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Graduation Requirements, Skills, Postsecondary Education, and the Michigan Economy

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***GRADUATION REQUIREMENTS, SKILLS, POSTSECONDARY
EDUCATION, AND THE MICHIGAN ECONOMY***

Testimony presented to
Michigan Senate Education Committee

By

Dr. Timothy Bartik
Dr. Kevin Hollenbeck

February 20, 2006

Introduction

We are Dr. Timothy Bartik and Dr. Kevin Hollenbeck, senior economists with the W.E. Upjohn Institute for Employment Research. We are also school board members. Bartik is currently President, Kalamazoo Board of Education, and Hollenbeck is a trustee on the Portage Board of Education. Furthermore, Hollenbeck is on the board and is a past president of the Michigan Association of School Boards. We want to make it clear, however, that the views that we're expressing do not necessarily represent the W.E. Upjohn Institute, Kalamazoo Public Schools, Portage Public Schools, or the MASB.

We would like to thank the committee for its commitment to gather the input of individuals from across the state as it considers the important issue of high school graduation requirements and to thank you for the opportunity to share our thoughts with you. While we are heavily involved in public school governance, our testimony is mainly motivated by our professional work in the economics of employment.¹

Michigan's Economy and High School Reform

As far as we can tell, there is bipartisan agreement that the state's economy is not performing or growing at an adequate rate. The impetus for the increase in graduation requirements seems to be from a belief that this policy/legislation will contribute to solving that problem. There seems to be two strands of logic. First, the increase in graduation requirements will improve the *skills* of (future) Michigan workers, and second, the increase in graduation requirements will increase the postsecondary attendance rate for high school graduates. As the

¹ For the record of the committee, we have attached to this testimony copies of letters regarding the high school graduation requirements that we have sent to Superintendent Flanagan and Lt. Governor Cherry. Our testimony today uses some of the same arguments and even same verbiage as these letters. However, these letters add some additional points about how Michigan can promote economic development through education in other ways than changing high school graduation requirements.

Cherry Commission and an abundance of studies have pointed out, there is a strong relationship between economic growth and postsecondary educational attainment.

Ironically, we agree wholeheartedly with the notions that the skill levels of workers could and should be improved, and the postsecondary attendance rate (and the in-state retention rate of those with postsecondary degrees) should be increased in order to improve the state's economy. We simply believe that the postsecondary graduation requirements that are being promulgated will, at best, be an extremely blunt instrument to achieve these ends, and, at worst, may have unintended negative consequences for them.

Being associated closely with schools, we are aware that high school curricula have changed over time to be more rigorous and relevant. We are teaching more and more complex material. Furthermore, data-driven accountability has magnified the attention paid to teaching and learning. However, there is no room for complacency as international comparisons and trends in achievement show. High school reform must proceed in order to (1) improve achievement, (2) reduce achievement gaps, and (3) better prepare students for postsecondary and career success. But the reform must be targeted on curriculum and instruction (including student incentives to learn), not on a command and control policy about course taking.

We recognize that the Legislature may feel compelled to adopt some high school graduation requirements that mandate course taking. Later in this testimony, we present some specific graduation requirements proposals that respond to this political need, but are sufficiently flexible that they will be consistent with current high school reform efforts. In contrast, in our opinion the current graduation requirement proposals of the Michigan Department of Education (MDE) are so rigid that they would inhibit needed high school reforms.

How Do the Skills that Employers Want Relate to the Proposed Graduation Requirements?

In short, they don't.

Many commissions and studies have identified the skills that employers want from productive employees. There has been fairly wide agreement that these skills overlap considerably with the 21st Century Applied Learning Core portion that have, unfortunately, been superficially appended to the graduation requirements legislation. From an economic development perspective, those are the skills that will contribute to our state's economy.

Hollenbeck (1994) interviewed employers in Southwest Michigan to determine what skills/knowledge are necessary to succeed in any level of a corporation, from "mail room" to "board room." This study resulted in 23 "Workplace Know-How Skills" that have been inculcated into the career and technical education curriculum in this county. Among those skills are "Basic reading, basic verbal/speaking, writing, listening, and basic math (arithmetic, fractions, decimals, measurement)." Equally emphasized were task achievement competencies such as "flexibility, problem solving, time management, and understanding the 'big picture'." This report shows virtual overlap between the Southwestern Michigan results and studies from 10 states, including the entire state of Michigan.

In 1996, Murnane and Levy wrote a well-researched and well-received book called *Teaching the New Basic Skills: Principles for Educating Children to Thrive in a Changing Economy*. What are these new basic skills, which would legitimately be part of minimum high school graduation standards for all students? On page 32 of the book, these are described by Murnane and Levy as

The ability to read at the ninth grade level or higher; the ability to do math at the ninth-grade level or higher; the ability to solve semistructured problems where hypotheses must be formed and tested; the ability to work in groups with persons of various backgrounds; the ability to communicate effectively, both orally and in writing; the ability to use personal computers to carry out simple tasks like word processing. These are the New Basic Skills, the minimum skills people now need to get a middle class job.

Murnane and Levy then explain on page 33 that

If the New Basic Skills appear surprisingly modest, recall that they are a floor. Many good jobs require greater skills, but very few require less. Doing math at a ninth-grade level means the ability to manipulate fractions and decimals and to interpret line graphs and bar graphs. It requires only a bare minimum of algebra. The fact that firms must test for this level of mathematical skill confirms the obvious: many recent high school graduates don't have it.

Superintendent Flanagan made the following argument in his rationale for the proposed graduation requirements:

More than 60 percent of employers report that recent graduates have poor math skills, and nearly 75 percent report deficiencies in grammar and writing skills. Unqualified and poorly trained, these high school graduates are likely to become trapped in unskilled, low-paying jobs that do not support a family.

Superintendent Flanagan's statement is true. However, what is missing is not college-prep skills, but rather more basic math and literacy skills. If employers are reporting that high school graduates they hire cannot read graphs, the proper response is to make sure they learn to read graphs, not to pass them on to a watered-down Algebra 2 course.

Whereas there have been a number of studies that have resulted in a consistent picture that what is needed in the workplace are The New Basic Skills (or to use our Michigan title—21st Century Applied Learning Core), there are, to our knowledge, less than a handful of studies that examine the causal link between high school course taking and productivity payoffs in the workplace. In probably the most rigorous study, Rose and Betts (2001) suggest that there is a positive relationship between the particular math courses taken in high school and earnings in later life. However, much of the effect stems from the amount and type of postsecondary education that follows high school. Furthermore, in a technical appendix, these authors note that the impact of Algebra II and higher level courses disappears when an instrumental variables technique is used for estimation and when ability is controlled.

A report that appears to largely provide the intellectual rationale for Michigan's proposed new graduation requirements is *Ready or Not: Creating a High School Diploma That Counts*, prepared by Achieve, Inc., The Education Trust, and the Thomas E. Fordham Foundation. This report explicitly states on page 8, that "Successful preparation for both postsecondary education and employment requires learning the same rigorous English and mathematics content and skills." This statement is supposedly backed up by examples of jobs that require the English and mathematics benchmarks described in the report. But if you actually look at the jobs described in the report, in most cases they do not require Algebra II, let alone the two years of foreign languages in the proposed Michigan graduation requirements approved by the State Board:

Page 74: Machine operator: Very minimal algebra and geometry requirements.

Page 76: Licensed nurse: Very minimal algebra and geometry requirements.

Page 78: Actuary: Very minimal algebra requirements. But does require some statistics, which is not addressed in Michigan's proposed graduation requirements.

Page 80: Wafer fabrication technician and manufacturing technician: No algebra requirement, but does require some statistics.

Page 82: Public events manager: No math requirements.

Page 84: Loan officer: Needs to be able to do some basic numerical operations, but no algebra or higher math requirements.

In addition, the *Ready or Not* report does not consider many other good-paying jobs that do not require Algebra II or foreign languages: auto mechanic, plumber, carpenter, etc. These jobs require high levels of skills, but these are not the skills that are taught in regular college prep classes.

Will the Graduation Requirements Increase College Attendance?

In a word: unlikely.

A large majority of our high school students already pursue postsecondary education.

Kalamazoo County follows up on its career and technical education students, which is about half

the graduates, and consistently finds that about 80 percent of career and technical education graduates attend a postsecondary program. Nationally, about two-thirds of high school graduates pursue college training (Digest of Education Statistics, 2004).

It is incredible to us that this whole debate about graduate requirements in Michigan is being pursued in the absence of data about the course taking patterns of our students.

Anecdotally, we know that high school students in this state who aspire to a four-year college degree are well aware of and likely pursue the 19 credits recommended by the President's Council.

Recently, the U.S. Department of Education released a report based on the Education Longitudinal Study of 2002 (ELS:2002) that showed that more than 75 percent of seniors in the U.S. had taken Algebra 2 as their highest mathematics course.² We would seriously doubt that Michigan lags the U.S.

So the evidence suggests that a large share of students already pursue postsecondary schooling and probably already satisfy the proposed requirements (or at least, come close). But there does appear to be less than universal postsecondary attendance. There is some chance that more students could be enticed to go on to a postsecondary educational program.

We think that the response to why there would be at most, a marginal response, comes from a well-known labor economist at American University, Robert Lerman, who recently presented a paper on career-focused education at an Urban Institute conference. On pages 39-40, he comments on the K-12 agenda being pushed by the National Governors Association and Achieve, Inc.:

A recent report published by the National Governor's Association (NGA) [and Achieve], *An Action Agenda for Improving America's High Schools* (Conklin and

² Precisely, the report indicates that 45.5 percent of the seniors reported Trigonometry, pre-calculus, or calculus as their highest math course, and 30.0 percent reported Algebra 2.

Curran 2005), offers a good indication of the viewpoint of many policymakers. The authors begin by emphasizing how gaps in learning and inadequate preparation for college or work have “serious implications for our economy and prosperity.” According to the report, because future jobs will require more sophisticated skills, all students should have comparable preparation in high school, whether then enter a four-year or two-year college, postsecondary training, or go directly to work. Yet, although the report focuses on the economic rationale for improving high schools and student preparation for work, the report and many like it pay little attention to the realities of the job market and to sound workforce preparation.

First, the report fails to recognize the heterogeneity of the labor market. Although math skills beyond Algebra 1 are useful and intellectually rewarding, there are large shares of workers who will never use such skills in their jobs. The same is no doubt true of advanced classes in other subjects as well. It is true that upper level science, math, and social studies are often required by universities, it is far less obvious that such courses are vital to success in the work place. Moreover, it is not clear that the high school academic courses actually offered are the most appropriate for success in the workplace or in other aspects of life.

Lerman concludes his paper, on p. 49,

Efforts to improve the nation’s education and training system face an array of obstacles. Perhaps the biggest are ideological, especially misplaced egalitarianism. Equality of opportunity is too often defined as preserving the chance for all students to attend and graduate from a four-year college, regardless of their performance in academic courses or on external tests. It is certainly desirable to raise the educational competencies of U.S. students to reach the levels required to perform college level work. However, some strategies for doing so are crowding out initiatives to improve career-focused education and training and other ways of helping young people prepare for rewarding careers. The likely result is that fewer students will learn important career-oriented skills and earn good salaries. It does no favor to push students to pursue a purely academic-based education when a career-focused, contextualized learning approach would be much more appealing and productive.

Even if the increased graduation requirements do not enhance the skills that are productive in the workplace, and even if they do not result in a significant increase in the postsecondary attendance rate of Michigan students, the question still remains as to whether they might not be justified on some non-economic, social or political basis. Unfortunately, we believe that there are too many “down side” risks to justify them.

Potential Down Side Risks of the Requirements

We suggest that there are at least five unintended consequences that might seriously jeopardize any positive outcomes from these requirements. First, they might increase the likelihood of a student dropping out of high school. Michigan already has a significant drop-out problem. These students disengage from the educational system for many reasons: boredom, poor educational background in elementary and middle school, lack of non-school resources or parental/guardian interest, or lack of effort. Overly rigid high school graduation requirements that do not engage these students' career interests will only exacerbate the high school dropout problem.

Second, the requirements may result in “watering down” the curriculum for all. If a significant share of students struggle with algebra 2 or physics, for example, it won't be too long until sections of these courses are developed that go slower, cover less material, and so forth. This watering down of the curriculum could damage the math and science preparation of many Michigan students, the opposite of the intent of the MDE's graduation requirement proposals.

Third, as alluded to by Lerman, some excellent classes, such as in the area of career and technical education, may get crowded out of the curriculum. Our EFE consortium in this county has been rated as one of the five best secondary vocational education programs in the Nation. But as students are shoehorned into particular course taking patterns, they are less and less likely to sign up for courses such as EFE, which in fact teach the 21st Century Applied Learning Core.

Fourth, the graduation requirements will stifle curricular innovation. Hollenbeck (1997) describes an innovative course that was offered in a high school in Michigan that was a three-hour interdisciplinary course that attracted an extremely heterogeneous mix of students. They were given a project to solve for the year – how should some undeveloped land next to the high

school be used productively. They studied science and came up with water-testing stations. They studied mathematics and engineering by designing and constructing a bridge over a creek. They studied social studies by meeting with the city government and learning about zoning requirements and the economics of acquiring the materials to construct the bridge. They applied language arts skills in writing weekly journals and making presentations to civic groups. This kind of course is no longer possible because the highly qualified teacher aspects of No Child Left Behind force departmentalization. The proposed graduation requirements will be one step further down this road.

Finally, the Michigan Department of Education is unlikely to have the resources to administer the requirements. Will they be able to monitor the more than 700 high schools in this state? Will they be able to handle the myriad of details such as special education circumstances, waivers, audits, and so forth? We're concerned that at some point, a lack of staff or resources will cause the department to take a short cut such as promulgating a rule or exit test that all districts must use or, worse yet, declare that certain graduates in fact did not meet the requirements because of a staff person's interpretation of the rules. The MDE history with MEAP releases hardly gives us confidence.

Potential Legislative Alternative

What do we propose that the Michigan Legislature do about state graduation requirements? Our suggestion is that the Legislature adopt state graduation requirements that do require increased skills development for all students, but these requirements should be flexible, in order to respond to the diversity of skills requirements for different types of high-paying jobs, and the diversity of student interests. In other words, Michigan's graduation requirements should

recognize that there are more ways of making money and being happy than going to a 4-year liberal arts college.

In brief, our proposed graduation requirements would allow Michigan students the flexibility of getting a high school diploma through either of two options: (1) a baccalaureate prep diploma option; (2) an associates degree prep diploma option. In order to get a high school diploma, almost all students would have to receive an endorsement for their high school curriculum for at least one of these two options, that is would have to receive either a baccalaureate endorsement or an associates endorsement. Students would be allowed to seek both endorsements on their high school diploma if they wished to do so. In addition, as we will discuss later, a limited percentage of students (no more than 5% in each district) would be allowed waivers to pursue individual career goals that cannot fit within these two options.

Both of these diploma endorsement options would develop high levels of student skills. Both of these diploma options would prepare students for postsecondary education. However, unlike the proposal of the Michigan Department of Education, allowing for these options would respond both to our economy's needs for workers with a wide variety of types of "high skills," and to students' interests in many types of high-wage careers.

Table 1 outlines our proposed graduation requirements compared to the requirements proposed by the Michigan Department of Education. The baccalaureate prep diploma option would be similar to the MDE's proposed requirements. We would recommend some modest but important modifications to provide more flexibility:

- Cut total course requirements down from 18 credits to 16 credits. This increases the open credits for students, which would allow a minimum of 8 credits to be flexible for schools that choose a non-block high school schedule with 24 credits. This allows even students who want to go to four-year liberal arts college the option to pursue other interests, such as career and technical education courses, or arts and music courses.

- Cut the 18 credit requirement down to 16 credits by eliminating the arts and health/PE requirements as separate courses. Key elements of art history and appreciation could be incorporated into the required social studies credits. Key elements of the health/PE requirements could be incorporated into the required science credits. We do agree that arts courses, health courses, and PE courses are desirable for many students to take. However, many courses might be argued to be desirable for students to take: philosophy, religion, personal financial management, environmental studies, benefit-cost analysis, etc. If high school graduation requirements were based on including every course that it might be desirable for students to take, we would probably end up with a 40-credit high school graduation requirement. The bottom line is that the arts and health/PE requirements are not required for students to be admitted to even the most highly selective colleges. Therefore, the rationale for requiring these courses while omitting many other worthwhile courses is weak.
- Eliminate the requirement for an on-line course. Any possible gains for students in learning about the internet and technology is outweighed by the higher costs for local school districts and students, and the reduction of flexibility for students.
- Eliminate the requirement that math be taken in the senior year. While this is desirable for students going on to careers in math or science fields, taking math in the senior year is not necessarily the highest priority for other students. While it may be argued that Michigan and the U.S. needs more students to become engineers or science researchers, not every student needs to do so, and making this a universal requirement reduces the ability of students with other career goals to pursue their special interests and skills developments.

The associates degree prep option would include basic academic requirements plus a career and technical education (CTE) prep major requirement. The basic academic requirements for an associates endorsement would include the following credit requirements: 4 English, 3 science, 3 math, and 3 social studies, for a total of 13 credits. This leaves free at least 11 credits for career and technical education courses and other courses. The career and technical prep major requirement would require each student to take at least 3 credits in a specific career and technical education major, which would represent some broad career area.

Therefore, the total number of credits required for the baccalaureate endorsement, or an associates endorsement, would be the same: both would require 16 credits. We would argue that in both cases the required curriculum is highly demanding.

For the associates degree endorsement, we would suggest more flexibility on the make-up of the courses in each subject area to meet the career interests and skills needs of students. The 4 English credits would include 3 regular English credits plus one technical writing credit. The 3 science credits would not specify which science credits are required, to allow students more flexibility to do science credits that might be tied to their CTE major. The 3 social science credits would be identical to the baccalaureate endorsement option and the MDE proposed requirements, as these credits are in part rationalized as preparation for citizenship responsibilities. The 3 math credits would be required to include algebra I and geometry, but the third math course would be more flexible, to allow students to take a math course that might be more relevant to their CTE major (e.g., for many CTE majors, statistics might be more relevant than algebra 2).

We believe that either the baccalaureate endorsement option, or the associates endorsement option, would prepare students for postsecondary education and high-wage careers. The baccalaureate endorsement option is designed for students who believe that their career and life goals might best be achieved by a high school program that prepares them to succeed at a four-year liberal arts college or university, which then leads to a well-paying career. The associates endorsement option is designed for students who know that their career and life goals will best be achieved by a high school program that is articulated with career and technical degrees or certificates at a community college, which then leads to a well-paying career. Both these options deserve our respect. Our economy needs students with the skills developed in either option.

Some students might wish to choose to try to obtain both endorsements. This is possible to do, because of the considerable overlap between the credit requirements for the two options.

We believe that there is significant academic rigor in this associates degree prep option that students with this diploma endorsement would be able, if they changed their minds, to at a later date pursue the liberal arts college route to career success. Students who received the associates degree prep option would be well-qualified to enroll and do well at a community college, and later transfer to a four-year liberal arts college or university. In addition, students with an associates degree prep option would also be admitted and do well at the overwhelming majority of U.S. colleges and universities, which are not highly selective. What about the most highly selective colleges? Students aspiring to such colleges might be well-advised to make sure they fulfill the baccalaureate prep requirements. However, the reality is that regardless of whether students pursue the baccalaureate endorsement or the associates endorsement, getting into a highly selective college or university is highly competitive. Students with such aspirations are already taking courses that go far beyond any requirements the state of Michigan might impose.

In any case, we would suggest that the state require a more meaningful accountability for results from these graduation requirements than is envisioned in the MDE's recommendations. The MDE is currently saying that they will design course-level content expectations corresponding to these required credits, and then develop statewide tests for "voluntary use" (at present at least) by local school districts. Even if such tests were made mandatory, this accountability only requires that students be able to do well at taking standardized tests.

Our alternative suggestion is that school district accountability for results be based instead on follow-up with students at least one to two years after high school graduation. The state should design and fund a system of collecting data for all high school graduates for at least two years after high school graduation. What we are interested in measuring is how many

students are successful in the post-secondary option they have chosen, whether a 4-year college or a community college, or are successful in a job. The state could design an accountability system that measured each school district's results, in terms of student success, to what would be expected based on the socioeconomic mix of students in the district, and the availability of postsecondary options and jobs near the district. Such an accountability system would be modeled after the types of accountability systems currently used by federal and state governments to measure the effectiveness of job training programs. In our jobs at the Upjohn Institute, we have considerable expertise in working with such job training accountability systems, and we believe these systems could be adopted to hold school districts accountable for achieving student results. Our argument is that such an accountability system holds districts accountable for making sure that students actually do better in postsecondary institutions and jobs, rather than making sure that students can ace a standardized test.

We emphasize that such an accountability system would require the Michigan Legislature to provide the MDE with sufficient resources and staff that they can administer this accountability system in a high-quality manner. If funds cannot be found to allow adequate administration of this accountability system, we suggest that accountability be left to individual school districts. Individual school districts are held accountable by voters, and by the school choices of parents. Substituting a poorly-funded MDE accountability system for this local accountability system does not make sense.

We would also suggest that the graduation requirements allow a more flexible option for students and parents to opt out of this system, but only for a limited percentage of students. The MDE graduation requirements only allow students to opt out of the requirements after three years of taking the prescribed curriculum. However, we believe that if at any point it is clear to a

student, his or her parents/guardians, and the district that some different types of skills development would best meet the needs of that individual student, then there should be an ability to opt into a set of individually-tailored graduation requirements. These individual graduation requirements would need to explain why the student's needs clearly cannot be met through either the baccalaureate endorsement or the associates endorsement options. We would suggest that such opt-out requests be limited to no more than 5% of all high school graduates. Any district that approved such opt-out requests for more than 5% of their graduates would receive strict scrutiny from the MDE, and would have to demonstrate that the district had rigorous criteria for limiting opt-out requests to students who clearly would not have their best career interests met by either of the two endorsement options.

Conclusion

In sum, we believe that the MDE's proposed graduation requirements are overly rigid. Their one-size fits all requirements do not meet the diverse needs of our economy for many types of high-skill workers, and do not meet the diverse interests of our students. These overly rigid requirements would inhibit needed high school reforms that would develop innovative ways to engage students with a wide variety of learning styles in authentic learning that is relevant to students' future careers.

Our proposed graduation requirements will require all students to develop high levels of skills. But they will give students the flexibility to pursue the career options that interest them. By allowing more flexibility, they will help increase the skills levels of students graduating from Michigan high schools, while avoiding increases in high school dropout rates. Furthermore, the greater flexibility of the requirements we have proposed can better accommodate needed reform efforts to make high schools more relevant to students. Both the Michigan economy and

Michigan students will benefit from high school reforms and skills requirements that are flexible enough to meet the real needs of our economy and students.

Table 1

Comparison of MDE Proposal to Bartik/Hollenbeck Proposal

Feature	MDE Proposal	Bartik/Hollenbeck Proposal	
OPTIONS FOR STUDENTS	One option for all	Baccalaureate prep option	Associates degree prep option
NUMBER OF REQUIRED CREDITS	18	16	16
ENGLISH CREDITS	4 (English 9–12)	Same as MDE	4 with technical writing subbed for one of regular English
MATH CREDITS	4 including Algebra 1, Geometry & Algebra 2, plus math senior year	Same as MDE except no senior year requirement	3 including Algebra 1 & geometry
SCIENCE CREDITS	3 including biology & physics or chemistry	Same as MDE	3 with more career-relevant science permitted
SOCIAL SCIENCE CREDITS	3 including government economics, U.S., world	Same as MDE	Same as MDE
HEALTH/PE CREDITS	1	Incorporate key elements into science	Incorporate key elements into science
VISUAL/PERFORMING ARTS	1	Incorporate key elements into social science	Incorporate key elements into social science
WORLD LANGUAGE CREDITS	2	Same as MDE	Not required
CAREER/TECHNICAL EDUCATION CREDITS	Not required	Not required	3 credit CTE major
ON-LINE COURSE	Required	Not required	Not required
WAIVERS	Only after junior year	At any time, but must have career rationale, no more than 5% of students	
ACCOUNTABILITY	Course level content expectations with voluntary tests	2-year follow-up to see if students successful at college/careers	

ATTACHMENTS

November 22, 2005

Mr. Michael P. Flanagan Superintendent
of Public Instruction Michigan
Department of Education 608 West
Allegan Street
P.O. Box 30008 Lansing, Michigan 48909

Dear Mr. Flanagan:

We are writing to raise serious concerns about the high school graduation requirements you proposed on November 8, 2005. In our view, these graduation requirements would have extremely high social costs for Michigan by increasing high school dropouts, weakening alternative and career/technical education, and encouraging the watering down of course content. There are better alternatives to increase the proportion of scientifically and mathematically trained personnel in the Michigan labor force.

Both of us are writing based on our knowledge and experience in both economics and education. Both of us are labor economists. One of us (Bartik) has written extensively on what factors best promote state economic development, including writing a paper for the Cherry Commission on how college graduation rates influence state economic development. One of us (Hollenbeck) has written extensively on career education and adult education programs. Both of us also have experience as members of local school boards. One of us (Hollenbeck) is a past President of the Michigan Association of School Boards. However, the comments in this letter should only be construed as our views, and not as official views of our employer, the Upjohn Institute, or as official views of any of the various boards with which we are affiliated.

To begin with, we challenge your premise that “the preparation students need for success in education beyond high school is the same as the preparation required for success in the workplace” (p. 4 of November 8 memo by Michael Flanagan on proposed graduation requirements). Furthermore, we challenge the *implicit* premise of the proposed graduation requirements that all students must meet requirements that might be appropriate for admission to the University of Michigan.

For example, it is simply not the case that all or even most high-wage jobs require the use of Algebra II. If you don't believe us, you might ask any random group of labor economists from Michigan state universities and colleges to examine this issue. The vast majority of labor economists will tell you that what is required for success in a highly selective university in a math or science related field is not the same as what is required for success in all high-wage jobs in the labor market.

We think you and the state Board should ask yourselves the following question: if I were tested in Algebra II tomorrow, could I pass the test? We assume that most of you are in relatively high-wage jobs and are doing your jobs well. Unless the majority of the state Board can pass an Algebra II test tomorrow, we don't see how you can decide to deny a high school diploma to

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high school students who do not pass such a test, on the grounds that such skills are supposedly required for all high-wage jobs.

If the state of Michigan imposes these graduation requirements on all students, and the courses with these titles are not watered down in difficulty, we predict that the result will be a significant increase in high school dropouts in Michigan. This is a social cost that the state government will simply be passing on to local communities throughout the state.

We also think that the proposed graduation requirements will have damaging effects on high school alternative and career/technical education programs. Alternative education programs frequently have modified graduation requirements that are significantly lower than the proposed state graduation requirements. However, many of these programs are successful in increasing the skills of many students, and bringing them up to a skill level at which they can succeed at a community college or technical college program that will lead to well-paying jobs. By damaging these programs, the proposed state graduation requirements will harm these students' job prospects and reduce the supply of workers with these skills to Michigan employers.

Because the proposed graduation requirements are so damaging, we suspect that the pressure on schools to water down course content will be difficult to resist. If the content of Algebra II is watered down so that more students can pass it, then the proposed graduation requirements will also hurt the skills development of our most mathematically gifted students.

What is our alternative to the proposed graduation requirements? We assume that the real motivation of the proposed graduation requirements is to promote Michigan's economic development. We believe that Michigan's economic development will be promoted if we can increase the percentage of Michigan residents who complete college with higher levels of math and science skills, and stay in the state. However, the proposed state graduation requirements are an extremely socially costly method of trying to achieve that goal.

We believe that increased state spending on a number of educational programs would be a more effective and less socially costly way of promoting greater technical expertise in the Michigan workforce. First, the state should fund high school math and science centers statewide, similar to the highly successful Kalamazoo Area Math and Science Centers (KAMSC). Math centers such as KAMSC provide rigorous math and science education to high school students with a high aptitude and interest in those fields.

Second, the state should increase funding to encourage better math and science teaching. Extra scholarship funds should be made available to college math and science majors who are willing to go into math and science teaching. The state should be funding more curriculum development to increase the relevance and rigor of math and science teaching, and funding more teacher training of K-12 math and science teachers.

Third, the state should provide greater scholarship funding for college students who agree to

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major in math and science-related fields, and stay in the state for a number of years after graduation. College costs are obviously a significant issue for many working-class and middle-class Michigan families. Any program to help families pay for those costs arouses enormous interest and will change the behavior of students. Witness, for example, the enormous public interest in the recently-announced "Kalamazoo Promise".

We believe these proposals would be a far more effective way than the proposed graduation requirements of using the educational system to promote the state's economic development. These proposals are targeted on the key problem, which is the need for more mathematically and scientifically trained personnel. Furthermore, these proposals recognize the diversity of the interests and needs of students and the diversity of high school programs around the state.

The only advantage of the proposed graduation requirements, compared to our proposals for expanded state funding related to math and science education, is that the proposed graduation requirements have lower short-run costs to the state budget. Indeed, the costs are being pushed onto local districts. We suspect that the lower short-run state budget cost is the real motivation for pushing these state graduation requirements. It seems like a cheap way of promoting the state's economic development. However, these lower short-run costs come at the expense of extremely high social costs for Michigan in higher high school dropouts, a diminished diversity of educational programs, and a watering down of course quality.

We urge you, the state Board, the Governor, and the state legislature to reconsider the proposed state graduation requirements. There are better ways of promoting higher student achievement and the state's economic development.

Sincerely,



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December 21, 2005

Lt. Gov. John D. Cherry, Jr.
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Dear Lt. Gov. Cherry:

This letter follows up on Tim Bartik's brief conversation with you on December 19 about high school graduation requirements, after the Governor's meeting with the economists' group.

We have enclosed a copy of the letter that we sent to Superintendent Flanagan on November 22, 2005. The letter expresses our concern that the proposed high school graduation requirements will increase high school dropout rates, and damage career/technical education and alternative education. We suggest alternative ways of increasing Michigan's supply of scientific personnel that we think would be more effective.

One question we have been asked in response to our letter is whether we can back up our contention that the increasing skill requirements of the workplace do *not* match college prep graduation requirements. We have two parts to our answer to this question.

First, this is the opinion of most other labor economists who have studied the skills issue. For example, a well-known labor economist at American University, Robert Lerman, recently presented a paper on career-focused education at an Urban Institute conference. On pages 39-40, he comments on the K-12 agenda being pushed by the National Governors Association and Achieve, Inc., which is what was followed by Superintendent Flanagan and the State Board in making their graduation requirements recommendation:

A recent report published by the National Governor's Association (NGA) [and Achieve], *An Action Agenda for Improving America's Schools* (Coklin 2005), offers a good indication of the viewpoint of many policymakers. The authors begin by emphasizing how gaps in learning and inadequate preparation for college or work have "serious implications for our economy and prosperity." According to the report, because future jobs will require more sophisticated skills, all students should have comparable preparation in high school, whether then enter a four-year or two-year college, postsecondary training, or go directly to work. Yet, although the report focuses on the economic rationale for improving high schools and student preparation for work, the report and many like it pay little attention to the realities of the job market and to sound workforce preparation.

First, the report fails to recognize the heterogeneity of the labor market. Although math skills beyond Algebra 1 are useful and intellectually rewarding, there are large shares of workers who will never use such skills in their jobs. The same is no doubt true of advanced classes in other subjects as well. It is true that upper level science, math, and social studies are often required by universities, it is far less obvious that such courses are vital to success in the work place. Moreover, it is not clear that the high school academic courses actually offered are the most appropriate for success in the workplace or in other aspects of life. For example, statistics may well have broader relevance to jobs than trigonometry; economics more than certain history and civics classes.

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Other labor economists who have considered the skills issue are Dick Murnane of Harvard's Graduate School of Education, and Frank Levy of MIT. In 1996, Murnane and Levy wrote a well-researched and well-received book called *Teaching the New Basic Skills: Principles for Educating Children to Thrive in a Changing Economy*. What are these new basic skills, which would legitimately be part of minimum high school graduation standards for all students? On page 32 of the book, these are described by Murnane and Levy as

The ability to read at the ninth grade level or higher; the ability to do math at the ninth-grade level or higher; the ability to solve semistructured problems where hypotheses must be formed and tested; the ability to work in groups with persons of various backgrounds; the ability to communicate effectively, both orally and in writing; the ability to use personal computers to carry out simple tasks like word processing. These are the New Basic Skills, the minimum skills people now need to get a middle class job.

Murnane and Levy then explain on page 33 that

If the New Basic Skills appear surprisingly modest, recall that they are a floor. Many good jobs require greater skills, but very few require less. Doing math at a ninth-grade level means the ability to manipulate fractions and decimals and to interpret line graphs and bar graphs. It requires only a bare minimum of algebra. The fact that firms must test for this level of mathematical skill confirms the obvious: many recent high school graduates don't have it.

Superintendent Flanagan says, in his rationale for the proposed graduation requirements, that:

More than 60 percent of employers report that recent graduates have poor math skills, and nearly 75 percent report deficiencies in grammar and writing skills. Unqualified and poorly trained, these high school graduates are likely to become trapped in unskilled, low-paying jobs that do not support a family.

Superintendent Flanagan's statement is true. However, what is missing is not college-prep skills, but rather more basic math and literacy skills. If employers are reporting that high school graduates they hire cannot read graphs, the proper response is to make sure they learn to read graphs, not to pass them on to a watered-down Algebra II course.

Our second answer is that if anyone looks at specific occupations, most middle class occupations do not require anything close to the complete college prep curriculum that is mandated in Michigan's proposed new graduation requirements. For example, consider the report *Ready or Not: Creating a High School Diploma That Counts*, prepared by Achieve, Inc., The Education Trust, and the Thomas E. Fordham Foundation, a report that appears to largely provide the intellectual rationale for Michigan's proposed new graduation requirements. This report explicitly states on page 8, that "Successful preparation for both postsecondary education and employment requires learning the same rigorous English and mathematics content and skills." This statement is supposedly backed up by examples of jobs that require the English and mathematics benchmarks described in the report. But if you actually look at the jobs described in the report, in most cases they do not require Algebra II, let alone the two years of foreign languages now in the proposed Michigan graduation requirements.

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Page 74: Machine operator: Very minimal algebra and geometry requirements.

Page 76: Licensed nurse: Very minimal algebra and geometry requirements.

Page 78: Actuary: Very minimal algebra requirements. But does require some statistics, which is not addressed in Michigan's proposed graduation requirements.

Page 80: Wafer fabrication technician and manufacturing technician: No algebra requirement, but does require some statistics.

Page 82: Public events manager: No math requirements.

Page 84: Loan officer: Needs to be able to do some basic numerical operations, but no algebra or higher math requirements.

In addition, the *Ready or Not* report does not consider many other good-paying jobs that do not require Algebra II or foreign languages: auto mechanic, plumber, carpenter, etc. These jobs require high levels of skills, but these are not the skills that are taught in regular college prep classes.

Another question we have been asked in response to our letter is what graduation requirements we would propose. What we would suggest is that we seek to increase skills, but that we recognize the heterogeneity of skills requirements in the labor market, and the heterogeneity of students. This requires that we recognize that the college prep route is only one of many routes to career success.

To allow for multiple routes to success, alternatives to the proposed Michigan graduation requirements would be allowed. The currently proposed Michigan graduation requirements would be relabeled as "state-endorsed college prep requirements." Students would not receive a state-endorsed college prep diploma unless they met these minimum requirements. Local districts would be permitted to add to these requirements in creating their own college prep diploma. More importantly, local school districts would be allowed to award "career-oriented academic" diplomas to students whose desired career path did not require the college prep curriculum.

We would suggest that local school districts be empowered to both define a number of pre-specified career paths curricula that would qualify for "career-oriented academic" diplomas, and to allow for individual career plans for specific students. School districts would be subject to audit by the Michigan Department of Education to demonstrate that the career paths and career plans they approved were in fact rigorous enough to build true skills and lead to a decent career. This would include requirements for follow-up to see if students were in fact successful in pursuing their career path. In addition, there should be accountability requirements for the college prep curriculum that students should be successful afterwards in college and a subsequent career.

Therefore, we are envisioning that school districts that already have well developed career and technical education programs would elaborate these established programs into defined career path diplomas. School districts that have alternative education programs would determine how these alternative education programs relate to a variety of specific careers. In addition, districts would be able to allow for individual students to pursue their own defined career plans, even if the district does not have an established career path diploma in that area. For example, students with special interests in the arts or music might pursue an individually defined curriculum in high

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school that would lead to an arts college or a music college, even though it might not meet the “state-endorsed college prep requirements.”

In addition to these more flexible graduation requirements, we continue to believe in our proposals outlined in our letter to Superintendent Flanagan that would promote the growth of math and science personnel in Michigan. These proposals include: funding specialized math and science centers for high school students similar to the Kalamazoo Area Math and Science Center; more funds for math and science curriculum development and teacher training; a college scholarship program, which could be described as a scaled-back or more affordable version of the Kalamazoo Promise or the Georgia Hope scholarship program, that would provide free college tuition for qualified math and science majors who agree to stay in the state after graduation for some number of years.

Thank you for considering these ideas. We would urge the Administration to consider these options in negotiating the final form of graduation requirements with the legislature.

Sincerely,



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cc: Governor Granholm
Superintendent Flanagan
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