

**PRISMS Project: Promoting Rural Improvement in Secondary Math and Science
 Absolute Priorities 1 and 2: Teacher Quality Partnership Grant
 CFDA #84-336**

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The PRISMS Project – TQP Grant CFDA #84-336

Competitive Preference Priority #1: Promoting Science, Technology, Engineering, and Mathematics (STEM)

A primary goal of the PRISMS Project is to increase the availability of well-prepared, highly effective and diverse teachers interested in teaching in rural schools particularly in the high-demand, shortage areas of STEM. The Next Generation Mathematics Teachers (NGMT) pre-baccalaureate program will create a new category of math teachers for the region who are specifically and thoroughly prepared through course work and clinical experience to meet both the demands of the CCSS-Math and the specific needs of middle grades (7-9) students, including ELLs and those with special needs. Prospective teachers will be strategically recruited from underrepresented groups, well supported academically and socio-emotionally, and have opportunities for scholarship support through Noyce Scholars, the MSSTI Program and the Teacher Recruitment Project. Most candidates for the Residency in Secondary Education (RiSE) Program will complete four-year bachelor's degrees in math or sciences that are specifically designed to develop deep knowledge of content and pedagogy aligned to the new standards, with field experiences, hands-on laboratory experiences, and opportunities for undergraduate research. High quality preparation in content and pedagogy will continue in the credential program with content-specific pedagogy courses closely tied to residency or teaching practicums in which candidates will learn to facilitate student inquiry, make multi-disciplinary connections, foster curiosity and provide hands-on experiential learning related to real-world problems (MiddleWeb, 2013). Course work in NGMT and RiSE will be augmented by professional development opportunities provided by the project.

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Competitive Preference Priority #2: Implementing Internationally Benchmarked College- and Career-Ready Elementary and Secondary Academic Standards

Beginning in their undergraduate subject matter programs, prospective teachers will learn about the Common Core or Next Generation Standards and see the integration of those standards into subject-specific pedagogy modeled in their courses. The strong focus on the standards will continue in the NGMT and RiSE program teacher preparation coursework where candidates will be required to address the content and ELD standards in their instructional planning and demonstrate effective strategies relevant to the standards in their field-based teaching. Training provided at CSU system regional workshops and funded by the Bechtel and Irvine Foundations will support subject matter and SOE faculty in revising program courses to reflect the new standards. To ensure that clinical experiences align to the new standards, faculty in the partner districts will also engage in a variety of professional development and networking activities.

Support for implementing the standards will be provided by faculty experts and professional development activities of the Northern California Writing Project, the Chico Math Project, the California Science Project – Inland Northern California, the Center for the Advancement of Reading and the Glenn and Tehama County Offices of Education. Additionally, teacher candidates and faculty will have access to a wealth of resources and strategies for implementing CCSS and NGSS through MERLOT.

Evaluation of the effectiveness of these efforts will be conducted annually and also supported by funding from the Bechtel and Irvine Foundations.

CFDA# 84.336S - The PRISMS Project: Promoting Rural Improvement in Secondary Mathematics and Science (Absolute Priorities 1 and 2) (Competitive Preferences 1 and 2)

Project Overview California State University, Chico is committed to preparing highly effective teachers in high demand content areas to meet the needs of all students in Northern California rural schools. The PRISMS Project: *Promoting Rural Improvement in Secondary Mathematics and Science* represents a major commitment by all partners to a comprehensive reform initiative aimed at significantly improving the preparation and retention of secondary STEM, English and special education teachers and enabling those teachers to effectively support improvement and equity in student academic performance in rural schools. The Project will address two priorities: (1) the development of Next Generation Math Teachers (NGMT), a blended pre-baccalaureate program (Absolute Priority 1) leading to a bachelor of arts degree in mathematics and a foundational level mathematics credential; and (2) the creation of RiSE: Residency in Secondary Education (Absolute Priority 2), an 18-month, post-baccalaureate master's and credential program for prospective secondary math, science, English and special education teachers with an intensive one-year teacher residency.

NGMT and RiSE programs aim to provide candidates with the knowledge and skills to overcome patterns of low academic achievement in STEM and language arts, particularly among underrepresented students and those with linguistic, disability and socioeconomic challenges. To achieve this goal, the PRISMS Project will significantly increase new teachers' content and pedagogical content knowledge related primarily to STEM disciplines and special education (Competitive Preference #1) and supporting the implementation of the internationally benchmarked, college- and career-ready secondary academic standards contained in the Common Core State Standards (CCSS) and the Next Generation Science Standards (NGSS) (Competitive Preference #2).

(a) SIGNIFICANCE:

(a.1) Significance: Needs Assessment. This Project focuses on meeting the needs of low-income, high-need schools in northern California's vast 38,000 square-mile rural region. According to the National Center for Education Statistics 2011-12 survey, approximately one-third of public elementary and secondary schools nationwide are located in rural communities, and, in some states, the majority of public school students attend rural schools (Keaton, 2013). Rural schools face a variety of special challenges. For rural teachers, those challenges may include isolation; low salaries; multiple teaching assignments; inadequate resources and training to support underserved students, students with special needs and English learners; limited access to professional development opportunities; and lack of familiarity with rural schools and communities (Barley, 2009, Abel & Sewell, 1999). For rural students, the challenges may include home- and school-based challenges of poverty; marginalization because of race, ethnicity, language, and/or disability; low academic expectations, lack of access to advanced or AP coursework, low self-concept, poor motivation and limited aspirations (Bouck, 2004; Hardre, 2012).

Partner needs/eligibility. Two of our partner districts are eligible for the Rural Low-Income Schools (RLIS) Program, and one qualifies for the Small Rural Schools Achievement (SRSA) Program. The student populations of the partner schools range from 59% to 81% qualifying for the Free and Reduced School Lunch Program, and show higher levels of diversity than is typical for rural schools in the northern California region. The diverse student subgroups of partner LEAs show within-school performance gaps on the California STAR Test (CST) in language arts and mathematics. On average, minority students, English Language learners (ELLs) and students with disabilities in the partner LEAs scored below the California average for these same student

categories. Because our partner districts and schools have very limited hiring per year, we have looked at the issue of teacher need at the county level. Information from the California Commission on Teacher Credentialing (CCTC) 2012-13 Teacher Supply Report indicates that both Glenn and Tehama Counties have in excess of 1.4% of teachers with emergency, provisional or temporary certification or licensure. Data on poverty, teacher need, student demographics and academic achievement for the partner districts and counties, can be found in Appendix A.

The partner district superintendents have articulated three specific challenges in hiring and supporting excellence in new teachers: (1) small applicant pools that may not represent the most excellent teachers, particularly in high demand areas; (2) the need for teachers specialized in foundational level math for grades 7-9; and (3) the lack of resources to provide adequate professional development for faculty to effectively implement the CCSS and NGSS.

(Superintendent memos are included in Appendix A)

(2)(i) Building local capacity The pre-baccalaureate Next Generation Math Teachers (NGMT) Program is specifically designed to provide our partners with a new type of teacher they need for departmentalized middle schools or self-contained classrooms who are well prepared in content, concepts, pedagogy and clinical experience to support middle school level students' math achievement.

In addition, through a variety of PRISMS-supported professional development opportunities, expansion of school-based professional learning communities and regional networks, collaboration with residents and engagement in inquiry and research activities, partner LEAs will build local capacity to enhance their in-service teachers' knowledge and skills in implementing CCSS and NGSS, integrating content literacy and instructional applications of technology, and

supporting struggling students, including ELLs and those with special needs.

Enhancing the excellence of teachers in our regional schools will have capacity-building benefits for the university as well by improving the quality of clinical placements available to support teacher preparation programs. Moreover, the increased quality and diversity of the regional teaching force will support greater academic achievement for all students. Minority teachers can create a sense of school belonging and community for minority children, increase their academic achievement and provide them real-life examples of future career paths (Bireda & Chait, 2011; Dee, 2004; Schmitz et al., 2012). These minority teachers can also help their colleagues to understand the needs of minority children and to engage in culturally relevant teaching. Increased teacher quality and diversity is expected to result in an increase in the number of students from underrepresented groups in the north state going to college and pursuing careers in teaching and STEM-related fields, thereby providing benefits for the university, the region and the students themselves.

(2)(ii) System change and improvement The pre-baccalaureate NGMT program and the RiSE teacher residency programs represent systemic change and improvement and will have the effect of promoting more change in subject matter and credential programs and in the partner LEAs. The NGMT program in its emphases on conceptual understandings and specific math curriculum and pedagogy appropriate to the target age group (grades 7 through 9) represents a major shift in how math faculty look at preparing teachers and acknowledges the critical role of clinical experience with school-based educators.

The program recognizes that, while not all those with a strong interest in math and in teaching will persist in pursuing a traditional BS in math, students can nevertheless engage in rigorous preparation in math and math pedagogy to provide a strong foundation for K-12

students to pursue higher levels of math and science learning in high school and beyond. Increases in entering students across races pursuing STEM majors in college have been offset by low graduation rates, especially among students of color, with half changing to non-STEM majors and half leaving without a degree earned (Hurtado et al, 2010; Chen & Soldner, 2013). The NGMT program provides a third choice that may keep more students with math interests on the STEM track.

The NGMT program will be aligned to the state Foundational Level Math (FLM) program standards and the department will apply for approval by the California Commission on Teacher Credentialing as one of only five FLM subject matter preparation (waiver) programs in the state. This program will then serve as a model for other California universities.

The previously TQP-funded Rural Teacher Residency (RTR) for elementary and special education teachers has led to significant changes in our teacher preparation programs and in our relationships with our K-12 partners. RTR led, in fact, to a small, unfunded residency pilot program in secondary schools that in turn led to the plan to develop the RiSE Program. The development of RiSE will require comprehensive re-envisioning of the Single Subject (secondary) Credential Program as a master's level program, the revising of program curriculum to address content and pedagogy for CCSS and NGSS, the reconfiguration of classes and the development of more field-based assignments to strengthen the interweaving of academic content and clinical practice, and the building of the residency experience around the co-planning/co-teaching model. Some of the changes brought about by RiSE will affect how non-RiSE candidates will be prepared as teachers as well, including curriculum changes, use of the co-teaching model within a non-residency clinical experience, the use of PACT as both a

summative assessment and a framework for promoting teacher inquiry, and the possibility of applying credential courses to the completion of a Master of Arts in Teaching.

It is also anticipated that the partner schools will be changed, as will the university's relationship with them. The departmentalization of secondary schools makes PLC work difficult, particularly in rural schools where there may be one teacher teaching pre-algebra, another teaching geometry, or one teaching earth science and another teaching biology and only one special educator on staff. This structure can preclude the possibility of best practice and assessment data sharing and make teachers feel isolated. Through PRISMS we will build online, across-district PLCs, both content-alike and general to support PLC work in a way that is relevant, effective and sustainable. Experience with RTR also indicates that the action research conducted by residents has the potential to change mentor teachers' practice and that those changes can be shared more broadly through the PLC networks that will be established.

(2)(iii) *Preparing Personnel for Shortage Areas* Our partner and regional LEAs still face the common, historical challenges of rural and small-town districts in recruiting and retaining excellent teachers, especially in shortage areas such as STEM and special education due to shrinking tax bases and resources and the inability to pay salaries comparable to urban districts (Dessof, 2010). While the shortage of teachers in STEM-related fields has been nationally recognized, the shortage of special education teachers is equally if not more acute. The need nationwide for qualified personnel to serve pupils with disabilities has grown along with the increase in the number of children with disabilities to be served. There were more than 6.1 million children being served by IDEA in 2006, about 9.1% of all school age children. And between 1997 and 2006 the number of children diagnosed with autism and ASD increased from .07% to .35% of the total population of school age children, an increase of 600% (OSEP, 2008).

Two types of districts encounter the most serious problems in hiring new teachers to address this increasing need: those in inner cities and those in isolated rural areas (Clewell & Villegas, 2001). Special education teacher shortages have been historically acute in rural communities, where districts may have only one teacher certified to teach special education who may or may not be highly qualified under the federal regulations (Ludlow et al., 2005; Rude et al, 2005; Collins et al., 2005).

A primary goal of the PRISMS Project is to increase the availability of well-prepared, highly effective and diverse teachers interested in teaching in rural schools particularly in the high-demand, shortage areas of STEM and special education. The infusion of teacher candidates strategically recruited and prepared through NGMT and RiSE into the teacher applicant pool will enhance the selectivity of partner and other high-need rural schools in the region in their hiring decisions and support greater diversity and excellence among their faculty. The plan to prepare 80 new foundational level math teachers and 100 new secondary STEM, language arts and special education teachers will meet the needs of our partner districts and increase hiring of excellent teachers across the broader region. The PRISMS Project will also contribute to the key role being played by the California State University System in preparing 15,000 elementary and 15,000 secondary teachers in STEM subjects in support of the national100Kin10 Coalition.

(b) PROJECT DESIGN:

(b.1) Project design. The PRISMS Project is designed to reform the preparation of teachers to address current needs, concerns and understandings identified through research. One current concern is the shortage of math and science teachers due to too few being produced and too many leaving the field because they feel underprepared (Beaudoin et al, 2013; Ingersoll, 2007; Sterling, 2004). It is clear that new teachers must be well prepared and in-service teachers well

supported to teach their content. This is particularly true as teachers prepare to implement the Common Core State Standards (CCSS) and the Next Generation Science Standards (NGSS). These rigorous standards for student learning will significantly impact the work of teachers in the classroom, requiring significant changes to what, how, and how much students learn, and demanding new levels of academic engagement (Porter et al, 2011). For pre-service teachers these standards will require that they learn to teach in distinctly different ways than they were taught, and for in-service teachers, in different ways than they have been taught to teach. For example, the new standards will require teachers to deepen their content knowledge in order to help students make multiple connections, to engage students in critical thinking as they master new knowledge and skills, to place greater emphasis on disciplinary literacy, and to plan instruction using emerging technologies for students to use to engage in inquiry- and model-based learning to demonstrate understanding of new ideas. (Coggshall, 2012; DeVoss et al, 2010; Faulkner, 2013; Sampson & Schleigh, 2013; MET II, 2012).

Such approaches can create new challenges for students with special needs, as well as ELLs, as they depend upon both individual and social knowledge construction and advanced literacy and academic language skills. To support ELLs and students with special needs, to implement the new instructional routines called for in the new standards, and to promote high levels of content and language learning, diagnostic and formative assessment, differentiating instruction, scaffolding, and the ability to use a variety of teaching approaches will be essential (Kinsella, 2012; Coleman & Goldenburg, 2012).

Teachers prefer professional development that relates directly to the specific grade level and courses they teach, that is relevant and useful, and that can be put into practice in their classrooms (Chval et al, 2008; Beaudoin et al, 2013). This support should also move from a

model of professional development, in which teachers participate in activities to obtain knowledge, skills, and qualifications, to a model of professional learning, in which educators engage in cycles of continuous improvement guided by the use of data and active inquiry around authentic problems and instructional practices (Coggshall, 2012; Darling-Hammond et al, 2009; Desimone et al., 2002). This inquiry-based approach to teacher development prepares teachers to learn through teaching, to integrate multiple perspectives into instruction and to support students in conducting their own inquiry (Darling-Hammond, 2000). In addition, a study by Capraro, Capraro and Helfeldt (2010) found that participating in an inquiry-based field experience model that included classroom action research significantly increased candidates' self perceptions of their professional competence as compared to candidates in other models.

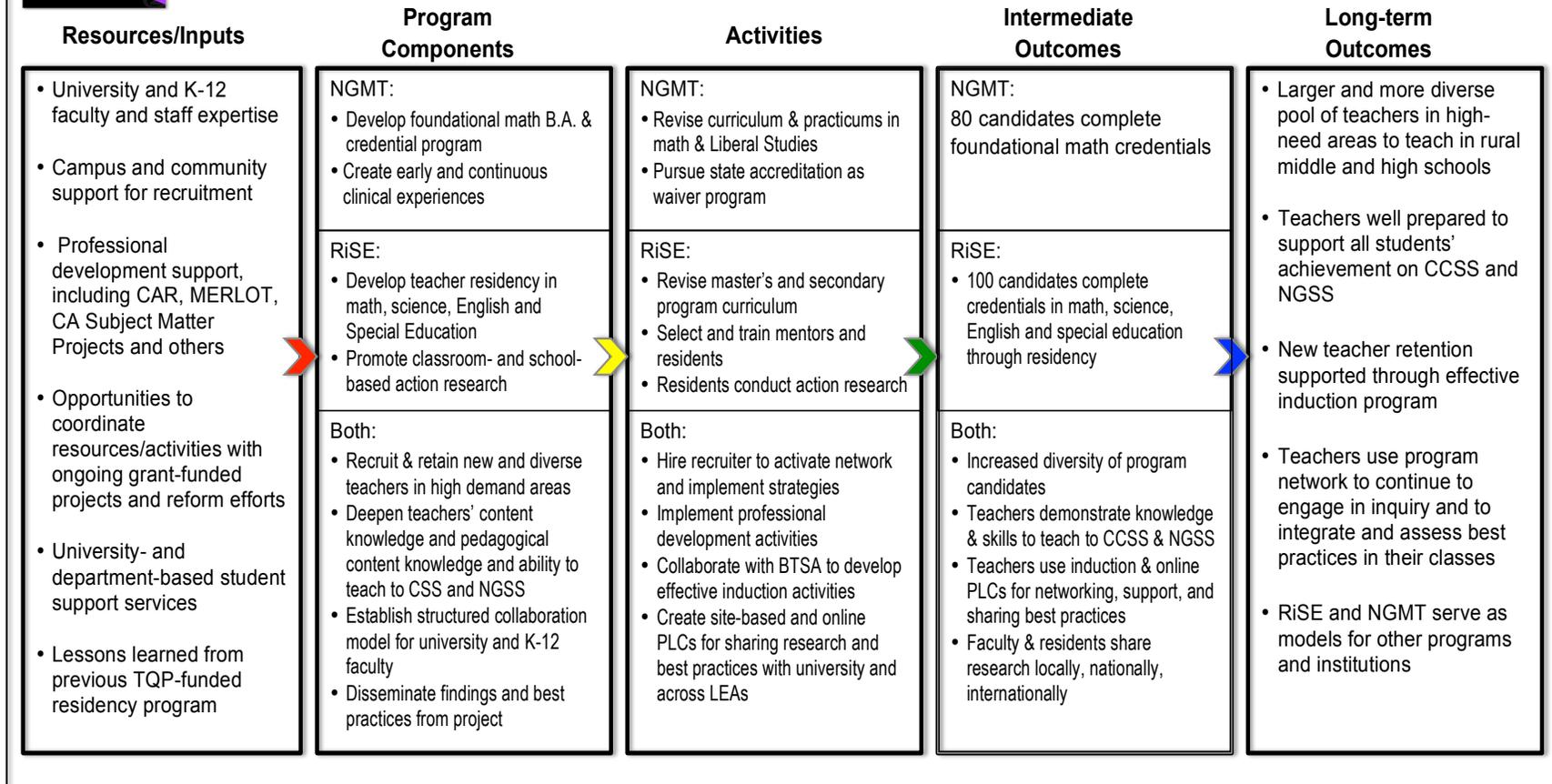
The PRISMS Project is designed around innovative approaches to addressing each of these issues: teacher shortages in high demand fields, the need to support all students on new standards, and the need for quality professional development that includes professional learning and inquiry.

(b)(2)(i) Strong Theory The PRISMS Project Logic Model for the pre-baccalaureate Next Generation Math Teachers (NGMT), and Residency in Secondary Education (RISE) programs is presented on page 12. The Logic Model shows how the PRISMS Project will leverage a variety of resources and inputs to build the project components through collaborative activities with partners to achieve intermediate and long-term outcomes to address the issues described above.

(b)(2)(ii) Professional Development Activities Professional learning and development activities will focus in five areas: (1) implementing new standards, (2) literacy development, (3) integrating technology, (4) supporting English learners, and (5) meeting special student needs.



PRISMS Project Logic Model: Promoting Rural Improvement in Secondary Math & Science



(see information on professional development providers below in Appendix H.8)

Implementing new standards University, K-12 faculty and teacher candidates will be supported in the integration of the standards in their planning and teaching by university and K-12 faculty experts and professional development activities of the Northern California Writing Project, the Chico Math Project, the California Science Project – Inland Northern California, the Center for the Advancement of Reading and the Glenn and Tehama County Offices of Education.

Additionally, they will have access to a wealth of resources and strategies for implementing CCSS and NGSS through the MERLOT Teaching Commons and the CSU Digital Ambassadors. (See also response to Competitive Preference #2).

Literacy Development Because of the considerable amount of new and difficult vocabulary required for content learning in STEM classes, the need for teachers to provide literacy support, including explicit and strategic vocabulary instruction, is acute (Kennedy & Wexler, 2013). With the Common Core State Standards and the Next Generation Science Standards, students will also be exposed to a greater variety of texts and new and different kinds of digital texts and be asked to take an inquiry stance that allows them to grapple with the complexities and challenges of literacy in different disciplines (DeVoss et al, 2010). Through coursework in second language acquisition, literacy development and pedagogy, candidates will develop knowledge and skills to support student literacy. Further literacy training for pre-service and in-service teachers will be grounded in the work of the Center for the Advancement of Reading (CAR) and the Northern California Writing Project (NCWP). At the university, CAR will work with teams of subject area and teacher preparation faculty to ensure a strong focus on literacy and extensive modeling of literacy development across disciplines in both coursework and clinical experiences. In addition, CAR and NCWP will provide workshops and on-site coaching for candidates, university faculty,

K-12 teachers, and field supervisors. Training will focus on the diagnostic and formative assessment of reading ability and the development of skills in content-specific reading, academic language and oral and written communication to support student achievement relevant to CCSS and NGSS. Implications for English Learners and struggling readers will be addressed in depth.

Integrating Technology Technology is central to the CCSS and NGSS, so candidates in PRISMS programs will see technology integration modeled in their coursework and in the field and learn to use technology by learning through technology. Teacher candidates will become “co-learners with their students and colleagues” to develop “the skills of digital age professionals” (ISTE, 2014, para 2), plan instruction that makes use of emerging technologies and digital texts to promote student engagement and inquiry for CCSS and NGSS, and use current technology applications for teaching and learning in their classes and at their schools, including assistive technology. Additionally, they and their mentors will use online PLCs through MERLOT Teaching Commons to network with content-alike colleagues across districts and to develop a library of evidence-based practices. Support for technology integration will be provided by university and K-12 experts and the MERLOT Digital Ambassadors.

Supporting English learners Through course work, workshops and coaching built around techniques and resources of Specially Designed Academic Instruction in English (SDAIE), Observation Protocol for Academic Literacies (OPAL), Sheltered Instruction Observation Protocol (SIOP) and lesson study, teacher candidates and university and partner K-12 faculty will be provided training focused on the knowledge and skills required by teachers to effectively make learning and achievement under the new challenges of CCSS and NGSS accessible for ELLs. Areas of focus for preparing teachers to fully meet the needs of English Learners will include culturally relevant pedagogy, academic language development, differentiating instruction,

creating language-rich classrooms, and integrating literacy skills across the curriculum.

Meeting special student needs With professional development and resource support from CSU Chico special education faculty, Glenn and Tehama County Special Education Local Plan Areas (SELPAs), the IRIS Center, and Autism Internet Modules, both general and special education candidates and in-service teachers will develop knowledge and skills required by teachers to work effectively with students with disabilities to meet the challenges of the CCSS and NGSS, including literacy development and learning strategies, behavior management, differentiated instruction, use of technology, use of data and research to improve instruction, and content-specific instruction. The intensive focus on support strategies and ongoing collaboration between general and special education residents and mentors both in coursework and at the partner school sites will prepare them for effective IEP teamwork and provide a critical model of support.

Annual evaluations of these professional development activities will be conducted using data from surveys, field observations, interviews, PACT, and CSU system-wide evaluations (see Appendix H.1).

(b)(2)(iii) Coherent, sustained program of field training As described under Absolute Priorities 1 and 2, the pre-baccalaureate NGMT program will provide early and continuous field experiences, each linked to seminars or pedagogy courses beginning in the freshman year, continuing through the program and culminating in a student teaching practicum or residency. The RiSE residency is aligned to graduate-level coursework and field-based assignments and structured around an intensive, full-time co-teaching model with a mentor teacher.

(b)(2)(iv) Collaboration of partners PRISMS Project is a comprehensive partnership of educational, community and business partners committed to the success of the project as evidenced by letters of support in Appendix G. Major CSU Chico partners include the College of

Communication and Education, the School of Education and the Liberal Studies Program; the College of Natural Sciences, the Department of Mathematics and Statistics, the Department of Science Education and the Center for Mathematics and Science Education; the College of Engineering, Computer Science and Construction Management; the College of Humanities and Fine Arts and the Department of English; and the Office of Graduate Studies. The Butte-Glenn Community College District is also a higher education partner.

The three district and six public school partners are Corning High School, and the Corning Union High School District (CUHSD); Los Molinos High School, Los Molinos Elementary School, Vina Elementary School and the Los Molinos Unified School District (LMUSD); and Orland High School, C.K. Price Intermediate School and the Orland Unified School District (OUSD). The partner counties include Tehama County Office of Education and Glenn County Office of Education.

Education agency and program partners include the California State Board of Education, the Californians Dedicated to Education Foundation, the California Commission on Teacher Credentialing; Beginning Teacher Support and Assessment (BTSA) Induction Program; California University System; the Center for the Advancement of Reading (CAR); the Center for Teacher Quality (CTQ); the Multimedia Educational Resource for Learning and Online Teaching (MERLOT); the Chico Mathematics Project; the California Science Project – Inland Northern California; and the Northern California Writing Project.

Business/community partners include the Bechtel Foundation, The Irvine Foundation and the Packard Foundation, as well Anderson & Son Shelling, Bundy's Catfish, Los Molinos Chamber of Commerce, and Orland Community Connection.

PRISMS will also coordinate its teacher credential efforts with reform activities taking

place in partnership schools. Participating districts and schools have strong leadership and a commitment to reform. They were invited to participate not only based on eligibility criteria but also for their significant needs and willingness to take on reform efforts on behalf of improving achievement of all students, such as the nursing career academy at Orland High School funded by the California Career Pathways Trust and the participation of Glenn and Tehama Counties in NorCal Collaboration for Low-Incident Personnel Preparation. These districts have local, state, and federal resources to support the project, including funding under Title I and IDEA.

The project will also be closely aligned with funded grants and scholarship programs that support reform efforts and complement PRISMS, including *Math Teacher Education Partnership (MTEP)*; *Noyce Scholars Program for STEM Majors*; *California Math and Science Partnership (CaMSP)*; *Math and Science Secondary Teaching Initiative (MSSTI)*; *CPEC Improving Teacher Quality (ITQ)*, as well as other grant projects, including *Northern California Collaboration for Low Incidence Personnel Preparation (NorCAL CLIPP)*; *Teacher's PD Inc.*; and *Collaborative Professional Development (CPD) Project in Rural California Schools*.

(b)(2)(v) Resources and sustainability California State University, Chico devotes approximately \$3 million annually to the preparation of K-12 teachers. SOE alumni are strong financial supporters and provide funding to meet a variety of needs including student scholarships. The campus offers a wide variety of resources including technology equipment and support, library and media holdings and an array of student services to support recruitment and retention of a diversity of students. The campus is also supported by programs of the CSU system, such as the Center for Teacher Quality, and funding support from foundations including Packard, Bechtel and Irvine. Strategies that will ensure institutionalization of project activities and reforms have been built into program planning. Allocating necessary resources, CSU Chico is committed to

comprehensive program redesign and implementation that cuts across the university. The structural changes that the PRISMS Project will bring about in undergraduate courses at the university, the teacher preparation program at the university, partnership activities between the university and the local school districts, the new teacher support programs, and the ongoing professional development activities are all supported by the top leadership of the institutions and will be sustained when the program's federal funding ends. The multi-year financial model provided in Appendix H.3 clearly demonstrates that resources will be available to operate the project beyond the length of the grant.

(b)(2)(ii and iii) PROGRAM PLANS FOR ABSOLUTE PRIORITIES 1 AND 2

PRISMS PRE-BACCALAUREATE PROGRAM (ABSOLUTE PRIORITY 1)

(a) Program Accountability

California faces a daunting challenge to staff mathematics classes with highly qualified teachers. Historically the state has been unable to produce enough fully credentialed single-subject mathematics teachers, and so has relied on a series of alternate credentials and authorizations to fill the void. Some of these new credentials are Foundational Level Mathematics (FLM) credentials. In response to the need expressed by our partner districts, the goal of this credential is to allow non-math majors to obtain subject matter competency to teach up to Algebra II/Math 3, typically through passage of the CSET-FLM test. Unfortunately, data shows that significant numbers of such credentials are awarded to teachers with little formal mathematical training (Berglund, 2012). These underprepared teachers are disproportionately placed in low-performing schools serving socioeconomically challenged students, compounding the inequality in the state's educational system.

This problem is now exacerbated by the implementation of the new California Common Core State Standards. Teaching to these new standards requires not only a deep understanding of the mathematics to be taught but also rich pedagogical knowledge. Current Foundational Level Mathematics Credential holders are woefully underprepared for this challenge. Next Generation Mathematics Teachers (NGMT) provides a solution to both the current math teacher shortage and the lack of mathematical preparedness of those working towards a Foundational Level Mathematics Credential by providing an innovative teacher preparation program which gives prospective teachers both a rich mathematical background and the pedagogical knowledge called for in the CCSS. The new NGMT program will be an innovative mix of current mathematics courses, new mathematics-for-teachers courses, pedagogy courses and clinical experiences.

Next Generation Mathematics Teachers (NGMT) will prepare highly qualified mathematics teachers by providing a rigorous major in mathematics education and coursework designed to prepare teachers to teach all students, including students with special needs and English Language Learners and students who are gifted and talented. This new degree will be created by modifying the existing mathematics education option in the baccalaureate program in mathematics and reducing theoretical content courses in favor of content courses that develop a deep understanding of the mathematics covered by the CCSS. The new program will focus on the subject matter requirements for the certification in Foundational Level Mathematics (FLM), which enables the holder to teach middle school through Algebra II/Integrated III, as outlined by the CCSS. The degree program coursework will emphasize discourse-based instruction, cross-cultural education, technology in the classroom, and knowledge of and experience with the Standards of Mathematical Practice as outlined by the CCSS. It will also include a focus on special education challenges, in particular the range of disabilities categorized as dyscalculia that

impact a person's ability to learn math, along with familiarity with research-based instructional strategies and assistive and adaptive technologies that can be used to accommodate those disabilities. Additionally, the mathematics content courses developed as a part of this new major will be integrated into the mathematics Subject Matter Authorization pathway for Liberal Studies majors, deepening their content knowledge of mathematics related to the middle school, as detailed by the CCSS.

Candidate competencies will be determined using the following sources as guides for courses and field supervision: CCSS (California DOE, 2014), Single Subject Preliminary Credential Program Standards (Commission on Teacher Credentialing, 2013), MET II (CBMS, 2010), California English Language Development Standards (California DOE, 2012), California Teaching Performance Expectations (CCTC, 2013), and National Council for Accreditation of Teacher Education (NCATE) Standards (NCTM NCATE, 2012).

(b) Required Reforms The CCSS envisions a substantive shift in the way mathematics is taught and what students should be doing in a mathematics classroom. To be able to successfully implement these standards, prospective teachers will need to develop a deep understanding of the mathematics they will be teaching, as well as a strong pedagogical foundation. A traditional mathematics major followed by a fifth-year credential program, the standard path in California to a single subject (7-12) mathematics credential, falls short of this goal. First, the traditional mathematics courses focus on exposing students to the next level of abstraction in mathematics. As a result, there is little development of a deep understanding of the mathematics taught by single subject mathematics teachers. Second, having the credential program follow after the subject matter course work is completed provides little opportunity to develop a constructive synergy between mathematics and the teaching of mathematics. We therefore envision a bold

new approach to preparation of mathematics teachers based on a strong collaboration between the Department of Mathematics and Statistics, the School of Education and K-12 partner schools. This program will bring together some traditional mathematics courses with a series of mathematics courses specifically designed for teachers of mathematics. At the same time, we envision a blending of a bachelor of arts in mathematics with a credential program, allowing students to complete the degree and credential in four years, but also to take advantage of the natural connection between the learning of mathematics and the teaching of mathematics. Since research indicates that teachers tend to teach in the way they were taught (Cross, 2009; Harbin & Newton, 2013), special attention will be paid to designing and teaching mathematics courses in a way that supports teaching that is in line with the CCSS.

Teachers with FLM competency will need a strong content background as well as skills in education to address diverse learner populations and utilize classroom resources for learning. This program will include a core of strong mathematics courses as well as courses in education. Candidates will take courses focusing on second language acquisition, developing literacy, teaching special populations, understanding access and equity in education, understanding rural schools, developing pedagogical knowledge and analysis of assessment data to improve instruction. Mathematics for teaching courses will focus on development of content knowledge and effective use of technology while also developing candidate knowledge of research- and standards-based teaching and student learning modalities. Mathematics content courses to be developed for this program, along with developing content essential for high-quality teaching, will model pedagogies to support conceptual understanding, procedural skill and fluency, and application.

Clinical experiences throughout the program will develop candidate ability to improve instruction through analysis of assessments and will provide opportunities to assess candidate development of teaching skills. Collaboration between the School of Education and the Department of Mathematics and Statistics will enable a strong content focus while also developing deep pedagogical knowledge.

(c) *Clinical Experience* For those Next Generation Mathematics Teachers entering the program in their freshman year, clinical experience with experienced K-12 educators will begin in their first semester and continue for four semesters. School site experiences will include tutoring, after-school programs and math classrooms. Clinical experience will be combined with a bi-weekly seminar designed after the successful Project MATH seminar, which has been producing high quality, fully credentialed single subject mathematics teacher for the past 10 years. Seminars will involve work done in teams of three, comprised of a 1st year participant, a 2nd year participant, and either a mentor teacher or a university faculty. These seminars will provide opportunities to write, critique, and modify lesson plans, as well as work within an early field experience placement for lesson presentation and reflection. Further, the seminars will provide opportunities for participants to develop and lead enrichment mathematics activities to help students to connect mathematical content and mathematical practices as they engage in mathematical tasks. Participants will be placed as a cohort into one of two participating classrooms, one a junior high classroom, the other a high school classroom.

In the junior year, students will begin their credential work along side their content classes. This will lay the groundwork for their modified Practicum I work in the classroom in the fall of their senior year. The Practicum I will be taken in conjunction with a mathematics course focused on lesson study linked to the placement classroom. Their final semester will be a full

Practicum II student teaching experience, including a rigorous Performance Assessment of California Teachers (PACT) assessment. The plan will be structured in a way that will allow NGMT candidates to transition into the RiSE Program for their final clinical experiences should they qualify and choose to do so. The variety of rich field experience in high-need rural schools provided by NGMT will guarantee students will have worked with diverse student populations, preparing these future teachers for the diversity found in today's rural schools.

(d). Induction PRISMS NGMT will work closely with district partners and state agencies to create a safety net of support for new teachers through the implementation of a highly effective induction program developed collaboratively between partner school personnel, university faculty and the California Beginning Teacher Support and Assessment (BTSA) program. Through the PRISMS Project and the Northeastern California Teacher Education Collaborative (NECTEC), collaboration with the state-accredited Beginning Teacher Support and Assessment (BTSA) will be further strengthened and aligned to better connect the university pre-service experience of teacher candidates with induction in a coherent model of new teacher development (Ingersoll & Smith, 2004). University faculty will also serve as content experts, providing needed assistance to new teachers and trained mentors in the induction programs in the partner school districts. The induction support design will include the development and implementation of an Individual Induction Plan for each beginning teacher to support individual needs, including improving classroom practice, using technology to support student learning guided by CCSS and NGSS, providing culturally relevant instruction, supporting ELLs and students with disabilities and engaging in classroom inquiry and reflection. Regular, ongoing, formal and informal meetings between mentors and the participating new teachers will result in attention to these areas and continuous growth to address the needs that arise during the first two years of teaching.

Mentors will receive compensation for their work with new teachers and may receive release time or workload credit as appropriate (see Appendix H.8 for information regarding BTSA).

(f) Recruitment Research indicates that students from rural areas are more likely to return there to work and to do so for many years (Rosenkoetter et al, 2004). Thus, special consideration will be given to recruiting applicants from or connected to rural communities, as well as underrepresented, high-poverty, minority culture and language groups and those with disabilities. Effective recruitment mechanisms and activities will be developed and implemented by the PRISMS Project Recruiter to expand the pool of qualified candidates to become highly qualified math teachers through the NGMT program. Recruitment will begin at the high school level using Web-based and print materials, recruiting visits, networking, campus-based student support organizations and articulation and advising agreements with community colleges statewide. The PRISMS Project Recruiter will build upon the existing pipeline into undergraduate core majors, such as Liberal Studies, mathematics, science and engineering, and work with rural community colleges, high schools and ethnic communities to disseminate information about the program and to identify potential candidates. In addition, the recruiter will enlist the support of campus-based student support organizations, such as Upward Bound, Education Talent Search, Teacher Recruitment Project, Equal Opportunity Program, Veterans Affairs, Office of Diversity and Inclusion, and Center for Bilingual and Multicultural Studies to promote diversity among program applicants. Our public school, business and community organization partners will also be encouraged to identify and recruit qualified individuals from their rural communities, including district employees, mid-career professionals, former military personnel and recent college graduates with strong academic records. Advertising in regional print and on-air media, development of a website, use of Craig's List and YouTube, as well as Facebook and other social

media will also play a role in recruitment efforts.

(g) Literacy Training Through courses in mathematics pedagogy and content literacy, field-based observations and assignments and professional development activities, such as those provided by the Northern California Writing Project and the Center for the Advancement of Reading, candidates in NGMT will develop comprehensive knowledge and skills to support student literacy, including understanding and integration of literacy demands and strategies specific to their disciplines, knowledge of assessments to determine students' literacy levels and to monitor their growth, and ability to differentiate instruction for students with deficiencies in literacy skills. Prospective and mentor participants in literacy training activities may receive course credit, release time or a stipend as appropriate. Please see additional information on pages 13-14.

PRISMS NGMT incorporates a clear vision of effective mathematics teaching; extended and multiple field experiences across integrated settings and grade levels; subject matter pedagogy and learning theory taught in the context of practice; well-defined standards of practice of prospective teacher performance; and extensive use of teacher research and performance assessments (Darling-Hammond and Bransford, 2005).

TEACHING RESIDENCY PROGRAM (ABSOLUTE PRIORITY 2)

(a) Establishment and Design In recent years efforts have increased to develop models of teacher preparation that address the critical and persistent disconnect between campus-based coursework and school-based clinical experiences (Zeichner, 2010). An NCATE Blue Ribbon Panel has called for “programs that are fully grounded in clinical practice and interwoven with academic content and professional courses” (2010, p. ii). The PRISMS Residency in Secondary Education (RiSE) will be a program “situated at the nexus between universities and schools – the

place where theory and practice can come together” (Rust, 2010, p. 5). This university- and district-based teacher education program pairs master's-level education content with a rigorous full-year classroom practicum and is designed to meet the specific staffing needs of rural middle and high schools in the areas of STEM, English and special education. The PRISMS RiSE program is based on the Chicago and Boston UTR programs’ common set of seven components of high quality residency programs: (1) weaving education theory and classroom practice together in a year-long residency model of highly relevant teacher education; (2) focusing on resident learning alongside an experienced, trained mentor; (3) preparing candidates in cohorts to cultivate a professional learning community, foster collaboration, and promote school change; (4) building effective partnerships and drawing on community-based organizations to promote a “third way” for teacher preparation; (5) serving school districts by attending to their teacher supply problems, curricular goals and instructional approaches; (6) supporting residents for multiple years once they are hired as teachers of record; and (7) establishing incentives and supporting differentiated career goals to retain residents and reward accomplished, experienced teachers (Barnett et al, 2008).

(a)(1)The integration of pedagogy, classroom practice and teacher mentoring will be accomplished through a combination of online, on-campus, and on-site coursework, as well as field-based assignments and learning activities. The sources of candidate competencies that will direct courses and supervision will be the same as those cited for the NGMT Program. For the teacher residents (TRs), credential preparation and M.A. coursework will begin during the semester prior to the beginning of the clinical site residency. Integrated with this initial coursework will be early field experiences and learning through service at their school sites to provide opportunities for observing and working in different grade level content and English

Language Development (ELD) and special education resource classrooms, and linking theory to rural school and classroom practices. Just prior to the beginning of the residency year, TRs and their mentors will participate in a multi-day workshop focused on co-teaching models, communication styles and coaching, classroom-based action research and positive school environments. During the residency year, TRs will participate in carefully designed learning activities in their program coursework that are closely connected to their classroom experiences. Teacher preparation will be enriched by the inclusion of school site-based professional development activities focusing on content-specific literacy and pedagogy, integration of technology in instruction, curriculum development and instruction for Common Core and Next Generation Science Standards, and best practices in teaching English language learners and students with disabilities, all of which will be available to both TRs and mentor teachers. The Center for the Advancement of Reading (CAR) and the participating California Subject Matter Projects in Math, Science and Writing will provide content workshops and on-site coaching in literacy, math/science curricula and effective teaching.

(a)(2) Residents will also be engaged in rigorous graduate-level coursework in order to earn their master's degree while completing their teaching residency. In addition to extensive literature-based research throughout the program, TRs will work with mentors and administrators at their school sites to identify student needs and related questions, challenges, policies and/or practices in their classrooms. With the support and guidance of university faculty, the TRs will formulate inquiry questions, review literature, and develop inquiry tools and processes to engage in action research that will form the basis for their master's theses or projects. This action research will also provide the framework for the planning, instruction, assessment, data analysis and reflection required for the Performance Assessment for California Teachers (PACT). This

deep blending of theory, inquiry and practice will allow TRs to make meaningful connections between current educational theory and research and their daily classroom practice.

(a)(3) Experience and learning opportunities alongside a trained and experienced mentor teacher will be a key element of the RISE program. TRs and their mentors will engage in intense collaboration around diagnosing student needs, designing interventions, monitoring student progress, and adjusting instruction and interventions as needed (Friend, 2008). Candidates will support the work of the Mentor through co-teaching strategies of assisting, team teaching, parallel teaching, differentiated teaching, and station teaching that allow for intensive individual and small group instruction for struggling or accelerated students. Mentors will undergo initial training in state standards for general and special education credentialing as well as training in co-teaching strategies and cognitive coaching to facilitate support of TRs. In addition to mentoring TRs, they will be expected to serve as exemplary members of a PLC, both at their school site and across the partner districts, and to participate with teacher and TR colleagues in continual improvement of their capacity to effectively address the CCSS or NGSS and to advance learning for all students. Mentors will participate in professional development activities of the project and provide expertise and advice on the development of field-based assignments for program coursework. They may choose to receive continuing education and/or graduate credit for their participation and may be relieved from teaching duties, if appropriate, as a result of their additional responsibilities.

(a)(4) Establishment of clear criteria for the selection of Mentor Teachers will be done collaboratively between partner districts and schools and the university but will include appropriate subject area knowledge and teacher effectiveness measures including: (1) Effective classroom practice demonstrating deep content knowledge and extensive pedagogy and

assessment that includes the use of diagnostic and formative assessments to improve student learning; (2) instruction that engages students with different learning styles; (3) collaboration with colleagues to improve instruction; (4) analysis of gains in student learning based on multiple valid and reliable measures; and (5) appropriate skills in essential content areas of mentor candidates, including literacy and math.

(a)(5) The PRISMS Project RiSE will be built around a cohort design to facilitate professional collaboration. In both program coursework and school site placements, TRs will be in cohorts that will include candidates in math, sciences, English and special education. These cohorts will allow TRs to develop collaboration skills in addressing the interdisciplinary and literacy-based learning required by the CCSS and NGSS and in identifying, monitoring and supporting students with learning disabilities or other disabilities (Mellard, 2008). This collaboration for special needs students is key in overcoming the challenges faced by rural school districts with few, and often itinerant special educators (Rosenkoetter et al, 2004). The emphasis on the development of PLCs at partner schools and across districts will further collaboration between all TRs, mentors and other teachers, and school administrators as they engage in continuous inquiry and improvement related to student achievement.

(a)(6) Partner districts will play a key role in the development of the admissions goals and priorities. The rural partner districts will participate in the selection of candidates for the RISE program, including the creation of the admissions criteria, rubric, and interview protocol. Representatives from the districts, along with CSU faculty, will conduct interviews and work together to determine which applicants will be admitted. The districts will determine the number of TRs and the mix of content area teachers and special educators in each cohort and consideration will be given to applicants representing populations underrepresented in the

teaching profession and those whose interests and background reflect the communities in which they will teach. When possible, the partner districts will give strong consideration to the hiring of TRs completing the program.

(a)(7) Support for Teacher Residents once hired as teachers of record will be provided, as described under Absolute Priority #1, through the induction program developed collaboratively between partner school personnel, university faculty and the exemplary California Beginning Teacher Support and Assessment (BTSA) program. This program will include the development and implementation of an Individual Induction Plan for each beginning teacher and regular, ongoing, formal and informal meetings between support providers and participating new teachers.

(b) Selection of individuals as teacher residents.

(b)(1) Eligible individual To be considered for selection as a teacher resident, applicants must be IHE graduates or credential recipients, current teachers, or mid-career professionals from outside the field of education possessing strong content knowledge or a record of professional accomplishment.

(b)(2) Selection criteria Each candidate must submit an application to RiSE that includes evidence of (1) strong content knowledge in field or subject area, as indicated by completion of a state-approved subject matter preparation program with a GPA of 3.0 or above or completion of a bachelor's degree in any content with a GPA of 3.0 or above and passage of the California Subject Exam for Teachers (CSET); (2) strong written skills demonstrated by writing samples; (3) strong verbal skills demonstrated in a structured interview; and (4) strong attributes and dispositions linked to effective teaching and collaboration, described in letters of reference.

(c) Provision of stipends or salaries

(c)(1-3) Stipends or salaries The PRISMS RISE Program will provide a one-year living stipend

to any candidate accepted into the program who requests it. Each applicant requesting the stipend must submit an application that contains information and assurances required by the partnership, as well as agreements that the applicant will: (i) Serve as full-time teacher for a total of not less than 3 academic years immediately after successfully completing the 1-year RISE Program; (ii) Teach in a high-need school preferably one served by the eligible, high-need LEA in the partnership when possible and teach in a designated high-need subject or area; (iii) Provide to the eligible partnership a certificate from the chief administrative officer of the high need LEA in which the teacher resident is employed, documenting the employment required under paragraph (d)(3)(i) and (ii) of this priority at the beginning of, and upon completion of, each year or partial year of service; (iv) Meet the requirements to be a highly qualified teacher, as defined in section 9101 of the ESEA, or section 602 of the IDEA, when the applicant begins to fulfill the service obligation under the program; and (v) Comply with the requirements established by the eligible partnership under paragraph (e) of this priority if the applicant is unable or unwilling to complete the service obligation required by the paragraph.

(d) Repayments (1) Each recipient of a stipend or salary under paragraph (c)(1) of this priority who does not complete or who notifies the partnership that he or she intends not to complete, the service obligation required by paragraph (c)(3) of this priority will be required to repay the stipend or salary to the PRISMS Project together with interest at a rate specified by the partnership in the agreement and in accordance with such other terms and conditions specified by the eligible partnership, as necessary. (2) Other terms and conditions specified by the PRISMS Project will include reasonable provisions for pro-rata repayment of the stipend or salary described in paragraph (c)(1) of this priority, or for deferral of a teaching resident's service obligation required by paragraph (c)(3) of this priority, on grounds of health, incapacitation,

inability to secure employment in a school served by the eligible partnership, being called to active duty in the Armed Forces of the United States, or other extraordinary circumstances. (3) The PRISMS Project will use any repayment received under paragraph (e) to carry out additional activities consistent with the purposes of the Teaching Residency program.

(c) MANAGEMENT PLAN

The management plan of the project includes major roles and major voice in decision-making for each partner in a collaborative design that builds on the functions of each and brings them together in a comprehensive effort focused on achieving major reforms. Each of the partners is committed to the project and to the integration of its full range of professional development and related activities to create changes in fundamental operations that can be institutionalized and sustained to maximize project effectiveness. The project will establish governance and decision-making structures permitting all partners to plan, implement, and assess the adequacy of project activities. Top-level leaders will be involved from each partner agency, and all partners are committed to data-driven decision-making and reform. K-12 teachers and administrators will have important roles in project design, implementation and evaluation, including continuous review and revision of the project's activities based on evaluation results.

(c)(2)(i) Responsibilities, timelines and milestones The Management Plan describes the responsibilities, timelines, and milestones of the project and includes procedures for ensuring feedback and continuous improvement and quality in products and services of the project.

The organizational structure for the project will include (a) the PRISMS Project Advisory Board (see Appendix H.4), the chief decision-making body, which meets two times per year and is composed of key leaders from school district, college and business partners; (b) the NGMT and RiSE Program Planning Committees (see Appendix H.4), who are responsible for revision of

PRISMS Project Management Plan

GOALS/ACTIONS	TIMELINE	LEAD	BENCHMARKS
Action 1. Convene PRISMS Advisory Board	November 2014	Project Dir.	Board established and networking
Goal 1. Improve and promote equity in K-12 student academic achievement through renewal/reform of teacher preparation			
<i>Develop pre-baccalaureate Next Generation Math Teachers (NGMT) Program</i>			
1. Convene Program Planning Board (PPB)	October 2014	NGMT Dir. PPB	Schedule of meetings established & sequence & roles determined
2. Develop NGMT Curriculum Map	February 2015	NGMT Dir. NGMT PPB	Sequence of courses planned and approved by department
3. Develop new program courses, revise existing courses	August 2015	Program Dir. NGMT PPB	Courses focusing on concepts, CCSS-M developed and approved by department
4. Create early and continuous clinical experiences	May 2015 & repeated for year 2	NGMT Dir. Clin. Dir. NGMT PPB	Early field experiences planned and arranged for Cohort 1 with partner schools
5. Seek approval of program plan	May 2016	NGMT Dir.	Program approved by AURTEC & Academic Senate & submitted to CCTC
6. Implement program	August 2015	NGMT Dir. Faculty	Cohort 1 begins coursework & early field experiences
7. Analyze assessment data and feedback	September 2016 & repeat annually	NGMT PPB	Evaluate program components & revise as needed
<i>Develop Residency in Secondary Education (RiSE) Program</i>			
1. Convene Program Planning Board (PPB)	October 2014	RiSE Dir. RiSE PPB	Schedule of meetings established & sequence & roles determined
2. Revise program courses & curriculum map	December 2014	RiSE Dir. RiSE PPB	Integrate CCSS, NGSS & align to residency schedule
3. Seek approval of program plan	December 2014	RiSE Dir.	Program approved by Grad. Studies
4. Develop resident selection plan to include writing samples, references, interview activities	November 2014	RiSE PPB	Selection Criteria, process, scoring tools and committee determined
5. Collaboratively select residents	December 2014 & annually	Admissions Committee	Cohort 1 residents selected and admitted
6. Cohort 1 begins program	January 2015 & annually	RiSE Dir. Advisor	Residents begin course work and early field placement
7. Develop mentor selection plan	January 2015	RiSE PPB	Selection Criteria, process and district

			panels determined
8. Collaboratively select mentors	May 2015 & annually	Clin. Coord. Distr panels	Mentors selected and matched to residents
9. Initiate annual Mentor-Resident Summer Workshop	July 2015 & annually	RiSE Dir.	3-day workshop addressing standards, co-teaching, cognitive coaching, PLCs.
10. TRs/Mentors begin residency	Aug 2015 & annually	Clin. Coord.	Clinical personnel provide observation feedback & regular support meetings
11. TRs engage in action research	Oct 2015-May 2016 & annually	SOE faculty	Literature review, research question, intervention/innovation, collection & analysis of data, presentation of results
12. Analyze assessment data and feedback on student performance and perceptions	Sept 2016 & repeat annually	RiSE PPB	Evaluation of program components & program improvement plans
Goal 2. Recruit and retain highly qualified individuals to the teaching profession in high-need rural areas			
<i>Expand & diversify NGMT and RiSE Program applicant pools</i>			
1. Begin recruitment for NGMT & RiSE	Oct 2014	Project Dir. Recruiter	Recruiter hired
2. Develop recruitment materials, resources	Oct 2014 & ongoing	Recruiter	Print, media, online materials, Website
3. Develop campus, community pipeline	Oct 2014 & ongoing	Recruiter	Support/referrals from student service programs, LEAs, Partners, etc.
4. Assess effectiveness of recruitment strategies	Annually	Recruiter	Database of info sources, referrals
<i>Place and retain more teachers in high-demand subjects throughout the rural region.</i>			
1. Career Shop, Education Career Fair	Apr 2016 & annually	SOE/Career Center	Workshop on resumes, job search, interviewing. Recruiter visits.
2. Prepare program completers for induction	May 2016 & annually	Mentor Supervisor	Summative residency evaluation & Individual Induction Plan
3. Integrate a system of support for induction	May 2016 & ongoing	SOE/BTSA	Plan aligned to standards & inquiry
4. Monitor retention of teachers in schools	May 2017 & annually	Project Dir.	CTQ data analysis
Goal 3. Strengthen the education of future teachers for rural schools, especially in STEM, English and special education			
<i>Initiate professional development opportunities</i>			
1. Prepare teachers for CCSS & NGSS	Fall 2015 & ongoing	Project Dir.	Schedule PD activities with partners
2. Prepare teachers to support all students	Fall 2015 & ongoing	Project Dir.	Schedule PD activities with partners
3. Evaluate PD effectiveness	Fall 2016 & annually	PPBs	Analysis of survey & assessment data
Goal 4. Develop and sustain the project's partnerships and institutionalize its reforms.			

<i>Establish a structured collaboration model</i>			
1. Develop/enhance school-site PLCs	Fall 2015 & ongoing	Clin. Coord.	Meeting schedules, plans of work
2. Implement online, cross-partners PLCs	Fall 2015 & ongoing	MERLOT	Content-alike and whole project learning communities
<i>Disseminate findings and materials developed from the project</i>			
1. TR action research	Annually	Clin. Coord.	Findings presented at school sites, state and national conferences
2. Project products, practices, materials	Ongoing	Faculty	Publication in MERLOT as well as other repositories with open access to educators and researchers.
3. Evaluation of Project	Annually	SRI Education	Findings from evaluation reported to partners, University, funders, etc.

curriculum and clinical experiences, evaluation of assessment and feedback data for program improvement and input to the Advisory Board, and ensuring uniform quality in materials designed/produced by the project, and (d) the Admissions Committee who select teacher residents for each of the four participating districts.

(c)(2)(ii) Key Personnel The project includes a primary staff that represents the Colleges of Communication and Education and Natural Sciences listed by roles below. Their vitae are provided in Appendix H. 2 of the proposal, along with other faculty. Those who will play key roles in the partner LEAs and schools have yet to be determined. (see Vitae in Appendix H.2)

1) Principal Investigator/Project Director: Maggie Payne, Ed.D. Higher Education. Grants: Co-PI, Project Co-STARS/Program Director, Rural Teacher Residency; **2) Director, RiSE Program:** Jennifer Oloff-Lewis, Ph.D. C & I/Mathematics Education. Grants: CSU-MTEP, Noyce Scholars, Mathematics in the Early Grades; **3) Director, NGMT Program:** Jorgen Berglund, Ph.D. Mathematics. Grants: Noyce Scholars, MSSTI, Chico Mathematics Project; **Single Subject Program Coordinator:** Alfred Schademan, Ph.D. C& I/Science Education. Grants: Chico Rural Teacher Pathway, Summer STEM Institutes, Project STREAM; **Special Education Program Coordinator:** Talya Kemper, Ph.D. Special Education. Grants: California Low-Incidence Personnel Preparation (CLIPP); **SOE Graduate Coordinator:** Cris Guenter, Ed.D. Educational Foundations. Grants: Enhancing Education through Technology, Rural Teacher Residency; **Clinical Coordinator:** Maris Thompson, Ph.D. Education. Grants: CALNET, MASCOT; **CME Grants Coordinator:** Joleen Barnhill.

(c)(2)(iii) Performance feedback and continuous improvement The regular assessment and evaluation of program components is evidenced in the Management Plan. As part of its ongoing state accreditation process, CSU Chico School of Education collects a variety of assessment data

each year and reports annually to the CSU Chancellor's Office and to Title II and biennially to the CCTC on the data analysis and implications for program improvement. The PRISMS Project and its programs will undergo the same scrutiny, as well as annual reports to the TQP funders.

(d) PROJECT EVALUATION

CSU, Chico has engaged SRI Education, a division of SRI International, to design and conduct the independent evaluation of the PRISMS Project, including both the NGMT pre-baccalaureate program and RiSE program. SRI has longstanding experience conducting rigorous evaluations of teacher preparation programs in California and nationally. These capabilities span utilization of quantitative and qualitative methods to provide formative input to inform continuous improvement efforts, as well as summative evaluation of program outcomes. The SRI evaluation will be based on a data collection and analysis plan designed to report annual descriptive results for program performance measures required under GPRA and the HEA, and to incorporate Quasi-Experimental Design (QED) study to investigate whether the PRISMS pre-baccalaureate residency programs have resulted in improved teacher and student outcomes, compared to traditional teacher preparation programs. Data will be maintained in a project specific longitudinal database to gauge progress and allow for comparisons within and across cohorts. The evaluation plan is designed to provide timely formative feedback on program implementation to PRISMS partners and to explicate quantitative findings. We will share formative feedback through regular project briefings designed to support program improvement. Summative findings will be reported to multiple audiences, including US Department of Education, CSU and program stakeholders.

(d)(2)(i) Valid and reliable performance data on relevant outcomes The table below depicts the goals, priority actions, objectives and sub-objectives of the PRISM program. The evaluation will

be designed to collect data to better understand and assess progress against these goals and objectives. Data will be collected from existing sources, including GPRA and HEA enrollment, academic performance, retention and other data collected by the CSU system, as well as survey instruments designed to measure participants' progress.

PRISM Program Goals and Objectives

Goals	Priority Actions
<p>(1) Improve and promote equity in K-12 student academic achievement through the renewal/reform of teacher preparation;</p> <p>(2) Recruit and retain highly qualified individuals to the teaching profession in high-need rural areas;</p> <p>(3) Strengthen the education of future teachers for rural schools, especially in STEM and special education;</p> <p>(4) Develop and sustain partnerships and institutionalize reforms.</p>	<ul style="list-style-type: none"> • Reform the teacher preparation academic program by developing a blended pre-baccalaureate program (NGMT Program) • Reform the teacher preparation academic program by developing a post-baccalaureate teaching residency program (RiSE Program) • Prepare new teachers to teach to the Common Core State Standards and the Next Generation Science Standards • Create early and continuous clinical field experiences • Initiate professional development opportunities • Establish a structured collaboration model
Objectives	Sub-Objectives
<p>Objective 1: To strengthen academic content knowledge and research-based instructional strategies among 100 teacher residents and 80 pre-baccalaureate candidates.</p>	<p>1.1 enhance academic content knowledge.</p> <p>1.2 enhance research-based instructional strategies.</p> <p>1.3 enhance literacy-teaching skills.</p> <p>1.4 enhance technology integration skills.</p>
<p>Objective #2: To enhance and integrate a continuum of clinical/field experiences to provide early and significant learning among prospective teachers to support student achievement relevant to the CCSS and NGSS.</p>	<p>2.1 engage credential candidates in K-12 school and community-based activities designed to improve success of at-risk, ELL, and Special needs students.</p> <p>2.2 expand use of online communities to review and evaluate instruction.</p> <p>2.3 intensify clinical experience through implementation of the co-teaching/co-planning model.</p>
<p>Objective #3: To expand new teacher induction to foster alignment between K-12 support activities for new teachers and university roles supporting teacher education graduates.</p>	<p>3.1 increase success of graduates in promoting student achievement using a wider variety of instructional practices.</p> <p>3.2 integrate a system of support by BTSA and University during induction.</p> <p>3.3 increase new teacher retention with an increased number of candidates completing the CSU Chico credential program and remaining in the profession beyond their first three years.</p>
<p>Objective #4: To recruit new and diverse talent into teaching and retain qualified teachers.</p>	<p>4.1 expand the pool of applicants to reflect the changing demographics of rural communities and schools.</p> <p>4.2 place and retain more teachers in high-demand subjects throughout the rural region.</p>
<p>Objective #5: To improve the preparation of new and future teachers to meet specific learning needs of</p>	<p>5.1 improve secondary teacher performance in working with students with special needs to support improved student achievement.</p>

students with disabilities.	5.2 increase the number of new teachers who will demonstrate competency in meeting the needs of students with special needs, 5.3 improve candidate performance on Individualized Education program (IEP) teams.
Objective 6: To improve the preparation of new and future teachers to meet specific learning needs of English language learners (ELL)	6.1 improve the performance of general education credential graduates in working with ELLs. 6.2 increase the number of new teachers who will demonstrate competency in meeting the needs of English Language Learners
Objective #7: To improve schools through the use of teacher inquiry and action research.	7.1 increase number of new teachers prepared to research school-based issues and problems. 7.2 increase number of studies focusing on student achievement and closing the gap. 7.3 strengthen new teachers' abilities to impact policy at the district level.
Objective #8: To disseminate the findings and materials developed from the PRISMS Project	8.1 publish and present project outcomes and TR's research at state and national conferences. 8.2 Project materials will be developed and published in MERLOT as well as other repositories with open access to educators and researchers.

To understand the impact of the PRISMS program pre-baccalaureate and residency components on teacher candidates and their students, SRI will use both existing data and collect additional data regarding program implementation, including the recruitment and selection of teacher candidates, teachers' experience in the PRISMS program, data on graduation and certification, teacher placement, retention, and, where possible, eventual impact on student learning. The CSU Center for Teacher Quality (CTQ) is a critical data source, and will provide data on teacher candidates. The CTQ is implementing a longitudinal data system that compiles measures of professional educator practice as well as evidence of improved student learning. Data elements in the expanded CTQ database include (1) CSU program applicant data (e.g., undergraduate institution and GPA; results from the California Subject Examination for Teachers (CSET); demographic information); (2) CSU program completer and credential data; (3) School placement data; (4) Results from the CSU Teacher Preparation Exit Evaluation; (5) Teacher retention data; (6) Teacher performance assessment data; (7) Results from the annual Survey of

First-Year CSU Teaching Graduates; (7) Results from the annual Survey of School Principals and Supervisors of First-Year CSU Teaching Graduates. These data will contribute to understanding of all aspects of the PRISMS program as articulated in the objectives above.

SRI will develop data sharing agreements with CSU, Chico and partner school districts to supplement the data from the CTQ, providing additional insight regarding program admission, retention and participation data (from CSU, Chico) and teacher retention and student achievement data from partner school districts. These data will support comparison of teacher and student outcomes for PRISMS teacher candidates to (a) national and state standards of excellence in teacher preparation, (b) outcomes of other credential programs at CSU, Chico, and (c) outcomes of similar credential programs throughout the CSU System. We will supplement available data with interviews of PRISMS teachers that target PRISMS program goals.

Recruitment and Selection. To gauge progress on measures of recruitment and selection for the PRISMS programs, we will examine and describe data regarding measures and characteristics of the prospective teaching pool, including recruitment targets; selection rates; underrepresented groups representation; STEM (or other education-related) backgrounds; GPA; California Subject Exam for Teachers (CSET) results; admissions interview scores; and declared subject matter preparation area and certification. The primary source of applicant data will be the CTQ, supplemented with more detailed admission data from CSU, Chico and candidate interviews.

Teacher Preparation. The evaluation of PRISMS will also utilize data related to teacher preparation, collected in compliance with GPRA and HEA. These data include measures of persistence (i.e., the percentage of program participants who were not scheduled to graduate in the previous reporting period and persisted in the postsecondary program in the current reporting period.) Persistence data will be collected through CSU, Chico annually. Measures regarding

teacher preparation will also identify candidates' specific subject matter preparation area, similarity of mentor and candidate certification, and quality of preparation (i.e., the extent to which different preparation components contribute to candidate perceived self-efficacy for teaching). Data on these measures will be collected via the CSU Teacher Preparation Exit Evaluation (available through CTQ), and SRI interviews of candidates.

Graduation and Certification. GPRA and HEA each require measures related to graduation and certification. The PRISMS evaluation will incorporate data elements regarding graduation (the percentage of program completers who attain initial certification/licensure by passing all necessary certification/licensure assessments and attain a master's degree (residency program) within two years of beginning the program) by obtaining data from CTQ on degrees and specific teaching certifications (including authorized subject matter and grade spans, special education credentials, and authorization to teach ELs) and dates awarded. These data will be used to gauge whether degrees and certifications were obtained within the specified timeframe.

To investigate certification/licensure assessments results (GPRA Measure 3, Improved Scores: the percentage of grantees that report improved scaled scores on assessments for initial State certification or licensure of teachers; and the HEA measure, improvements in the pass rates and scaled scores for initial state certification or licensure of teachers) we will obtain teacher preparation candidates' scores on the state licensure exams and the California Subject Examination Tests (CSET) from the CTQ. SRI will also assess the extent to which candidates are completing requirements for certification in STEM and high-need academic subject areas. Pass rates will be reported as percentages and changes in scale scores as means. HEA also requires data regarding achievement for prospective and new teachers. For this measure, we will utilize teaching CTQ data from the Performance Assessment for California Teachers (PACT).

Placement. For new teachers, SRI will analyze the results of the survey of school principals and supervisors of first year CSU teaching graduates (from the CTQ), in addition to analyzing PACT scores. HEA requires collecting data regarding hiring, subject areas taught, and placement in high need areas and schools. SRI will utilize this data to explore the percentage of highly qualified teachers who are (1) hired by CSU, Chico; (2) members of underrepresented groups; (3) teach high-need academic subject areas; (4) teach in high-need areas (including special education and language instruction educational programs for limited English proficient students); and (5) teach in high-need schools, disaggregated by the elementary school and secondary school levels. All data related to these measures will be collected annually from CSU, Chico.

Retention. We will assess retention, and in particular, teacher retention in the first three years of a teacher's career, utilizing the following HEA and GPRA measures: a) the percentage of beginning teachers who are retained in teaching in partner districts one year after being hired; b) the percentage of beginning teachers who are retained in partner districts three years after being hired. We will calculate retention rates using the initial number of graduates per cohort, not the number of teachers remaining in the cohort in the prior year. We will collect data regarding each cohort of PRISMS participants from participating districts to determine who is retained in teaching in those districts. Given the timeframe of the evaluation, we will report on three-year retention for the first cohort. We will also gather information about teacher resignations and transfer to non-teaching positions, and the new positions assumed within or outside the participating districts. Analysis of these data will yield findings regarding multiple aspects of teacher retention. Financial reporting of both grant and in-kind expenditures in Annual Performance Reports will provide the fiscal data necessary to determine the cost per successful outcome, i.e., a per capita cost, of teacher retention for three years after initial employment.

Student Outcomes. The evaluation of PRISMS will include information regarding student learning outcomes, using the percentage of grantees that report improved aggregate learning outcomes of students taught by new teachers (GPRA student learning measure). We will calculate the learning outcomes of students taught by program graduates using data collected from the partner districts. SRI will collect student demographic data as well as test scores on the Smarter Balanced ELA and mathematics assessments and future NGSS-aligned science assessment if available and reliable.

(d)(2)(ii) Feasible, appropriate methods

Descriptive Statistics SRI will provide annual summaries of the quantitative teacher and student outcomes measures described above, including the GPRA and HEA performance measures. SRI will compare these metrics for PRISMS teacher candidates with national and state standards of excellence in teacher preparation as well as to the outcomes of other credential programs at CSU, Chico, using chi-square or analysis of variance to examine statistical significance as appropriate.

Quasi-Experimental Design (QED) In the final year of the evaluation, SRI will conduct an analysis of select teacher and student outcome measures using a QED to address whether the PRISMS pre-baccalaureate and residency interventions are more effective at preparing teachers than traditional teacher preparation programs. Waiting until the final year of the evaluation will allow us to pool data from all available appropriate cohorts to increase sample size – CSU Chico estimates 80 participants in the pre-baccalaureate and 100 participants in the residency program over the term of the grant. The teacher outcome variables for the QED will be measures of teacher preparation drawn from the Survey of First-Year CSU Teaching Graduates and the Survey of School Principals and Supervisors of First-Year CSU Teaching Graduates (available through CTQ), teacher performance as measured by the Performance Assessment for California

Teachers (PACT), teacher placement in a high-needs school, and teacher retention from participating partner districts' human resource data. Student outcomes will include scores from the English language arts/literacy (ELA/literacy) and mathematics Smarter Balanced assessments and the future science assessments used in California (i.e., the assessments based on the Next Generation Science Standards or the science California Standards Tests).

A central challenge in estimating the relationship between pre-baccalaureate teacher preparation programs and teacher residency programs and teacher and student outcomes is disentangling the effects of the program from the effect of participant selection. For example, does the program improve teacher instructional practice, retention in the profession, and student learning, or would the types of prospective teachers who apply and are admitted to the PRISMS programs exhibit these desirable outcomes no matter what type of preparation they received or program they attended? This is a particular concern with teacher residency programs, which tend to attract a relatively younger and more affluent cohort of teacher candidates than traditional preparation programs. To address the threat of selection bias, we propose to utilize a Euclidean distance matching technique to identify an appropriate sample of candidates from traditional teacher preparation programs at CSU, Chico.

The purpose of matching is to create groups that are equivalent on the observable pre-intervention variables known to be related to the outcomes of interest so that post-intervention differences can be causally attributed to the preparation program (Shadish, Cook, & Campbell, 2002). There are two other matching algorithms used frequently by researchers to identify comparison groups: propensity score matching and Mahalanobis distance matching (Guo & Fraser, 2010; Stuart, 2010). Propensity score matching is the most well-known method, and requires a large sample size to reliably create well-matched comparison groups (Luellen,

Shadish, & Clark, 2005). When the number of treatment teachers is small (as may be the case with PRISMS), scaled Euclidean and Mahalanobis distance matching are better options (Judkins, 2013). Once we have obtained the data, we will confirm that Euclidean distance matching is the most appropriate matching technique given the size and composition of the treatment group and pool of comparison teachers. We will also consider Mahalanobis distance matching, propensity score matching, and propensity score weighting. In addition, we will utilize a one-to-many matching strategy (i.e., each PRISMS teacher will be matched to multiple comparison teachers), if possible, in order to improve the statistical power of the analyses (Shadish et al., 2002).

For teacher level outcomes, we will identify teachers in traditional preparation programs as matches for PRISMS teachers based on all available pre-treatment candidate background characteristics, financial information, and program information that are available from the CSU application process. For student level outcomes, we will further restrict the pool of matched teachers by forcing exact matches on the grade level and subject of candidates' teaching placement and additionally matching on the aggregate demographic and prior achievement characteristics of teachers' placement classrooms and schools. Matching on the aggregate demographic and prior achievement characteristics of teachers placement classroom and schools will help to ensure baseline equivalence of student outcomes between students in PRISMS and comparison teachers' classrooms. This is particularly important given the fact that the PRISMS interventions are designed to place teachers in high-need schools.

Following the matching, we will calculate the standardized difference in the teacher-level means (i.e., the mean difference between the treatment and comparison groups divided by the pooled standard deviation) for each of the continuous achievement measures used in the matching process. This numerical balance diagnostic will determine the quality of the matches.

In accordance with What Works Clearinghouse (WWC; U.S. Department of Education, 2014) guidelines for baseline equivalence, we will explore identifying a different potential pool of comparison teacher candidates if the differences between the treatment and comparison teacher candidates on the achievement measures are greater than 0.25 standard deviations.

Teacher-level impact analyses will pool outcomes across grade-levels and subject areas to measure teacher outcomes (preparation, performance, placement and retention) consistently across teachers. We will compare PRISMS teachers who attend the residency program to those of the matched sample using additional regression adjustment, controlling for key, pre-treatment, candidate-level characteristics. Since matching generally produces very similar, but not identical, treatment and control groups, analyzing the matched samples using regression models with additional controls helps minimize any bias due to inexact matching and is consistent with WWC guidelines (Rubin & Thomas, 2000; U.S. Department of Education, 2014).

For student outcomes, we will utilize hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002) to account for the nesting of students within classrooms and schools. The benefits of HLM are well documented for calculating accurate standard errors and significance tests with nested data. If estimation problems do occur using HLM, we will conduct regression analyses with a robust variance estimator that relaxes the assumption that the students' scores are independent within classes (Maas & Hox, 2005; White, 1980). The student-level impact analyses will be conducted separately for each course and grade level. The impact analyses will include all of the variables used in the matching algorithm to select the comparison groups as control variables. After conducting the individual student-level impact analyses, we will calculate effect sizes based on each analysis. To calculate the effect sizes, we will divide the differences between the means for the students taught by program graduates and comparison

students over their respective pooled standard deviations (WWC, 2014). SRI will use meta-analysis to calculate an overall impact estimate in each year of the grade by averaging the impact estimates across courses and grades (Lipsey & Wilson, 2001). The performance measure will be: annually, the difference between the mean achievement for students of program graduates and matched students of matched comparison teachers will be equal to or greater than an effect size of 0.20 after accounting for control variables. An effect size of 0.20 would be equivalent to the teachers moving their students from the 50th percentile to the 58th percentile while the comparison teachers kept their students at the 50th percentile (Lipsey et al., 2012). An effect size of 0.20 is likely attainable based on a review of impact estimates from studies on prior educational interventions (Hill, Bloom, Black, & Lipsey, 2008).

Data on Project Implementation In addition to quantitative data on teacher and student outcomes discussed above, SRI will collect data on program implementation, including the collaboration among partners, the development of new curriculum, the selection of mentor teachers, and the operationalization of the PRISMS approach. Critical to any evaluation is clear understanding of the intervention model being implemented. Such an understanding enables researchers to suggest ways in which outcome data may be related to specific features of the intervention, helping to shed light on which features of the intervention may be most critical, for whom, and under what conditions. Monitoring the implementation fidelity of an intervention requires a clear account of the idealized model, the particular context in which that model is being implemented, and a nuanced and dynamic picture of what is happening on the ground.

SRI's evaluation will attend to each of these three components. First, the evaluation will be grounded in a well-articulated logic model, which demonstrates the relationship between program components, intermediate outcomes, and longer-term outcomes. Second, in order to

describe the context for the intervention, the evaluation will review available curricular documents and interview key stakeholders to develop a meaningful picture of the setting for the intervention. Third, in order to assess the fidelity with which the program is being implemented as designed, our interviews of PRISMS teachers and CSU, Chico faculty and administrators will include both open and closed-ended questions about how participants experience the program. We will report our findings on program implementation to PRISMS partners through semi-annual project briefings to support program improvement.