Comprehensive Program Review Self-Study
M.Ed. Secondary Mathematics

Columbus State University
September 2005

Executive Summary for the M.Ed. Secondary Mathematics

Major Findings of the Program's Quality and Productivity

Program Quality: Very Strong
In February 2005, a continuing approval review of the College of Education was conducted by a Board of Examiners (BOE) consisting of representatives from the National Council for Accreditation of Teacher Education (NCATE) and the Georgia Professional Standards Commission (PSC). The 2000 NCATE Standards and the Georgia 2000 Standards were used to assess the unit and its programs. The BOE judged all standards to be met for the unit and for all initial and advanced programs.

Overall, the M.Ed. Secondary Mathematics program is strong and prepares highly qualified mathematics teachers who have the knowledge, skills, and dispositions to help all students learn. The Real Analysis course sequence has been problematic for some candidates. This is indicated by course grades and informal feedback from candidates. We are continuing to monitor this situation and exploring ways to better support graduate students in these courses.

Program Productivity: Satisfactory
Enrollment in the M.Ed. Secondary Mathematics program increased by 61.5% in Fall 2003 with only a 4.8% decrease the following year. Average enrollment for the four-year period from 2001-2005 was 16.5. The program ranks sixth in average enrollment among the ten M.Ed. programs housed in the Department of Teacher Education. Courses are offered on a one- or two-year cycle, and enrollment in required courses is good. This helps to contribute to the cost-effectiveness of the department. The program has a diverse group of majors (on average 64% female and 30% minority) from a wide range of age groups. Graduates of the program are in high demand.

The number of M.Ed. Secondary Mathematics degrees conferred by CSU is small (an average of 3.25 per year) but has been fairly consistent over the past four years and is comparable to the number of degrees conferred by other USG state universities. As the only USG institution within a 90 mile radius of Columbus that offers a master's degree in secondary mathematics, CSU provides math teachers in its service region an opportunity that they might not have otherwise, to gain expertise in mathematics education.

List of Recommendations for Improving Program Quality
Though the program quality is very strong, we continue to look for ways to make improvements. Current initiatives include:

- providing professional development and networking opportunities for teachers and graduate students through the Support, Mentoring and Resources for Teachers Project (Project SMART) funded by the Calculus Consortium for Higher Education,
- aligning coursework with the new Georgia Performance Standards for Mathematics in an effort to help prepare teachers to teach with the new standards,
- connecting content in graduate mathematics courses to the secondary curriculum so that teachers see the relevance of the mathematics they are learning.

List of Recommendations for Improving Program Productivity

The Mathematics Program Advisory Committee (PAC) oversees the M.Ed. program in Secondary Mathematics and works to improve the curriculum, courses, and resources offered to teachers. Recommendations to improve program productivity are as follows.

- Align coursework with the new Georgia Performance Standards for Mathematics in an effort to help prepare teachers to teach with the new standards. By responding to current initiatives and mandates, we hope to recruit more teachers into the M.Ed. program.
- Provide additional support for students in graduate mathematics courses through advising and/or offering prerequisite courses or professional development opportunities that better prepare students for the graduate mathematics courses.
- Connect the content of the graduate mathematics courses to the secondary curriculum. By making the coursework more relevant to teachers, we hope to attract more teachers into the M.Ed. program.
- Work with Enrollment Services to develop a recruitment and retention plan to attract more students into the undergraduate mathematics and mathematics education programs.

Conclusion about the Program's Viability at CSU

The M.Ed. Secondary Mathematics program at CSU is a viable one. As indicated by the evaluation of the NCATE/PSC Board of Examiners in February 2005, the quality of the program is very strong. All NCATE/PSC standards were judged to be met for all initial and advanced programs. In addition, program quality is enhanced by special opportunities available at CSU. Mathematics education majors have access to resources and professional development opportunities offered through the Columbus Regional Mathematics Collaborative (CRMC), Project SMART (Support, Mentoring, and Resources for Teachers), and the Georgia Partnership for Reform in Science and Mathematics (PRISM).

The viability of the program is also ensured by the sharing of resources among all secondary mathematics programs at CSU. Graduate mathematics courses at the 5000-level also enroll undergraduates on a cross-listed basis. Furthermore, the College of Education, Mathematics Department, CRMC, and P-12 teachers work collaboratively on the design and implementation of the secondary mathematics programs at all levels (B.A, M.Ed., and Ed.S.). Representatives from each of these groups work together to make improvements to the mathematics education programs at CSU and to impact mathematics education in our region. The M.Ed. program in secondary mathematics is a valuable resource for teachers in our region who want to grow professionally and gain expertise in the field of mathematics education.

Graduates of the M.Ed. Secondary Mathematics program are also a valuable resource for our undergraduate program in secondary mathematics. A substantial number of program graduates teach in systems served by CSU, especially Muscogee County. Our graduate programs in secondary mathematics have helped to create a cadre of leaders within our Partner School Network. Graduates often serve CSU as pre-student teaching cooperating teachers and cooperating teachers for student teaching. They are an invaluable asset in assisting with the development of our undergraduates.

Though small, the number of M.Ed. Secondary Mathematics degrees conferred by CSU has been fairly consistent over the past four years and is comparable to the number of degrees conferred

by other USG state universities. As the only USG institution within a 90 mile radius of Columbus that offers a master's degree in secondary mathematics, CSU provides math teachers in its service region an opportunity to gain expertise in mathematics education. This is an opportunity that they might not have if CSU did not offer this degree program. With the critical shortage of highly-qualified mathematics teachers, we need to provide every possible opportunity for teachers to grow professionally and enhance their knowledge and skills in teaching mathematics.

Program Improvement Plan

In response to the findings of the Comprehensive Program Review, the faculty members and administrators of the M.Ed. in Secondary Mathematics Education propose the strategies outlined below to improve the quality, productivity and viability of the program. These strategies will be facilitated by the Secondary Mathematics Program Advisory Committee (PAC).

Departmental Plans and Priorities	***CPR Indicator***	***Projected Timeline***
1. Refine the College of Education Recruitment Plan to focus on specific methods for recruiting Secondary Mathematics graduate students from diverse backgrounds	Productivity Viability	2006-2007
2. Explore various funding sources to provide scholarships for students seeking advanced degrees in Secondary Mathematics	Productivity Viability	2006-Ongoing
3. Collaborate with the Columbus Regional Mathematics Collaborative to maximize the visibility of the secondary mathematics graduate programs in local schools	Productivity Viability	2006-Ongoing
4. Align appropriate graduate courses with the Georgia Performance Standards (GPS) to make the individual courses as well as the program highly attractive to prospective graduate students who will be implementing the GPS.	Quality Productivity Viability	2006-2007
5. Continue to connect the content of the graduate mathematics courses to the secondary mathematics curriculum	Quality Productivity Viability	2006-Ongoing
6. Maximize recruiting opportunities by providing professional development and networking opportunities for teachers and graduate students through the Support, Mentoring, and Resources for Teachers Project (Project SMART) funded by the Calculus Consortium for Higher Education	Productivity Viability	2006-2007

The Interim Dean and the Vice President for Academic Affairs have reviewed the plan and will commit financial and personnel resources to accomplish priorities 1, 4, and 5 for program improvement. Resources from external funding will be necessary to support priorities 2, 3, and 6. The Program Coordinator will communicate additional resource requests as needed to the appropriate administrator within the College of Education at Columbus State University.

Summary Recommendation and Supporting Rationale

Recommendation: *Maintain the Program at the Current Level*

The program quality is very strong, but the number of degrees conferred each year is small. Because of decreasing interest in mathematics as students progress through high school and college, few students take the higher level mathematics courses needed to prepare one for a

career in mathematics or mathematics education. Until we are able to recruit more students into undergraduate programs in mathematics or mathematics education, opportunities for expansion of the M.Ed. program in secondary mathematics will be limited. There are also factors beyond our control that have an impact on the M.Ed. program. Since teachers can get a master's degree in any field and receive an increase in pay, some of the math teachers in our service region have chosen to pursue a master's degree in an area other than secondary mathematics.

As previously mentioned, CSU will continue to work to improve the current M.Ed. program in secondary mathematics by responding to new initiatives (e.g., Georgia Performance Standards), improving the curriculum, providing better support and resources for students, and intensifying recruitment efforts. By enhancing the quality of the program, we hope to attract more potential students.

I. Program Overview

The M.Ed. program in Secondary Mathematics Education prepares highly qualified mathematics teachers who possess the knowledge, skills, and dispositions necessary to promote high levels of learning for all students in grades 6-12. In mathematics content courses, mathematics education courses, professional courses, and field experiences, candidates have multiple opportunities to demonstrate excellence in teaching, scholarship, and professionalism. Creating opportunities for candidates to demonstrate excellence in these three areas is consistent with the College of Education (COE) Conceptual Framework and is reflected in the broad goals of the secondary mathematics education program. These goals are briefly summarized as:

1. understanding and using mathematics (scholarship);
2. planning effective instruction (teaching);
3. implementing effective instruction (teaching);
4. evaluating instruction, both the effect on individuals and on programs (teaching);
5. using research in making decisions about teaching and programs (scholarship);
6. becoming a professional (professionalism).

Candidates who have developed *proficiency* in each of these areas through initial certification programs should develop and demonstrate *expertise* as they progress through the M.Ed. program in Secondary Mathematics Education. Graduates of the program are prepared to apply their expert knowledge of mathematics and mathematics teaching and learning in grade 6-12 classrooms, thus helping to meet the demand for highly qualified mathematics teachers.

The M.Ed. program in Secondary Mathematics helps CSU to accomplish its mission of serving the educational needs of a diverse region. By preparing highly-qualified teachers in a critical needs area and developing teacher leaders, the program helps improve the quality of education and the quality of life in the institution’s service area.

II. Summary Findings of the Program's Overall Quality

In February 2005, a continuing approval review of the College of Education was conducted by a Board of Examiners (BOE) consisting of representatives from the National Council for Accreditation of Teacher Education (NCATE) and the Georgia Professional Standards Commission (PSC). The 2000 NCATE Standards and the Georgia 2000 Standards were used to assess the unit and its programs. The BOE judged all standards to be met for the unit and for all initial and advanced programs. Following is a summary of the findings taken from the BOE final report.

Standard 1: Candidate Knowledge, Skills, and Dispositions

Assessment data from Praxis I, Praxis II, GPA's, MAP evaluations, exit examinations, and national licensing exams indicate that teacher candidates know their subject matter and candidates for other school roles know their fields, both of which are aligned with professional, state, and institutional standards. MAP evaluations and the Disposition Evaluation Form give evidence that candidates and other school personnel know how to teach their subject matter and can deliver information in a clear and meaningful way so that all students learn.

Areas for Improvement: Candidates in Art Education, Biology, Chemistry, and French do not demonstrate content mastery.

Rationale: While overall more than 80 percent of the candidates in the unit have passed their respective content licensure exams, fewer than 80 percent of candidates in Art Education, Biology, Chemistry, and French passed their respective content licensure exams. Note: Chemistry and French had only one program completer each over the past three years.

Standard 2: Assessment System and Unit Evaluation

The unit maintains a comprehensive assessment system for the initial and advanced levels to ensure the systematic collection of data, providing opportunities for the unit to analyze, evaluate, and improve the quality of programs, unit operations, and candidate performance. The assessment systems reflect the conceptual framework and are aligned with INTASC and NBPTS standards as well as specialty professional associations. The unit utilizes information technologies to effectively collect and aggregate data for candidate, program, and unit improvement.

Standard 3: Field Experiences and Clinical Practice

All of the unit's programs which prepare candidates to become teachers or fill other roles as members of the education profession include field work/clinical practice as an integral part. Use of the MAP Evaluation Instrument and the Dispositions Evaluations which connects with the Conceptual Framework supports the work of the unit and provides scaffolding so that candidates acquire the knowledge, skills, and dispositions needed by those who are in professional education roles. Candidates are also surrounded by experienced, caring, competent professionals representing both the University and P-12 partners. Innovations such as the use of information technology for scheduling and tracking candidate progress in a very flexible and comprehensive database, the STEADY new teacher mentoring program, and the

refinement of the Partner School Network enhance to quality of the program and its graduates.

Standard 4: Diversity

The unit has clearly defined its candidate dispositions related to diversity, and these dispositions are assessed throughout required coursework in the initial and advanced programs. Three of the 32 unit faculty represent diversity. The diversity of candidates in unit programs roughly mirrors that of the university and service area as a whole. Because of the racial and ethnic diversity in the university's service area, initial and advanced candidates also work with a broadly diverse population of P-12 students.

Areas for Improvement: The college has not been successful in recruiting and retaining a diverse faculty.

Rationale: Even though efforts have been made to recruit additional minority faculty, currently there are three minority faculty in the unit. While this constitutes a slight improvement from 1998, a significant impact has not been made to ensure that candidates have the opportunity to work with diverse faculty.

Standard 5: Faculty Qualifications, Performance, and Development

Unit faculty have extensive academic backgrounds. Eighty-four percent (84%) of the full-time faculty, and seventeen percent (17%) of the part-time faculty hold terminal degrees while the remaining faculty either are working to complete doctoral studies or have master's degrees. Unit faculty are effective teachers who model best teaching practices in their areas of specialty. Most faculty have been engaged in scholarly activities and service activities to the local, state, regional, national, and international communities. All full-time tenured and non-tenured faculty are systematically and annually evaluated by their department chair, personnel committee, unit dean, and throughout the university input system. The faculty serve on committees and boards at the university and in the local community. They are also involved in local, state, and national professional associations. The unit has an expectation of professional growth/development of both full-time and part-time faculty, and faculty concur with the expectation by attending workshops and conferences, reading journals, and conducting research.

Areas for Improvement: Part-time faculty are not systematically evaluated.

Rationale: There is no systematic process for evaluating part-time faculty across the unit.

Standard 6: Unit Governance and Resources

The unit has the responsibility for authority for the delivery of the preparation of all professional educators. Systems and processes are in place to ensure that all constituencies are represented in the design, delivery and assessment of unit programs. Facilities, personnel and budget are adequate to meet the needs of candidates, faculty and programs. The unit does not require part-time faculty who teach or supervise student teachers to attend an orientation/training session on the conceptual framework or the use of the disposition or MAP rubrics.

Areas for Improvement: Not all part-time faculty are adequately trained on assessments used to evaluate candidates.

Rationale: The unit cannot ensure that part-time faculty have the requisite knowledge and skills to effectively assess candidates.

III. Summary Findings of the Program's Overall Productivity

Enrollment in the M.Ed. Secondary Mathematics program increased by 61.5% in Fall 2003 and has remained relatively stable since that time. The program ranks sixth in average enrollment among the ten M.Ed. programs housed in the Department of Teacher Education. Courses are offered on a one- or two-year cycle, and enrollment in required courses is good. This helps to contribute to the cost-effectiveness of the department. The program has a diverse group of majors (on average 64% female and 30% minority) from a wide range of age groups. Graduates of the program are in high demand.

The number of M.Ed. Secondary Mathematics degrees conferred by CSU is small but has been fairly consistent over the past four years and is comparable to the number of degrees conferred by other USG state universities. As the only USG institution within a 90 mile radius of Columbus that offers a master's degree in secondary mathematics, CSU provides math teachers in its service region an opportunity that they might not have otherwise, to gain expertise in mathematics education.

III A. Enrollment of Students in the Program

The enrollment pattern for the M.Ed. program in Secondary Mathematics is shown in Table 3.1.

Table 3.1 Number of Declared Majors in M.Ed. Secondary Mathematics – Fall Semester

	2001-2002	2002-2003	2003-2004	2004-2005
Full-Time	3	4	6	6
Part-Time	9	9	15	14
Total	*12*	*13*	*21*	*20*

The majority of students in the M.Ed. program are part-time students who teach during the day and take evening classes. Enrollment increased by 61.5% in Fall 2003 with only a 4.8% decrease the following year. This increase may be due in part to recent collaborative efforts between the Mathematics Department, College of Education, and Columbus Regional Mathematics Collaborative. These efforts include:

- a conference hosted by CSU in May 2002 that brought together mathematicians and mathematics educators from across the state to discuss the mathematical preparation of secondary teachers;
- initiation of the Support, Mentoring, and Resources for Teachers of Secondary Mathematics Project (Project SMART), providing professional development, support, and mentoring for secondary mathematics teachers in the CSU service area through professional meetings and a list serv;
- restructuring of graduate mathematics education programs (e.g., offering a greater selection of courses during the summer; development of a four-semester M.Ed. program).

Table 3.2 shows the total enrollment in all M.Ed. programs housed in the Department of Teacher Education at CSU. Since 2003-2004, enrollment in the M.Ed. Secondary Mathematics program has been comparable to the enrollment in most other graduate education programs. In average

enrollment, it ranks sixth among the ten M.Ed. programs listed in the table. All secondary education programs have seen an increase in enrollment since 2001.

Table 3.2 Number of Declared Majors in M.Ed. Programs – Fall Semester

Program	2001-2002	2002-2003	2003-2004	2004-2005	Avg. Over Four Years
Early Childhood Education	26	25	24	22	24.25
Health & Physical Education	10	13	11	11	11.25
Middle Grades Education	29	50	53	58	47.5
Secondary English	9	24	33	27	23.25
Secondary Mathematics	***12***	***13***	***21***	***20***	***16.5***
Secondary Science	13	22	20	17	18
Secondary Social Science	7	19	22	15	15.75
Special Education – Behavioral Disorders	15	15	18	16	16
Special Education – Learning Disabilities	22	33	28	31	28.5
Special Education – Mental Retardation	10	17	8	8	10.75
Total	*153*	*231*	*238*	*225*	*211.75*

The Mathematics Program Advisory Committee (PAC) oversees the M.Ed. program in Secondary Mathematics and works to improve the curriculum, courses, and resources offered to teachers. Currently, we are aligning coursework with the new Georgia Performance Standards for Mathematics in an effort to help prepare teachers to teach with the new standards. By responding to current initiatives and mandates, we hope to recruit more teachers into the M.Ed. program.

III B. Annual Degree Productivity of the Program

As indicated in Table 3.3, the number of M.Ed. degrees conferred each year in Secondary Mathematics is small and has actually decreased since 2001-2002.

Table 3.3 Number of Degrees Conferred – Fiscal Year

Program	2001-2002	2002-2003	2003-2004	2004-2005
Early Childhood Education	12	9	11	11
Health & Physical Education	1	3	6	6
Middle Grades Education	10	10	10	26
Secondary English	7	3	6	16
Secondary Mathematics	***5***	***1***	***4***	***3***
Secondary Science	1	4	6	10
Secondary Social Science	1	4	5	2
Special Education – Behavioral Disorders	7	5	8	3
Special Education – Learning Disabilities	10	8	13	7

Special Education – Mental Retardation	3	3	1	3

There are several factors contributing to the small number of degrees conferred each year.

1. Though enrollment increased significantly in 2003, some students take several years to complete the program because of teaching schedules and other obligations.
2. Some students in the M.Ed. program are working concurrently on coursework for teacher certification. They must complete their certification coursework prior to completing their M.Ed. degree.
3. Students sometimes fail to see the relevance of the required mathematics content courses, and for a few students this may be a deterrent to program completion.

The Mathematics Department hired a mathematics educator two years ago and has been studying the curriculum in the graduate mathematics courses. Ongoing efforts to connect the curriculum in these courses to the topics that are taught in high school will hopefully increase the number of M.Ed. degrees conferred each year as students begin to see the relevance of their coursework to their teaching.

III C. Program Completion Efficiency & Graduation Rate

Table 3.4 shows the graduation rates for all M.Ed. programs housed in the Department of Teacher Education at CSU.

Table 3.4 Graduation Rate

Program	2001-2002	2002-2003	2003-2004	2004-2005
Early Childhood Education	46%	36%	46%	50%
Health & Physical Education	10%	23%	55%	55%
Middle Grades Education	34%	20%	19%	45%
Secondary English	78%	13%	18%	59%
Secondary Mathematics	***42%***	***8%***	***19%***	***15%***
Secondary Science	8%	18%	30%	59%
Secondary Social Science	14%	21%	23%	13%
Special Education – Behavioral Disorders	47%	33%	44%	19%
Special Education – Learning Disabilities	45%	24%	46%	23%
Special Education – Mental Retardation	30%	18%	13%	38%

Graduation rates tend to fluctuate as students complete their programs of study at different rates. The graduation rates for the M.Ed. Secondary Mathematics program tend to be lower than the rates for most other M.Ed. programs. This is due in part to the following factors:

1. Some students in the M.Ed. program are working concurrently on coursework for teacher certification. They must complete their certification coursework prior to completing their M.Ed. degree.

2. Students whose bachelor's degrees are in areas other than mathematics, mathematics education, or a closely related field must often take a significant number of prerequisite mathematics courses, thus adding to the length of their program of study.
3. Several students have left the program to pursue a master's degree in another area.

Providing a quality program in Secondary Mathematics is the primary concern of mathematics and mathematics education faculty. We will continue to make every effort to provide meaningful and relevant coursework that prepares teachers with the knowledge, skills, and dispositions to help all students learn mathematics. Ongoing efforts to offer additional support and resources to teachers as they work on their M.Ed. degree should ensure that most students who enroll in the program are able to complete it.

III D. Efficiency & Clarity of the Program's Course Requirements

The M.Ed. Program in Secondary Mathematics Education requires a professional core (7 credits), a secondary education/concentration core (23 credits), and recommended electives (6 credits). Course requirements are listed below.

Area 1: Professional Core (7 hrs.)
EDUF 6115 Educational Psychology: Achievement for Diverse Learners (3)
EDUF 6116 Research Methods and Action Research (3)
EDUF 6795 Seminar in Collaboration in School and Student Academic Improvement (1)

Area 2: Concentration (23 hrs.)
EDCI 6158 Trends and Issues in Middle Grades and Secondary Education (2)
EDCI 6255 Teacher Inquiry and Investigation (2)
EDSE 6795 Applying Best Practices in Secondary Mathematics Classrooms (1)
EDSE 6125 Teaching Mathematics in Secondary School (3)
EDSE 6526 Topics in Secondary Mathematics (3)
MATH 5151 Introduction to Real Analysis 1 (3)
MATH 5152 Introduction to Real Analysis 2 (3)

Select six semester hours of graduate mathematics at the MATH 5000 level or above.

Area 3: Electives (6 hrs.)
Select **six** semester hours (5000 level or above) from MATH, EDSE, or EDMG with agreement of advisor.

These requirements are communicated online and through the CSU Catalog. At the beginning of each semester, a Graduate Orientation is held for all new graduate students. At this orientation, program requirements are clearly communicated, and the program coordinator works with each student to develop a tentative program of study. Subsequently, the program coordinator communicates with graduate students each semester by e-mail, phone, or face-to-face meetings to update degree progress sheets and advise on course selection.

Plans to improve program efficiency include offering a summer math course that will help prepare students for the Real Analysis sequence. The Program Advisory Committee will also explore the possibility of offering additional options for the required math course sequence in the program. Other options may include Abstract Algebra or Mathematical Statistics.

III E. Frequency and Sequencing of Course Offerings Required for Program Completion

As shown in Table 3.5, courses required in the M.Ed. Secondary Mathematics program are offered on a regular basis. Students beginning their program in summer semester can complete their program of study in four semesters, if they so choose. Students are advised to take EDUF 6116 early in their program of study. EDCI 6158 is a prerequisite or co-requisite for EDCI 6255 which is usually taken during one of the last two semesters of a student's program. MATH 5151 and 5152 is a two-course sequence in Real Analysis. Other courses may be taken in any order.

Table 3.5 Frequency of Course Offerings

Number of Sections Per Semester													
	F 01	Sp 02	Su 02	F 02	Sp 03	Su 03	F 03	Sp 04	Su 04	F 04	Sp 05	Su 05	F 05
EDUF 6115	5	1	3	3	4	2	4	3	3	2	2	2	2
EDUF 6116	1	5	5	6	4	4	4	3	3	2	3	3	2
EDUF 6795										1	1	1	1
EDCI 6158	1		1	1		1	1		1	1		1	1
EDCI 6255		1	1		1	1	1	1	1	1	1	1	1
EDSE 6795				1	1		1	1		1	1		1
EDSE 6125			1						1				
EDSE 6526						1						1	
MATH 5151	1			1			1			1			1
MATH 5152		1			1			1			1		
MATH 5*** electives	4	5	1	4	5	1	3	3	1	3	2	1	5
EDMG/EDCI Math 5000 level or above	3	1	2	1	1	2	1	1	2	2	1	2	1

At this time, the frequency and sequencing of course offerings meets the needs of our M.Ed. students. As additional mathematics faculty are hired, the Math Department may be able to give students more options in their mathematical studies by offering additional graduate level mathematics courses.

III F. Enrollment in the Program's Required Courses

Table 3.6 shows the average enrollment per section for required courses in the M.Ed. Secondary Mathematics program. All M.Ed. students must take EDUF 6115, EDUF 6116, and EDUF 6795, so average enrollments in these courses are higher. EDCI 6158 and EDCI 6255 are required in the M.Ed. programs for all middle grades and secondary education majors. Enrollments in EDSE 6125 and EDSE 6526 are the best indicators of enrollment trends in the secondary mathematics program. Enrollment in these courses has remained fairly consistent during the period from 2001 to 2005, with an average enrollment of 9.75.

Table 3.6 Average Enrollment in the Program's Required Courses

Average Enrollment Per Section													
	F 01	Sp 02	Su 02	F 02	Sp 03	Su 03	F 03	Sp 04	Su 04	F 04	Sp 05	Su 05	F 05
EDUF 6115	8.4	26	13	13	13.5	15.5	11.5	10	15.3	22.5	18.5	14	19.5
EDUF 6116	25	8.8	12.2	7	13	16	13.5	19	18	25.5	14.7	17	21
EDUF 6795										35	12	16	65
EDCI 6158	13		16	25		15	26		29	28		26	24
EDCI 6255		11	7		22	12	17	21	18	9	26	12	16
EDSE 6795				7	3		5	4		6	1		2
EDSE 6125			7						10				
EDSE 6526						12						10	
MATH 5151G	4			7			7			7			6
MATH 5152G		2			4			3			3		

By offering the required MATH and EDSE courses on a one- or two-year cycle, enrollment is high enough that the courses do not have to be cancelled. Occasionally, we have to substitute another course for EDSE 6125 or EDSE 6526 since those courses are offered on a two-year rotation cycle. An alternate course that is frequently used as a substitute is EDCI 5555G CRMC Workshops. This course is offered every summer through the College of Education and the Columbus Regional Mathematics Collaborative.

We are looking at ways to help students through the Real Analysis sequence (MATH 5151 and MATH 5152). Many graduate students struggle with these courses. In a couple of cases, students have failed to complete the M.Ed. program in secondary mathematics because of this required course sequence. By finding ways to provide additional support for students and working to connect the content of the course to the secondary curriculum, we hope this course sequence will become less of an obstacle for students as they work to complete their degree.

III G. Diversity of the Program's Majors and Graduates

Table 3.7 shows the gender and ethnic origin of students in the M.Ed. Secondary Mathematics program. Overall, the student enrollment by gender has been 64% female and 36% male. These figures are comparable to the institution's enrollment percentages by gender.

On average, 70% of the program's majors since Fall 2001 have been white, 27% have been black, and 3% have belonged to other ethnic groups. There have been no international students in the program during this time period. The percentage of black students in the M.Ed. Secondary Mathematics program is larger than the overall percentage of black students in graduate programs at CSU.

Table 3.7 Ethnic and gender diversity among M.Ed. Secondary Mathematics majors

Gender	**2001-2002**	**2002-2003**	**2003-2004**	**2004-2005**
Female	7 (58%)	10 (77%)	13 (62%)	12 (60%)
Male	5 (42%)	3 (23%)	8 (38%)	8 (40%)
Ethnicity				
Asian	0	1 (8%)	0	0
Black	3 (25%)	4 (31%)	6 (29%)	5 (25%)
Multi-Racial	0	0	1 (5%)	0
White	9 (75%)	8 (61%)	14 (66%)	15 (75%)

The gender and ethnic origin of program graduates since Fall 2001 is shown in Table 3.8. Overall, 31% of the program graduates have been male and 69% have been female. These figures are fairly consistent with the overall enrollment percentages for the program by gender (36% male and 64% female).

Though 27% of the students enrolled in the M.Ed. Secondary Mathematics program have been black, the overall percentage of black students graduating from the program since Fall 2001 is only 15%. The reason for this is unknown at this time. We need to track the black students who enroll in the program to determine if they are dropping out of the program or just taking several years to complete it.

Table 3.8 Ethnic and gender diversity among M.Ed. Secondary Mathematics graduates

Gender	**2001-2002**	**2002-2003**	**2003-2004**	**2004-2005**
Female	3 (60%)	1 (100%)	2 (50%)	3 (100%)
Male	2 (40%)	0	2 (50%)	0
Ethnicity				
Asian	0	0	0	1 (33%)
Black	1 (20%)	0	0	1 (33%)
Multi-Racial	0	0	0	0
White	4 (80%)	1 (100%)	4 (100%)	1 (33%)

Students in the M.Ed. program in Secondary Mathematics are from diverse age groups. The majority of students are between 31 and 50 years of age. Table 3.9 shows the age composition of all M.Ed. students in the Secondary Mathematics program since 2001.

Table 3.9: Age diversity among M.Ed. Secondary Math students

Age	2001-2002	2002-2003	2003-2004	2004-2005
21-25	1	2	6	6
26-30	2	1	5	1
31-40	6	6	5	8
41-50	2	4	4	5
51-60	1	0	1	0
Over 60	0	0	0	0
Total	12	13	21	20
Average	36.7	35.4	33.9	33.4

The larger number of students in the 31-50 age range might be due to a couple of factors:

1. Students graduating from a bachelor's program usually teach for a while before entering a graduate program.
2. For some students in the M.Ed. program, teaching is a second career choice. They may be coming from another field to obtain teacher certification along with the M.Ed.

Though the trend indicates that graduate students tend to be older, there was an increase in 2003 in the number of students in the 21-25 age range. This suggests that more students are entering the M.Ed. program shortly after completing an undergraduate program.

Faculty from the College of Science and College of Education are working with Enrollment Services to develop a plan for recruiting and retaining math and science education majors. Included in this plan will be strategies for attracting students from diverse groups into mathematics education. As the diversity of undergraduate mathematics or mathematics education majors increases, the pool of prospective candidates for graduate study will also be more diverse.

III H. Cost-Effectiveness of Instructional Delivery in the Program's Home Department

As shown below in Tables 3.10 and 3.11, the budget for the Department of Teacher Education represented approximately 13% of the total instructional costs for Columbus State University (CSU) from 2001 to 2004. During this time period, over $1,000,000 of the department budget came from grant funds that, for the most part, supported the work of the Centers of Excellence (see note in Table 3.12). In 2004-2005, the department budget represented 8% of the total instructional costs at CSU. Considering that, in Fall 2004, 1340 (19%) of the 7224 students enrolled at CSU were majoring in a program offered through the Department of Teacher Education, instructional delivery in the department is very cost-effective.

For the graduate programs in secondary education, the cost per major has decreased by approximately 64% since 2001. In 2004-2005, the cost per credit was $284.00 compared to $162.15 for the institution. The higher cost per credit is due to the smaller number of students enrolled in graduate courses.

Table 3.10 Instructional Costs for Department of Teacher Education and Graduate Secondary Education Programs

	2001-2002	2002-2003	2003-2004	2004-2005
Department Budget*	$3,116,951	$3,176,287	$3,143,501	$2,032,092
Cost Per Major (M.Ed. & Ed.S. Secondary Education majors) *(Pro-Rated Expenditures/Number of Declared Majors)*	$10,390	$8,359	$6,573	$4,064
Credit Hours Taught Fall and Spring (M.Ed. & Ed.S. Secondary Education majors)	989	1,387	1,335	1,358
Cost per Credit (M.Ed. & Ed.S. Secondary Education majors)	$567	$573	$542	$284
* Note: Centers of Excellence units (ETTC, CRMC, Child Care R&R and Oxbow Meadows removed from academic departments in FY 2005).				

Table 3.11 Total Instructional Costs at CSU

	2001-2002	2002-2003	2003-2004	2004-2005
Instructional Costs	$23,311,457.76	$23,963,598.65	$23,784,544.59	$25,240,030.43
Total Credit Hours	116,543	133,777	148,797	155,654
Cost per Credit	$200.02	$179.13	$159.85	$162.15

By offering the required mathematics education courses in the M.Ed. Secondary Mathematics program on a one- or two-year cycle, the number of students enrolled in these courses is high enough to contribute to the cost-effectiveness of the department. In addition, the program requires some of the same courses (e.g., Educational Psychology, Action Research, Trends and Issues, Teacher Inquiry, etc.) that are required in other M.Ed. programs. These courses have higher enrollments and thus help to contribute to the cost-effectiveness of the department.

The Mathematics Program Advisory Committee (PAC) oversees the M.Ed. program in Secondary Mathematics and works to improve the curriculum, courses, and resources offered to teachers. Currently, we are aligning coursework with the new Georgia Performance Standards for Mathematics in an effort to help prepare teachers to teach with the new standards. By responding to current initiatives and mandates, we hope to recruit more teachers into the M.Ed. program to make it more cost-effective.

III I. Program's Responsiveness to State Needs and Employer Demand for Program Graduates

Most graduates of the M.Ed. Secondary Mathematics program are already teaching in a middle or high school classroom. The expertise gained through the master's program contributes to these teachers' effectiveness in helping all students learn mathematics. Since 2001, graduates of the M.Ed. program who were not previously employed have had no trouble finding teaching jobs in mathematics. We frequently get calls or letters from schools or districts within and outside our service region that are looking to hire mathematics teachers.

Graduates of the M.Ed. Secondary Mathematics program are also a valuable resource for our undergraduate program in secondary mathematics. A substantial number of program graduates teach in systems served by CSU, especially Muscogee County. Our graduate programs in secondary mathematics have helped to create a cadre of leaders within our Partner School Network. Graduates often serve CSU as pre-student teaching cooperating teachers and cooperating teachers for student teaching. They are an invaluable asset in assisting with the development of our undergraduates.

The small number of mathematics and mathematics education majors at both the undergraduate and graduate levels limits this program's ability to be more productive and responsive to the needs of the state. The number of students who have the mathematics background to pursue a graduate degree in mathematics education is small. Some of our current efforts focus on trying to recruit more high school students into the secondary mathematics program by:

- visiting area high schools to talk with students who are interested in mathematics,
- bringing high school students in the Future Teachers Academy program on campus and providing them with information about degrees and career opportunities in mathematics education.

In addition, we are working to attract more mathematics teachers into the M.Ed. program by:

- aligning coursework with the new Georgia Performance Standards for Mathematics in an effort to help prepare teachers to teach with the new standards,
- providing additional support for students in graduate mathematics courses, and
- connecting the content of graduate mathematics courses to the secondary curriculum.

III J. Position of the Program's Annual Degree Productivity among Comparable USG Programs

As indicated in Table 3.12, among the seven USG state universities that offer a master's degree in secondary mathematics, CSU ranks third in average number of degrees conferred. CSU is the only USG institution within a 90 mile radius of Columbus that offers a master's degree in secondary mathematics.

Table 3.12 M.Ed. Secondary Mathematics Degrees Conferred by Institution

Institution	FY 2001	FY 2002	FY 2003	FY 2004	Avg. of Four Years
State Universities					
University of West Georgia	4	11	2	9	6.5
North Georgia College & State University	9	1	3	7	5
Columbus State University	**5**	**5**	**1**	**4**	**3.75**
Georgia Southwestern State University	2	2	5	3	3
Armstrong Atlantic State University (Program Deactivated)	0	1	1	6	2
Albany State University	0	0	3	2	1.25
Augusta State University	1	0	2	1	1
Regional and Research Universities					
Valdosta State University (Effective Date Unknown)	0	0	0	0	0
University of Georgia	13	14	25	39	22.75
Georgia State University	11	13	19	23	16.5
Georgia Southern University	4	5	3	3	3.75

Plans for improving the position of CSU's program among comparable USG programs include enhanced recruitment and retention efforts, improved services and support for mathematics education majors (e.g., a math tutoring center), and continued support for students and classroom teachers through a variety of professional development activities.

III K. This Program's Contribution to Achieving CSU's Mission

The M.Ed. program in Secondary Mathematics helps CSU to accomplish its mission of serving the educational needs of a diverse region. By preparing highly-qualified teachers in a critical needs area, the program helps to improve the quality of education and the quality of life in the institution's service area.

IV. Conclusion about the Program's Viability at CSU

The M.Ed. Secondary Mathematics program at CSU is a viable one. As indicated by the evaluation of the NCATE/PSC Board of Examiners in February 2005, the quality of the program is very strong. All NCATE/PSC standards were judged to be met for all initial and advanced programs. In addition, program quality is enhanced by special opportunities available at CSU. Mathematics education majors have access to resources and professional development opportunities offered through the Columbus Regional Mathematics Collaborative (CRMC), Project SMART (Support, Mentoring, and Resources for Teachers), and the Georgia Partnership for Reform in Science and Mathematics.

The viability of the program is also ensured by the sharing of resources among all secondary mathematics programs at CSU. Graduate mathematics courses at the 5000-level also enroll undergraduates on a cross-listed basis. Furthermore, the College of Education, Mathematics Department, CRMC, and P-12 teachers work collaboratively in the design and implementation of the secondary mathematics programs at all levels (B.A, M.Ed., and Ed.S.). Representatives from each of these groups work together to make improvements to the mathematics education programs at CSU and to impact mathematics education in our region. The M.Ed. program in secondary mathematics is a valuable resource for teachers in our region who want to grow professionally and gain expertise in the field of mathematics education. Students in the M.Ed. program take what they learn and apply it in their own classrooms to help their students learn mathematics.

Graduates of the M.Ed. Secondary Mathematics program are also a valuable resource for our undergraduate program in secondary mathematics. A substantial number of program graduates teach in systems served by CSU, especially Muscogee County. Our graduate programs in secondary mathematics have helped to create a cadre of leaders within our Partner School Network. Graduates often serve CSU as pre-student teaching cooperating teachers and cooperating teachers for student teaching. They are an invaluable asset in assisting with the development of our undergraduates.

Though small, the number of M.Ed. Secondary Mathematics degrees conferred by CSU has been fairly consistent over the past four years and is comparable to the number of degrees conferred by other USG state universities. As the only USG institution within a 90 mile radius of Columbus that offers a master's degree in secondary mathematics, CSU provides math teachers in its service region an opportunity to gain expertise in mathematics education. This is an opportunity that they might not have if CSU did not offer this degree program. With the critical shortage of highly-qualified mathematics teachers, we need to provide every possible opportunity for teachers to grow professionally and enhance their knowledge and skills in teaching mathematics.

V. Program Improvement Plan

The Mathematics Program Advisory Committee (PAC) will oversee the following efforts to improve the curriculum, courses, and resources offered to teachers.

- Align coursework with the new Georgia Performance Standards for Mathematics (2005-2006). Work will be supported by a PRISM mini-grant.
- Explore ways to provide additional support for students in graduate mathematics courses (ongoing). A faculty member in the Mathematics Department has submitted a proposal to establish a Math and Science Center at CSU that would provide tutoring and other services for students enrolled in math or science courses.
- Consider ways to connect the content of the graduate mathematics courses to the secondary curriculum (ongoing). These efforts were initiated in May 2002 with a conference on the mathematical preparation of secondary teachers. A graduate course is now offered through the Department of Teacher Education that examines high school

mathematics from an advanced standpoint. We are still looking at ways to make these connections in the mathematics content courses.

- Provide professional development and networking opportunities for teachers and graduate students through the Support, Mentoring and Resources for Teachers Project (Project SMART) funded by the Calculus Consortium for Higher Education (ongoing). Activities include a one-day conference, monthly meetings, and a list serv.
- Work to recruit high school students into mathematics or mathematics education (2005-2006 and beyond). Faculty members from the CSU Department of Teacher Education will visit area high schools to talk with students who are interested in mathematics or science. Also, high school students in the Future Teachers Academy program will be invited to CSU to learn more about degree programs and opportunities in mathematics and science. These efforts are supported by PRISM monies.

VI. Summary Recommendation

Recommendation: Maintain the Program at the Current Level

The program quality is very strong, but the number of degrees conferred each year is small. Because of decreasing interest in mathematics as students progress through high school and college, few students take the higher level mathematics courses needed to prepare one for a career in mathematics or mathematics education. Until we are able to recruit more students into undergraduate programs in mathematics or mathematics education, opportunities for expansion of the M.Ed. program in secondary mathematics will be limited. There are also factors beyond our control that have an impact on the M.Ed. program. Since teachers can get a master's degree in any field and receive an increase in pay, some of the math teachers in our service region have chosen to pursue a master's degree in an area other than secondary mathematics.

As previously mentioned, CSU will continue to work to improve the current M.Ed. program in secondary mathematics by responding to new initiatives (e.g., Georgia Performance Standards), improving the curriculum, providing better support and resources for students, and intensifying recruitment efforts. By enhancing the quality of the program, we hope to attract more potential students.