Guiding Principles for Secondary Mathematics Teacher Preparation Programs
(REVISED WORKING DRAFT – August 23, 2012)

The goal of the Mathematics Teacher Education Partnership (MTE-Partnership) – an initiative of the Science and Mathematics Teacher Imperative of the Association of Public and Land-grant Universities – is to transform the preparation of secondary mathematics teachers to ensure teacher candidates can promote mathematical excellence in their future students, leading to college and career readiness as described in the Common Core State Standards for Mathematics (CCSS-M) and other documents.

The following section outlines a set of “guiding principles” that form a shared vision to be explored and refined by the MTE-Partnership and others involved in preparing secondary mathematics teachers in order to meet this goal. A second section outlines priorities for action, based on these guiding principles. A third section will be added at a later time, including more-detailed descriptions of each guiding principle and its indicators, including sample practices, measures, and priorities for action.

Note that this document was developed with extensive input from members of the MTE-Partnership, as well as from other leaders in the field of mathematics teacher education. An appendix provides additional background information on the development of this document and the partnership will also be added at a later time. More information about the partnership can also be found online at www.MTE-Partnership.org.

1 This material is based upon work supported by the National Science Foundation under Grant No. 1147987. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

2 The guiding principles are built on the Mathematics Teacher Education Assessment (Coble et al., 2012), which were adapted from the SMTI Analytic Framework developed (Coble et al., 2011). This document further builds on other sets of recommendations with implications for secondary mathematics teacher preparation, including the NCTM NCATE Standards Revision Draft – Secondary (2012) and The Mathematical Education of Teachers II (Conference Board of the Mathematical Sciences, 2012).
PART 1. OVERVIEW OF THE GUIDING PRINCIPLES

Secondary mathematics teacher preparation programs should effectively prepare teacher candidates who have the potential to promote mathematical excellence in their future students leading to college and career readiness as described in the Common Core State Standards for Mathematics and other documents. The “guiding principles” describe a shared vision to be explored and refined by the MTE-Partnership and others involved in preparing secondary mathematics teachers by:

1. building a national consensus on what effective secondary mathematics teacher preparation programs need to do in order to develop teacher candidates who promote mathematical excellence in their future students;
2. enhancing communication among the partners involved in a secondary mathematics teacher preparation program in order to clarify program goals, to assess the effectiveness of the program, and to guide program development and revision;
3. serving as the framework for an emerging national research and development agenda related to secondary teacher mathematics preparation; and
4. helping to organize the identification, development, and dissemination of resources supporting effective secondary mathematics teacher preparation programs.

The guiding principles are separated into three sections focusing on partnerships that undergird secondary mathematics teacher preparation, the knowledge and skills that secondary mathematics teacher candidates should develop, and the support structures that are necessary for successful programs.

I. Partnerships

Guiding Principle 1. Partnerships as the Foundation

The preparation of effective secondary mathematics teachers engages a comprehensive partnership -- institutions of higher education (including faculty members focused on mathematics, mathematics education, and teacher preparation), schools and districts (including mathematics teachers and administrators), and other stakeholders such as state departments of education -- focused on preparing teacher candidates who promote students’ development of college and career readiness, as described in the Common Core State Standards for Mathematics (CCSS-M) and other documents.

Indicators of the guiding principle include:

1-A. Shared Goals and Vision: All partners involved in the secondary mathematics teacher preparation program work together to develop and promote a common vision and goals for how to best prepare teacher candidates who can promote students’ development of college and career readiness, as described in the Common Core State Standards for Mathematics (CCSS-M) and other documents.

1-B. Mutual Learning: All partners involved in the secondary mathematics teacher preparation program are committed to learning from and with each other in
continuing to better achieve their respective missions and to continually improve the program.

1-C. **Shared Accountability and Responsibility:** All partners involved in the secondary mathematics teacher preparation program are actively engaged in the design of the program and share responsibility for the success of the program.

**Guiding Principle 2. Commitments by Institutions of Higher Education**

*Institutions of higher education demonstrate institutional support for secondary mathematics teacher preparation, with an emphasis on providing the necessary resources to support the program and promoting shared responsibility and accountability within their institutions and with other partners involved in the program.*

Indicators of the guiding principle include:

2-A. **Institutional Focus:** The infrastructure of the institution of higher education supports a focus on secondary mathematics teacher preparation that emphasizes shared responsibility and accountability across the institution.

2-B. **Disciplinary Partnerships:** The mathematics faculty, mathematics teacher education faculty, and general teacher education faculty (and the departments and colleges within which they are employed) at institutions of higher education work as partners in preparing mathematics teacher candidates.

2-C. **School Partnerships:** Faculty members (including mathematicians and mathematics educators) at institutions of higher education actively engage inservice mathematics teachers and administrators from partnering schools and districts in the design and implementation of the secondary mathematics teacher preparation program.

2-D. **Institutional Support for Faculty:** Policies and practices at institutions of higher education provide encouragement, support, and rewards for faculty members who provide leadership in mathematics teacher preparation.

**Guiding Principle 3. Commitments by School Districts and Schools**

*The schools and districts actively partner with institutions of higher education in secondary mathematics teacher preparation across the teacher development continuum from recruitment to initial preparation to induction into the field and beyond.*

Indicators of the guiding principle include:

3-A. **Institutional Commitment:** Partnering school districts and schools participate in secondary mathematics teacher preparation as an integral part of their mission of supporting the mathematical success of all students.
3-B. **Focus on Important Mathematics**: Mathematics teachers and other personnel in partnering schools and districts ensure that as teacher candidates progress through the program, they experience effective educational practices that promote mathematical excellence in all students as described in CCSS-M and other documents.

3-C. **Support and Recruitment of Mentor Teachers**: Partnering school districts and schools work with their other partners to actively recruit, develop, and support inservice master secondary mathematics teachers who can serve as mentors across the teacher development continuum from preservice to beginning teachers and beyond.

### II. Teacher Candidate Knowledge and Skills

**Guiding Principle 4. Candidates’ Knowledge and Use of Mathematics**

*The secondary mathematics teacher preparation program ensures that teacher candidates have the knowledge and understanding of mathematics necessary to promote student success in mathematics as defined in the CCSS-M, Mathematical Education of Teachers II (MET II), and other documents.*

Indicators of the guiding principle include:

4-A. **Mathematical Practices**: The secondary mathematics teacher preparation program ensures that teacher candidates engaged the mathematical practices and processes as outlined in the CCSS-M and other documents, while engaged in learning important mathematics content in both their mathematics content courses and teacher education courses.

4-B. **Knowledge of the Discipline**: The secondary mathematics teacher preparation program ensures that teacher candidates have an understanding and appreciation of mathematics as a discipline, as described in MET II, CCSS-M, and other documents.

4-C. **Specialized Knowledge of Mathematics for Teaching**: The secondary mathematics teacher preparation program ensures that teacher candidates possess the specialized mathematical knowledge, skills, and dispositions needed to effectively teach secondary mathematics, as described in MET II, CCSS-M, and other documents.

**Guiding Principle 5. Candidates’ Knowledge and Use of Educational Practices**

*The teacher preparation program ensures that students have the knowledge and skills needed to implement educational practices found to be effective in supporting student success in mathematics as defined in the CCSS-M and other documents.*

Indicators of the guiding principle include:
5-A. **Design of Instruction:** The teacher preparation program ensures that teacher candidates can design mathematics units and lessons, selecting tasks and activities that actively engage all students in developing mathematical practices and processes, while engaged in learning important mathematics content as described in CCSS-M and other documents.

5-B. **Instructional Methods:** The teacher preparation program ensures that teacher candidates are able to create an effective mathematical learning environment and implement a range of instructional strategies that promote student engagement, understanding, and motivation to learn.

5-C. **Assessment and Reflection:** The teacher preparation program ensures that teacher candidates can assess the ongoing learning of their students using both formative and summative assessments, and appropriately and ethically use data from those assessments to promote the success of all students as well as to reflect on their own professional growth.

5-D. **Use of Instructional Technology:** The mathematics teacher preparation program ensures that teacher candidates can integrate the use of appropriate technology – including tools specific to mathematics and more general tools -- to engage students in learning mathematics in a manner reflecting the technologically rich world within which they live.

5-E. **Attention to Diversity:** The teacher preparation program ensures that teacher candidates understand and acknowledge the unique contributions of all students in their classes – including low-performing students; gifted students; students of different racial, sociolinguistic, and socioeconomic backgrounds; English language learners; students with different sexual orientations; and students with disabilities – and maintain high expectations for all students.

**Guiding Principle 6. Clinical Experiences**

*The teacher preparation program provides clinical experiences to ensure that teacher candidates are able to demonstrate practices found to be effective in supporting student success in student success in mathematics as defined in the CCSS-M and other documents.*

Indicators of the guiding principle include:

6-A. **Embedded, Early, Sequential, and Intensive Clinical Experiences:** The teacher preparation program provides teacher candidates with clinical experiences that begin early in their program and become increasingly intense as they progress through the program, focused on learning and demonstrating effective mathematical and educational knowledge.

6-B. **Well-Supervised Clinical Experiences, Aligned with Program Goals:** The teacher preparation program provides supervision of clinical experiences based
on a partnership between knowledgeable university faculty and master teachers of mathematics, who share a common vision of mathematics teaching and learning.

III. Support Structures

Guiding Principle 7. Student Recruitment, Selection, and Support

The teacher preparation program actively recruits high-quality and diverse teacher candidates into the program, and monitors and supports their success in completing the program.

Indicators of the guiding principle include:

7-A. **Effective Recruitment Strategies:** The teacher education program has developed and sustained an infrastructure in cooperation with schools to recruit teacher candidates from a range of contexts and settings.

7-B. **High Admission Standards:** Institutional and/or program policies and practices ensure that secondary mathematics teacher preparation is highly selective, admitting teacher candidates with demonstrated academic skills and dispositions likely to lead to success in mathematics teaching at the secondary level.

7-C. **Supporting Candidate Success:** The teacher preparation program provides academic support for teacher candidates’ continued growth as they progress through the academic pipeline – from recruitment into the program to completion of the program and beyond – based on effective monitoring of their progress.

7-D. **Promoting Diversity in Teacher Candidates:** The mathematics teacher education program actively recruits teacher candidates representative of the broad diversity of students who they will teach and provides them with the support necessary for their success.

Guiding Principle 8. Beginning and Inservice Teacher Support

Institutions of higher education in partnership with schools and districts support the development of secondary mathematics teachers as they enter their field and continue their professional growth.

Indicators of the guiding principle include:

8-A. **Mentoring Beginning Teachers:** The mathematics teacher preparation program provides mentoring and support mechanisms to encourage the continued growth of new teachers, based on a partnership between institutions of higher education and schools.
8-B. **Supporting Continued Teacher Growth:** The mathematics teacher preparation program promotes the development of professional learning communities among higher education and faculty and administrators to support the growth of secondary mathematics teachers across the professional continuum, including recruitment, initial preparation, induction into the field, continuing professional development, and teacher leader development.

**Guiding Principle 9. Tracking Success**

*The secondary mathematics teacher preparation program tracks the success of its program completers in order to better understand the needs of beginning secondary mathematics teachers and to improve the success of the program in producing effective secondary mathematics teachers.*

Indicators of the guiding principle include:

9-A. **Tracking Success of Beginning Teachers:** The mathematics teacher preparation program tracks and assesses the effectiveness of program completers as they begin their teaching careers, and uses that data to improve the program and increase retention of beginning teachers.

9-B. **Collaborative Improvement:** Mathematics teacher preparation programs work within their partner institutions and across programs in order to continuously improve what they do and to develop effective practices that can be implemented by other programs.
PART 2. PRIORITIES FOR ACTION

Based on extensive input from the partnership teams, the following four areas were identified as being of immediate priority to be addressed by the MTE-Partnership. Each of these priorities is tied to a specific guiding principle and will be addressed by the partnership in the coming months.

I. **Building a common vision** across the participants on a partnership team involved in secondary mathematics teacher preparation.

   In order to support the implementation of the CCSS-M across the United States, programs that develop secondary school mathematics teachers need to have a common vision for mathematics education among all those involved in the program. Particular focus is needed on challenges that must be faced in ensuring effective collaboration, both between K-12 school partners and teacher preparation institutions, as well as among mathematicians and mathematics educators. (Drawn from Guiding Principle 1.)

II. **Preparing and supporting mentor teachers** of field experiences for secondary mathematics teacher candidates.

   While field experiences are a critical component of secondary mathematics teacher preparation, many mentor teachers face a formidable challenge in helping prepare the next generation of teachers, while also continuing to develop their own teaching skills in light of the CCSS-M. Effective mechanisms are needed to prepare and support mentor teachers as they ensure teacher candidates receive field experiences that will help them progress as teachers of mathematics able to teach the CCSS-M. (Drawn from Guiding Principle 3.)

III. **Improving mathematics content preparation** of secondary mathematics teacher candidates.

   Teachers need specialized content knowledge related to the CCSS-M content standards and Standards for Mathematical Practice, and the draft Mathematical Education of Teachers II describes the mathematics learning opportunities future teachers need if they are to gain this mathematical knowledge for teaching as part of their secondary mathematics teacher preparation. Courses or other learning experiences are needed to support acquisition of this specialized content knowledge. (Drawn from Guiding Principle 4.)

IV. **Recruiting and retaining teacher candidates** in secondary mathematics teacher preparation, with focus on increasing diversity.

   School districts continue to be challenged to find sufficient highly qualified teachers of mathematics capable of addressing CCSS-M and who are reflective of the diversity of
their student populations. Innovative approaches are needed to recruit additional high-quality candidates, including students from diverse backgrounds, and retain them in their programs in order to meet the demand for new mathematics teachers. (Drawn from Guiding Principle 7.)

Additional commentary on these priorities will be added to Part 3, and additional information on how they were identified will be provided in the appendix.

PART 3. DISCUSSION OF GUIDING PRINCIPLES

In this section, each guiding principle, along with indicators that lead to successful implementation of the principle, are discussed in more detail. In addition to commentary describing the principle and its indicators, discussion of the following are included:

(a) Sample practices that might be useful in attaining the guiding principle. This discussion is meant to be suggestive of practices that might be explored or conditions that might need to be considered.
(b) Sample measures that suggest how a program might determine their progress in achieving the guiding principle.
(c) Priorities for the development of additional practices and measures that will support the continuing improvement of secondary mathematics teacher preparation programs.

Part 3 will be added in the next draft, following additional input on Parts 1-2.

APPENDIX. BACKGROUND INFORMATION

This section will be added in the next draft.