see appendix C for a brief review of the literature). The research findings are also clear that educators need external support to develop their capacity to conduct these activities. But there is little research on how state education agencies and external service providers support these efforts—the focus of this report.

Study questions

Two research questions guided this study:

- What state education agency initiatives support data-driven decisionmaking by districts and schools in the Northeast and Islands Region? What are their similarities and differences?

- What service providers do the state education agencies work with to support educators in using data to inform education decisions, and what services do they provide? What are their similarities and differences?

The first research question concerns state education agency initiatives to develop the capacity of

district and school leaders to use data to adjust instruction and organize schools to improve student achievement (see box 1 for definitions of key terms). The second research question examines service providers in the region and how they support data-driven decisionmaking in districts and schools. State education agencies contract external service providers to support data-driven decisionmaking initiatives by providing technology tools and professional development. The responses to these research questions will be useful to state leaders who are designing or implementing initiatives for building the capacity of educators to conduct data-driven practices at the school and district levels and to district administrators who sometimes contract with service providers to support data-driven decisionmaking.

To answer these questions, the project team conducted a qualitative study of data-driven decisionmaking initiatives in the Northeast and Islands Region (see box 2 and appendix B for details on the study methods). The report also provides an overview of the literature on data-driven decisionmaking in schools and districts and the external supports for those efforts (appendix C), case profiles of state education agency initiatives (appendix D), a catalogue of the nine providers contracted by state education agencies to support data-driven decisionmaking in districts and schools in their jurisdiction (appendix E), and case profiles of three service providers (appendix F).

The state education agencies and service providers in the Northeast and Islands Region profiled in this report offer a range of examples of how to support data-driven decisionmaking at the district and school levels. While ideally state education agencies could provide a comprehensive range of supports for data-driven decisionmaking, limited resources often force tradeoffs between providing data and tools and fostering a climate that encourages a process of data-driven decisionmaking. The examples in the report are intended to expand the dialogue on how state education agencies can support data-driven decisionmaking and help practitioners better meet the needs of their students.

WHAT STATE EDUCATION AGENCY INITIATIVES SUPPORT DATA-DRIVEN DECISIONMAKING BY DISTRICTS AND SCHOOLS?

The descriptions in this section provide a snapshot of the data-driven decisionmaking initiatives and their context in Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont, and the Virgin Islands. Table 5 at the end of this report compares the major elements of the initiative in each jurisdiction, including targeted groups, data collected, data analysis tools, and service providers working with the state education agencies. A full description of each state education agency initiative is in appendix D.

State education agency data-driven decisionmaking initiatives by state and jurisdiction

The goal of each state education agency's work with districts and schools on data-driven decisionmaking is to help local educators use data to improve student outcomes. Despite this common mission, individual agencies in the Northeast and Islands Region support data-driven decisionmaking in distinct ways. This section describes each state's approach.

Connecticut. Connecticut's data-driven decisionmaking initiative emphasizes improving the outcomes of low-performing schools. Under the Connecticut Accountability for Learning Initiative of the State Department of Education, regional educational service centers train school teams in low-performing districts to analyze data to improve student performance. Classroom and school-level data are examined, including state assessment scores from the Connecticut Academic Performance Test and Connecticut Mastery Test, along with data on student behavior and school climate. Professional development

The goal of each state education agency's work with districts and schools on data-driven decisionmaking is to help local educators use data to improve student outcomes

BOX 2

Study methods

Study sample and analysis. The researchers used publicly available information to identify statewide data-driven decisionmaking initiatives, key respondents, and service providers; supplemental documents provided by respondents from state education agencies and service providers; semistructured, open-ended interviews with key respondents from each state education agency and each service provider; and observations of professional development activities. Data collection was iterative, with the state education agency initiatives informing the selection of service providers.

Interviews were conducted with a state education agency official with a key role in the data-driven decisionmaking initiatives in each of the eight state education agencies included in the study (Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont, and the Virgin Islands;[1] two officials were interviewed in Massachusetts). Each respondent was asked to identify at least one service provider supporting that state education agency's data-driven decisionmaking initiatives and the person responsible for implementing the state contract (appendix B provides more details on the selection criteria). Three service providers from the list of nine identified providers were selected for more in-depth profiles: Measured Progress, Performance Pathways, and the Connecticut Regional Educational Service Centers Alliance (see appendix F). They were selected because they serve multiple jurisdictions in the region, have been in existence for two or more years, have provided data-driven decisionmaking services for at least two years, and offer professional development services in using data to inform teaching and learning.

Interviews were recorded and transcribed. Transcripts and observation notes were coded using the qualitative data analysis software ATLAS-ti. The coding output was analyzed alongside documents to triangulate the evidence about state education agency policies and service provider efforts. Researchers used these data to develop state case profiles and service provider profiles. The completed profiles facilitated systematic analysis of cross-state education agency and cross-provider issues. The research team met regularly to share case profiles and to develop cross-case themes.

Limitations of the study. The primary limitation of this study is the small number of respondents interviewed. The knowledge and opinions of one state education agency official from each jurisdiction may not represent the knowledge or perspectives of all state education agency staff. In addition, information in the three service provider profiles cannot be generalized to represent the six providers that were not profiled. Also, the study focuses on the role of state education agencies and does not explore in any depth the role of districts in supporting data-driven decisionmaking initiatives. Finally, the study does not examine the effectiveness of any of these initiatives or their impacts on schools.

Note

1. The plan originally included all nine state education agencies in the region. Despite attempts over several months, the research team was unable to coordinate an interview with an appropriate individual from the Puerto Rico Department of Education. As the study moved into the second phase of the research, focusing on service providers, a decision was made to proceed without information from Puerto Rico because of time constraints.

in data-driven decisionmaking for teachers and school administrators focuses on creating data teams and training them to build and sustain a five-step process of embedding data and evidence into their decisionmaking processes. No technology is used during the training; data are typically on paper. Certification training, intended for educators who want to create a schoolwide culture of inquiry through facilitation of ongoing professional development at their schools, is provided by the Leadership and Learning Center, a partner organization.

The Connecticut State Department of Education does not have a statewide data warehouse to store student assessment data, but officials are considering one. The regional educational service centers had provided a statewide warehouse to districts through a vendor, TetraData, but that relationship ended in June 2008. Connecticut

received a longitudinal data system grant from the U.S. Department of Education in 2005. According to the U.S. Department of Education web site, the Connecticut State Department of Education is using the grant to enhance its technology infrastructure to support data collection, but not to support data-driven decisionmaking in districts and schools.

Maine. Although Maine lacks a formal data-driven decisionmaking initiative, state education leaders have long recognized the need to assist local educators in developing a culture of inquiry in schools to support the use of evidence in decisionmaking. Since the early years of the Maine Educational Assessment (first administered in 1984), the Maine Department of Education and Measured Progress, a service provider focusing on assessment development, have provided workshops to district and school administrators to support them in interpreting the state assessment reports. In addition, in the 1990s and the early 2000s the state accountability system included local performance assessments.[1] In recent years the workshops also have trained educators on an online data tool, designed by Measured Progress, that allows users to customize the Maine Educational Assessment reports. Administrators are then expected to share this training with their colleagues.

Maine Department of Education staff provide follow-up support for school teams—to conduct item analysis and to discuss how to identify student needs and strengthen instruction based on state assessment evidence—but very few personnel are available to serve the state, which is as large as the rest of New England combined. Department staff support data-driven decisionmaking within specific programs (such as Title I, Reading First, and special education), but limited state funds mean that these services are available only to a targeted set of schools. Maine is using a federal longitudinal data grant to develop a new data system that will give all schools access to an online longitudinal data system that will integrate state assessment scores with student information and staffing data.

Although Maine lacks a formal data-driven decisionmaking initiative, state education leaders have long recognized the need to assist local educators in developing a culture of inquiry in schools to support the use of evidence in decisionmaking

Massachusetts. The Massachusetts Department of Elementary and Secondary Education has a data-driven decisionmaking initiative that focuses on creating a virtual data warehouse and sophisticated tools to help educators analyze the data. In 2001 the department created a centralized system to collect student background information and link it to Massachusetts Comprehensive Assessment Systems data. For the past three years the department has been developing and pilot testing its virtual Educational Data Warehouse initiative, which will give people at all levels (state, district, and school) access to a variety of state-maintained data (such as state assessment scores and student and educator information) and data analysis and reporting tools. Districts will have the opportunity to add their own data, including course grades and attendance or discipline data.

The virtual Educational Data Warehouse uses software developed and managed by Cognos Corporation. As of May 2008, 76 districts (of 388) were piloting the data warehouse. The pilot includes training on the data tools and professional development support for implementing a process of data-driven decisionmaking. Once the pilot ends and the initiative is available statewide, districts will need to provide training on the data analysis tools and professional development from their own budget.

New Hampshire. In 2007 New Hampshire unveiled Performance Tracker, a suite of software developed by Performance Pathways to support the state's formal data-driven decisionmaking initiative, Follow the Child. Follow the Child focuses on measuring growth in the personal, social, physical, and academic facets of each student's life and on defining the support systems students need to succeed. The intention is to ensure that personalized

learning and student well-being are at the center of district and school policies.

Along with storing and analyzing student and educator data, Performance Tracker can link curriculum, assessments, and standards and help educators create and store local assessments. New Hampshire, like Connecticut and Maine, is the recipient of a grant from the U.S. Department of Education to improve its longitudinal data system. The federal support has allowed New Hampshire to waive the subscription fee for districts to the state's data warehouse. New Hampshire also is using its federal grant to provide professional development for educators at all levels—from preschool to postsecondary—to make better use of multiple kinds of data to support the learning and development of each child and to foster a climate that supports the use of data and evidence to guide instruction. The New Hampshire Department of Education appears to have the most comprehensive data-driven decisionmaking initiative in the Northeast and Islands Region.

New York. Although the New York State Education Department does not have a formal statewide data-driven decisionmaking policy for districts and schools, its support for low-performing schools encourages data-driven decisionmaking. It also encourages state-sponsored and other agencies to incorporate supports for data-driven decisionmaking into their programs.

New York has a strong history of using data to inform education decisions at all levels of the system. A network of regional school support centers, created in 2003, provides professional development for teachers in low-performing schools in using data to drive instructional decisions. The New York State Testing and Accountability Reporting Tool (nySTART), introduced in 2006, gives school leaders access to a variety of reports on scores on New York's standardized tests. Educators can view and sort data by performance level, content strand or standard, test item, and subgroup. District and school administrators and teachers are expected to use the information to inform education decisions. Furthermore, the regional Boards of Cooperative Educational Services (BOCES), created in 1948 to provide shared education programs and services to New York school districts, offer data-driven decisionmaking services based on the needs of the regions they serve. Many low-performing schools seek BOCES services in using data to improve teaching and learning.

Although the New York State Education Department does not have a formal statewide data-driven decisionmaking policy for districts and schools, its support for low-performing schools encourages data-driven decisionmaking.

Rhode Island. The Rhode Island Department of Elementary and Secondary Education supports data-driven decisionmaking in the state through major investments in a data warehouse system to support its longitudinal data system and tools to enable districts to use the data to inform instructional decisions. State, district, and school educators and parents will have access to the online consolidated data warehouse, which facilitates data collection and provides data analysis tools. In 2006 the Rhode Island Department of Elementary and Secondary Education contracted with Tetra-Data and ESP Solutions Group to create a central virtual repository to consolidate vast amounts of information and data that had been available in separate locations (such as New England Common Assessment Program data,[2] student and financial information, and teacher certification). The system is being introduced gradually over a two-year period. During the roll-out district staff are being trained in how to use the components of the new data system.

Vermont. Since the mid-1990s the Vermont Department of Education has supported educators' use of data to improve instruction and student outcomes. However, before passage of the NCLB Act, these initiatives were not tied to accountability efforts. Currently, the department has a formal data-driven decisionmaking initiative with specific requirements as part of its work with low-performing schools. It also informally provides some resources related to data-driven decisionmaking to

all schools in the state. Schools in need of improvement must provide data-based evidence of the impact of their school improvement efforts on student learning.[3] These schools receive support and training for data-driven decisionmaking processes through principal learning communities;[4] by 2009 similar professional learning communities will be required for all teachers in these schools through teacher learning communities.

In addition to services provided free of charge to low-performing schools, districts can subscribe to the Vermont Data Warehouse, which has both data storage and analysis capabilities. Fees are based on a sliding scale, according to district size and revenues. The warehouse uses software developed by TetraData and is administered by the Vermont Data Consortium, a partner agency of the Vermont Department of Education. The data warehouse provides training on the use of its data tools.

Virgin Islands. The Virgin Islands Department of Education does not have a formal policy to support data-driven decisionmaking in its districts and schools. A department official noted that the jurisdiction relies on the provisions in the NCLB Act to encourage the use of data in decisionmaking. The Virgin Islands Territorial Assessment of Learning (VITAL) has been in place since 2004/05; before that the jurisdiction had had a five-year moratorium on standardized testing. Since territorywide testing resumed in 2004, the assessment has been taken by students in grades 5, 7, and 11 in each of the past three test administrations. The Virgin Islands Department of Education is beginning to develop a longitudinal data system to access and analyze both assessment data and student information, and the professional development that supports the use of the data system is part of a contract with Pearson School Systems, the external service provider that created the system.

Four key components to support data collection and use

Analysis of state education agency data-driven decisionmaking initiatives in the Northeast and Islands Region revealed that agencies typically have one or more of four key components in place to support data collection and use by schools and districts in making education decisions. These components provide a logical framework for presenting findings.

Analysis of state education agency data-driven decisionmaking initiatives in the Northeast and Islands Region revealed that agencies typically have one or more of four key components in place to support data collection and use by schools and districts in making education decisions

- *Centralized data system/warehouse.* A centralized data system/warehouse combines data from multiple sources into a centralized repository. Such centralized systems provide a range of stakeholders with an integrated view of multiple data sources and provide a customized interface to access these data (Dembosky et al. 2005). Data range from classroom assessment data to school-level information about students and staff (Gallagher, Means, and Padilla 2007; Wayman 2005).

- *Tools for data analysis and reporting.* Data tools are software that allows teachers and administrators to collect, organize, and analyze data and use them for decisionmaking (see, for example, case studies by Larocque 2007; Storandt, Nicholls, and Yusaitis 2007; Chen, Heritage, and Lee 2005; Lachat and Smith 2005; Light et al. 2005; Murnane, Sharkey, and Boudett 2005; Mason 2002). These software tools can reside on individual personal computers or be provided online. User-friendly software allows easy access to and manipulation of data to inform decisions about classroom practice.

- *Training on data systems/warehouses and tools.* Educators often need training on effective and efficient use of data systems/warehouses and tools (Earl, Katz, and Fullan 2006; Dembosky et al. 2005). Teachers and district and school administrators may receive technical training and support through

Six of the eight state education agencies provide data reporting and analysis tools to local educators, often with the support of an external service provider

workshops, user conferences, review of annotated score reports, or technical assistance sessions led by project managers.

- *Professional development in using data for decisionmaking.* Professional development in data-driven decisionmaking builds educators' expertise and habits in identifying and analyzing relevant data and adjusting instruction and other practices in response to the data (Boudett and Steele 2007; Knapp, Copland, and Swinnerton 2007; Young 2006; City, Kagle, and Teoh 2005; Lachat and Smith 2005; Murnane, Sharkey, and Boudett 2005; Copland 2003; Feldman and Tung 2001). Professional development occurs over time and often involves an iterative cycle in which teachers examine data, plan for implementation of targeted strategies, implement those strategies, and evaluate their impact (Abbott 2008). It often focuses on building collaborative teams that use data to examine improvement efforts (Love et al. 2008). Such professional development is often delivered through workshops or ongoing coaching for data teams in schools and districts.

These four components have been implemented in varying combinations and sequences and are at different stages of implementation in the agencies studied. Choices about which components to implement—and about the depth and breadth of implementation—are shaped at least in part by the availability of funding and the implementation capacity of state education agencies. The agencies are extending their capacity to support data use in districts and schools by contracting with organizations that can provide services for one or more of the data-driven decisionmaking components.

Similarities and differences in data-driven decisionmaking initiatives across state education agencies

This section looks at the extent to which state education agencies in the region implement the four key components of data-driven decisionmaking, focusing on similarities and differences. It also looks at how available funding and capacity for data-driven decisionmaking supports shaped the decisions of state education agencies on which components to implement, who would receive access to these supports, and which outside vendors to work with states to provide supports.

State education agencies in the Northeast and Islands Region have implemented the four components to different extents and in varying combinations and sequences (see table 1 for an overview of the components).

Centralized data system/warehouse. The state education agencies in the region offer various systems to support data-driven decisionmaking in districts and schools. These include consolidated virtual data warehouses (Massachusetts, New Hampshire, Rhode Island), a data warehouse run by a partner organization rather than the state education agency (Vermont), integrated but more limited data systems (Virgin Islands), and separate repositories for different types of data (New York and Maine). Maine is developing a consolidated data warehouse that should be available to all schools within three years. Connecticut plans to develop a statewide data warehouse, but currently data-driven decisionmaking relies on data collected by districts and at schools.

Tools for data analysis and reporting. Seven of the eight state education agencies (all but Connecticut) provide data reporting and analysis tools to local educators, often with the support of an external service provider. In Vermont a partner agency provides data tools, which are available to districts for a subscription fee. Massachusetts, New Hampshire, Rhode Island, and the Virgin Islands offer software that facilitates analysis of assessment and other data when used in conjunction with their data warehouses.

The Massachusetts Department of Elementary and Secondary Education has purchased a license for

TABLE 1

Components of state education agency initiatives in the Northeast and Islands Region, 2007/08

Jurisdiction	Centralized data system/warehouse: Consolidated data system/ warehouse	Centralized data system/warehouse: Separate data system/ warehouses	Tools for data analysis and reporting	Training in data systems/ warehouses and data tools	Professional development in using data for decisionmaking
Connecticut					✓
Maine		✓	✓	✓	✓[a]
Massachusetts	✓		✓	✓[b]	✓[b]
New Hampshire	✓		✓	✓	✓
New York		✓	✓		✓
Rhode Island	✓		✓	✓	
Vermont	✓[c]		✓[c]	✓[c]	✓
Virgin Islands		✓	✓	✓	

a. A limited number of Maine Department of Education staff are available to support data-driven decisionmaking at the school level.
b. State education agency funding is available only for pilot districts. Available statewide through districts' funds.
c. These services are provided by a partner organization for a subscription fee.

Note: Puerto Rico is not included because the study team was unable to set up interviews with key respondents from the Puerto Rico Department of Education, despite repeated attempts over several months.

Source: Authors' compilation based on interviews and documents provided by state education agency officials and information available on state education agency web sites.

data warehouse software that will house all the state-maintained data and will eventually allow school districts to load and analyze their own data. All New Hampshire districts have access to Performance Tracker, the state-adopted data warehouse and analysis tool that is used in conjunction with the state's data warehouse. The Rhode Island Department of Elementary and Secondary Education is creating a data warehouse to hold all of its education-related data. It will include a data analyzer available at all levels of the state education system. The Virgin Islands Department of Education contracts with Pearson School Systems, the vendor that created its system, to access and analyze state assessment data and student information. Maine and New York have stand-alone web-based tools that allow educators to conduct analyses and create reports using assessment and other types of data. Maine works with Measured Progress to offer a web portal that enables district staff and school faculty to generate customized score reports from Maine Educational Assessment data. New York's nySTART tool gives school leaders access to a variety of reports on students' standardized test scores.

Training in data systems/warehouses and data tools. Six of the eight jurisdictions (Maine, Massachusetts, Rhode Island, New Hampshire, Vermont, and the Virgin Islands) provide training on use of the data warehouses and data analysis tools. In Vermont the training is provided by a partner organization. Maine provides workshops on the online data tool, designed by Measured Progress, which allows users to customize Maine Educational Assessment reports. Districts that have been piloting the Massachusetts data warehouse have received training on uploading assessment data to the warehouse and on the analysis tools. District staff in Rhode Island are being trained to use their new system. Performance Pathways provides New Hampshire educators with training in their warehouse data analysis and reporting tools. As part of the contract with Pearson School Systems, the Virgin Islands Department of Education provides professional development in the use of its data system to access and analyze both student assessment data and student information.

Professional development in using data for decisionmaking. Six jurisdictions (Connecticut,

Maine, Massachusetts, New Hampshire, New York, and Vermont) provide professional development in using data for education decisionmaking. Connecticut provides this training through its low-performing districts initiative, Connecticut Accountability for Learning Initiative. Professional development for teachers and school administrators focuses on training data teams to build and sustain a five-step process of embedding data and evidence into decisionmaking processes. The Maine Department of Education has staff available to facilitate item analysis with school teams and to help teams better understand how data can inform classroom practice and improve student achievement. In Massachusetts state funds are available for professional development for pilot districts only. Once the initiative is launched statewide, districts will need to use local funds to implement this component. New Hampshire provides training in implementing a schoolwide culture that maintains a consistent focus on the use of data. New York's regional school support centers provide professional development to teachers and administrators from low-performing schools in data-driven decisionmaking for content areas. In Vermont teachers in schools in need of improvement receive training in developing and maintaining professional learning communities.

State implementation of key components. Among the study jurisdictions only New Hampshire appears able to offer all four components of state education agency initiatives to every school in the state (see table 1). Massachusetts and Rhode Island are creating a longitudinal data system and data tools and preparing training on how to use them. Massachusetts is piloting a data warehouse and providing professional development for data-driven decisionmaking in pilot districts. Once the initiative is implemented statewide, however, each district will have to fund its own training for using data analysis tools and professional development in using data in decisionmaking. New York provides a data system, data tools, and professional development, although these are all part of separate initiatives and have little overlap. Maine is piloting a longitudinal data system and has online tools to access a limited warehouse of state assessment data, provides training in using those tools, and offers some help for schools in using data for decisionmaking. Vermont has a statewide data warehouse available to districts by subscription and also provides professional development to its low-performing schools in using data for decisionmaking. Connecticut is the only state focused solely on the process of data-based decisionmaking. It targets professional development in using data for decisionmaking to low-performing districts, although a centralized data system is planned for the near future.

Among the study jurisdictions only New Hampshire appears able to offer all four components of state education agency initiatives to every school in the state

Although only New Hampshire is currently implementing a comprehensive data-driven decisionmaking system that is available to all schools, state education officials across the region noted the importance of having access to a data warehouse, being proficient in using data analysis tools, and understanding how to use data for decisionmaking. While initiatives in Connecticut, Massachusetts, and Rhode Island focus primarily on one component, state officials are aware of the need for a more balanced approach.

The Massachusetts Department of Elementary and Secondary Education is funding a data warehouse and recognizes the need for professional development on data use; however, districts are expected to invest in supports for teachers and administrators. As one department official explained, "districts have to come up with the training plan, professional development, and probably some consulting services" (interview, October 23, 2007). The University of Rhode Island has provided assistance to schools in using data for decisionmaking, with some support from the Rhode Island Department of Elementary and Secondary Education.[5] While Connecticut is currently focused on investing in professional development in using data for decisionmaking, it

has a federal longitudinal data system grant and is exploring ways to provide districts and schools greater access to data. An official from the Vermont Department of Education stressed the need for both technology and the capacity of educators to analyze data:

> *I really see there being two sides to this. . . . There is the tech side; every state gives a lot of data, and it's overwhelming if you don't know how to analyze it. Then there's the team side; data is only as valuable as you have people to look at it. If you don't have teachers [involved], then kid-specific solutions won't be discussed. In fact, without this perspective [of teachers], people can make bad decisions. They might, for example, decide to change the curriculum, but it turns out it's the kids who don't eat breakfast who do badly.* (Interview, October 23, 2007)

Although Maine and Vermont are working toward implementation of all four components, limited funding has forced state education agencies to make choices about the components they provide. An official from the Maine Department of Education lamented the fact that their services are targeted to only a few schools: "Am I happy that we are hitting everybody and providing good instruction in how to use data? No. We just simply don't have the staff, but we do what we can" (interview, February 20, 2008).

State education agency officials in the Northeast and Islands Region voiced the need for access to a data system/warehouse, for data tools, and for teachers and administrators to receive training in those tools, as well as for professional development in using data for decisionmaking. In every jurisdiction but New Hampshire limited state funding and capacity appear to have hampered long-term goals of implementing a more comprehensive data-driven decisionmaking initiative.

State education agency resources shape approaches to data-driven decisionmaking initiatives. Respondents noted competition for resources in implementing a comprehensive data-driven decisionmaking initiative. In particular, initiatives for a data warehouse and for tools to use the data warehouse are sometimes competing priorities. This study reveals how funding and capacity shape state education agencies' implementation of the data-driven decisionmaking initiatives provided to districts and schools. State education agency officials from several states reported that available funding and staff capacity have influenced decisions about which components to implement, who receives access to these supports, and which external service providers to work with to expand support.

In every jurisdiction but New Hampshire limited state funding and capacity appear to have hampered long-term goals of implementing a more comprehensive data-driven decisionmaking initiative

Funding. The source and amount of funding for state education agency initiatives can affect the services provided and who receives support. The Connecticut State Department of Education relies primarily on education funding from the state legislature and allocates its limited resources to support districts and schools with the highest needs. The Maine Department of Education offers training to a team of administrators from each district in using the online reporting tools for the state assessment, and staff are available to coach schools in using data for decisionmaking. Because of staff limitations, this coaching is available primarily to schools participating in specific grant programs (such as Title I and Reading First). Some districts in New York City have used Title II funding to support the development of school leaders (Darling-Hammond et al. 2007), which includes training in analyzing data and leading school faculty in an evidence-based school improvement process.

Massachusetts provides state funding to support its statewide data warehouse, which will be available free of charge. It is piloting implementation with selected districts that have access to federal funds. Once the initiative is available statewide,

All state education agencies in the region have turned to external service providers to develop data warehouses and other technology solutions and to provide training in use of data tools

the Massachusetts Department of Elementary and Secondary Education will provide guidance to districts on professional development in using the data tools and using data for decisionmaking, but districts will need to fund their own services. According to a Department of Elementary and Secondary Education official, the availability of federal funds has facilitated the pilot: "It's been helpful for us to have partners . . . in the districts who have actually reached out and have applied for the Title II D grants" (interview, October 23, 2007). Vermont charges a subscription fee for access to its data warehouse and analysis tools, which are developed and maintained by a partner agency. Also for a fee, the partner agency provides professional development in using the data tools and analyzing the data. Vermont provides funds to low-performing schools for professional development on data-driven decisionmaking, but other schools and districts must pay their own way. With a federal longitudinal data grant, New Hampshire has been able to offer free statewide access to its data system and tools, training on tools, and professional development in data-driven decisionmaking.

Capacity. State education agency support for data-driven decisionmaking in districts and schools is also shaped by the capacity of staff to work with districts and schools. The assessment division of the state education agency is commonly charged with helping local educators understand test items and how analysis of student scores can shape instructional practice. But these divisions are now being asked to do more with the same level of staffing. Although the state education agencies in the Northeast and Islands Region administered statewide assessments before 2001, under the NCLB Act they now test all students in grades 3–8 every year and at least once during high school, dramatically increasing the number of assessments to be administered, scored, and analyzed. An official at one of the Maine Department of Education's service providers, Measured Progress, previously assessment coordinator at the Maine Department of Education, noted the increased pressure on staff:

> *[Departments of education staff] are being asked to do exponentially more with fewer resources. Prior to NCLB, most states tested at three grade levels. Overnight, they had to more than double the number of kids they were testing. In most cases, [departments of education] were doing it with the same and even reduced staff. And they were also trying to implement data warehouses. It's insane what we ask state employees to do.* (Interview, March 24, 2008)

With inadequate staffing and the need for highly specialized skills in data-driven decisionmaking, state education agencies in the region are seeking vendors who can provide the needed services to districts and schools. All state education agencies in the region have turned to external service providers to develop data warehouses and other technology solutions and to provide training in use of data tools. The Massachusetts Department of Elementary and Secondary Education contracted with Cognos to develop a data warehouse, but three full-time staff members also work on it, and other staff are available for consultation. Vermont partnered with another organization to develop a data warehouse and focused state education agency resources and personnel on professional development for data-driven decisionmaking processes in low-performing schools. The external service provider is responsible for the data warehouse, analysis tools, and training on these tools. As one Vermont Department of Education official put it: "Being small, the department can't do a lot of in-house services" (interview, October 23, 2007).

State education agencies have also turned to external service providers to expand supports for implementing data-driven decisionmaking. Maine and the states that use the New England Common Assessment Program (New Hampshire, Rhode Island, and Vermont) have negotiated their large-scale assessment contracts with Measured

Progress to include some support for data-driven decisionmaking. The New York State Department of Education works with its regional school support centers to provide data-driven decisionmaking workshops to all of its low-performing schools. As a New York State Department of Education official stated:

> *I oversee implementation of school improvement in New York City and there's another office upstate in Albany that handles it, even though I do policy for everyone. We have regional support centers that we fund because we do not have the capacity to cover the state.* (Interview, January 30, 2008)

The Connecticut Department of Education, lacking adequate staff and expertise, partnered with the RESC Alliance to implement the professional development necessary to support its data-driven decisionmaking initiative for low-performing districts.

WHAT SERVICE PROVIDERS DO STATE EDUCATION AGENCIES WORK WITH TO SUPPORT EDUCATORS' USE OF DATA-DRIVEN DECISIONMAKING?

This section provides an overview of the external service providers mentioned in interviews with state education agency officials and then profiles three organizations that reflect the variety of services provided by the full sample of organizations.

Interviews with state education agency officials in the Northeast and Islands Region identified nine organizations that were contracted to support data-driven decisionmaking initiatives at district and school levels (table 2). These organizations are not an exhaustive list of service providers in the region, but only those mentioned by interviewees. However, the organizations represent the range of services available in the region and the variety of organizations that exist to support state education agencies. Three of the service providers administer state assessments and provide support in interpreting test scores (the Center for Assessment, ESP Solutions Group, and Measured Progress), four focus on creating data warehouses and tools to analyze data (Cognos, Pearson School Systems, Performance Pathways, and TetraData), and three focus on professional development for using data to improve school planning and classroom practice (BOCES, Connecticut RESC Alliance, and Measured Progress). Appendix E provides additional information on the nine organizations.

Three of the service providers identified by state education agency officials administer state assessments and provide support in interpreting test scores, four focus on creating data warehouses and tools to analyze data, and three focus on professional development for using data to improve school planning and classroom practice

In-depth investigation of three service providers

Three service providers were selected for profiling. Providers had to have worked with multiple jurisdictions in the region, have been in existence for two or more years, and have offered these services for two or more years. In addition, organizations had to offer professional development in using data to inform teaching and learning, not just support on the other components. Connecticut RESC Alliance, Measured Progress, and Performance Pathways were selected on this basis (table 3). (Appendix B provides more detail on the selection process; appendix E provides a more in-depth profile of each provider.)

Connecticut RESC Alliance. The Connecticut RESC Alliance, a regional education agency, is a consortium of all six regional educational service centers in the state. Since 2000, the regional educational service centers have met regularly to share problems and solutions and cost-effective methods for meeting the needs of public school districts through a variety of programs and services. Through the Connecticut Accountability for Learning Initiative, the RESC Alliance provides training for school data teams at low-performing districts, to help them build a data-driven decisionmaking process—the only data-driven

TABLE 2
Overview of service providers identified by state education agencies, 2007/08

State education agency	External service provider	Services provided
Connecticut State Department of Education	Connecticut Regional Educational Service Centers Alliance (ctrescalliance.org)	• Programs and services tailored to the needs of particular schools and districts • Training in data-driven decisionmaking • Data warehousing
Maine Department of Education	Measured Progress (measuredprogress.org)	• Development, implementation, and administration of K–12 education assessments • Professional development related to use of data tools, item analysis, and formative assessment
Massachusetts Department of Elementary and Secondary Education	Cognos (cognos.com)	• Business intelligence software
New Hampshire Department of Education	Performance Pathways (perfpathways.com)	• Data-analysis tools and training on tools • Professional development in creating a data-informed culture in schools
New York State Education Department	NY Board of Cooperative Educational Services (BOCES) (eboces.wnyric.org/wps/portal/BOCESofNYS)	• Technical assistance and technology supports to districts and schools • Professional development in data-driven decisionmaking • Professional development in data management
Rhode Island Department of Elementary and Secondary Education	ESP Solutions Group (espsolutionsgroup.com)	• Data systems and psychometrics in K–12 education for federal, state, and local education agencies • Consulting and direct services
	TetraData (tetradata.com)	• Data management tools, created expressly for the K–12 community
Vermont Department of Education	Center for Assessment (nciea.org)	• Partner with states and agencies • Design and implementation of effective assessment and accountability policies and programs
Virgin Islands Department of Education	Pearson School Systems (pearsonschoolsystems.com)	• Assessment development • Technology products to facilitate data storage and analysis

Note: The state education agencies each identified one primary provider of data-driven decisionmaking services, except for Rhode Island, which identified two providers.

Source: Authors' compilation based on interviews with service provider and state education agency staff and material provided by service providers.

decisionmaking component that the Connecticut State Department of Education implements. The RESC Alliance also provides technical assistance and training in district-level data warehousing and associated data analysis and offers a variety of customized work, such as spreadsheet and database training and custom report development for schools and districts.

Although the RESC Alliance is an agency of the state of Connecticut and serves any district in Connecticut that requests support, it has also worked with districts in Massachusetts and is beginning to serve districts and schools in Rhode Island. The RESC Alliance is partially funded by the state but also raises revenue through outside grants and fee-for-service arrangements with districts.

TABLE 3
Summary of three service providers, 2007/08

Service provider	Years in existence	Type of service	Clients	Who pays?
Connecticut RESC Alliance	4	• Training to develop school data teams to build a data-driven decisionmaking process • Training and technical assistance for district-level data warehousing and data analysis applications	Districts: Any Connecticut district that requests services for data-driven decisionmaking States: Massachusetts and Rhode Island nonprofit education institutions	• Partially funded by the state • Partially funded by revenues from delivery of services to districts and grant funds
Measured Progress	24	• Assessment development • Professional development in analyzing assessment results, using data to improve instruction, and using formative assessment	Districts: Professional development provider to Maine, Massachusetts, New Hampshire, and Vermont States: Assessment developer for Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont (in the region) and others outside the region (25 states in all) (includes both assessment and professional development on using assessment data)	• State assessment contracts include some professional development to districts and schools • Districts and states contract directly with Measured Progress and pay for professional development
Performance Pathways	4 (8 years for the two companies that merged to form Performance Pathways)	• Software for data analysis, assessment, and curriculum mapping and alignment to standards • Professional development in using these software tools and creating a data-driven culture	Districts: Connecticut, Massachusetts, New York, and Rhode Island (in the region) and others outside the region (47 states in all) States: State contract with New Hampshire	• Statewide contracts provide software with some professional development; additional professional development can be purchased from the company • Districts with their own contracts pay for all their own services

Source: Authors' compilation based on interviews with service provider and state education agency staff and material provided by service providers.

Measured Progress. Measured Progress, a nonprofit company, provides both large-scale and alternative assessments, as well as professional development services in using data to improve student achievement. Founded in 1983 as Advanced Systems in Measurement and Evaluation, Inc., the company's stated mission is to improve teaching and learning by providing assessment data customized to the needs of schools and by helping educators make the best use of the data to improve student achievement. Measured Progress has worked with more than 35 states and major districts to develop large-scale and alternative assessments.

In the Northeast and Islands Region the company has created assessments for Maine, Massachusetts, and New York and joint assessments (New England Common Assessment Program) for New Hampshire, Rhode Island, and Vermont. It also has contracted with districts in Maine, Massachusetts,

State education agencies rely on the specialized skills of these service providers to implement aspects of their data-driven decisionmaking initiatives at the district and school levels

New Hampshire, and Vermont to provide professional development on using data and formative assessment to improve classroom practice. State assessment contracts with Measured Progress include some professional development to districts and schools on analysis of assessment data and its use in improving instruction.

Performance Pathways. Performance Pathways, a for-profit technology company, focuses on bringing a data-driven informed culture to educators in schools. The company uses a suite of three products to achieve this goal: Performance Tracker, Assessment Builder, and the TechPaths Curriculum Mapping System. Performance Tracker software allows users to access assessment data and student information in a central location and produce reports and graphs for analysis. Using Assessment Builder, educators can create and score local benchmark assessments based on a library of items aligned to state standards. TechPaths helps educators create, map, and align curriculum and instruction to state standards.

The company has been in existence for three years, the result of a merger between AlterNet Performance and TechPaths Company. The merger allowed the two companies to expand their offerings to include data tools, training on the use of tools, and support for creating a data-informed culture in districts and schools. Professional development provided by Performance Pathways focuses on the use of their data tools to support evidence-based decisionmaking and facilitate the development of curriculum and local assessments aligned with state standards.

In the Northeast and Islands Region Performance Pathways has a state contract with New Hampshire and works with individual districts in Connecticut, Massachusetts, New York, and Rhode Island. Statewide contracts provide districts with software and some professional development. Additional professional development can be purchased from the company. Districts also contract directly with Performance Pathways, using their own funds to pay for those services.

Similarities and differences across the three service providers

The three service providers offer different types of services to support one or more of the four components of a statewide data-driven decisionmaking initiative (table 4). While each of the three service providers has a different focus, state education agencies rely on the specialized skills of these service providers to implement aspects of their data-driven decisionmaking initiatives at the district and school levels. Two of the service providers offer services to support all four components, while one focuses on a single component. Two provide data tools and training in using the tools for analysis and reporting (Wayman et al. 2005; Foley et al. 2008). All three provide at least some support to districts and schools in using data for decisionmaking or in creating a school culture

TABLE 4
Service providers' support for the four components of state education agency initiatives, 2007/08

Service provider	Centralized data system/ warehouse	Tools for data analysis and reporting	Training in data systems/warehouses and data tools	Professional development in using data for decisionmaking
Connecticut RESC Alliance				✓
Measured Progress	✓	✓	✓	✓
Performance Pathways	✓	✓	✓	✓

Source: Authors' compilation based on interviews with service provider and state education agency staff and material provided by service providers.

that uses data-driven decisionmaking (Boudett and Steele 2007; Knapp, Copland, and Swinnerton 2007; Young 2006; City, Kagle, and Teoh 2005). And all three follow the "train the trainer" model as a way of leveraging districts' professional development funds.

The three providers differ in their emphasis on developing a culture of using evidence for making education decisions and on promoting proficient and widespread use of data tools. The Connecticut RESC Alliance is more focused on building the capacity of data teams in schools, while Performance Pathways' work is grounded in the development and use of data tools. Measured Progress falls between the two, with its assessments and analysis tools intended to build a climate of data use in schools.

Centralized data system/warehouse. Two of the profiled external service providers provide a centralized data system/warehouse. Performance Pathways' Performance Tracker software allows users to store multiple forms of data, so users can upload assessment data, student information, and other relevant data. The information is stored and linked together in a central location to support reporting. Measured Progress, as part of its work on assessments, helps clients create a web portal to facilitate customized data reporting. Data are generated from the assessments created and scored by Measured Progress. The Connecticut RESC Alliance, which emphasizes the process of data-driven decisionmaking over the use of data tools, does not support services for creating a centralized data system.

Tools for data analysis and reporting. The three service providers vary considerably in the use of technology to support data analysis and reporting. The Connecticut RESC Alliance offers services to support data-driven decisionmaking without the use of technology. District and school teams typically use paper copies of their state assessment reports and other data used in decisionmaking. Measured Progress is beginning to develop online data tools and generate accompanying reports. The tools are housed on their web-based portal. Performance Pathways markets three data tools: one stores and analyzes data, another creates and scores local benchmark assessments, and a third facilitates mapping and aligning of curriculum and instruction to state standards.

Training in data systems/warehouses and data tools. The two service providers that provide tools for data-driven decisionmaking, Measured Progress and Performance Pathways also provide training in their use. Both organizations stress the importance of this training for maximizing the effectiveness of the tools. Measured Progress uses a train the trainer model for its online tools. Performance Pathways also offers a train the trainer model, providing training for school district representatives who then educate their colleagues on how to use the tools and data. This approach to professional development is increasingly common for districts (Dembosky et al. 2005) and indicates an orientation toward developing a process that will live beyond the initial workshops and participants.

Professional development on using data for decisionmaking. All three service providers offer professional development on using data for decisionmaking. The Connecticut RESC Alliance trains teams of educators from low-performing districts to develop a data-driven culture through a collaborative process of examining data and student work. The training is intended to lead to changes in teacher instruction and student learning. In Connecticut a for-profit partner of the RESC Alliance and the Connecticut Accountability for Learning Initiative, the Leadership and Learning Center, offers certification to participants to prepare them to lead data teams and teach their colleagues about using data for decisionmaking.[6]

In conjunction with assessment work Measured Progress emphasizes changing the climate of schools and districts by using data to inform

All three service providers profiled in the study offer professional development on using data for decisionmaking

instructional decisions. Measured Progress works with educators on how to interpret and use the assessment reports. Performance Pathways offers workshops to educators on how to use the information generated by their reports to make informed instructional decisions.

CONSIDERATIONS FOR STATE EDUCATION AGENCY LEADERS DEVELOPING DATA-DRIVEN DECISIONMAKING INITIATIVES

Several issues emerged from this study that may be relevant to state education agency leaders as they develop or expand initiatives to support data-driven decisionmaking.

Adding components of a data-driven decisionmaking system

Although resource constraints force choices about which components of a data-driven decisionmaking system to implement, state education agency leaders interested in supporting data use for decisionmaking in districts and schools might consider whether adding components could help to meet both intermediate and long-term student achievement goals:

- Where the focus has been on data warehousing, state education agencies might consider providing more professional development on how to convert the stored data into usable knowledge that influences teaching and learning.
- Where the focus has been on providing professional development to educators on using data for decisionmaking, state education agencies might consider investing in a data warehouse and data analysis tools to collect, organize, and analyze data for use in decisionmaking.

Where inadequate resources impede implementation of a comprehensive data-driven decisionmaking initiative, state education agencies could explore a range of funding options to augment their investments in data-driven decisionmaking

Any decision to implement additional components will also depend on resources, including capacity and funding.

Sources of funding

Where inadequate resources impede implementation of a comprehensive data-driven decisionmaking initiative, state education agencies could explore a range of funding options to augment their investments in data-driven decisionmaking. State education agencies might consider adopting more creative ways to fund their data-driven decisionmaking initiatives, to enhance the supports provided to districts and schools. Specifically, state education agencies might take advantage of various federal grant programs (such as Title I, Title II, and Reading First) to augment state funding for data-driven decisionmaking.

Strategies to enhance capacity

The state education agencies in this report support data-driven decisionmaking in districts and schools despite limited staff and sometimes limited expertise in developing tools or training educators. State education agencies have turned to external service providers to augment their data-driven decisionmaking initiatives. They might also consider negotiating additional related services under existing contracts to leverage current programs and offer greater support for data use in districts and schools.

CONSIDERATIONS FOR FURTHER RESEARCH

This study describes how state education agencies in the Northeast and Islands Region support data-driven decisionmaking in districts and schools (see table 5 for a snapshot of services in the region). While it fills some gaps in the research, it raises additional questions about implementation of data-driven decisionmaking. The research could be expanded by looking at state education agency support and implementation of data-driven decisionmaking in greater depth, at implementation at different levels of the education system, and

at the impacts of data-driven decisionmaking on student achievement.

Stages of implementation

Many jurisdictions in the region are in the early stages of implementing these initiatives for data-driven decisionmaking. As state education agencies provide more support for data-driven decisionmaking, it would be interesting to revisit this topic:

- How do states scale up their efforts to provide either comprehensive training or expand their support to all districts?
- How do they support a range of data-driven decisionmaking activities, such as formative assessment?

Different levels of the education system

This study did not examine implementation of data-driven decisionmaking at the state, district, school, or classroom level. Exploration of implementation at these levels of the education system could help to answer important questions.

State education agencies. Although this study examined how state education agencies support data-driven decisionmaking by districts and schools, it did not address how state education agency leaders might employ data-driven decisionmaking to inform their own decisions. The emphasis in the literature has been on district and school implementation rather than on state implementation. Some questions to consider:

- What kinds of data-driven decisionmaking practices do state education agency leaders engage in? What kinds of data do they collect and use to make decisions on education policies and practices?
- What kinds of decisions are made by state education agency leaders who engage in data-driven decisionmaking practices?

Districts. Although most data-driven decisionmaking research has focused on implementation at the school level, stakeholders in the region may wish to learn more about data-driven decisionmaking in districts throughout the Northeast and Islands Region.

- How are districts supporting data-driven decisionmaking in schools?
- Specifically, now that the Massachusetts Department of Elementary and Secondary Education has created its data warehouse infrastructure, how are districts helping school-level staff use that data for decisionmaking?

Schools. Avenues for further research at the school-level include:

- Is data-driven decisionmaking increasingly embedded in school processes and classroom practice?
- Are teachers and principals implementing the skills taught in professional development sessions?
- What types of decisions are made by teachers and school administrators? Do they have access to the data needed to inform those decisions?

Impact of data-driven decisionmaking on student achievement

Once the data-driven decisionmaking initiatives are more fully implemented, there will be a need to investigate how data-driven decisionmaking affects student achievement.

- Does data-driven decisionmaking help schools meet adequate yearly progress requirements?
- What are the impacts of specific data-driven decisionmaking programs or practices on student achievement?

TABLE 5

Snapshot of data-driven decisionmaking initiatives in the Northeast and Islands Region, 2007/08

Jurisdiction	Description of data-driven decisionmaking initiative	Targeted group	Data collected	Technology availability	Service provider[a]
Connecticut	• Part of the Connecticut Accountability for Learning Initiative • Professional development and technical assistance for low-performing districts • Basic professional development focuses on process of data-driven decisionmaking and use of data teams and trains school leaders • Follow-up technical assistance provided throughout the year	• Teachers and administrators • Low-performing districts	• Local data teams work with classroom- and school-level data, including state assessment scores (Connecticut Academic Performance Test and Connecticut Mastery Test) and behavioral and school climate data	• For professional development and technical assistance no technology is used; data are on paper and are sometimes in spreadsheets • Connecticut is currently considering developing a statewide data warehouse	• Regional educational service centers • State Education Resource Center
Maine	• Before the No Child Left Behind (NCLB) Act, the Maine Department of Education supported teachers in using data-driven decisionmaking to understand Maine Educational Assessment (MEA) scores and create local assessments • Since the NCLB Act, focus is shifting to create a longitudinal data system • Recipient of a Department of Education grant to support creating a longitudinal data system • Service providers offer training on data tools • The Maine Department of Education supports school staff in item analysis and supports targeted schools in using data to create school improvement plans • Professional development to help special educators use data	• Administrators (data tools) • Teachers and school leaders (item analysis) • Schools with funding from Title I or Reading First (data for school improvement plans) • Teachers working with students receiving special education services (process of data-driven decisionmaking)	• State assessment scores • Student and some staffing information are in the Maine Education Data Management System (MEDMS) • These are not currently an integrated system.	• Web portal for MEA scores • Piloting web portal that will integrate MEDMS and MEA databases	• Measured Progress (MEA administrator and web portal to access MEA scores) • Infinite Campus (integrated web portal)

(CONTINUED)

TABLE 5 (CONTINUED)

Snapshot of data-driven decisionmaking initiatives in the Northeast and Islands Region, 2007/08

Jurisdiction	Description of data-driven decisionmaking initiative	Targeted group	Data collected	Technology availability	Service provider[a]

Massachusetts	• Creation of a statewide virtual data warehouse
	• Warehouse will provide a sophisticated software tool that will allow users at state and district levels to analyze state and district data and to make decisions based on them
	• Early stages of statewide implementation
	• Initiative will not be mandated
		• All schools and districts	• State data:
			  • State assessment scores
			  • Student and educator information
			  • Financial data (expected)
			• Districts can add their own data, including:
			  • Course results
			  • Attendance
			  • Discipline
				• Web portal to provide access to data and create reports	• Cognos (data warehouse)

New Hampshire	• Data-driven decisionmaking initiative supports the Follow the Child policy
	• Data warehouse and analysis software allows educators to track individual student progress on the New England Common Assessment Program and on local assessments and link assessments to curricula, lessons, and postsecondary data
	• New Hampshire Department of Education received a federal grant to improve longitudinal data system
		• All schools and districts	• State data:
			  • State assessment scores
			  • Northwest Evaluation Association results
			  • Dynamic indicators of basic early literacy skills and Development Reading Assessment results
			• Districts can add their own data, including on:
			  • Local assessments
			  • Curricula
			  • Attendance
			  • Sociodemographic characteristics
			  • Physical development
				• Data warehouse and analysis tools (Performance Tracker)	• Performance Pathways

(CONTINUED)

TABLE 5 (CONTINUED)

Snapshot of data-driven decisionmaking initiatives in the Northeast and Islands Region, 2007/08

Jurisdiction	Description of data-driven decisionmaking initiative	Targeted group	Data collected	Technology availability	Service provider[a]
New York	• The New York State Education Department has no formal statewide initiative • The department encourages data-driven decisionmaking as part of low-performing school improvement plans • Regional school support centers provide professional development to low-performing schools that incorporates data-driven decisionmaking into content areas	• All district and school leaders have access to New York State Testing and Accountability Reporting Tool • Low-performing schools receive targeted professional development	• Varies depending on the initiative	• New York State Testing and Accountability Reporting Tool	• Board of Cooperative Educational Services • Regional information centers
Rhode Island	• Statewide data warehouse system serve as a central repository for data held in all systems • System will give users access to real-time information and the ability to run reports based on data in the system	• Available to district officials, state education agency employees, school faculty, and parents	• State assessment data • Student information • Financial information • Teacher certification	• Web portal to collect and analyze data online. (Consolidated Education Information System)	• TetraData • ESP Solutions Group
Vermont	• Low-performing schools required to show data use; they receive support through principal learning communities • Data warehouse and analysis software • Emphasis on team use of data	• Low-performing schools have more requirements and receive more support • All schools can access the data warehouse and analysis software by subscribing to the service	• State assessment data • Vermont Development Reading Assessment • Common District Model for collection of local data	• Vermont Data Warehouse and associated analysis software	• TetraData • Center for Assessment
Virgin Islands	• The Virgin Islands Department of Education does not have a data-driven decisionmaking initiative beyond the requirements of the NCLB Act • Early stages of data use • Virgin Islands Territorial Assessment of Learning implemented in 2004/05	• Local administrators	• Virgin Islands Territorial Assessment of Learning • Iowa Test of Basic Skills • School Administration and Student Information System (SASI)	• SASI database (includes student information, Iowa Test of Basic Skills, and Virgin Islands Territorial Assessment of Learning data)	• Pearson School Systems

Note: For further information on the material in this table, see appendix D.

a. The service providers listed were identified by state education agency officials as the leading provider in the jurisdiction.

Source: Authors' compilation based on interviews, documents provided by state education agency officials, and information available on state education agency web sites.

APPENDIX A
GLOSSARY

Culture of inquiry. A type of data-driven decisionmaking in which faculty create an organizational culture focused on using data and other evidence to shape instructional practices.

Cycle of inquiry. An iterative process in which educators collaboratively analyze data to understand their instructional practice and develop a plan to support improvement efforts.

Data. Information maintained by state education agencies, districts, schools, or teachers. Can include assessment data, school-level data on students and staff, demographic data, state test scores, and financial information.

Data-driven decisionmaking. Systematic collection and analysis of various types of data—including input, process, outcome, and satisfaction data—by teachers, principals, and administrators to guide decisions to help students and schools succeed.

Data-driven informed culture. A term used by Performance Pathways for data-driven decisionmaking.

Data system. A centralized repository that combines data from multiple sources to provide an integrated view of data sources and a uniform interface for data access (also called a data warehouse).

Data teams. Small groups of teachers and administrators working together on an ongoing basis to examine individual student work generated from common formative assessments. Data teams use collaborative, structured, scheduled meetings that focus on the effectiveness of teaching and learning.

Data tools. Software that allows teachers and administrators to collect, organize, and analyze data for use in decisionmaking. Can be software on individual personal computers or online tools. User-friendly software allows users to easily access, manipulate, and analyze data to improve classroom practice.

Formative assessment. All activities undertaken by teachers and their students to assess student understanding and to provide feedback for ongoing adjustments in teaching and learning. Timely adjustments help students achieve targeted learning goals or standards within a set timeframe.

Longitudinal data system. A system that holds and tracks multiple years of student and teacher demographic data, test scores and assessments, and other information.

Low-performing school or school in need of improvement. A school that has not made adequate yearly progress for two consecutive years, as specified under the No Child Left Behind Act of 2001. Such schools are identified as "in need of improvement."

Multiple measures. The use of various assessments to characterize the performance of students, schools, and school districts. Measures for assessing student achievement can include student portfolios and exhibitions, performance assessments, teacher observations, and formal tests. School and district measures can include student growth measures, promotion rates, attendance records, suspension rates, graduation rates, enrollment in honor or advanced placement classes, and formal tests.

Service providers. External organizations working with states, districts, and schools to provide technology, professional development, and technical assistance for data-driven decisionmaking.

State data-driven decisionmaking initiatives. Initiatives conceptualized at the state level with a set of comprehensive goals, objectives, and purposes and with designated resources (such as funds and personnel) to support development and implementation. State education agency leaders must communicate such policies to districts in the state and offer them support.

Train the trainer model. A system in which some individuals are trained in a theory or technology and are then in turn responsible for training others in the same material.

User conferences. Meetings that bring together educators who are working with a given product and allow them to learn more about the product and other products and how they work with each other.

APPENDIX B
STUDY METHODS

This project has two main purposes: to catalogue statewide data-driven decisionmaking initiatives being implemented in the Northeast and Islands Region through document reviews and interviews with key respondents from state education agencies and to catalogue service providers that support data-driven decisionmaking initiatives in the region while profiling three such providers.

Research questions

Two research questions guided the study:

- What state education agency initiatives support data-driven decisionmaking by districts and schools in the Northeast and Islands Region? What are their similarities and differences?
- What service providers do the state education agencies work with to support educators in using data to inform education decisions, and what services do they provide? What are their similarities and differences?

Sample selection

The original sample included all nine jurisdictions in the Northeast and Islands Region. However, the research team was unable to schedule interviews with key respondents in the Puerto Rico Department of Education despite repeated attempts over several months to contact the department. All other jurisdictions in the region are profiled (see appendix D for state education agency profiles).

The research team identified key respondents at state education agencies by drawing on existing relationships within the Regional Educational Laboratory Northeast and Islands, through liaisons and researchers assigned to each state and through the team's professional contacts from previous research in the region. In a few cases the team found respondents through web sites describing states' data-driven decisionmaking initiatives. Depending on the state, the respondents held various roles in the state education agencies, including assessment coordinator, director of evaluation and research, information technology director, school improvement consultant, and information systems specialist (among others).

Respondents at each state education agency provided names and contact information for lead service providers supporting its data-driven decisionmaking initiative with professional development for districts and schools. From this list a catalogue of nine service providers was created (see appendix E). This catalogue includes providers mentioned by state education agency respondents in interviews as the lead provider in their state and is not an exhaustive list of all providers working in the region. It includes one provider contracted with each state except Rhode Island, for which two were chosen because both had been selected by the state through the requests for proposals process.

Three providers were then selected for more in-depth profiles. These providers met the following criteria: they worked with multiple jurisdictions in the region, they had existed for two or more years, and they had offered services for two or more years (that is, they were not starting up the activities). This reduced the sample to eight providers—the New York Board of Cooperative Educational Services was excluded because it served only districts and schools in New York State. Organizations were selected from the remaining eight providers of professional development in using data to inform teaching and learning in addition to other services to districts in the region. That left four organizations—the Connecticut Regional Education Service Center Alliance, Measured Progress, Performance Pathways, and TetraData. TetraData and Performance Pathways offered similar services. As Performance Pathways offered a larger range of services, it was selected.

The three service providers profiled in the report and in appendix F are:

- The Connecticut Regional Educational Service Centers Alliance (provides professional

development on the process of data-driven decisionmaking).

- Measured Progress (provides data warehousing services, data analysis tools, and professional development on these tools and on data-driven decisionmaking).

- Performance Pathways (provides tools for data analysis, reporting and curriculum alignment, with professional development on these tools and on data-driven decisionmaking).

Data sources

To answer the research questions, researchers used data from four sources:

- *Publicly available information.* This included reports from state education agencies and service providers on data-driven decisionmaking, descriptions of procedures and technical assistance to support data use, schedules of procedures, and information on state education agency and service provider web sites.

- *Supplemental documents.* Respondents from both state education agencies and service providers offered additional documentation that was not publicly available.

- *Interviews.* Semi-structured, open-ended interviews were conducted with key respondents from each state education agency and service provider. An application to Education Development Center's Institutional Review Board for an expedited review of involvement of human subjects in a research project was approved, and researchers informed respondents of their rights and responsibilities through written informed consent forms.

- *Observations.* When possible, interviews and reviews of official materials were supplemented with observations of professional development activities—a check on the self-reported information from the providers. Researchers observed two of the three providers profiled in the report. The timing of the project made it impossible for researchers to observe the workshops conducted by Measured Progress, which are held when state assessment data are released. Instead, researchers spoke with a participant from a school district that has worked with Measured Progress and an observer from the Maine state education agency to gather information about whether the workshop matched the service provider's description.

Two open-ended protocols were developed for the study, one for state education agencies and one for service providers, to guide data collection. The protocols for state education agency officials included questions addressing 11 key factors:

- Motivation for the initiative.

- Overarching goals of the initiative.

- Data collected and used.

- Tools used to collect, house, and disseminate data.

- Users of data at different levels of the system.

- Data analysis tools.

- Decisions made using information gleaned from the data.

- Leaders of the initiative.

- Infrastructure in place to support data-driven decisionmaking.

- Personnel supports in place.

- Challenges to scaling up the initiative.

The protocols for service provider personnel were designed to collect information on 12 key factors:

- Objectives of services.

- Skills targeted.
- Key components.
- Users of the services.
- Leaders of the services.
- Amount of time that services had existed.
- Numbers of schools and districts that programs served.
- Timeframe for the services.
- Cost of the services.
- Research base for the services.
- Reasons states gave for selecting the services and service providers.
- State leaders' experiences working with the service providers.

Some of these factors were based on the four dimensions of data-driven decisionmaking that are designed to build and sustain capacity: leadership, personal supports, infrastructure, and programmatic content (Abbott 2008).

Data collection methods

Data collection began in September 2007 and ended in April 2008. Six sequential steps were taken to answer the research questions:

- *Collect publicly available information on data-driven decisionmaking initiatives.* Public online documents, including state education agency web sites and web sites for state education agency partners (such as education agencies), were reviewed to gather information on jurisdictions' data-driven decisionmaking practices. This helped to describe the initiatives and, in some cases, to locate key contacts in each jurisdiction.
- *Conduct interviews with state education agency respondents.* Three researchers investigated two jurisdictions each, and two researchers examined one each. Researchers held 45-minute interviews with a key state education agency contact in each jurisdiction to gather descriptions of data-driven decisionmaking strategies. In all but one jurisdiction interviews were limited to one respondent. In Massachusetts two state education agency officials were interviewed. Most interviews were held by telephone, but interviews in Maine, Massachusetts, and Vermont were held in person at the state education agencies. In addition to answering questions about the jurisdictions' data-driven decisionmaking initiatives, state education agency contacts supplied the names of data-driven decisionmaking professional development service providers who worked with them and the names of their contacts at each service provider. All interviews were recorded and transcribed.
- *Gather publicly available information about service providers who work with state education agencies.* Information from service provider web sites was used to create the catalogue of data-driven decisionmaking professional development service providers in appendix E.
- *Select three service providers for in-depth profiling.* From the nine providers in the catalogue, three were chosen for in-depth profiling using the criteria described above.
- *Interview key respondents at service providers.* Telephone interviews were conducted with two key contacts at each of the three profiled service providers to gather information about their professional development services in data-driven decisionmaking. At Measured Progress, in addition, researchers interviewed a district administrator who had participated in the training and who demonstrated the data tools. Some phone interviews were followed up with in-person interviews to observe

service provider activities. All interviews were recorded and transcribed.

- *Observe professional development services.* Teams of two researchers observed professional development training programs or workshops. The observations allowed researchers to confirm information reported by the service providers. During the visits researchers asked contacts to provide additional documentation, including training and curriculum materials, course syllabi, and marketing information, thus gathering practical information that could be useful to the state education agencies. For example, details on the cost, duration of services or activities, and size of typical workshops and trainings for a given provider can help states understand what to expect when working with such providers. Researchers also focused on learning how service providers met the differing needs of jurisdictions. Interview transcripts and observation notes were systematically analyzed using the ATLAS-ti software program. Documents were used to further illustrate or explain issues raised in the observations and interviews.

Because Measured Progress had already finished all its professional development activities at the time it was contacted, researchers reviewed workshop materials and spoke with two additional respondents who had attended its workshop in Maine.

Researchers also interviewed two district officials in Massachusetts to understand how they access the state's data warehouse initiative and how they use the available data for decisionmaking.

Data analysis strategies

The analysis of all collected data, including documents and other provider materials, interview transcripts, and observational field notes, was based on the categories outlined in the original research proposal and in data collection protocols.

The research team developed a code book or coding scheme based on the factors that guided data collection and discussed and developed subcodes to allow a more nuanced analysis of the transcripts and notes. Most of the codes were developed before coding began, but a few subcodes were added during the discussions to ensure intercoder reliability. Subcategories were developed during analysis, though the overarching themes had been identified in the original proposal. The main coding themes, and examples of the subcodes that guided the analysis of transcripts and notes, appear in tables B1 (state initiatives) and B2 (professional development). Cross-state education agency analysis allowed the researchers to identify the four components of a data-driven decisionmaking initiative—a framework for the findings.

To ensure uniform conclusions when coding transcripts and documents, just two coders were assigned to each of the two sets of interview transcripts (state education agency and service provider), but with three researchers participating in the coding. One researcher coded both sets of transcripts, partnering with a second researcher to code one set and with a third to code the other set. The two researchers coding each set worked closely to agree on interpretations of the qualitative data and to ensure consistency in coding. For each set, after coding a single transcript separately, researchers then discussed their individual coding of the transcript item by item. Each coder then coded a different subset of transcripts and notes.

To develop the case profiles of statewide data-driven decisionmaking initiatives and triangulate evidence supporting the description of the initiatives, transcript data were reviewed alongside both publicly available documents and those provided by state personnel. Information relevant to each code and category was synthesized thematically, based on the categories outlined in the analysis protocols (Abbott 2008), and the syntheses were used to describe each initiative.

For the service provider case profiles, interview transcripts and observational field notes were

TABLE B1
State initiative coding scheme

Main theme	Examples of subcodes
Initiative	• Direction • Requirement • Focus
Motivation for the initiative	• Accountability • Analyzing data
Overarching goals of the initiative	• Data storage • Accountability
Data collected and used	• State assessment • Student information
Tools used to collect, house, and disseminate data	• Software from outside provider • Data warehouse
Users of data at different levels of the system	• State department of education • Principals
Data analysis tools	• Use of software and reporting • Use of professional development
Decisions made using information gleaned from the data	• Academic • Financial
Leaders of the initiative	• State department of education personnel • District officials
Infrastructure in place to support data-driven decisionmaking	• Professional development • Data warehouse
Personal supports in place	• Professional development centers • State department of education personnel
Challenges to scaling up the initiative	• Money • Culture
Evaluation	• Initiative • Outside provider
Definition	• Data-driven decisionmaking

Source: Authors' analysis.

analyzed alongside documents provided by contacts at the service providers and coded for the key categories included in the interview and analysis protocols. Information for each code and category was synthesized thematically, based on the categories outlined in the analysis protocols, and compiled into each case profile.

This systematic analysis of the collected data allowed the researchers to build case profiles of the state education agencies and the service providers. The team reviewed each profile, revised it based on comments from the team, and sent the revised profile to respondents for validation. Profiles were again revised after comments were received from respondents.

After reviewing all the profiles, the team held several discussions to identify cross-profile similarities, differences, and challenges. These became the cross-profile themes that guided the discussion of findings in the body of the report, including the

TABLE B2
Professional development services coding scheme

Main theme	Examples of subcodes
States	• New York • New England Common Assessment Program
Overarching goals of the organization	• Provide technology-based products in data-driven decisionmaking to districts and states • Provide professional development for using assessment data to districts and states
Objectives of the services	• Create culture of data-driven decisionmaking in schools • Make states better consumers of data
Skills targeted	• Analysis of data • Use of technology-based tools for data-driven decisionmaking
Key components	• Training in process of data-driven decisionmaking • Training in use of technology-based products for data-driven decisionmaking
Users of the services	• District personnel • Principals
Leaders of the initiative	• State department of education personnel • Outside service provider
Amount of time services had been in existence	• 1–3 years • Varied for each service provided
Numbers of schools and districts that programs served	• All districts in a state • Some districts in a state
Timeframe for the services	• Less than three months • 1–3 years
Cost of the services	• Paid by state • Paid by districts
Research base for the services	• Based on work of data-driven decisionmaking experts • Large-scale evaluation work
Curriculum and content	• Analysis of data • Use of technology-based tools for data-driven decisionmaking
Trainers	• Company personnel • District personnel previously trained by trainers
Trainees	• District personnel • Principals
Kinds of data analyzed	• State assessment • Student information
Analysis tools	• Use of data teams • Software-generated reports
Decisions made using information gleaned from the data	• Financial • Academic
Medium of delivery	• In person, with technology • Online

(CONTINUED)

TABLE B2 (CONTINUED)
Professional development services coding scheme

Main theme	Examples of subcodes
Training process	• Based on work of one data-driven decisionmaking expert • Based on work of various data-driven decisionmaking experts
Materials provided to trainees	• PowerPoint presentation from training • Activity sheets
Follow-up training	• Follow-up technical assistance as part of professional development • Follow-up technical assistance when requested
Supports	• Follow-up technical assistance • Technology-based tools
Activities and goals	• Data analysis and interpretation activity worksheets • Train other teachers and administrators in a district and school
Connections with everyday practice	• Use of real data • Access to real assessment items
Implementation experience issues	• Capacity • Teacher resistance

Source: Authors' analysis.

four components of a state education agency data-driven decisionmaking initiative. One member of the team took notes during the discussion and drafted the themes. Once the team had reviewed the draft, it met for another discussion to flesh out the themes and add documentation from the profiles. A similar process guided the development of the considerations for state education agency leaders and for further research.

Study limitations

The primary limitation of this project was the small number of respondents interviewed at each state education agency and service provider. Although the research team triangulated the information from the interviews with documentation and observations, it is unclear whether the opinions of the respondents represented their colleagues' perspectives.

In addition, the project did not explore the role of the districts or schools in supporting the implementation of data-driven decisionmaking, nor did it consider the impact of data-driven decisionmaking initiatives on school improvement or student achievement. Finally, this project did not assess the effectiveness of any of the state education agency initiatives for data-driven decisionmaking or the impact of the professional development that was provided to build educators' capacity to use data-driven decisionmaking.

APPENDIX C
RESEARCH ON THE IMPLEMENTATION OF DATA-DRIVEN DECISIONMAKING, BARRIERS TO IMPLEMENTATION, AND SUPPORTS AVAILABLE

This appendix examines the literature on data-driven decisionmaking. In particular, it explores what research says about the implementation of data-driven decisionmaking, the barriers to its implementation, and the available support to states, districts, and schools in implementing a data-driven culture.

Implementation of data-driven decisionmaking at the district and school levels

Studies of how data-driven decisionmaking is implemented show that districts and schools encourage various activities to build educators' capacity to use data and evidence to improve student outcomes. The research suggests that, to ease the use of data-driven decisionmaking, districts and schools provide technology infrastructure and professional development to help educators collect, organize, and analyze data and to foster an environment that supports a culture of inquiry. Although most of these findings were gleaned from case studies of district and school implementation, one national survey of teachers has documented their data-driven decisionmaking practices.

Education professionals collect various data, including test scores, classroom assessments, and information on the background characteristics of faculty, students, and schools (Gallagher, Means, and Padilla 2008; Wayman 2005). These data may be housed in data systems/warehouses (Marsh, Pane, and Hamilton 2006; Mills 2008; Wayman, Stringfield, and Yakimowski 2004), which facilitate teacher and administrator access to multiple sources of data (Dembosky et al. 2005; Kerr et al. 2006; Lachat and Smith 2005; Marsh, Pane, and Hamilton 2006; Storandt, Nicholls, and Yusaitis 2007; Supovitz and Klein 2003; Wayman 2005). In 2006/07 nearly all school districts in a nationally representative sample surveyed by the U.S. Department of Education's National Educational Technology Trends Study maintained at least some student data electronically and the majority (91 percent) of teachers surveyed reported access to at least limited data on their students (Gallagher, Means, and Padilla 2008).

In addition, many educators have access to data tools that can facilitate data-driven decisionmaking. These can include software programs and online data portals that provide more advanced and customized ways of analyzing and reporting data (see case studies by Larocque 2007; Storandt, Nicholls, and Yusaitis 2007; Chen, Heritage, and Lee 2005; Lachat and Smith 2005; Light et al. 2005; Murnane, Sharkey, and Boudett 2005; Mason 2002). These software programs can either be separate from data warehouses or used in conjunction with data warehouses or other types of databases. Training on both the data systems/warehouses and the analysis tools is commonly provided by the organization that developed the system or through a district's central office staff (Foley et al. 2008). Training educators how to access and analyze data is an important part of developing data-driven decisionmaking among school or district staff—research shows that educators often lack an understanding of data, or the skills needed to track and analyze useful data (Earl, Katz, and Fullan 2006; Dembosky et al. 2005).

Research on implementation of data-driven decisionmaking reveals that teachers and administrators also receive professional development on data-driven decisionmaking. Schools with comprehensive data-driven decisionmaking develop a culture of inquiry in which educators collaboratively analyze data, to understand their instruction practice and to develop plans to support school improvement efforts (Boudett and Steele 2007; Knapp, Copland, and Swinnerton 2007; Young 2006; City, Kagle, and Teoh 2005; Lachat and Smith 2005; Murnane, Sharkey, and Boudett 2005; Copland 2003; Feldman and Tung 2001).

This cycle of inquiry helps schools evolve into learning organizations or "organizations where . . . people are continually learning to see the whole

together" (Senge 1990, p. 3). In these schools educators use data to clarify instructional problems (Firestone and González 2007). Professional development to support these processes follows the model of professional learning communities, which focus on the development of collaborative, reflective practices (Feger et al. 2008). In professional learning communities for data-driven decisionmaking, often called data teams, coaches guide teams of educators through data-driven decisionmaking to help them use data to make and evaluate changes in instruction (Love et al. 2008).

Barriers to data-driven decisionmaking

Research on data-driven decisionmaking in districts and schools also documents barriers to using data to improve student outcomes. A primary barrier is that the available data may not be relevant to school and district improvement plans. For example, data used to demonstrate adequate yearly progress may not be appropriate for analyzing classroom practice (Mandinach 2008). Where teachers have access to student data, the data system might not provide tools to organize and analyze the data in a meaningful or relevant way (Gallagher, Means, and Padilla 2008). Many educators face difficulties in transforming data into actionable knowledge (Massell 2001; Chen et al. 2000; Gallagher, Means, and Padilla 2008; Hassler, Buck, and Torgesen 2004; Love 2004; Lang et al. 2007), in part due to a lack of essential knowledge and skills to analyze data (Lang et al. 2007; Marsh, Pane, and Hamilton 2006).

External supports for data-driven decisionmaking in districts and schools

To overcome the barriers described above and to effectively use data-driven decisionmaking in districts and schools to improve student outcomes, educators not only must have access to data but also must know how to organize and analyze the data available. Often they need external supports to develop their capacity to use data in their districts and schools, so a variety of external organizations provide professional development on data-driven decisionmaking to district and school administrators and teachers (Feldman and Tung 2001; Lachat and Smith 2005; Ikemoto and Marsh 2007). Such external support often comes from organizations that create data tools (Dembosky et al. 2005; Storandt, Nicholls, and Yusaitis 2007; Wayman, Stringfield, and Yakimowski 2004) or from professional development organizations or universities that help districts and schools develop data-driven decisionmaking (Boudett, City, and Murnane 2005; Darling-Hammond et al. 2007; Thorn, Meyer, and Gamoran 2007).

Although most research on external supports for data-driven decisionmaking focuses on professional development organizations and universities, state education agencies have also recently begun to support data-driven decisionmaking in districts and schools (Dembosky et al. 2005; Massel 2001; Moss and Piety 2007; Reichardt 2000). Because these initiatives are new, there is little research in this area. A handful of descriptive studies were found that looked at state education agency initiatives to support data-driven decisionmaking at the local level. They show that states have supported the needs of local educators in three primary ways: creating a policy structure to support and encourage data-driven decisionmaking, providing data storage and analysis tools, and building the capacity of local educators to use data.

One descriptive study, released prior to the implementation of the No Child Left Behind (NCLB) Act, documents that the state education agency in Wyoming supported data-driven decisionmaking in three ways: by providing access to state assessment data (through a standards-based accountability system), by requiring school improvement plans to include using data to measure progress, and by providing each district with Statistical Package for the Social Sciences software and free training on that software (Reichardt 2000). Another study, involving 100 interviews with educators in six districts and surveys of 26 superintendents, detailed how the state education agency in Pennsylvania makes resources available

to all districts to support data-driven decisionmaking (Hergert et al. 2009). These supports include customized reports of state assessment data, an annual training seminar on data-driven decisionmaking, and help for districts to implement the Pennsylvania Value Added Assessment System for growth modeling of individual student achievement. The Pennsylvania state education agency also focuses other resources—for example, supports for school improvement planning—on schools in need of improvement. Interviews with state education agency officials and a review of documents revealed that state education agencies in the Northeast and Islands Region support educators in low-performing schools to develop their capacity to analyze and use data in their school improvement plans (Hergert et al. 2009).

Data-driven decisionmaking at the local level is not new. But the need for the state education agency to play a role in supporting data-driven decisionmaking in districts and schools has increased dramatically in the past decade, with new state and federal external accountability systems. The increased nationwide emphasis on data-driven decisionmaking as a school improvement strategy, combined with a lack of information about state education agency supports for data-driven decisionmaking, makes this report an important contribution to data-driven decisionmaking efforts.

APPENDIX D
PROFILES OF STATE EDUCATION AGENCIES' DATA-DRIVEN DECISIONMAKING INITIATIVES

This appendix provides profiles of the state data-driven decisionmaking initiatives in Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont, and the Virgin Islands.

Connecticut

The Connecticut State Department of Education's statewide data-driven decisionmaking initiative targets low-performing districts. Under the department's Connecticut Accountability for Learning Initiative (CALI), regional educational service centers train teams from schools in low-performing districts to analyze state assessment results and other data to improve instruction and student performance. The basic training for teachers and school administrators focuses on how to build and sustain data-driven decisionmaking in district- and school-level data teams. The Leadership and Learning Center, a partner, provides certification training for educators who plan to create a schoolwide culture of data use through professional development at their schools.

State context. Connecticut has 1,111 schools serving 575,058 students. The majority of students are White (67.0 percent), and the rest are either Hispanic (15.4 percent) or Black (13.7 percent). Roughly a quarter (26.5 percent) of students in the state are eligible for free or reduced-price lunch, and 44 percent of the schools are Title I. Connecticut schools have long been high performing, obtaining scores above the country average on mathematics and reading for all administrations of the National Assessment of Educational Progress (NAEP) since 1992.

The Connecticut Mastery Test (CMT), a state assessment, is administered annually to all public school students in grades 3–8 to assess mathematics, reading, and writing skills. The Connecticut Academic Performance Test (CAPT), given to students in grade 10, is a natural extension of the CMT. The CAPT assesses and reports on student performance in four areas: mathematics, reading across the disciplines, writing across the disciplines, and science.

The state has been making major changes to the organization of the Connecticut State Department of Education and its relationship to school districts and schools, with a new commissioner appointed in May 2007 and new school reform legislation passed in June 2007. The Bureau of School and District Improvement and the Bureau of Accountability, Compliance, and Monitoring were tasked with delivering "systematic and systemic" support to schools and districts. These bureaus work with all districts to provide data on student and district outcomes, processes to analyze data, methods of developing improvement activities, and training through the CALI.

Overview of the initiative. The Connecticut State Department of Education's statewide data-driven decisionmaking initiative is part of the CALI, which aims to advance learning for all students, particularly students from the 12 districts under corrective action. The Connecticut State Department of Education partnered with the regional educational service centers and the Leadership and Learning Center to provide support to districts and schools in six key areas (Connecticut State Department of Education 2008):[7]

- *Data-driven decisionmaking data teams:* using district and school data for analyzing, setting goals, and implementing research-based instruction strategies.
- *Making standards work:* aligning school and district assessment and instruction and developing classroom-based assessments to monitor student progress.
- *Effective teaching strategies:* examining ways to write lesson plans and deliver instruction using Dr. Robert Marzano's research-based strategies (Marzano, Pickering, and Pollock 2001, cited in Connecticut Department of Education 2008).

- *Common formative assessments:* collaboratively designing assessments to improve learning, as opposed to assessments of learning, and analyzing the results.

- *School climate improvement to support academic achievement:* exploring practical structures and strategies that address bullying and school violence by creating safe learning environments.

- *Accountability in district and school improvement planning:* creating a framework for a new accountability system.

The CALI's overarching goal is to reduce student achievement gaps. Its data-driven decisionmaking component, which began in 2004, provides districts with professional development and technical assistance in using data to improve pedagogy and learning. The professional development and technical assistance are offered to Title I districts and schools identified by adequate yearly progress measures as in need of improvement. Ineligible districts and schools can participate for a fee, although in 2008 the professional development and technical assistance will be offered to the entire state. For districts that choose to participate, four days per year are set aside for professional development, and follow-up technical assistance is offered throughout the year.

Three external service providers offer data-driven decisionmaking services to high-need districts in the state: the CALI, the Leadership and Learning Center (an educational professional development, publishing, and consulting organization based in Denver, Colorado), and the Regional Educational Service Centers (RESC) Alliance (see appendix E) with the State Education Resource Center (SERC). The CALI oversees implementation of the professional development and technical assistance, which are funded by the districts. The Leadership and Learning Center creates materials for the professional development training. The RESC Alliance and SERC deliver the training.

The CALI offers two kinds of data-driven decisionmaking training: basic training and certification training. The basic training is a two-day seminar for teachers and school administrators, including curriculum developers, superintendents, and principals. Participants learn first how to examine their own real student data using a six-step data-driven decisionmaking process (treasure hunting, analyzing needs, prioritizing needs, setting goals, identifying instructional strategies, and determining results indicators) and then how to develop and sustain this process in district- and school-level teams of fellow teachers and administrators. These data teams collaboratively analyze data and identify student strengths and weaknesses. Team members then come up with instruction strategies to address these as well as required learning standards.[8] Team members implement their strategies, monitor them, and discuss them at the next meeting, which should take place in their districts.

The three-day certification training is for educators who plan to create a schoolwide culture of data use through professional development at their schools. During the training they learn more about the data-driven decisionmaking process taught in the basic training and about how to become effective leaders of professional development in their schools. Participants bring their own classroom- or school-level data to be analyzed. Some attendees bring state assessment data. Others bring data on behavioral issues, such as tracking the number of classroom referrals and office referrals for students. In addition, some bring school climate survey data. The data are typically on paper or in a spreadsheet. No technological analysis tools are used. Data analysis occurs through the six-step process mentioned above: users examine their data (treasure hunting), identify and analyze student needs, prioritize the needs, set goals for meeting them, identify instruction strategies to target the goals they set, and devise ways to measure whether the goals have been met once the strategies have been tested (determining results indicators). Actions resulting from this process include curriculum revision, program redesign, and funding redistribution.

Districts that participate in the professional development receive two kinds of support: technical assistance and materials to facilitate data team work. Technical assistance, provided to districts throughout the year as a follow-up to the professional development sessions, is based on the specific needs of each district that requests it. Once the training is complete, the materials provided during the training support the formation of data teams in each participant's district. These materials include a booklet with an overview of the six-step data-driven decisionmaking process, activity worksheets for each step, a booklet describing the data teams and how they should work, and activity sheets to guide participants in implementing the teams in their districts. In addition, a DVD is provided with video clips of a sample data team. The initiative does not provide a technological infrastructure to house data.

Next steps. Starting in fall 2008, the CALI planned to expand its services to all districts in the state, rather than providing them to only low-performing districts.

Additional resources. These include:

- The CALI web site at www.sde.ct.gov/sde/cwp/view.asp?a=2618&Q=321754, technical assistance standards at www.sde.ct.gov/sde/cwp/view.asp?a=2618&q=322294, and data-driven decisionmaking and related training at www.sde.ct.gov/sde/cwp/view.asp?a=2618&q=321744 and www.sde.ct.gov/sde/lib/sde/word_docs/curriculum/cali/cali_training_description.doc.
- The Leadership and Learning Center web site at www.leadandlearn.com.
- The Connecticut RESC Alliance web site at http://ctrescalliance.org/index.html.
- The SERC web site at www.ctserc.org.
- The web site for public summary performance reports for Connecticut's statewide testing programs at www.CTreports.com.

Maine

Both leadership and staff at the Maine Department of Education are aware of the importance of data-driven decisionmaking. Before the No Child Left Behind (NCLB) Act of 2001 took effect, Maine was developing a balanced accountability system that combined local assessments with statewide testing in various grades. Maine implemented the Maine Educational Assessment (MEA) in 1984 and has since supported teachers in analyzing MEA test scores to improve classroom practice. As the department moves to implement annual NCLB testing requirements, its focus is shifting from performance assessments to longitudinal analysis of MEA data, with a federal grant supporting the development of a longitudinal data system. Despite constrained resources and a small staff, the department encourages and supports data-driven decisionmaking within specific programs and provides some support to schools and districts for developing their capacity to analyze data.

State context. Geographically, Maine is the largest state in New England, with a larger landmass than the rest of New England combined. That creates challenges to equitably serving students across the state. Maine's population of 1.3 million is 96 percent White, compared with 67 percent across the United States, and is largely rural. Although an increasing population of immigrants has settled in the state's three urban centers, overall school enrollment is declining slowly. Public school enrollment declined from 213,867 in 1996/97 to 193,335 in 2006/07 (Maine Education Policy Research Institute 2008). Historically Maine has had a high-achieving school system, measured in part by high rankings on the National Assessment of Educational Progress (Maine Education Policy Research Institute 2008).

Overview of the initiative. Maine created the MEA in 1984 and, from its beginning, helped local educators interpret their MEA scores and use the data to inform classroom practice. The state expanded this work in the 1990s. Maine's education standards, the Maine Learning Results, were approved in 1997 and

included a local performance assessment designed to show what students knew and were able to do. In the late 1990s and early 2000s Maine helped districts develop local assessments and helped teachers and principals use the data to improve student achievement. With limited state resources, and given the difficulty of holding schools and districts accountable for myriad performance assessments, the Maine Department of Education is now focusing on creating a longitudinal data system that will support analysis of MEA scores at the student level.

Although the department encourages data-driven decisionmaking in many of its state-sponsored programs and in its support of low-performing schools, it has no overarching, integrated policy or vision to encourage data-driven decisionmaking in districts and schools. Capacity is low: at the time of the study the state had several vacancies in data-related positions, no director of state assessment, and no National Assessment of Educational Progress coordinator, and both positions had been empty for some time. Also, Maine's focus has been on supporting activities at the school level rather than on crafting a statewide data system. This focus is beginning to shift, with stronger external accountability measures imposed by the federal government and a federal grant supporting the development of Maine's longitudinal data system.

The MEA coordinator, one of a few department staff members dedicated to assessment-related work, is passionate about using data in the classroom—something she did actively when she was a teacher. "Having yearly data following kids through is powerful—if you know what you're looking for" (interview, February 20, 2008). She regrets that, with limited staffing, state assessment staff cannot get out to schools:

> *I don't work with individual districts that much. I think we have an obligation as a department to provide data-driven decisionmaking workshops, [to help them use] all the information that is available to them. We get calls from people asking, "Can you help me? I have all this data, and I don't know what to do with it; what I should be looking for?" We don't have the capacity to do that on a large-scale basis. . . . I help people on the phone all the time, but I can't get out there.* (Interview, February 20, 2008)

Other department offices deploy content experts to work with teachers on item analyses. But, without an overarching state policy, the data-driven decisionmaking work can became sequestered in programs within the department. For example, the special education program supports districts in analyzing data on students with special needs, and the Title I office helps low-performing schools with data-driven decisionmaking. Staff from different program offices concur that MEA data are critical to their school improvement work and that data-driven decisionmaking is a key part of that work. Despite the lack of a formal, overarching data-driven decisionmaking policy, informal communication and collaboration appear to support using data-driven decisionmaking across programs.

The Maine Department of Education supports professional development for understanding and using MEA data, including both training and support in reading MEA reports and in using data to improve instruction. Support in reading MEA reports is provided by staff from the department assessment office and from the assessment company Measured Progress. The workshops, part of the state's assessment contract, are provided free to districts. Other department offices support using the data to improve teaching and learning.

Maine has contracted with Measured Progress to develop, administer, and score the MEA, to report test scores to each school in the state and to support district and school leaders in using the test data. Every fall, staff from Measured Progress and the Maine Department of Education's assessment office lead report interpretation workshops. These are held in five locations around the state to ensure that they are accessible to all Maine educators. In the fall of 2007 Measured Progress rolled out a web-based portal

for accessing MEA scores, focusing professional development on helping school leaders both understand their scores and use the portal. The workshops are offered to district leaders, such as superintendents and curriculum directors. Some principals also attend. These leaders attend primarily to learn how to use data and understand adequate yearly progress in their schools. Such workshops have been offered since the state began administering the MEA in 1984.

According to the MEA coordinator, with the new Measured Progress interactive web-based portal, a grade 5 teacher not only sees students' MEA scores for this year but can check how they did on the grade 4 test. Yet a visit to a school district showed that the database accessible through the interactive portal is populated with only one year of MEA data. This is the first year Measured Progress has used the portal to provide assessment reports to schools, so only the current year of data is available online (interview, April 7, 2008). Because of recent changes to state standards and the MEA, there are no plans to add earlier test scores to the database. However, new test scores will be added in each subsequent year. Currently, the lack of longitudinal data limits the portal's usefulness.

Maine Department of Education staffers provide more in-depth professional development, focused on test content, to help faculty use MEA scores to improve instruction and to tailor it to each student. The department offers workshops for teachers in reading, writing, math, and science. Department staff realize that teachers will not use a lot of the MEA data, so they try to focus on item-level data and how these data can help teachers with instruction.

Department staff go to schools, where they can tailor professional development to help school faculty learn from their classes' responses to particular items. The staff explain how to look at specific released items and how to analyze data trends over time. They want teachers to be very familiar with the standards, or Maine Learning Results—the standards students are measured against on the MEA. In the words of the MEA coordinator:

> *They are supposed to teach [to] standards, and the MEA is supposed to assess [by] those standards. So rather than teaching to the MEA, they should be teaching [to] the standards [that] the MEA will identify . . . but that's a disconnect for people. They just want to get ready for the test. So we've been providing release items for many, many years. . . . We encourage them to integrate as much as they can into the everyday class work [and] not just . . . get ready for the test a week before the test.* (Interview, February 20, 2008)

At the time of this study, though, there were only two content-area coaches to serve the entire state of Maine.

Next step. The Maine Department of Education's support for data-driven decisionmaking has evolved over time since the MEA was created in the 1980s. But such support appears to have grown stronger in recent years. The MEA coordinator attributed some of this to NCLB accountability requirements:

> *We always encourage data-driven decisionmaking. That's always our goal, internally as well as externally. I have seen a big change, anecdotally, since No Child Left Behind came in. The test finally means something to them. Before you'd get your bad score in the paper and you'd feel terrible, but now it's changed. It's huge. Now, they are actually looking at the data, and a lot of them didn't before.* (Interview, February 20, 2008)

Despite this shift in attitudes, the coordinator recognized that the state could do more:

> *Am I happy that we are hitting everybody and providing good instruction in how to use data? No. I've identified that as a need going forward, that we really need to collaborate. . . . We just simply don't have*

the staff, but we do what we can. (Interview, February 20, 2008)

This issue has recently come to the fore in Maine. In June 2007 the Department of Education received a three-year, $3.2 million grant from the U.S. Department of Education to support the development of a longitudinal data system. The grant was intended to help states expand their existing data systems so they can better use data to meet reporting requirements, support decisionmaking, and aid education research. States were selected in a competition and judged on their need for the project, its quality of design and management plan, and its promotion of timely generated accurate data for local, state, and federal reporting requirements.

In February 2008 Maine contracted with Infinite Campus, an information management firm, to integrate its current databases into one longitudinal data system. The Maine Department of Education's leadership, along with its data management team, determined that the state needed a new data system to meet growing data needs. The new system will integrate MEA data with the student information system, Maine Educational Data Management Systems, and eventually will include staffing data. It is currently being piloted with a small number of schools. It will take several years to integrate all districts and schools into the system.

Additional resources. These include:

- Measured Progress at www.measuredprogress.org.
- Infinite Campus at www.infinitecampus.com.

Massachusetts

Massachusetts is implementing the Educational Data Warehouse, a statewide initiative. The Massachusetts Department of Elementary and Secondary Education has purchased a license for data warehouse software that will house all the state-maintained data and allow school districts to load and analyze their own data. Staff at all levels (department, district, and school) will have access to the data for reporting and for making curricular and pedagogical decisions. For three years Massachusetts piloted the initiative, and at the time of the study it was working toward statewide implementation, with 76 districts having access to the virtual warehouse.

Participation in the initiative will not be mandatory—the state lacks funding to enforce it. The department obtained funding to purchase the online tool and pay a maintenance fee, to hire a few staff dedicated to the data warehouse, and to support school districts in the pilot phase. Once the initiative is statewide, districts that join will rely on their own budgets to build their capacity to understand, run, and use the software.

State context. Massachusetts is the most populous of the six New England states, with more than 6 million residents. The public education system serves nearly a million students in 388 school districts and 1,873 schools. In 1993 Massachusetts passed the Education Reform Act, which required the development of content and performance standards. As a result, the state developed the Massachusetts Comprehensive Assessment System (MCAS) to test all public school students on the state learning standards. Students are tested every year in reading and math in grades 3–8 and in high school. Science is tested in one elementary grade, one middle grade, and one high school grade. In addition to the content assessments, English language learner students are required to take the Massachusetts English Proficiency Assessment (MEPA).

Since 2001 the state has had a centralized system, the Student Information Management System (SIMS), to collect student background information. Each student has a unique identification number that allows the student's SIMS and MCAS data to be tracked. At the time of the study, the state was in the first year of implementing the Education Personnel Information Management System, which gives each educator in the state an identification number.

Overview of the initiative. A few years ago, senior personnel at the Massachusetts Department of Elementary and Secondary Education concerned about increasing demands for using data in decisionmaking noted that the department collected and used data inconsistently and that data collected from the districts were not going back to the districts effectively. In 2005 the department obtained internal funding to pilot the Educational Data Warehouse. The state invited districts to apply to the two-year pilot. At about the time when department officials were considering the data warehouse, district officials in the Northampton School District were searching for a way to better deal with the data they were collecting and with its various locations. In 2005 a Northampton administrator met the state department official in charge of the Educational Data Warehouse initiative and shared the district's vision for data collection and analysis. The district was awarded an Educational Data Warehouse grant. It and six other school districts became the first cohort to pilot the initiative.

During the first six months of the pilot the districts and the department selected Cognos as the vendor for the data warehouse. Department officials met with representatives from Cognos to examine its data model and to discuss changes required to meet state and district needs. In 2006 Massachusetts bought a statewide license for the warehouse.

Once the warehouse was ready, the state department used it to make five years of its SIMS and MCAS data available to the pilot districts. Two districts with data management staff uploaded district-level data, such as students' grades and courses. Many months were spent learning how to use the warehouse—running the reports, identifying which local data could be uploaded, and learning how to upload them.

Professional development has been integral to the project explains one distinct official: "Assuming that you can get your data loaded and you have access to data, what are you going to do with the data? . . . That is by far the most important and difficult question to answer and the most work" (interview, December 3, 2007). During the first two years of the grant administrative personnel from the districts received professional development from the Connecticut RESC Alliance (see appendix E) on using data for decisionmaking.

The department got funding to expand the pilot for two additional two-year periods. May 2008 marked the end of the initial phase of full rollout, with 76 districts having access to the warehouse and the department finalizing details of its expansion to more districts. Although use of the data warehouse and tools will not be mandatory, department officials expect that districts will take advantage of them. Though initiated and managed by the Massachusetts Department of Elementary and Secondary Education, officials from the seven school districts in the first pilot cohort—especially those from Amherst and Northampton—have been important in shaping it. Its main goals are twofold: to provide a platform to house data collected by the state, districts, and schools, making those data accessible in decisionmaking, and to provide software that allows state and district users to analyze their data. Different stakeholders will use the warehouse differently. For example, department staff will use it for reporting purposes, school personnel will look at data longitudinally, and teachers will access their students' records from previous years to see their progress.

At the time of the study, the warehouse contained state-maintained data, such as SIMS, MCAS, and MEPA data, and the state was uploading Education Personnel Information Management System data. The tool can incorporate other data, explains one department official: "We would love to get our finance data in there, [along with] . . . licensure data, academic program data, and professional development information. The types of things we could include and ultimately link are endless" (interview, October 23, 2007). Districts will also be able to load their own data, such as data on courses, grades, student attendance, or discipline. State department officials will notify districts when reviewing the districts' uploaded data.

It is expected, once the data warehouse is implemented statewide, that people at different levels—policymakers, district officials, principals, school data teams, and teachers—will be able to access state data and their local data and to run reports tailored to their needs.

The state education department bought a statewide license for the virtual data warehouse that will be available free to every school district in the state. Although the state is planning to provide directions to districts about the warehouse, districts will have to budget to participate in the project and build district capacity around the warehouse.

The warehouse has developed several personnel supports through pilot testing the initiative. Three fulltime state department staff personnel and two contractors work exclusively on the warehouse. In addition, weekly conference calls between department staff and districts in the first two pilot cohorts allow discussion of implementation issues. District and pilot department user groups gather feedback from end users and share best practices with them. Finally, a steering committee of department and district personnel meets to prioritize enhancement work for the data warehouse team. It grew out of a previous steering committee, drawn from the pilot districts, that met several times over two years to make decisions about implementation.

Challenges to implementation. The warehouse has limited funding and will not be mandated once it is launched statewide. The pilots have shown that the initiative takes a good deal of districts' time and resources to implement. One district official noted that, although the district received funding, it was a challenge to find "the time to clean the data, or the time to load the data, or the time to do professional development" (interview, December 3, 2007).

Once the initiative is launched statewide, the state department's challenge will be to manage the expectations of the school districts. Districts must view the warehouse as a work in progress—for which cleaning and uploading data take time and resources—and learn how the uploaded data can be used for decisionmaking. Still, the state official in charge of the warehouse suggested that its advantages outweigh the challenges: "I would rather see a model such as [a statewide Educational Data Warehouse] as opposed to a hundred different data warehouses being purchased by only the districts that can afford them" (interview, October 23, 2007).

Additional resources. These include the Massachusetts Department of Elementary and Secondary Education, Educational Data Warehouse web page at www.doe.mass.edu/infoservices/dw/.

New Hampshire

The New Hampshire Department of Education has made using data to improve instruction and student outcomes a priority, resulting in a comprehensive approach to data-driven decisionmaking that includes tools for data storage and analysis, curriculum alignment, and the development of local assessments. The focus of its initiatives is on understanding individual student learning needs.

State context. New Hampshire, a primarily rural state, has a large number of small schools and single-school districts. Districts are organized into school administrative units, each under a single superintendent. New Hampshire's emphasis on local control has resulted in a recent education accountability law specifying that the state will not take over schools that fail to make adequate yearly progress.

New Hampshire established its Statewide Education Improvement and Assessment program (RSA 193-C) in 1993, long before the NCLB Act, to set standards and require education improvement and assessment plans. Recent legislation (RSA 193-H) sought to establish a single state accountability system for schools to be coordinated with the NCLB Act. This system seeks both to meet NCLB requirements and to go beyond them by including all public schools, both Title I and non–Title I.

New Hampshire has joined with Rhode Island and Vermont to develop the New England Common Assessment Program (NECAP), an annual assessment developed to comply with NCLB legislation. NECAP has been administered each fall in grades 3–8 since 2005. In fall 2007 it was given in grade 11. New Hampshire educators are also constructing course competencies at the secondary level that link content to skills and use multiple measures to evaluate student proficiency.

Since 2005 the state has emphasized educating the whole child. Its Follow the Child initiative fosters a personalized learning experience for each student and challenges districts to measure growth in and develop support systems for the personal, social, physical, and academic aspects of each student's life. Participation by districts, schools, and individual educators is voluntary.

Overview of the initiative. Data collection and use have been the focus of New Hampshire's approach to school improvement for the past five years. According to the leader of data use initiatives within the New Hampshire Department of Education, about three years ago the department recognized that its methods for data collection and data dissemination to districts did not make good analysis likely at the district and school level. For example, districts were unable to compare year-to-year assessment results or to calculate graduation rates meaningfully.

These deficiencies led New Hampshire to launch a coordinated statewide effort in 2005 to collect data that would allow for meaningful data analyses by districts and schools and to train users in data-driven decisionmaking. These efforts were aided by funding from the U.S. Department of Education for data collection and decisionmaking through a statewide longitudinal data system grant of $3.2 million over three years. This grant is being used to improve data warehouse and analysis tools, to fund the Follow the Child initiative (explained below), and to collaboratively develop a database to connect school and postsecondary data on students and teachers.

New Hampshire exceeds NCLB requirements through a joint initiative of the governor and the commissioner of education called Follow the Child, which brings together several data collection and use programs to track each student's progress toward (at least) proficiency on local and state assessments. Participation in Follow the Child is voluntary for districts (called school administrative units in New Hampshire), approximately half of which were participating at the time of the study.

New Hampshire is committed to the use of data to guide school improvement. A New Hampshire Department of Education publication states:

> *All of us must use school performance data to continuously improve the education system in our state. Making this data available to the public is essential. Providing every New Hampshire child with a quality education is a result of assessing and understanding the situation, working together in our communities, in our classrooms, and in our own homes to make a difference. (New Hampshire Department of Education 2006)*

The department's vision for data-driven decisionmaking in the state is to enable districts to analyze assessment data and other data in various queries, to support district efforts to develop and analyze their own local assessments, and to link these data to curriculum and lesson planning tied to state standards.

New Hampshire's Initiative for School Empowerment and Excellence system gives a unique identification number to each student in New Hampshire, letting districts easily retrieve data for all their students. The U.S. Department of Education longitudinal grant will allow the state to expand the database to include postsecondary students.

Statewide data collection efforts have been led by state education agency personnel. Professional development for district and classroom data use, led by New Hampshire's five regional professional

development consortiums and centers, offer basic and advanced data analysis training for schools and districts.

New Hampshire collects a wide range of data with its statewide data warehouse and analysis tool, Performance Tracker. All school administrative units have access to Performance Tracker. It has three modules: Performance Tracker stores assessment and other data and facilitates analysis through various queries, Assessment Builder allows districts to develop customized assessments, and Content Library facilitates linking assessments to curriculum and lesson plans. All the administrative units have free access to the first module. About 15 percent of the units (including Manchester and Nashua, the largest in the state) have paid for access to the other two, and many more units have expressed interest in accessing them. Funding such access through the federal longitudinal data grant has been discussed by the state department.

State department staff reported that one strength of Performance Tracker is the range of data it can store and analyze. New Hampshire's data-driven decisionmaking efforts have focused on making a wide range of data available for analyses. Types of data that districts can put into Performance Tracker include scores on NECAP, the Northwest Evaluation Association assessments (administered by about half of New Hampshire's school administrative units, these measure student instruction level and growth, to help teachers tailor instruction to individual needs), the Dynamic Indicators of Basic Early Literacy Skills (DIBLS) test, and the Developmental Reading Assessment, along with data on attendance and academic, social, personal, and physical development from the Follow the Child initiative.

The New Hampshire Department of Education has two types of infrastructure to support data-driven decisionmaking: its data warehouse facilitating data storage, retrieval, and analysis—described above—and policies that promote data-driven decisionmaking in schools and districts. The policies focus on tying funding and adequate yearly progress reporting to data collection and analysis—to make schools and districts aware of the importance the state places on data use and to give them an incentive to analyze their data. Recognizing the extra effort and training commitments districts must make to learn data-driven decisionmaking, department staff emphasize that their role is to provide customer service to help districts progress toward effective data use. The department answers immediate, individual questions from districts and schools on data collection and provides technical help with the data warehouse.

In addition, New Hampshire's five professional development consortiums and centers provide training in data-driven decisionmaking. The training is voluntary and funded by the districts. Thus, the consortiums and centers are motivated to cater training to district needs.

Challenges to implementation. New Hampshire has a strong tradition of local control. This allows schools to adapt to local circumstances, but it also presents challenges to statewide education initiatives. For data-driven decisionmaking it means that school administrative units use different assessments—NECAP is the statewide assessment developed in response to NCLB legislation, whereas other assessments such as the Northwest Evaluation Association's are used voluntarily by local educators. Similarly, professional development is decentralized, differing by area. With the state lacking personnel to provide professional development on data use, much of the state's formal training in data-driven decisionmaking is provided at the local level. Although the state department has provided supports for data-driven decisionmaking, in New Hampshire, it is difficult to determine how much data-driven decisionmaking is being implemented in school administrative units and schools given the strong local control in New Hampshire.

Additional resources. These include New Hampshire Department of Education at www.ed.state.nh.us/education/ and Performance Pathways at www.perfpathways.com.

New York

New York has a strong history of using data-driven decisionmaking to inform education decisions at different levels of the system. Although the New York State Education Department has no formal statewide data-driven decisionmaking policy for districts and schools, it encourages such decisionmaking in its support of low-performing schools and through state-sponsored and other agency programs. Those programs include New York's statewide data reporting system, nySTART, and the services provided by the Board of Cooperative Educational Services and the New York Data Analysis Technical Assistance Group.

State context. New York contains some of the most densely populated areas in the Northeast and Islands Region, includes a wide range of urban, suburban, and rural schools serving nearly 2.8 million students (U.S. Department of Education, National Center for Education Statistics 2007). The five largest districts—New York City, Buffalo, Rochester, Syracuse, and Yonkers—make up 42 percent of the state's public school population. New York has a very diverse population of students. A little over half (52.7 percent) are White, whereas the majority of the other half are either Hispanic (20.1 percent) or Black (19.8 percent). Most (68.2 percent) of the schools in the state are Title I, and almost half (44.8 percent) of the students are eligible for free or reduced-price lunch.

Overview of the initiative. The Elementary, Middle, Secondary, and Continuing Education department of the New York State Department of Education established the Office of School Improvement and Community Services (OSICS) in 2003. The OSICS is charged with designing and implementing the state's system of support for low-performing schools. Its overarching goal is to close the achievement gap in English language arts and mathematics for all students, including NCLB subgroups.

In 1998 New York became one of the first states to have a system of accountability. With the accountability plan came the School Under Registration Review process, which identifies schools performing furthest from state standards—based on state assessment scores—and requires that they create comprehensive improvement plans. The state education department has strong expectations that districts and schools include data-driven strategies in their improvement plans.

The seven regional school support centers are the primary means through which support is provided to New York's high-priority districts and schools. Established in 2003 along with the OSICS and funded by the state education department, the centers provide technical assistance and support to schools and priority districts, and they coordinate the implementation of the Reading First initiative and the reauthorization of the Individuals with Disabilities Education Improvement Act (IDEA of 2004).[9] One center serves New York City, and the remaining six are spread throughout the state. The centers work with four other department-supported regional network partners to deliver services to schools and districts.

Since the inception of the OSICS and the regional centers, low-performing schools have received substantial professional development focused on data-driven decisionmaking. Low-performing districts and schools, which must include data-driven strategies in their improvement plans, are encouraged to participate in data-driven decisionmaking professional development. When developing the plans, the districts and schools are expected to use data from multiple assessments, which can include standardized assessments—with data that can be disaggregated by student subgroups—and benchmark assessments demonstrating student progress toward meeting learning standards. Other assessments must be used to measure the impact of curriculum and instruction delivery in core academic areas.

These data can help schools revise their education priorities. Once priorities are established, they become the core of each school's comprehensive education plan, including specific annual goals,

measurable objectives, and action plans for observable and effective strategies to improve student achievement.

One approach used to provide data-driven decisionmaking to low-performing schools in New York is through the reading, mathematics, science, English as a second language, and special leadership institutes. Held several times a year, these are offered by the OSICS with the New York City Department of Education, Fordham University Graduate School of Education, and the New York Comprehensive Center. Representatives from low-performing schools are required to attend the institutes, at which the representatives attend workshops led by researchers, professors, consultants, professional developers, and other educators on integrating research-based strategies and practices into teaching and learning. Many workshops teach participants to use data for decisionmaking in particular content areas. For example, a workshop at a December 2007 institute addressed the alignment between assessments (formative and summative alike) and learning standards for English language arts and the use of assessment information to drive instruction. Another session taught participants how to identify student weaknesses in mathematics by analyzing state assessment items and to use the information to derive instruction strategies targeting such weaknesses.

Another approach to professional development in data-driven decisionmaking for low-performing schools is through the New York State Teacher Centers. The OSICS placed these on-site professional development centers in low-performing schools, where they help teachers to use data. The state has paid for mathematics and literacy tutors for each school without a Teacher Center, to help teachers examine data more closely and use it to inform instruction.

The professional development in data-driven decisionmaking provided to New York's districts and schools over the past decade or so has contributed to changes in the cultures of schools, shifting them toward knowing their data and being motivated to engage frequently with those data. Not only have teachers become better consumers of data but the state department's associate commissioner finds that leaders in districts and schools are better informed about their data:

> *When you go into our lowest performing schools . . . particularly in elementary schools, you will find that principals can talk to you about data. To me, this shows real change. . . . Before, you would have to find a classroom teacher to learn those things, if you were lucky.* (Interview, January 30, 2008)

Data-driven decisionmaking by district and school leaders is supported and encouraged in New York through avenues other than the initiative for improving low-performing schools. One data reporting and analysis tool is available to all school leaders, and two types of networks or groups encourage and support districts and schools in their use.

Through the statewide data reporting system, nySTART, the state education department encourages managing and reporting state assessment data. Formerly housed in 12 regional information centers, such data are now stored in the New York State Testing and Accountability Reporting Tool, or nySTART, a web site that gives school leaders (including district superintendents, principals, and teachers) access to reports on New York's standardized test scores.[10] The change reflected a desire to have a standardized online tool for the regional information centers and Boards of Cooperative Educational Services (see below) to work with state assessment data. Run by the Grow Network and McGraw-Hill, nySTART is funded by the state department of education. The nySTART web site contains detailed reports on test results for assessments, including the New York State Testing Program, New York State Alternative Assessment, the New York State English as a Second Language Achievement Test, and the New York State Regents Examinations. District and school administrators, as well as teachers, are expected to use the data reports to inform education decisions.

The nySTART system provides verification, assessment, and accountability reports. Verification reports let school district officials review and verify the accuracy and completeness of data. Assessment reports provide summary- and individual-level performance in PDF for English language arts and mathematics assessments in grades 3–8 and for the New York State Alternative Assessment. The data can be analyzed in a variety of ways. For example, teachers and administrators can view and sort performance data by district, school, grade, and student. They can analyze aggregate performance and examine data by performance level, content strands and standards, and test item. Data can be summarized for subgroups (disability status, race/ethnicity, English proficiency, and so on). Last, the accountability reports provide information about school status under the state and federal accountability systems, including school profile information, school accountability status, and performance.

New York's regional school support centers work with various types of partners that are not department-funded to provide professional development in data-driven decisionmaking. One such type is the Board of Cooperative Educational Services (BOCES), regional networks that provide services including student supports, professional development, technical assistance, and technology supports that individual districts cannot provide. The state's 37 boards are funded by the state and by districts, whose superintendents govern and determine services. BOCES provides data-driven decisionmaking services based on regional and district need. For example, in districts with the capacity to manage, interpret, and gather information from data to inform instruction, the boards may ease and enhance those tasks. Other districts lacking such capacity may receive professional development and technical assistance. Housed in the boards are the 12 statewide regional information centers, which provide participating districts with technology services for instruction and administration as well as training and support for teachers, students, and administrators. The centers store and process all the data required for the state and provide customized professional development on data management and analysis to districts.

The New York Data Analysis Technical Assistance Group, developed in 2000 at a Comprehensive District Education Planning conference and funded by the state's education department, grew out of a shared interest in creating data systems that would help teachers and other educators, rather than only those with technical expertise. The group is a research-based learning community, open to education professionals involved in supporting data use to improve instruction around the state. Members come from organizations including school districts, BOCES, special education training and resource centers, regional school support centers, regional information centers, the state education department, and the private sector. Members may be involved in a variety of data-driven activities, such as building data warehouses in the information centers or providing test scoring and data analysis to districts. The goal of the group is to "provide a leadership role in identifying, cataloging, and modeling best practices in the analysis and use of data for New York schools" (New York Data Analysis Technical Assistance Group 2008). The group holds meetings four times a year, with biannual conferences to discuss ways of building its capacity to provide data-driven decisionmaking services and supports. It also has an email list that is free to members, where members post questions and answers related to data-driven decisionmaking.

Next steps. The New York State Education Department has long understood the need for consistent data-driven decisionmaking in districts and schools. It continues to build on its data-driven decisionmaking initiatives, for example, by planning a new initiative to create an integrated data system for PreK through higher education. The new initiative was called for by the New York State Board of Regents in fall 2006. Its action plan calls for the department to create the new data system with the goal of using data to improve graduation rates in high school and in higher education (New York State Board of Regents 2006).

Additional resources. These include:

- The New York State Education Department School Comprehensive Educational Plan at http://schools.nyc.gov/NR/rdonlyres/75097FD5-478D-4129-AE78-EF0442C60B3D/32663/RequiredCEPAppendicesfor20072008ReleasedMay22007.doc and the District Comprehensive Educational Plan at http://schools.nyc.gov/NR/rdonlyres/138A84DB-3E16-418F-AF7C-A90B266FFAFE/32645/DCEPTemplate200708v807.doc.
- The Board of Cooperative Educational Services web site at www.monroe2boces.org/statewide.cfm.
- The Data Analysis and Technical Assistance Group web site at www.datag.org.
- nySTART web site at www.nystart.gov.
- Introduction to nySTART (PowerPoint) at http://emsc32.nysed.gov/irts/nystart/PD-0713-Intro-to-nySTART.ppt.
- *P-16 Education: A Plan for Action* at http://usny.nysed.gov/summit/p-16ed.pdf.

Rhode Island

The Rhode Island Department of Elementary and Secondary Education is creating a central data warehouse. Housing all education-related data, including state assessments, student information, teacher information, and financial information related to schools, the warehouse will allow users to access data with up-to-date graphs and figures as well as user-designed reports.

It will be available in different ways to users at all levels of the system: parents, teachers, administrators, education department employees, and the state legislature. The state is focusing professional development on helping users in all school districts understand the new data warehouse.

State context. Rhode Island is the smallest in area of any state. It is highly urban and densely populated, with a public school student population of 152,422. Most students are White (70.5 percent), with Hispanics (17.3 percent) the largest minority group. Close to half (40.9 percent) of the state's schools are Title I, and just over a third (34.9 percent) of the student population is eligible for free or reduced-price lunch.

In 2006 the state began to build a data warehouse for all education data. Formerly in several locations, data would now be available to users through one consolidated source (with seven components). Users can obtain up-to-date data in a user-friendly form and can generate reports based on the data.

Overview of the initiative. Rhode Island's work on a data warehouse began with district officials looking for a way to analyze data and use that data to inform decisions on education. As districts and the state education department began looking into systems, they realized that they were missing a foundation: a statewide student identification system. After such a system was created in March 2004, a two-year project to develop the warehouse was funded through a statewide bond referendum. In June 2006 two companies, ESP Solutions and TetraData Corporation, were chosen to create the warehouse.

The goal of the data warehouse is to let educators base their decisions on real assessment and student data rather than hunches. Education leaders want officials to "be able to back up actual decisions with actual data . . . [and] then to monitor [a] decision along the way to see if it is . . . paying off" (interview, December 3, 2007). The warehouse is designed for use by individuals at all levels of the state education system, from district officials to building administrators to classroom teachers.

The data warehouse initiative is run and supported by many state education department offices. The Office of Network and Information Services, assigned to build and maintain the warehouse,

now coordinates the work of the outside service providers selected to create it. The office answers questions from the external vendors, provides the data to them, and helps to coordinate and support training as components are rolled out.

Office of Assessment and Accountability staff are working with the warehouse project to verify the accuracy of data uploaded into the system. In addition, this office provides workshops throughout the year to help users interpret assessment data. The workshops are timed to coincide with the release of the data from the state. In addition, specialized workshops help districts identified as in need of improvement.

The data warehouse has seven components (some not funded under the current project):

- A consolidated educational information system portal.
- A data analyzer application.
- DASH, a front-end vision alignment tool for teachers and principles.
- New data collection software.
- Data collection using the Schools Interoperability Framework technology.
- A master directory.
- A graphic interface system.

The warehouse is being introduced gradually, with components launched at different times over the two-year period. Each component is piloted with smaller groups before being introduced to all the districts.

The first component, the consolidated educational information system portal, was released in May 2008. The master portal for the warehouse, it will give all users a single logon to access all the programs at their access level. The second component, the data analyzer application, also is online and was introduced to all districts in March 2007. The third component, DASH, released in fall 2007, is an interface with graphs and gauges on various data such as today's attendance rates. The graphics are based on a car's tachometer, with information color coded to indicate problem areas (red) and areas of trouble (yellow).

Additional formally funded warehouse components include new data collection software (released in October 2007) and a component to automate data collection in real time (initially released to the Providence school district in October 2007). The Schools Interoperability Framework (SIF) technology used for the data collection is designed to help all system directories speak the same language, allowing a free flow of data within the system. Explained one department of education official:

> *Let's say I am a district and I have a different computer system to track transportation. I have a different computer system for the lunch program. I have a different computer system for the library system and a different one for the student information system. None of these systems talk to each other. So, the idea is, let's say, the student information system is speaking French and the library system is speaking Spanish, SIF translates everything into English and then it's kind of like the gateway for communication. So, when a student enrolls into the student information system, a packet of information will be automatically sent to the library system saying this is a new student, enroll this student into the library. So, the idea again is to save time, data entry, and that type of thing.* (Interview, December 3, 2007)

Two additional components connected to the data warehouse were not funded under the initiative at the time of the study. The first, a master directory released in July 2007, stores directory information about districts and schools. The second is a graphic interface system that would display all

system information graphically. Coordinated by the SIF technology, the interface system would automatically update access to all warehouse systems. Its release date was still to be determined at the time of the study.

Data in the warehouse will include student information, such as enrollment, discipline, special education, and English proficiency data; statewide and local assessment data; financial information; and teacher certification information, with other information about teachers that can be linked to their classes and students.

Many goals are envisioned for the warehouse. The underlying one is to give educators the data they need to make the best decisions for their students, looking at programs and examining which have had better results. The warehouse will allow educators to examine treatment and effect—always an important goal and one that is especially crucial now, during a state of fiscal crisis. Tight resources make it critical that educators make informed program decisions; good data can help them.

The state education department has taken the lead in creating the warehouse. With the help of ESP Solutions and TetraData Corporation, it is creating a system that can be used by anyone with an interest in education. The primary focus has been on establishing the system and orienting users to components as they are introduced. Initially, training was done by the contractors creating the system, with emphasis on learning to use each new application. Current use and training were limited at the time of the study; however, the system is designed for many different people. Although access to and permitted uses of the data will vary based on a user's position, everyone will have appropriate access to the data through a variety of available tools.

Other state supports for data use. The Rhode Island Department of Elementary and Secondary Education created the School Accountability for Learning and Teaching (SALT) survey and process in 1998. The SALT process is a school-centered cycle of inquiry designed to improve Rhode Island school and student performance. The survey is administered by the National Center on Public Education and Social Policy at the University of Rhode Island. The university provides reports for every public school in the state and offers materials and technical assistance to help schools use the survey data to improve student achievement.

Challenges to implementation. The state has encountered numerous challenges—from capacity to time to funding—as it works to implement the warehouse. Funding to support training for users at different levels is limited. Also limited are the personnel who support both the creation of the warehouse and its ongoing maintenance (training, checking data, and so forth). Windows of time when all the right individuals can attend an appropriate training session have been very limited, the system being designed for users with different levels of exposure to data use. In addition, this project faces a challenge in coordinating its technical and analytic components: people with a technical understanding of the system are not always familiar with the analyses that will be run with the information. In contrast, the users of the system are not always familiar with the system's technology but do know what kinds of analyses they want to conduct. This could lead to a technologically sophisticated system not meeting users' analytical needs.

Additional resources. These include:

- The Rhode Island Department of Elementary and Secondary Education Office of Network and Information Services data warehouse web site at www.ride.ri.gov/onis/DW/DataWarehouse.aspx.

- The SALT survey web site at www.ride.ri.gov/PSI/salt/default.aspx and the "SALT Survey Databook Overview" at www.nksd.net/SALT/2008/overview.pdf/.

- University of Rhode Island National Center on Public Education and Social Policy "HiPlaces School Improvement Planning and Monitoring

Process: Instruction Matrix" at www.ncpe.uri.edu/research/matrix-instruction.asp.

Vermont

Vermont has a history of collecting and using data that predates the NCLB Act. The Vermont Department of Education has focused its data work on the human side of data—increasing the capacity of schools to collaboratively examine data and make instructional decisions. The state has a data warehouse and provides professional development on data analysis, contracting this work to partner organizations.

State context. Vermont has the highest percentage of rural residents of any state. Schools are decentralized and the state has many small schools and single-school districts. Districts are organized into supervisory unions, each under a single superintendent. Vermont's emphasis on local control has resulted in a recent education accountability law (Act 60, the Equal Education Opportunity Act) specifying that the state will not take over schools that fail to make adequate yearly progress. However, the state education commissioner determines whether districts are making progress in improving student performance and holds those not making sufficient adequate yearly progress accountable for using data and reporting progress.

Vermont has joined with New Hampshire and Rhode Island to develop the NECAP, administered each fall since 2005 in grades 3–8 and in fall 2007, for the first time, in grade 11.

Overview of the initiative. The Vermont Department of Education sees two components in data use: the technical side, or the data and its analysis, and the human side, or the importance of teams combining different perspectives to learn from the data. This dual emphasis is reflected in requirements that principals (as of 2007) and teachers (partly in 2008, fully as of 2009) participate in learning communities focused on using data to improve achievement. This requirement is a unique response to the issue of schools failing to make adequate yearly progress.

Because Vermont's history with data use predates the NCLB Act, it has traditionally focused on using data to improve instruction rather than to meet accountability requirements. The state assessment coordinator described Vermont's vision for the use of data in Vermont's classrooms: "I think teachers ought to be able to tell you at any moment in time where each kid's at" (interview, October 26, 2007).

An initiative launched in the 2007/08 school year requires that Vermont schools identified as in need of improvement provide data-based evidence on the effect of their school improvement efforts. The state education commissioner's Required Actions (16 Vermont State Law 165[b]) codify some of the responsibilities for low-performing schools and make these uniform statewide. All identified low-performing schools must:

- Identify measures to track student progress, with particular focus on the groups and content areas for which the school is identified (this triggers required implementation and monitoring of local assessment systems).
- Develop a continuum of support for student learning.
- Report to the state at the middle and end of the academic year, using data to show progress.
- Have principals participate in principal learning communities.
- Establish one teacher learning community during 2008/09.
- Have all teachers in teacher learning communities beginning in 2009/10.

According to the state assessment coordinator, these requirements are to ensure that school leaders can show the state education commissioner

that "they know whether kids are meeting standards. There are lots of ways to do this; we just want to know you're doing something. The Commissioner is saying, 'Tell me how you know where your kids are.'" Through this directive, the commissioner ensures that identified schools use data to guide their school improvement efforts.

In addition to this initiative focused on low-performing schools, Vermont is also working to expand the functions and uses of the state's data warehouse so that more districts can access it and better use data. The warehouse restructured its pricing to let smaller districts, with fewer resources, afford the services.

Schools are required to submit reports directly to the state education commissioner. The assessment coordinator manages a range of data and assessment projects within the department. Three school support coordinators within the department lead the initiative for low-performing schools. The Vermont Data Consortium, a nonprofit group that manages the data warehouse, has close ties to the department; one department employee worked with the consortium to develop queries to analyze data.

In Vermont data-driven decisionmaking is supported by the data warehouse, which stores data and facilitates data analysis, and by policies that provide incentives and accountability for data use. The Vermont Department of Education focuses more of its resources and personnel on supporting low-performing schools than on supporting data use by all schools, which is handled by partner organizations such as the Vermont Data Consortium and educational service agencies.

The Vermont Data Warehouse is a data storage and retrieval system, using software from Tetra-Data, that allows participating districts to access state assessment data (reported through spreadsheets) and generate queries to analyze those data. According to the consortium, the goal of the warehouse is to "ensure that Vermont supervisory unions/districts have cost-effective, timely, and accurate student and educational data available to address continuous school improvement as well as state and federal accountability and reporting requirements" (Vermont Data Consortium 2008). The consortium has worked with the department to create a Common District Model that includes data on students, teachers, courses, class sections, student schedules, course grades, and local assessments. The model will eventually expand to contain data on attendance, discipline, programs, and interventions; standards-based report cards; and more. In addition, the data warehouse software can use data stored in any student information system to generate reports. Data from NECAP, the Vermont Development Reading Assessment, and local assessments are also housed in the warehouse. Data are collected by schools, districts, and supervisory unions. About half of Vermont districts were participating in the warehouse at the time of the study.

The data warehouse allows teachers (at the classroom level), administrators (at the school level), and central office personnel (at the district level) to query the data through different filters. One can analyze how students performed on assessments, how different subgroups performed (in Vermont the most critical achievement gap is between students of low and higher socioeconomic status), and how they compare with other students in the state.

The state department of education provides technical assistance and, due to its small size, limited professional development in data use. The six educational service agencies (Vermont's regional education service providers) can provide more extensive professional development, including in data-driven decisionmaking; however, given the agencies' decentralized model, the department has little control over the content and quality of the professional development they provide.

For schools falling under the Required Actions legislation, support is available from principal learning communities in each of the state's four regions, as well as with technical assistance on data use. Unique to Vermont's accountability efforts,

such communities bring together principals of schools failing to make adequate yearly progress to share perspectives and reflect on school improvement efforts.

Challenges to implementation. Vermont's history of using data, including its focus on assessment in the decade before the NCLB Act, has created challenges to adding an accountability component to its work on data-driven decisionmaking. As the assessment coordinator said, "The notion of failing schools came later and unwillingly to us." Vermont has opted for the least punitive treatment for schools failing to meet adequate yearly progress requirements, focusing on support rather than sanctions. Other means, such as the Required Actions legislation, address accountability.

An additional challenge is that not all districts are members of the Vermont Data Consortium, the most powerful tool available for data-driven decisionmaking.

Next steps. The state department of education is providing increasing support and guidance for schools under corrective action. Besides the requirements detailed above, the department has been adding required teacher learning communities for all faculty in schools identified as low performing to be phased in by 2010. These communities will use data to develop strategies for improving student achievement.

In addition, the department and the Vermont Data Consortium are exploring ways to make the data warehouse more accessible to more schools and districts through a new fee structure, with lower costs for small districts.

Additional resources. These include the Vermont Data Consortium web site at http://vermontdata.org.

The Virgin Islands

The Virgin Islands Department of Education is in the early stages of crafting a policy to support data-driven decisionmaking in its districts and schools. The Virgin Islands Territorial Assessment of Learning (VITAL) has been in place since 2004/05, following a five-year moratorium on standardized testing. After territorywide testing resumed with VITAL in 2004, the assessment was taken only by students in grades 5, 7, and 11 in each of three successive administrations. The department was only beginning to develop a longitudinal data system at the time of the study.

Context. The Virgin Islands, consisting of St. Croix, St. John, and St. Thomas, has a population of only 120,000 (primarily on St. Thomas and St. Croix). Although the population is mostly of African descent, St. Croix has a large Hispanic community (mainly of Puerto Rican descent), and St. Thomas has a significant community of Danish and French descent. In addition, there are U.S. mainlanders as well as people from the Dominican Republic, West Bank and Gaza, and many other locations. All public school students qualify for free or reduced-price lunch.

The education department oversees two school districts, with 34 schools and about 18,500 students. In 2003 all 34 schools were deemed at risk and ranked in the bottom third of all schools in the United States and territories. The National Assessment of Educational Progress results for 2000 show that the share of grade 4 students performing at or above proficient level was 4 percent, compared with 28 percent nationally.

Overview of the initiative. The Virgin Islands Department of Education's director of planning and evaluation reported that, at the time of the study, it had only recently begun to create a longitudinal data system and was just starting to craft a data-driven decisionmaking initiative: "In the absence of formal policy, what we have been doing is using the NCLB [Act] as a motivator to encourage schools to use data" (interview October 26, 2007). For over a year the department did not have a permanent confirmed commissioner of education.[11] In the absence of a commissioner, the director of planning and evaluation was setting the direction for data-driven decisionmaking. One of the primary motivations

for helping districts and schools use data was to help them understand why their schools were not making adequate yearly progress.

The education department contracted with the education information company Pearson School Systems to support it in developing and administering its assessment and longitudinal data system. Pearson was also contracted to hold workshops for principals twice a year—to teach them how to query data in the school administration and student information system database, how to enter data into spreadsheets, and how to pull out the types of information they need.

Data management staff from the research and evaluation office also meet with the schools and stress the importance of data, helping them understand the significance of the data for making adequate yearly progress. According to the director of planning and evaluation:

> *One of the things we have done is share with them where their challenges are, based on the data in regards to their school's performance. . . . We found . . . in our last report card that participation rate and attendance were two of the big areas why schools didn't make [adequate yearly progress]. We found in the [2006/07] school year it is no longer a significant factor for missing [adequate yearly progress]. Now they are working on addressing the proficiency achievement attainment of the subgroups.* (Interview, October 26, 2007)

Next steps. The Virgin Islands has only recently begun using data for decisionmaking. At the time of the study its plans were evolving; it planned to incorporate a comprehensive data warehouse and longitudinal system that would include achievement data, student information, and staffing information. In the words of the director of planning and evaluation:

> *One of our plans is to incorporate a comprehensive data warehouse and longitudinal system [in which] data is gathered from the schools and uploaded to the state. . . . We will be able to not just look at student achievement data and see whether or not all the teachers are highly qualified but . . . also be able to electronically cross-check those data to other sources and facilities: what's happening nutritionally in the school lunch area, and the like. We are in the planning stage; we are developing a proposal to see what it will cost. We are moving forward with that. We are moving forward with trying to implement another level of data-driven decisionmaking.* (Interview, October 26, 2007)

Additional resources. These include:

- The Virgin Islands Department of Education web site at www.doe.vi.
- The Pearson School Systems web site at www.pearsonschool.com.

APPENDIX E
CATALOGUE OF SERVICE PROVIDERS

This appendix provides a brief profile of nine Northeast and Islands Region service providers. It includes providers mentioned by state education agency respondents in interviews as the lead provider in the state; it is not an exhaustive catalogue of all providers working in the Northeast and Islands Region.

Cognos

Used by more than 23,000 organizations in industries ranging from retail to defense, Cognos business intelligence software is an integrated performance management software by IBM that is relatively new to education. It is used to analyze and report on student performance data, as mandated by the NCLB Act. Rather than a simple repository for data, it integrates and aggregates data to multidimensionally analyze student performance by various factors. Parents, teachers, principals, and district and state administrators can access and manipulate data from the software according to their needs.

The Massachusetts Department of Elementary and Secondary Education has partnered with Cognos Corporation to create and manage a statewide data warehouse. Local districts are key to creating an accurate and consistent database; at the time of the study a pilot group of districts was participating in the data warehouse project. Project participants must complete training, which the department offers to end users, report authors, and data leaders. The "long-term goal," explains one official at the department of education, "is to provide every district and school with the ability to easily query and analyze its organization's state-maintained data [Student Information Management System, Massachusetts Comprehensive Assessment System, Massachusetts English Proficiency Assessment, and educator data], and to provide districts with the option to load and analyze their own data."

Connecticut Regional Educational Service Centers Alliance

The Connecticut Regional Educational Service Centers (RESC) Alliance comprises six educational service centers that provide responsive programs and services to Connecticut schools and districts in a cost-effective manner. As part of the Connecticut State Department of Education's Connecticut Accountability for Learning Initiative, one of its main services is professional development and technical assistance in data-driven decisionmaking for low-performing schools. Training for teachers and school administrators focuses on the data-driven decisionmaking process and how to build and sustain this process in district- and school-level data teams. The training is based on a "train the trainer" model in which trainees then become school leaders of data-driven decisionmaking professional development. Districts that request it receive follow-up technical assistance based on their unique data-driven decisionmaking needs. In addition, the alliance provides a variety of customized work to schools and districts, such as spreadsheet and database training and custom report development.

The RESC Alliance maintained the Connecticut Data Warehouse, powered by TetraData's EASE-e Data Analyzer, and provides technical assistance and training on understanding and using the data warehouse and the data analysis applications associated with it. At one point, as many as 76 districts of the 169 districts in Connecticut were receiving some type of training and professional development pertaining to the data warehouse. Because of a lack of funding and capacity at the district level, however, the data warehouse was not used and ceased functioning at the end of June 2008.

ESP Solutions Group

ESP Solutions Group provides data systems and psychometrics in K–12 education to federal, state, and local education agencies. Led by a management team with extensive experience in technology and education, it pioneered the concept of

"data-driven decisionmaking" in the 1970s. ESP offers consulting and services in data management, data collection and exchange, data analysis, and data reporting. Its products include the State Report Manager web tool, publications and reports, online data dictionaries, disaster prevention and recovery plans, and electronic transcript tools.

While leading the U.S. Department of Education's Performance-Based Data Management Initiative (now called Education Data Exchange Network), ESP worked with all states and territories. Past and present work with the Northeast and Islands Region states includes:

- Connecticut—Client: state education agency. Developing a statewide longitudinal educational data system using ESP's State Report Manager web tool and other dissemination tools. In progress.
- Maine—Client: state education agency. Taking data inventory using DataSpecs and ESP metadata inventory tool. In progress.
- Massachusetts—Client: Boston Public Schools. Past services for the Massachusetts Department of Education include making an applications inventory for the chief information officer (2006); consulting on statewide student identifiers, confidentiality, and data standards (2002); building a statewide student identification system (1998); and developing a data dictionary (1996).
- New Hampshire—Client: state education agency. Documenting state's i4see data management policies and procedures for student data access and data verification. In progress. Dropout data collection (1999).
- New York—Client: state education agency. Consulting on student identifiers (2002).
- Rhode Island—Client: state education agency. Designing and implementing a data warehouse; implementing a statewide Schools Interoperability Framework to automate vertical reporting of data. In progress.
- Vermont—Client: state education agency. Consulting work on state's information system design (1998).

Measured Progress

Measured Progress, an independent nonprofit organization, develops, implements, and operates education assessments for grades K–12 and provides related professional development. It also houses two research centers: one focuses on theoretical and applied psychometrics; the other, educational assessments. Consulting services in various areas are also offered.

Its K–12 assessment services division covers all aspects of large-scale, alternative, classroom, and online assessments and counts the following Northeast and Islands Region states as former and current clients:

- Connecticut and New York—alternative assessments.
- Maine—Maine Educational Assessment.
- Massachusetts—Massachusetts Comprehensive Assessment System; Massachusetts English Proficiency Assessment.
- New Hampshire—New Hampshire Education Improvement Assessment Program, from 1992–2006.
- New Hampshire, Rhode Island, and Vermont—New England Common Assessment Program.

Focusing on assessment literacy and effective assessment strategies, the professional development services division has delivered customized workshops in districts and schools across the Northeast and Islands Region. It also produces a guide to interpreting the state reports so that teachers

and administrators can use assessment data to inform, drive, modify, and improve instruction in the classroom. At the time of the study a new product—i-analyze—that would serve as a reporting portal with filtering options for schools was in development.

National Center for the Improvement of Educational Assessment

The National Center for the Improvement of Educational Assessment, Inc., or the Center for Assessment, is a nonprofit organization founded in 1998 to address the changes in accountability and assessment under way across the country. The center works with state and other education agencies to design and implement effective assessment and accountability policies and programs. It provides services in five areas: technical advisory committees, assessment systems, accountability systems, other consulting, and Reidy Interactive Lecture Series conferences. Since its founding, it has worked in 25 states; at the time of the study it was working with 11 state departments of education and one nonprofit organization. In the Northeast and Islands Region it was working with the Massachusetts and Vermont state departments of education:

- *Massachusetts.* The Massachusetts Department of Elementary and Secondary Education was creating an accountability system that is part of the Education Reform Law and that validates its psychometric measures and design scheme. The Center for Assessment helped to review the proposal for this system and its education and policy issues.

- *Vermont.* The Vermont Department of Education needed an accountability system that could meet its unique characteristics: many schools with small student populations and a history of local control. The state wanted a system that could house state tests and other assessment as well as incorporate locally determined data into a reliable measure of school achievement and progress. The center helped the department develop an accountability plan based on its specific needs.

New York Board of Cooperative Educational Services

The Board of Cooperative Educational Services (BOCES), created by the New York State Legislature in 1948, consists of regional support networks that provide services to districts in need of help, including technical assistance and technology support. Participating school districts receive services through a cooperative service agreement, though some services are free. BOCES provides data-driven decisionmaking services based on regional and district needs. Many low-performing schools seek BOCES help to use data to improve teaching and learning.

Housed in the 37 BOCES in the state are 12 statewide regional information centers that give districts access to instructional and administrative technology services as well as training and support for teachers, students, and administrators. They store and process all the data required for the state and provide districts with customized professional development on data management and analysis.

Pearson School Systems

Pearson School Systems is a part of the media giant Pearson that provides education, business information, and publishing services. Creating innovative education technology for 40 years, Pearson has the largest market share in student information systems solutions—with 6,500 school districts and 130,000 schools serving 22 million students using its products. In addition to its award-winning software, Pearson provides comprehensive consulting, implementation services, and project management.

Some of Pearson School Systems' most popular data products include:

- *Chancery SMS.* A solution for growing urban districts seeking specific implementation

and customization services, streamlined operations, and organizational process re-engineering.

- *Pearson Inform.* A data analysis and decision support tool for K–12 schools. Performs comparative and longitudinal analyses from student to district level. Analyzes data from multiple sources.

- *PowerSchool Premier.* A fully integrated, web-based, cross-platform student information system. It is a real-time, intuitive user-friendly communication tool.

- *SASI.* A flexible, comprehensive student information management system that allows teachers and administrators to monitor, track, and report on student data and progress (through SASI Gradebook, Parent Access, and Classroom). Included in the system is a communication tool that allows parents to track their children's academic progress online. Its focus is on day-to-day operations.

Performance Pathways

A technology company formed in 2005 by the merger of Technology Pathways Inc. with AlterNet Performance, Performance Pathways Inc. focuses on data analysis and a data-informed culture in education. It believes that districts need to have curriculum-driven assessment and that curriculum and assessment data should drive decisionmaking.

Performance Pathways develops and provides curriculum and assessment solutions for the PreK–12 environment. Its three integrated applications—Assessment Builder, Performance Tracker, and TechPaths Curriculum Mapping System—are designed to help teachers and administrators make informed and timely decisions about instruction:

- *Assessment Builder.* Designs, scores, and analyzes local assessments. Designed to assess benchmark skills to predict how students will perform on the main state test. Instruction can then focus on the identified area of need.

- *Performance Tracker.* An assessment management tool that collects assessment data and writes reports. It is web based (accessible) and integrates with other popular software. Curriculum and assessments are correlated to state and district standards.

- *TechPaths.* A curriculum mapping system developed by Dr. Heidi Hayes Jacobs. It uses assessment data and links to curriculum data.

More than 55,000 teachers from 500 schools in 47 states were using products from Performance Pathways at the time of the study. Most Northeast and Islands Region states have districts that employ Performance Pathways:

- New Hampshire—As part of its Follow the Child initiative, the state has provided Performance Tracker to all public schools since spring 2007. The system currently includes assessment data from the New England Common Assessment Program and Northwest Evaluation Association, but more indicators will be added later. It is geared primarily toward teachers and principals but will ultimately be available to students.

- New York BOCES—All BOCES districts can use the applications. Districts can obtain professional development directly from the BOCES or become certified and train themselves.

- Connecticut, Massachusetts, and Rhode Island—Client list of districts is increasing.

TetraData

Founded in 1997, TetraData became a subsidiary of Follett Software Company in 2006. Its products are data-driven performance solutions for grades K–12. Districts can come aboard any time in implementing their data system; they are

empowered to develop improvement plans as well as monitor, evaluate, and change their strategies along the way.

TetraData Analysis Suite, TetraData DASH, and TetraData Warehouse and Central Data Store are a suite of solutions. A combination of these products and services is packaged to meet each district's needs.

- *Analysis Suite.* Analyzes and monitors data factors, including longitudinal analyses; measures program efficacy; tracks disaggregated No Child Left Behind subgroups. Intended for use at the district level.
- *DASH.* Front-end vision alignment tool for the warehouse used by teachers and principals. A communications tool, DASH allows the district to quickly analyze data and disseminate them to principals and teachers.
- *Warehouse and Central Data Store.* Consolidates databases into a central information source.

In addition to the aforementioned products, TetraData provides data management services, professional development and training, hosting facility services, and customer service that includes a project manager assigned to each client district.

More than 600 K–12 education institutions nationwide, serving more than 2.3 million students, use TetraData products and services in one form or another. Its clients are typically districts with an average of 15,000–30,000 students; the cost of the system often precludes smaller districts from purchasing it. A typical contract is renewable and lasts for three years. In the Northeast and Islands Region New York City, Rhode Island, Vermont, and at least one district in Connecticut are clients of TetraData.

APPENDIX F
SERVICE PROVIDER PROFILES

Three service providers were selected for profiling. Providers had to meet the following criteria: work with multiple jurisdictions in the region, have been in existence for two or more years, and have offered these services for two or more years. In addition, organizations had to offer professional development in using data to inform teaching and learning, not just support on the other components. This appendix contains in-depth profiles of those three service providers—the Connecticut Regional Educational Service Centers (RESC) Alliance, Measured Progress, and Performance Pathways.

Connecticut Regional Educational Service Centers Alliance

The Connecticut Regional Educational Service Centers Alliance is a consortium of the six regional educational service centers in the state. Created under state statute, the centers come together to share common problems and solutions and determine cost-effective ways of meeting the needs of public school districts through various programs and services. The RESC Alliance works with Connecticut districts that request its services, though it has also worked in other Northeast and Islands Region states (Massachusetts and Rhode Island). Service areas offered include technology, assessment, curriculum, data warehousing, and data-driven decisionmaking, among others. The centers are funded partially by the state education department, partially by revenues from their services, and partially by federal grant money.

Overview. The Connecticut RESC Alliance was formed in 2000 after the regional educational service centers recognized the strong need for data warehousing in districts. This was before the Connecticut State Department of Education established the Connecticut Accountability for Learning Initiative (CALI), which provides professional development in data-driven decisionmaking and technical assistance to low-performing districts, among other services (see the Connecticut profile in appendix D). At the time, the centers were unsure of when the education department would begin to develop an approach to data warehousing, so they formed the Connecticut RESC Alliance and contracted a vendor to provide districts with data warehousing along with technical assistance so they could use the data to make informed education decisions.

Based on the recommendation of Victoria Bernhardt, an expert in the data-driven decisionmaking field, TetraData was contracted to provide data warehousing to districts. RESC members had worked with Bernhardt and valued her work in data-driven decisionmaking. The Connecticut data warehouse was powered by TetraData's EASE-e Data Analyzer software program.[12] In Connecticut 76 of its 169 districts have received some type of training and professional development in data warehousing.

The interviewees from the RESC Alliance emphasized that work on data-driven decisionmaking should focus on data warehousing and school improvement planning together, be a collaborative process, and involve multiple methods of collecting data.

RESC Alliance members suggested that districts should not only collect, house, and analyze their data to meet their individual needs but also do this with a focus on the development and monitoring of school improvement plans. EASTCONN, one of the regional educational centers, worked with the Hampshire Collaborative in western Massachusetts to help it develop its data warehouse and craft school improvement plans that would involve using data. One interviewee from the RESC Alliance described the importance of focusing simultaneously on both data and data use in school improvement in working with districts:

> *I went out and started working with [schools] initially just focused around data warehousing, but what I knew at that point from what we had tried to do in Connecticut was [how important it was] to really get them to focus*

> *on school improvement and not just data warehousing. I mean you can buy a data warehouse and that's fine, but if you don't think about the other side of this, which is what you're going to do with these data, and begin to develop these things down parallel roads, then you're going to build a wonderful warehouse and . . . what we found in Connecticut is that we built this great tool, but nobody knew what to do with it. And you know, for those districts in Connecticut that didn't know what to do with it, they failed.* (Interview, February 6, 2008)

The RESC Alliance also views data-driven decisionmaking as a collaborative process, as one interviewee described:

> *It's about conducting some root cause analyses so that you're getting to some of those underlying causes. I'm a firm believer that you can't get to the root cause in education because the variables are so many and so complex, but you've got to [make] . . . your best attempt at getting to some root causes. And then setting some . . . goals and developing some real, clear action plans. Strategies are fine, but the missing piece in some of this is having a real plan to implement those strategies. It's completing the loop here so that . . . we've got monitoring plans in place, we've got action plans, who is responsible, all of those kinds of things. You know, it's almost a misnomer to call it data-driven decisionmaking because you're doing more than making a decision.* (Interview, February 6, 2008)

Interviewees also noted the importance of having multiple methods of collecting data if data-driven decisionmaking is to be effective. Due to pressures to meet adequate yearly progress targets, districts and schools have made collecting and examining state assessment data from the Connecticut Academic Performance Test and the Connecticut Mastery Test a priority. The RESC Alliance recognizes that other data must also be used to make improvements and also that students should have classroom assessments to make more real-time decisions on instruction.[13] This vision for data-driven decisionmaking work is integrated with the services the RESC Alliance and CALI provide to Connecticut districts and schools.

Clients. The RESC Alliance works with any district in Connecticut that requests services and has also worked in other Northeast and Islands Region states (Massachusetts and Rhode Island). The data-driven decisionmaking training it delivers through CALI had been offered for free only to districts in corrective action, and for a fee to other districts. At the time of the interviews, the RESC Alliance was looking for funding to provide services free of charge to all interested districts.

Services. Along with technical assistance and training on understanding and using the data warehouse and the associated data analysis applications, the RESC Alliance also provides districts and schools with a continuum of services, including forming data teams and guiding school improvement planning. Customization is also available to schools or districts in, say, comprehensive data management services and assessment mapping.

RESC Alliance is involved in professional development services that are part of the Connecticut State Department of Education's CALI, which aims to advance learning for all students, particularly those from the 12 districts in corrective action. Initiated in 2004, CALI provides support to districts and schools in the following areas: data-driven decisionmaking data teams, making standards work, effective teaching strategies, common formative assessments, school climate improvement to support academic achievement, and accountability in district and school improvement planning. The professional development and technical assistance are offered to Title I districts and schools that are identified as in need of improvement. But ineligible districts and schools can participate for a fee. For those districts that choose to participate, four days per year are set aside for professional development; the technical

assistance is offered throughout the year as follow-up support.

The data-driven decisionmaking component of CALI aims to reduce achievement gaps by providing districts with professional development services and technical assistance on using data to impact pedagogy and learning and, by extension, improve student achievement. The hope is that these services will create a culture of data-driven decisionmaking in schools and districts where data teams of school administrators and teachers are examining multiple kinds of data in an ongoing format.

These services are based on the work of data-driven decisionmaking experts, including Doug Reeves (Reeves 2000, 2001), Nancy Love (Love et al. 2008; Love 2002), and Victoria Bernhardt (Bernhardt 1998). Reeves centers his approach to data-driven decisionmaking and other school improvement planning efforts (such as using effective teaching strategies and coaching) around a holistic accountability system where districts, schools, and communities are accountable for what happens within the system. The system must be collaborative and yield identifiable results based on set goals for each level of stakeholder. This process of collaboration provides a vehicle for examining data and student work that leads to changes in teacher instruction and student learning. In addition, Love and Bernhardt were the first to approach data-driven decisionmaking on a practical level, and their work focuses on providing technical assistance to schools and districts and around establishing a cycle of inquiry and data-driven decisionmaking. The trainers draw from the work of these experts to design their professional development sessions.

RESC Alliance data-driven decisionmaking training. Two of the regional educational service centers provide low-performing districts with professional development training in data-driven decisionmaking and data teams, and they have plans to deliver the common formative assessments training in the near future. The technical assistance follow-up to the professional development is also provided by the regional educational service centers—though not by the data-driven decisionmaking professional development trainers themselves—and the State Education Resource Center.

The RESC Alliance trainers were initially trained by consultants from the Leadership and Learning Center. These trainers could then train others, as well as provide on-site support, in the various modules that make up the organization's approach to school improvement. The interviewees were trained in data-driven decisionmaking and soon will be trained in common formative assessments in order to provide services in it. The individuals who provide the basic data-driven decisionmaking training have complementary backgrounds that bolster the services provided. While they are both certified to train others in data-driven decisionmaking, one has a stronger background in technical aspects of data-driven decisionmaking, including collecting, housing, and managing data; the other is stronger in school improvement.

Professional development services. The RESC Alliance delivers a two-day basic training in data-driven decisionmaking to eligible districts that are part of CALI.[14] This training gives district teams the opportunity to examine data from their own school and apply it within the context of the guided training. The basic training is a seminar for teachers and school administrators, including, for example, curriculum developers, superintendents, and principals. Participants learn how to examine their own real student data using a five-step data-driven decisionmaking process (see appendix D for an overview of this process) and how to develop and sustain this process on district- and school-level data teams composed of fellow teachers and administrators. Through this process, data teams collaboratively analyze data and identify student strengths and weaknesses. Team members devise instructional strategies that best address these areas as well as the required learning standards. These strategies must be one of the Effective Teaching Strategies identified in a

meta-analysis by Marzano, Pickering, and Pollock (2001, cited in Connecticut State Department of Education 2008). Team members are meant to implement their strategies, monitor them, and discuss them at their next meeting. A variety of actions are taken as a result of this process, including curriculum revision, program redesign, and funding redistribution.

Participants bring their own classroom- or school-level data to analyze during the trainings. Attendees bring a variety of data, including state assessment data; data on behavioral issues, such as tracking the number of classroom referrals or office referrals; and school climate survey data. The data are typically housed on paper or in a spreadsheet. No technology analysis tools are used in the training.

Technical assistance services. Technical assistance, based on particular district needs, is provided throughout the year to districts as a follow up to the professional development. Thus, it could involve doing the actual basic training described above, developing a common formative assessment, or even helping districts use spreadsheet software to examine their data. It could also involve helping districts learn how to provide differentiated instruction or examine student work.

Challenges. A main goal of CALI training is to encourage schools and districts to create a culture of educators using data frequently, with the ultimate goal of improving student achievement. However, there are challenges associated with getting data-driven decisionmaking practices institutionalized in schools and districts in the state. The first challenge needing attention is teacher resistance to change. As an interviewee from the RESC Alliance commented:

> *You continue to send a constant message, and at some point either the change starts to occur and they are still in the place they were in, or they start to internalize some of the message and make it their own. So that would be the first obstacle.* (Interview, February 6, 2008)

Furthermore, this is layered with the problem of districts making quick fixes to meet adequate yearly progress and ignoring the need for systemic change. Another interviewee stated:

> *Everybody is so "deer in the headlights" because of [adequate yearly progress]. I mean, it is hard to institutionalize anything because they are all about quick fixes. They are about safe harbor, which . . . gets you out of the newspaper, but that does not fix the problem. . . . You still have most of your kids not making [adequate yearly progress], but you made safe harbor. It's like, "Wait a minute . . . there's still something wrong with this picture here."* (Interview, February 6, 2008)

Another challenge is the lack of time in a typical school day to conduct such practices as data team meetings. In addition, there are often not enough individuals in the district or school who have the ability and time to keep the data-driven decisionmaking work on track throughout the year. But one of the biggest challenges noted by interviewees from the RESC Alliance was the lack of a clear vision for data-driven decisionmaking in districts. This is because, as one interviewee noted, "Without that shared vision, people don't know what it is they are trying to institutionalize." He also suggested that leadership is ultimately responsible for creating a vision of data-driven decisionmaking in a district or school and making sure that it is shared among administrators and teachers. A shared vision is often not institutionalized due to poor leadership, and sometimes teacher turnover. If there is an institutionalized vision in a particular district and a new leader comes in with a completely different idea of data-driven decisionmaking and how it should be implemented, a "flavor of the month" trend can result, preventing the district from making continuing progress in data-driven decisionmaking. One interviewee suggested that when districts are interviewing for a new superintendent or principal, they should explain to him or her that a culture already exists and encourage that person to embrace it and carry it forward. However, there often is not a culture in

place, so it is also important to ensure that a new leader has the motivation and ability to create a vision and make sure it is shared by all. Finally, while districts have the infrastructure for adequate yearly progress reporting purposes, they have not created the classroom and formative assessments that are needed to collect additional data beyond demographic and state assessment data.

Despite the challenges associated with institutionalizing a culture of data-driven decisionmaking in districts and schools in Connecticut, the RESC Alliance interviewees cite their success at the school level in raising awareness of the need for data to inform education decisions.

Additional resources. These include:

- Connecticut RESC Alliance web site at http://ctrescalliance.org.
- Connecticut Accountability for Learning Initiative web site at www.sde.ct.gov/sde/cwp/view.asp?a=2618andQ=321754.

Measured Progress

Measured Progress is a nonprofit company that provides large-scale and alternative assessments and professional development in using data to improve student achievement. Founded in 1983 as Advanced Systems in Measurement and Evaluation, Inc., the company has worked with more than 35 states and major districts to develop large-scale and alternative assessment programs. Headquartered in Dover, New Hampshire, Measured Progress also has facilities in Colorado, Kentucky, and New York, with more than 400 full-time employees.

Although the company has grown dramatically over the past 25 years, it remains focused on its original commitment to students and teaching and learning. Still leading the company, one of its cofounders began his career as an elementary school teacher; in fact, most senior staff members are former teachers who bring a wealth of experience in education and in supporting schools with Measured Progress. For example, the vice-president of client services is the former director of the Maine Educational Assessment testing program, and before that he was a classroom teacher and principal. As an employee of the state education agency in Maine, he worked closely with Measured Progress (then Advanced Systems) to develop and administer the assessment and was the original provider of the test interpretation workshops in Maine. In an interview he speculated that he has probably conducted test interpretation workshops as long as anyone in the field. Given its staff's rich backgrounds in the field, Measured Progress is particularly qualified to support local educators in implementing data-driven decisionmaking.

Overview. According to the company web site, Measured Progress embraces the motto, "It's all about student learning. Period." This was reiterated by senior staff and was evident in their descriptions of their work. One senior staff member commented on the problem of "data overload" in schools that does not lead to improved student learning, saying, "There's way too much data out there and way too little information."

The company's mission is to improve teaching and learning by providing assessment data that is customized to the needs of schools and then helping educators use data to improve student achievement. The company web site describes Measured Progress as striving to provide services for educators that meet the following characteristics:

- *Relevant.* Assessment is not an end in itself; its purpose is to foster student growth.
- *Personal.* Shared goals, values, and passions enable us to forge lasting relationships.
- *Focused.* You and your students are at the heart of our mission.
- *Reliable.* You know you can count on us to do what it takes to get the job done right.

- *Tailored.* Customization is part of who we are; we specialize in solutions that fit.

- *Student driven.* It *is* all about student learning!

Through its professional development, Measured Progress focuses on helping districts and schools develop several factors common to high-achieving schools, including a standards-based learning environment, teachers and administrators who understand assessments, effective use of a variety of strategies to gather information about student learning, adjustments and interventions during the learning process, professional learning communities, collaborative teams that examine all aspects of student work to determine program effectiveness, and the use of multiple data sources to plan for improvement. The ultimate goal is to help teachers use data to help students. In the words of another employee, quoted on Measured Progress' web site: "The intention of the company is, always has been, and always will be to impact how well teachers can help students to learn. It's why we exist."

This sentiment was echoed in interviews with two senior staff. Both spoke passionately about how their goal was to support teachers and students. One noted his strong distaste for one-shot professional development workshops that fail to build relationships with educators or to serve as a guide and consultant as educators deepen their understanding of how evidence can shape classroom practice.

Clients. Measured Progress serves districts and states around the country, developing and administering state assessments for 13 states (table F1). These statewide assessment contracts generally include professional development on administering the assessment and understanding and using assessment data; this is included in the state's contract and provided to educators in all districts and schools in the state. Measured Progress also has professional development contracts with 3 states and with individual districts in 12 states.

In the Northeast and Islands Region it serves seven states in various capacities. It has worked with Maine to develop and administer the Maine Educational Assessment since the test's inception in 1985. It also developed the Massachusetts Comprehensive Assessment System and works with New Hampshire, Rhode Island, and Vermont to administer the New England Comprehensive Assessment Program. It produces alternative assessments for Maine, Massachusetts, New Hampshire, New York, and Rhode Island and has been administering the Massachusetts English Proficiency Assessment since 2003. And it contracts directly with districts in Maine, New Hampshire, and Vermont to provide schools and districts with professional development that focuses on creating a data-driven culture.

Services. Measured Progress primarily offers two kinds of contracts to states and districts around the country. It develops and administers large-scale

TABLE F1
Measured Progress clients, 2008

Service provided	State of district contracting for services	State contracts
Assessments		Florida, Georgia, Kentucky, Maine, Massachusetts, Missouri, Montana, Nevada, New Hampshire, New York, Rhode Island, Utah, Vermont
Professional development	Georgia, Louisiana, Kentucky, Maine, Massachusetts, Michigan, Mississippi, Montana, New Hampshire, New Jersey, South Dakota, Vermont	Louisiana, Nevada, South Dakota,

Source: Authors' compilation.

and alternative assessments to help states and districts understand their assessment reports, and it provides professional development services to improve the capacity of educators to make data-driven decisions.[15] Most of these services are provided under multiyear contracts, allowing Measured Progress to tailor its assistance to client needs. Professional development is delivered by former educators, whose experience lets them focus on the needs of schools and classrooms.

The professional development services provided by Measured Progress address relevant categories discussed in the research on data-driven decisionmaking: building assessment literacy (Price and Koretz 2005; Center for Research on Evaluation, Standards, and Student Testing 2006), developing inquiry cycles to focus data analysis (Boudett, City, and Murnane 2005; Bernhardt 1998), examining instruction (City, Kagle, and Teoh 2005; Love 2002), and improving achievement (Love et al. 2008). Measured Progress is beginning to create data analysis tools (Wayman, Stringfield, and Yakimowski 2004). The company also houses two research centers, which help it stay up to date on large-scale and alternative assessment, formative assessment, and using data to improve classroom practice. Researchers from Measured Progress regularly present at state, regional, and national conferences. Measured Progress also stays current through its National Advisory Committee, made up of education experts; its partnership with the National Middle School Association; and its memberships in the Council of Chief State School Officers and the Council of Great City Schools.

Large-scale assessments. Measured Progress develops and administers various large-scale assessments. Most are criterion-reference tests, administered to students in each grade level along with alternative assessments for students who cannot participate in the regular assessment program. Measured Progress also administers high school graduation tests for Georgia and Nevada, writing portfolios for Kentucky's comprehensive assessment system, and a test of language arts proficiency for English language learner students (the Massachusetts English Proficiency Assessment) for Massachusetts.

It works with the states to develop large-scale and alternative assessments customized to the needs of each state education agency—aligning assessment items with state content and skills standards, for instance. The company scores the tests and creates test reports for each school and district and works closely with the states to support districts and schools in interpreting the test reports.

Professional development to support assessment contracts. In conjunction with the state assessments, Measured Progress provides professional development for local educators to help them make meaningful decisions using their test data. Supports include detailed assessment reports and workshops to help educators use the data to improve classroom practice and school and district programs.

Because Measured Progress believes a well designed score report is the first step in helping educators interpret assessment data, it carefully crafts its reports to guide discussions about school improvement. Explains a senior staff member:

> *The extent to which schools can use data from assessment is driven by the professional development they receive to some extent, but it's also driven by the design of the reports. We've always tried to design reports to maximize information to schools. It's the first line [for deciding] what information you want to communicate. What do you want to be able to say based on the results of these tests? What information do you want to give schools? We focus around . . . three essential questions [How did we do? What do the data tell us about parts of our program? What do the data tell us about parts of our population (No Child Left Behind subgroups)?]. If I see three years in a row that students always do worse in geometry, then that's program evaluation in its purest sense.* (Interview, March 24, 2008)

Reports are tailored for each state education agency. There is no boilerplate test report: each report looks different, based on the needs and priorities of the state education agency. Measured Progress tries to make the reports complement and align with other initiatives in the states. They provide item-level information linked to state standards so local educators can make meaningful decisions about school programs and classroom practice within the context of their state's accountability system. In the words of one administrator from Measured Progress:

> *The design of the reports is really where it starts, I think. The linking of data on individual item results is a way of making it easier for teachers to grab hold of the data and make some sense of it. The item-level report has generated more conversation among teachers than anything we've ever produced. It gets real personal on a kid level, and it helps them to think about why students got something wrong. . . . Massachusetts releases 100 percent of [the test items] every year. Maine and NECAP [states] would if they could afford it. . . . When you can show a teacher an actual item and how all their kids performed on that item, it becomes a personal thing for the teacher and that's really good.* (Interview, March 24, 2008)

In interviews, senior staff at Measured Progress made clear their belief that Measured Progress score reports are a major contribution to helping local educators use data to make informed decisions.

Measured Progress also offers workshops on test interpretation as part of its large-scale assessment services. These workshops focus on answering three important questions through the data: How did we do? What do the data tell us about parts of our program? What do the data tell us about parts of our population (the subgroups)? As one senior staff member at Measured Progress explained:

> *It's not just about training people how to look at reports; it's about what you do with them. . . . In the workshops we try to make the data come alive. Schools bring their own reports. We walk them through each one of the reports and give them clues about where they would find data about answering . . . those [three] questions.* (Interview, March 24, 2008)

Measured Progress works with the state education agency to design and implement the workshops, which typically last half a day and are offered in various locations in the state. Workshops targeted district administrators, principals, and teachers, who not only review their own data but are also expected to share the process with others at their schools.

Until recently, these workshops were face-to-face and included little technology. As Measured Progress moves toward online test administration and score reports, workshops are beginning to integrate more technology in order to train users on the new web-based data portal.

Professional development to support data-driven decisionmaking. Measured Progress offers additional professional development, separate from its large-scale assessment contracts, to help educators use data to inform decisionmaking. These professional development contracts are primarily with individual districts. One senior staff member noted:

> *We have a variety of professional development offerings, from looking at data to looking at student work. It's all loosely connected with assessment. . . . It's more elective on the part of districts, based on their own judgment or readiness for a variety of things. All professional development is customized for their needs.* (Interview, March 24, 2008)

Measured Progress helps districts create classroom assessment tailored to individual local client needs and aligned to state standards, so students are better prepared to take the high-stakes assessment. It also offers support for creating a formative

assessment process, which the company defines as adjustments and interventions during the learning process.

These contracts are longer term, not isolated workshops. This is part of the overall philosophy of the company, which urges building a relationship with clients to better meet their needs. The director of professional development described how essential this was to him:

> *When I joined Measured Progress, it was doing a lot of workshops. I wanted to move toward longer term relationships with clients. It was a condition of joining the company.* (Interview, April 10, 2008)

Measured Progress does offer low-cost, one-day workshops, however, primarily as an enticement to establish a longer term relationship.

Challenges. Measured Progress has been busy helping state education agencies scale up their large-scale assessments in the wake of the NCLB Act. Although most state education agencies administered statewide assessments prior to 2001, they now test all students every year, beginning in grade 3. Measured Progress staff understand and respond to the pressure this puts on states:

> *Departments of education are being asked to do exponentially more with fewer resources. Prior to NCLB, most states tested at three grade levels. Overnight, they had to more than double the number of kids they were testing. And in most cases [education departments] were doing it with the same and even reduced staff. And they were also trying to implement data warehouses. It's insane what we ask state employees to do.* (Interview, March 24, 2008)

Measured Progress has expanded to accommodate the needs of clients and to remain relevant in this new world of assessment. Senior staff point to a new challenge facing educators: they often have more data than they can use. Staffers also argue that in systems where data use is prevalent the biggest danger is in "overanalysis"—drawing conclusions that the data do not warrant. Measured Progress works on two levels to counteract both data overload and its possible misuse. First, it designs both score reports and professional development to make data as comprehensible and straightforward as possible, with a focus on the three essential questions listed above. Second, it designs assessments to lessen the possibility of users drawing erroneous conclusions by making sure that there are a sufficient number of questions in each subcategory. Finally, it works with state education agency officials and teachers in each state to ensure that questions are tied both to state standards and classroom curriculum.

It has also been a challenge to work with state education agencies to create data systems that comply with federal reporting requirements but also provide data that is meaningful for improving school programs. If the state education agency's data are not meaningful, it is difficult for the contractor to provide meaningful score reports and professional development on using that data:

> *The big [challenge] is the robustness of the [state education agency's] data warehouse. Basically, if you put garbage in, you get garbage out. . . . So that's certainly a huge challenge.* (Interview, March 24, 2008)

Both an assessment developer and a professional development provider, Measured Progress is uniquely situated to help state education agencies create data systems useful to educators and to guide data use to shape instruction and school programs.

Next steps. For a quarter of a century, Measured Progress has created customized products and services for its clients. In the twenty-first century this has evolved into administering assessments online, providing online data tools to facilitate using data at the school level, and supporting the external accountability systems that did not exist at its founding in 1983. Measured Progress has

adapted with the times but has faced challenges in meeting the needs of clients and staying current with the changing environment.

In recent years a shift toward online testing and reporting has presented many challenges for Measured Progress. Many of these are related to technology infrastructure and limited bandwidth to access the web-based tools. One challenge associated with online reporting, noted by respondents at the Maine Department of Education and by workshop participants, was finding a venue for the training that was geographically convenient for local educators but also had the capacity to give all participants access to the online reporting tools. Measured Progress will work with the education department to find a venue that supports hands-on computer-based training in using the tool. Similar logistical concerns may arise with other states as Measured Progress expands its online portal and moves from its pilot sites to general use. Another issue cited by users is the length of time it has taken to roll out the online tools to a point where they are operating at full capacity. This time lag reflects the "growing pains" of working toward more high-tech products for a company that has historically been more concerned with psychometrics and professional development.

Performance Pathways

Performance Pathways is a for-profit technology company focused on bringing a data-driven culture to educators in schools. The company uses a suite of three products to achieve this: Performance Tracker, Assessment Builder, and the TechPaths Curriculum Mapping System. Founded in 2005, Performance Pathways is the result of a merger of two companies, AlterNet Performance and TechPaths Company.

Overview. Founded in 2002 by Jeff Colosimo, the current president and chief executive officer of Performance Pathways, AlterNet Performance was a technology company dedicated to developing software solutions and services to manage assessment information. Its products included Performance Tracker and Assessment Builder. TechPaths Company was started in 1998 by Dr. Bena Kallick, current vice-president for professional and staff development at Performance Pathways, and contained the TechPaths Curriculum Mapping System. The merger of the two companies helped complete their mission to create a data-informed culture. One employee describes how the merger was almost inevitable and necessary for work in using data with educators:

> *There are commercials advertising Reese's Peanut Butter Cups [that ask], "Who got peanut butter in my chocolate and who put chocolate in my peanut butter?" That is kind of how this company is. At this point, it is almost impossible to separate, curriculum mapping and curriculum data from assessment data—kind of like the peanut butter cup. . . . It just became so evident that data and data-informed decisions are not just an assessment: that if you don't link that assessment information to curricular and teaching information, then you are really only getting half the picture. . . . We have too much peanut butter or too much chocolate [when] we really need to have the chocolate/peanut butter.* (Interview, April 4, 2008)

Performance Pathways uses its three software products to help teachers create a culture of data-driven inquiry in their schools. The products facilitate both analyzing assessment data and mapping curriculum, both essential to improving classroom practice.

Clients. The Performance Pathways suite of products is available to educators through statewide and district contracts. Through these different types of contracts, Performance Pathways serves more than 55,000 teachers from 500 schools and districts in 47 states. In the Northeast and Islands Region New Hampshire had a statewide contract with Performance Pathways at the time of the study. The state initially purchased Performance Tracker for use by all districts and recently chose to also offer Assessment Builder to districts ready

to begin work in this area. Some districts in New Hampshire have already purchased TechPaths for use in their curriculum mapping as well. In addition to New Hampshire, Performance Pathways contracts with districts in Connecticut, Massachusetts, New York, and Rhode Island on an individual or group basis.

Once a state has purchased the software products, all districts in the state have access to them. States using Performance Tracker are responsible (with the help of Performance Pathways) for uploading all their chosen data for users to access. In addition to providing the software for districts to use, states can also choose to purchase professional development services for the districts. If a state chooses not to purchase the full array of professional development services provided by Performance Pathways, districts can purchase additional services at a reduced price.

Districts can contract directly with Performance Pathways either by choosing to add additional products and professional development that are not offered by their state to use in conjunction with the products already purchased by the state or in states with no statewide contract by working directly with Performance Pathways to purchase and use the software products. The services provided to districts are the same as those provided to the states that purchase Performance Tracker; Performance Pathways loads the data into the system and maintains the data that the district has provided.

Services. Performance Pathways uses a suite of data tools and professional development services, which comprises Performance Tracker, Assessment Builder, and TechPaths. Performance Tracker houses different types of data and allows users to generate reports based on the available data. Assessment Builder allows users to build their own assessments with the assistance of a content library and easy references to state and district standards. Through the TechPaths software, users access advanced tools to develop a sophisticated curriculum map. The work is tailored to meet the needs of each client.

Data tools. Performance Pathways' three main products—Performance Tracker, Assessment Builder, and TechPaths—can be used individually, but they are also designed to be used together.

Performance Tracker is designed as an easy-to-use tool that can help schools collect and access data and meet accountability requirements. It is web based, so data can be quickly accessed and viewed in different formats (tables and graphs); it also produces performance-based reports. All the assessment data are correlated to state standards, and actual assessments can be added to the system and accessed through the software.

The second product, Assessment Builder, allows schools to create assessments based on state and district standards. The system allows users access to the current available state assessments, as well as previous assessments. Once the assessments are created, accompanying information details which standards are addressed in the test and which questions correspond with the standard. Beginning in summer 2008, a new component to Assessment Builder was introduced: OLA produces online assessments that allow teachers to immediately review the results. Accompanying the assessments are answer sheets that can be scanned into the system to produce item-analysis reports. When attached to Performance Tracker, the results can be uploaded into the system, compared with other assessments, and used to generate reports.

The third product, TechPaths, is a curriculum-mapping system that is based on the work of Heidi Hayes Jacobs (1989, 1997, 2004). It is designed to link curriculum and assessment data. TechPaths can be linked to both Performance Tracker and Assessment Builder to access assessments and their data. In addition, state standards are downloaded so users can align their curriculum with the standards. And they can reference the standards to evaluate how and when a particular standard is addressed in the curriculum.

The development of these products and the accompanying professional development services

is guided by the work of experts in the field. The work with curriculum mapping is based on the work of Heidi Hayes Jacobs (Jacobs 1989, 1997, 2004), Bena Kallick (Kallick and Costa 1995; Kallick and Wilson 2001; Kallick and Colosimo 2009), Grant Wiggins (Wiggins 1998), and Jay McTighe. The work of Wiggins and McTighe (Wiggins and McTighe 2005; McTighe and Wiggins 1999, 2004), along with that of Rick Stiggins (Stiggins et al. 2004; Chappuis et al. 2004), also influenced the assessment work.

Training. The suite of Performance Pathways products is accompanied by levels of professional development. These services are a key component of the work, as one staff member there explained:

> *Each of the tools, Tracker and TechPaths and Assessment Builder, in and of itself is simply a product. . . . Through training provided [we work] around how [to] get your staff together to actually use this as a tool. . . . What conversations do you have? What protocols do you use to begin to examine the data? . . . Then it really isn't just about, "Can you use the software?" It is far more about: "What do you do once you know how to use the software?"* (Interview, April 3, 2008)

In working toward this goal, the company offers two levels of training focused on creating a data-informed culture: introductory and advanced. The introductory training is technology-based, with a focus on how to use the software, what the software has to offer, and how to generate reports. The advanced training sessions, which make up the majority of the training sessions, are the next steps. These training sessions teach users how to work with the data and with the reports generated by the software. This training is designed to help administrators work with teachers to determine the best use of the available information: What types of conversations should teachers and administrators be having, and how should they use the information in order to go back and enhance their work with students? Additional skills developed during the training focus on linking curriculum and assessment data. The underlying goal of all the training is to focus on what improvements can be made for students.

The introductory and advanced training sessions are usually two-day workshops. Once a contract is established with Performance Pathways, the introductory training can be set up as in as little as one or two months. Once users are familiar with the software, they move on to the advanced training. The advanced training is continually administered as user needs and understanding of the product change. Districts can decide in conjunction with project managers how to space the training, how to introduce the products, and when to offer more advanced training. Although there is no minimum length, most contracts with Performance Pathways are for at least a year, to allow schools to look at a year's worth of data. Contracts are renewable and often run from one to three years.

District employees receive a first round of training, either introductory or advanced, from trainers from Performance Pathways. Once they are familiar with the products, they are trained again by Performance Pathways on how to train others in their districts to use the products. After this second round trainees continue to receive ongoing support from trainers from Performance Pathways. In states with statewide contracts individuals at larger regional service centers or professional development centers are trained to in turn train teachers and other educators in the districts, to reach a larger audience.

The training occurs almost exclusively with users accessing an individual computer loaded with the applicable software. This hands-on manner is very important, as the products are software based and require familiarity with all the tools, as one senior staff member explained:

> *[Performance Pathways is] a software company, so we really have to be in front of a computer. . . . The [introductory] training [requires] one user per computer. Everyone has to be hands-on; everyone has to get a feel*

> *for manipulating [the software] and getting a sense of how it works.* (Interview, April 3, 2008)

There are times when training takes place in a workshop format, with participants not on individual computers (such as during an advanced training session that is more content based, though this is not common), and in user conferences.

In addition to professional development on product use, in those states with statewide contracts, Performance Pathways also provides a user conference. This conference pulls together educators in the state who are working with the software products and allows them to learn more about the software as well as other products and how they work in conjunction with each other. One staff member described how sometimes districts are asked to come to a conference in teams of two or three people "because that is really critical. You need that collegiality and that shared experience" (interview, April 3, 2008).

A New Hampshire user conference for state and district administrators focused on Performance Tracker, as it was the first product purchased by the state. The conference began with information from New Hampshire Department of Education personnel, including the commissioner of education. The president and vice-president of Performance Pathways then gave a presentation on Performance Tracker and the overall work of the company in the area of data-driven decisionmaking. Performance Pathways' director of technology then presented information on upcoming changes to the software and other products. The remainder of the program took place in a variety of breakout sessions. These sessions were staffed by trainers and other employees of Performance Pathways and in some cases included individuals from districts in New Hampshire that have been using Performance Tracker. The sessions covered the basics of the software products, with information about each of the three software products. This included both introductory information for new users and more advanced information for those already familiar with the products. Other sessions focused on the culture of data-driven decisionmaking by looking at using data and establishing professional learning communities focused on using data. Districts with longer histories with the products presented their perspectives and experiences.

Product support. The products come with several layers of help and support. Each contract has a project manager who checks in with districts and states to find out how things are working and what additional training would best serve the needs of the district. The project manager notes areas of weakness or concern identified by the staff in order to best tailor the training to their needs. In addition, the project manager can monitor how often the software is being used. If the software is underused, he or she will talk with the district to try to understand the reasons for this and determine how they can best help make use of the product.

In addition to district-level support related to the overall use of the product, there are several other sources of support for users. For basic-level questions, such as difficulties logging on or entering information, a toll free number is available 24 hours a day, 7 days a week. In addition, each product comes with an online manual, and every screen has a "help" screen function as well as icons that direct users to help documents. And district or state administrators have access to the trainers and can email or call them directly with questions or concerns.

Challenges. Through their work inside districts, Performance Pathways employees have seen a shift in how teachers perceive assessment data: "It seems . . . [that] as a nation, we are going from educators who thought that the assessment information was really done for someone else to a nation of educators who believe that the assessments are truly for them" (interview, April 3, 2008).

Interviewees at Performance Pathways noted that they were receiving less resistance in schools but

were still encountering some initial resistance from teachers who see the software as overwhelming, requiring a lot of work through the training and collaborative planning. But once trained, teachers report being very happy, now able to run the reports with a few clicks rather than putting together a report using paper and pencil. One challenge Performance Pathways continues to face, though it is decreasing, is an inadequate level of technological experience by staff members: as the technology experience level increases, the software becomes easier to use and understand.

Next steps. As a company focused on using data to inform its decisions, Performance Pathways regularly collects data to evaluate its own work. In addition to data compiled from evaluations of its training program, frequent discussions with education leaders identify what is working and what is not and provide information on school successes. This continual evaluation is accompanied by the work of project managers who monitor the use of the software and check in with districts when it is underused. As a result of such evaluation, the company regularly makes both minor and large-scale changes to its products. Minor releases occur based on user comments. Larger changes to the software occur every six months to a year and require retraining staff. Performance Pathways informs clients of changes through release notes that outline the new features and provide a tutorial on them. Larger districts might also receive a web seminar on the changes in addition to the release notes.

NOTES

The research team for this project consists of employees of prime contractor, Education Development Center, Inc., of Newton, Massachusetts, and employees of its subcontractor, Learning Innovations at WestEd of Woburn, Massachusetts. No members of the research team at either organization or any of their colleagues in their research centers (Learning Innovations, Regional Educational Laboratory Northeast and Islands, or the Center for Children and Technology) have financial interests in any of the service providers discussed in this report, nor did they provide any support to the state education agencies in developing or evaluating their data-driven decisionmaking initiatives. The authors are not aware of any colleagues who might have financial interests in the organizations discussed in this report.

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1. Maine has given state assessments for a quarter of a century, but before the NCLB Act tests were not administered to each grade every year. In addition, in the 1990s and the early 2000s the state accountability system included local performance assessments, but in 2007, after about a decade of development, the requirement that each district create a performance assessment was abandoned.

2. The New England Common Assessment Program is the result of collaboration by New Hampshire, Rhode Island, and Vermont. This common assessment has been given in the three states since 2005.

3. Under the NCLB Act a Title I school that fails to make adequate yearly progress for two consecutive years, as measured against its annual measurable objective, is identified as in need of improvement.

4. Principal learning communities bring together principals of schools failing to make adequate yearly progress to share perspectives and reflect on school improvement efforts.

5. The Rhode Island Department of Elementary and Secondary Education created the School Accountability for Learning and Teaching (SALT) survey and process in 1998. The SALT process is a school-centered cycle of inquiry designed to improve school and student performance in the Rhode Island public schools. The survey is administered by the Center for Social Policy and Education at the University of Rhode Island. The university provides reports for every school in the state and offers materials and technical assistance to help schools use the survey data to improve student achievement. (For information about the SALT survey see www.ride.ri.gov/PSI/salt/default.aspx. To learn more about the services available through the University of Rhode Island, see www.ncpe.uri.edu/research/matrix-instruction.asp or www.nksd.net/SALT/2008/overview.pdf.)

6. See www.leadandlearn.com.

7. Each of these components is based on the work of nationally known researchers in education, including Dr. Douglas Reeves, Dr. Michael Schmoker, Dr. Robert Marzano, Dr. Richard Elmore, and Dr. John Simpson (cited in Connecticut Department of Education 2008).

8. Instructional strategies selected by the data teams must be one of the effective teaching strategies identified in a meta-analysis by Marzano, Pickering, and Pollock (2001, cited in Connecticut Department of Education, 2008).

9. Reading First is a grant-funded program held by several of the states in the Northeast and Islands Region: "Through Reading First, states and districts receive support to apply

scientifically based reading research—and the proven instructional and assessment tools consistent with this research—to ensure that all children learn to read well by the end of third grade" (Reading First 2008, p.1). This is another area in which data-driven decision-making is used in New York State. More specifically, part of the Reading First program involves teachers using a variety of assessments that identify students at risk of reading difficulty, diagnose their specific weaknesses, and monitor their progress over time. Information obtained through assessments is used formatively throughout the teaching and learning process.

10. New York City has recently developed its own data system called the Achievement Reporting and Innovation System. It is a web-based data management system that collects and analyzes information about student academic performance to help educators and parents make decisions that improve the academic performance of New York City students and schools. See http://schools.nyc.gov/Accountability/SchoolReports/ARIS/default.htm for further information.

11. On April 15, 2008, LaVerne Terry was confirmed as the Commissioner of Education for the Virgin Islands.

12. Due to district lack of funding and capacity, the data warehouse and the relationship with TetraData ended June 30, 2008. At the time of the study, the alliance was researching new vendors to provide data warehousing to districts and was building local databases for districts to meet their needs in the meantime.

13. Although collecting data from common formative assessments has occurred in some districts for years, it has never been a statewide initiative. At the time of the study, Connecticut was piloting a statewide online formative assessment tool.

14. A three-day certification training, the second kind of training offered by CALI, is delivered by the Leadership and Learning Center, and is intended for educators who plan to facilitate ongoing professional development at their schools, with the goal of creating a schoolwide culture of data use.

15. Given the timing of this research and the professional development schedule of Measured Progress, the researchers were unable to observe any sessions offered by the company. Because the New England Common Assessment Program is administered in the fall and the goal is to facilitate school and district use of the test reports to guide program improvement, all test interpretation workshops were completed by the time of this study. In Maine the test interpretation workshops are offered at the beginning of the school year, before the research team had identified service providers. To compensate for this, researchers interviewed the staff at Measured Progress and the Maine Department of Education who provided the training, spoke with a workshop participant, and reviewed materials used to guide the training.

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