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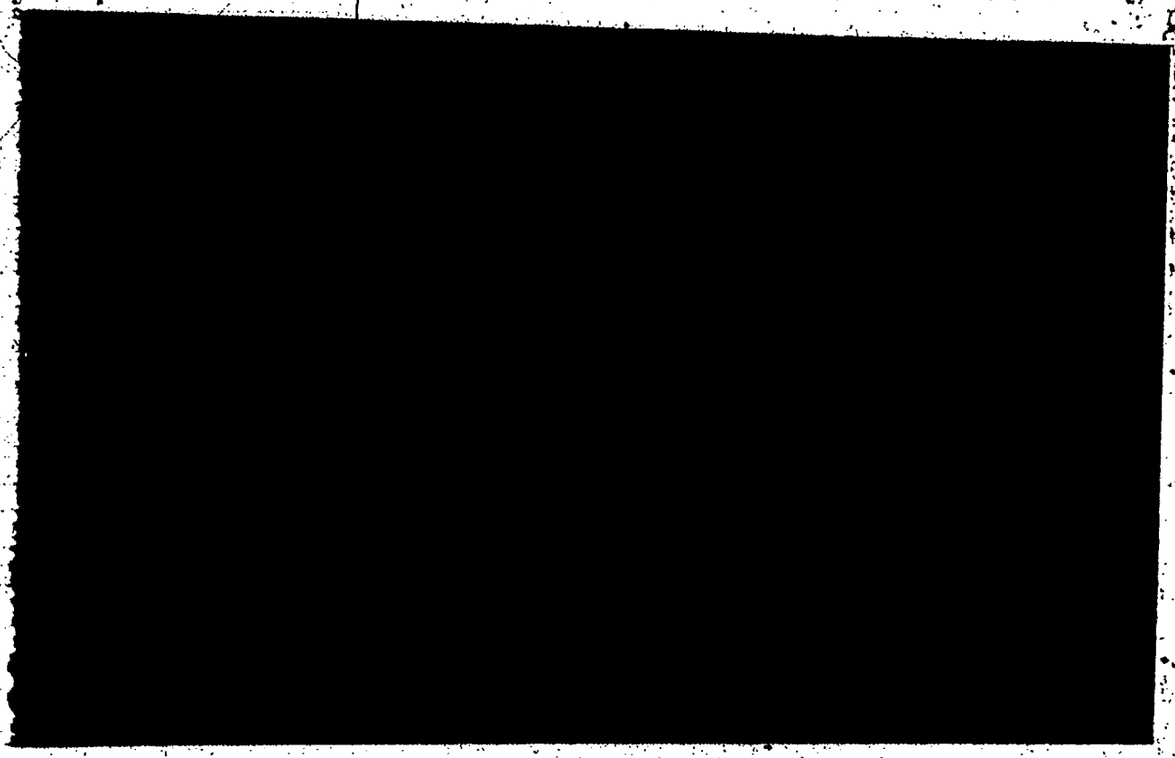
ABSTRACT

A study examined the transition from secondary to post-secondary education and the opportunities for academic preparation and planning available to Minnesota secondary students. Data concerning post-secondary enrollment patterns, curriculum, planning, and remedial and developmental studies were gathered from a number of sources. Extensive results included the following: (1) statewide, 77% of public high school juniors planned to enroll in some type of post-secondary institution immediately after high school; (2) state high school graduation requirements fall far below the preparation that most four-year Minnesota colleges expect but that only the University of Minnesota and some liberal arts colleges require; (3) students' opportunities for post-secondary planning depend on the secondary schools in which they are enrolled; (4) just over 15% of all community college students in a year are enrolled in courses that community colleges term remedial/developmental; and (5) many students, including some who had opportunities, are attending college without sufficient preparation to do the work required there. (Five tables, eight figures, and three maps of data are included; five maps of post-secondary system attendance rates by school district and an appendix containing remedial/developmental course descriptions of the state university system are attached.) (RS)

Retention of Minnesota College Students:
Reading, Writing and Remedial Education

Working Paper #2

October 1990



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October 1990

This report was prepared by KERRY KINNEY FINE, Legislative Analyst (296-5049), and MARY JANE LEHNERTZ, Legislative Analyst (296-8038). Questions may be directed to them.

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Summary of Findings

This is the second paper in a series on college student retention based on a study underway in the House Research Department. The study is examining rates of student retention, changes in the rates over time, factors related to those changes, characteristics of the students who leave college and those who remain, and students' explanations of their behavior.

This paper presents research and background information relating to students' preparation and planning for college. It examines the transition from secondary to post-secondary education and the opportunities for academic preparation and planning available to Minnesota secondary students.

Findings of this paper are presented below.

Post-secondary Enrollment Patterns

Statewide, over three-fourths of the public high school juniors (77%) planned to enroll in some type of post-secondary institution immediately after high school.

Fewer students actually enrolled in post-secondary schools than the number who planned to enroll. Statewide, 48% of all 1987 public high school graduates (25,812 of 53,533) enrolled in a Minnesota college or vocational school in Fall 1987.

Including the estimate of out of state enrollment, 59% of Minnesota's 1987 public and private high school graduates enrolled in post-secondary institutions immediately after high school.

School districts differ in their rates of post-secondary attendance; they also differ in the types of post-secondary institutions their students attend.

A significant difference among school district types is that rural students are much more likely to enroll in vocational institutions while urban students enroll more in collegiate institutions.

Curriculum

Curricular offerings in high schools are ranked based on the opportunity they provide for post-secondary preparation. Overall, small high schools are more likely to fall at the low end of the scale while large schools are more likely to be at the high end.

While one-third of the public high schools are providing very limited opportunities for post-secondary preparation, this is affecting about 8% of the public high school students.

State graduation requirements fall far below the preparation that most four-year Minnesota colleges expect, but that only the University of Minnesota and some liberal arts colleges require.

Although the state university and public two-year systems side-stepped the issue of instituting preparation requirements in their response to a legislative request, the state university is preparing now to face this issue as part of its "Q7" initiative. If adopted, this will further distance the four year college requirements from state graduation requirements.

Students from high schools that offer minimal preparation are less likely to be retained in a four year college than those from schools with better curricular opportunities.

Planning

Students' opportunities for post-secondary planning depend on the secondary school in which they are enrolled. High schools are categorized into three ranks based on the planning they provide:

Students in high school #1 are left largely on their own to plan for college or careers.

Students attending high school #2, the most common type of school in the state, have a better opportunity for planning than those in high school #1.

High school #3 not only has extensive resources available, often with the latest technology, but also has a sophisticated planning process.

Remedial/Developmental Programs

Just over 15% of all community college students in a year are enrolled in courses that the community colleges term remedial/developmental.

While remedial/developmental courses are serving many nontraditional students, the majority of enrollment is by students who are under 21.

Even when the size of the enrollment pool is controlled, most enrollment in remedial/developmental courses is from students who are very recent high school graduates.

The rates of remedial/developmental enrollment among the most recent high school graduates fluctuate across campuses.

A major determinant of remedial/developmental enrollment rates is the type and number of courses offered, and how these are defined. Each of the post-secondary systems considers some courses as remedial/developmental and does not define other related courses this way.

About half of all the state university and University of Minnesota-Duluth offerings are in math or English, the other half relate to some type of skills development such as career planning, college orientation and study skills. At the Twin Cities campus of the University of Minnesota, the offerings are almost entirely math and English.

Remedial/developmental courses generally award credits.

Although most of the courses identified in this paper are not defined as "remedial" by the campuses, none of them really includes the substantive knowledge one usually equates with a college education.

A factor relevant to enrollment in remedial/developmental courses is the role of campus learning centers which are available on all or nearly all campuses in the state.

Many of the services in campus learning centers are similar to courses offered for credit on campuses.

Current Policy Directions

It is clear that many students, including some who had opportunities, are attending college without sufficient preparation to do the work required there.

One method proposed to ensure better preparation of high school students is to move to a system of "learner outcomes" rather than courses or clock hours completed which will have significant effects on post-secondary education.

It appears that the K-12 and post-secondary systems are on a collision course, with students caught between them. The state board of education and other education organizations are rushing toward a learner outcome approach and, in the process, moving away from required curriculum. The post-secondary systems, at the same time, are heading toward more specific required coursework to improve college preparation.

I. Overview

This is the second paper in a series on college student retention based on a study underway in the House Research Department. The study[1] is examining rates of student retention, changes in the rates over time, factors related to those changes, characteristics of the students who leave college and those who remain, and students' explanations of their behavior.

This paper presents research and background information relating to students' preparation and planning for college. It examines the transition from secondary to post-secondary education and the problems and issues surrounding that transition. Retention in college is affected by the academic achievement and preparation of students in high school. Students who are more successful in high school tend to have higher levels of retention in college.

Additionally, retention is related to student planning. Those who plan ahead and make informed choices about college are more likely to remain enrolled than those who do not. These factors become more important as participation in post-secondary education grows. As the percentage of high school students going on to college increases, the overall level of preparation and planning is likely to decrease.

This paper examines the opportunities for academic preparation and planning available to Minnesota secondary students, and some effects that may be associated with the lack of these opportunities. Specifically, the paper examines:

- **Post-secondary enrollment patterns**, including enrollment rates for each school district and the types of colleges in which students from different parts of the state enroll
- **Curriculum**, including a comparison of secondary curricular offerings, and graduation requirements contrasted with post-secondary preparation requirements
- **Planning**, including a comparison of secondary school programs, as well as special state programs
- Remedial/developmental studies, including course offerings and enrollments

[1]For a more complete discussion of the study, see the House Research Publication entitled Retention of Minnesota College Students: Who Leaves College? Who Remains? Working Paper #1, Feb. 1990.

Data

The data used in this paper are from several sources. The analysis of students' college attendance patterns is based on graduation data from the Minnesota Department of Education and college student enrollment data from the Higher Education Coordinating Board (HECB). Graduation data for the 1986-87 school year were compared to the enrollment of new entering freshmen in Fall 1987 who had graduated that year, and to the retention of those students in Fall 1988. These data can only be used to examine the plans and college attendance patterns of students who attended Minnesota high schools and colleges. A student who attended high school out of state will not be included; a student who attended college out of state will appear to have not attended college. Moreover, HECB's student record data base only includes information on students enrolled on the tenth day of the fall term. A student not enrolled at that time will not appear. Thus the students' enrollment levels and their retention one year later, at best, are a conservative estimate on actual student college attendance. The reader should be cautious in interpreting this information since these data can be viewed only as a general pattern of students' actual behavior.

Secondary curricular information is taken from student guides published by each high school in the state. Information on secondary counseling is based primarily on a telephone survey of high school counselors in a sample of 148 Minnesota public high schools during the 1989-1990 school year. Additional information was provided by the Minnesota Department of Education, the University of Minnesota, and the Higher Education Coordinating Board.

Information on remedial/developmental enrollments in the community colleges was provided by the community college system. Listings of community college courses are taken from catalogs for each of the campuses. Catalog listings form the basis of the University of Minnesota and state university remedial offerings. The two systems provided enrollment information by course for 1989-90; listings were adjusted to include only those courses offered during that academic year.

II. Post-secondary Enrollment Patterns

Most new entering freshmen in Minnesota post-secondary institutions are recent graduates of Minnesota high schools. The reverse is also true: most recent Minnesota high school graduates enroll in a post-secondary institution. However, the rate at which graduates enroll in post-secondary education varies widely by school district. In some districts a large majority of students enroll, while in other districts the percent going on is much smaller.

Enrollment Rates

Numerous factors are related to the variation in the rate of post-secondary attendance. Some of these involve expectations of communities, families, and high schools, while others relate to economic opportunities and needs. We do not have adequate data to measure these sociological and economic effects.

Some of the variation is linked to location and size of high schools. This clearly is interrelated with sociological and economic factors. In turn, the location and size of a school are related to its curricular offerings which are discussed in the next section of the report.

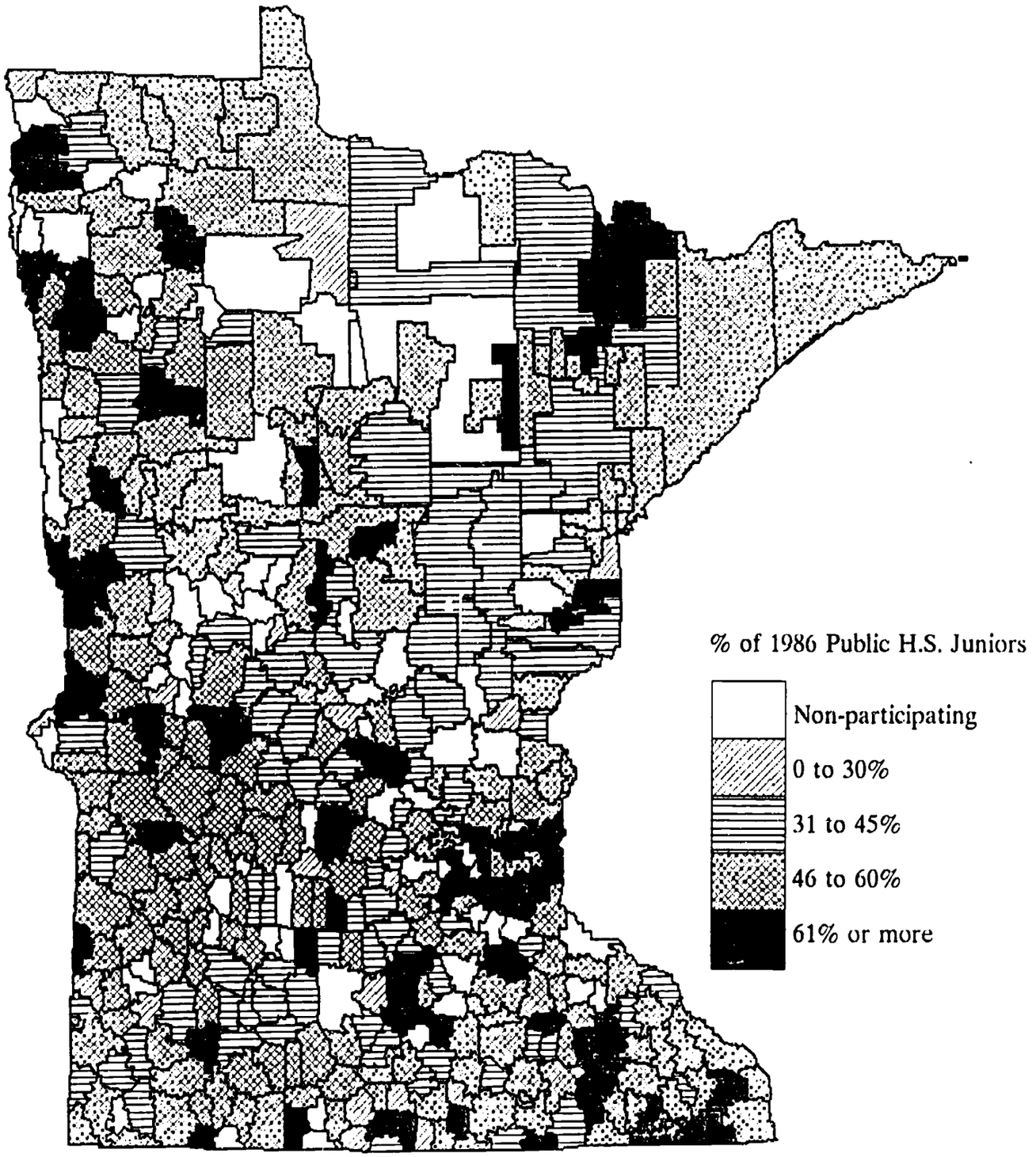
The maps on the following pages show for public school students in each school district:

- the rates of high school juniors in Spring 1986 planning to attend a two or four year college immediately after graduation
- the rates for that same student cohort in Fall 1987 actually enrolling in a Minnesota two or four year public or private college
- the rates of enrollment in Fall 1987 in all Minnesota post-secondary institutions (collegiate and vocational) for those same students

It is important to note some caveats about the rates shown in these maps. The percentage of students planning to attend college is based on public high school students completing the Plans and Background Survey offered by the Higher Education Coordinating Board (HECB) as part of its Post-high School Planning Program.[2] In order to make meaningful comparisons, we only

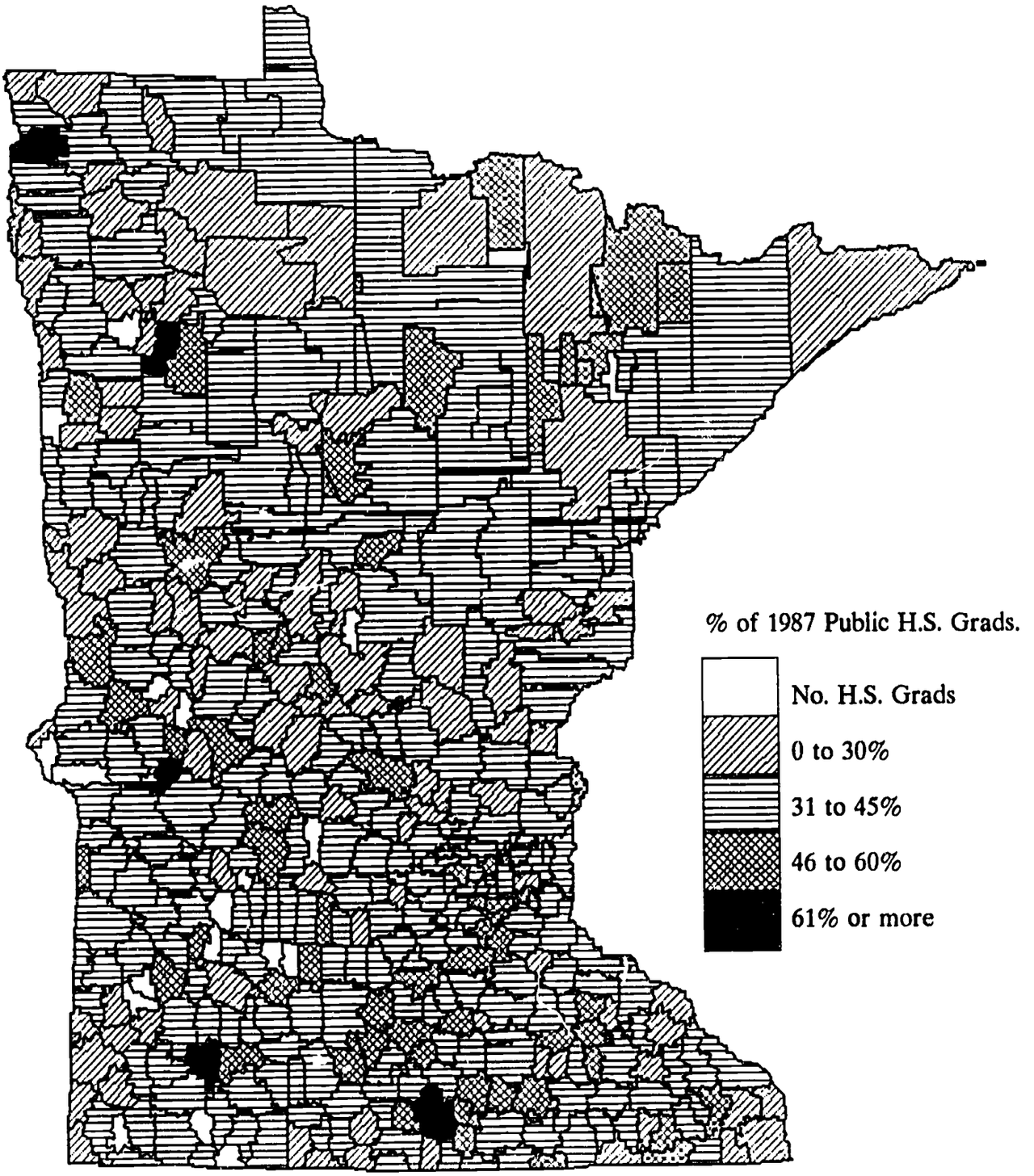
[2]For a more complete discussion, see the House Research report, Post-High School Plans of Minnesota Students (Jan. 1988).

Map 1
Students Planning to Attend Minnesota 2 or 4 Year Colleges in 1987 by School District



House Research Graphics

Map 2
New Entering Freshmen Attending Minnesota 2 or 4 Year Colleges in 1987 by School District



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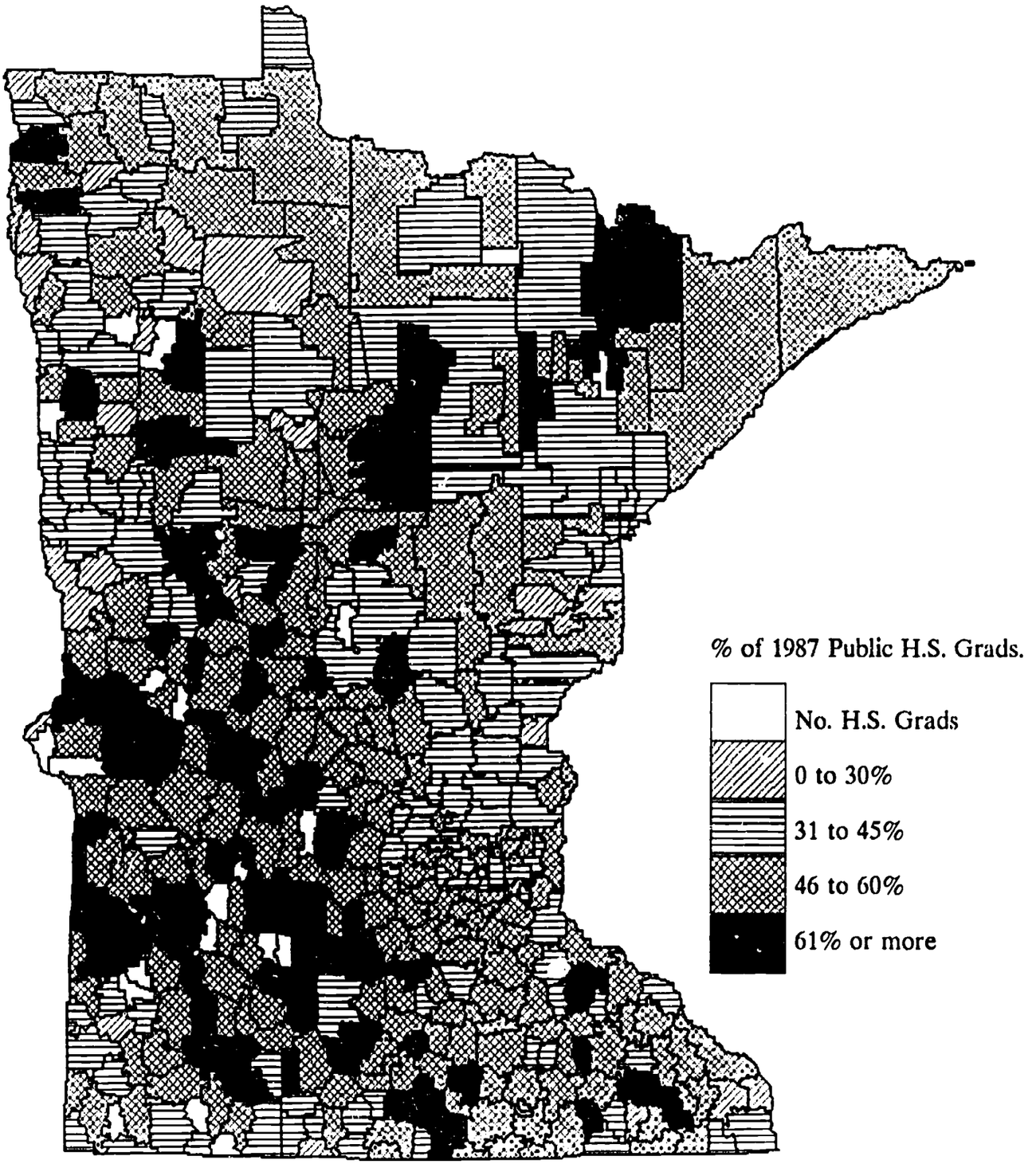
Map 3
New Entering Freshmen Attending any Minnesota Post-secondary School in 1987 by School District



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included districts in which at least 50% of the junior class participated. This left 367 districts or 88% of those with a secondary school. The percentage of students entering Minnesota colleges and vocational schools is based on only one year: 1987 Minnesota high school graduates enrolling in a Minnesota post-secondary institution in Fall 1987. Therefore, students who first enrolled in a later term or year and students who attended an out-of-state institution are not included. (However, an estimate of total out-of-state attendance is given.)

Statewide, over three-fourths of the public high school juniors (77%) planned to enroll in some type of post-secondary institution immediately after high school. Most of the students (57%) expected to be in an academic setting; another 20% expected to be in a vocational school.

The percentage of students planning to and actually continuing their education varies widely by school district, however. As the maps show, in some districts the large majority of students planned to or actually went on, while in other districts only a small number planned or enrolled in more schooling.

Fewer students actually enrolled in post-secondary schools than the number who planned to enroll. Statewide, 48% of all 1987 public high school graduates (25,812 of 53,533) enrolled in a Minnesota post-secondary institution in Fall 1987. 38% enrolled in a two or four year college; 10% in a vocational school. If private high school students are included, the number enrolled increases (27,825 of 57,757 graduates) but the percentage enrolled in Minnesota colleges and vocational schools remains the same--48%.

This percentage does not include Minnesota graduates who enrolled in a post-secondary school out of state Our data do not include the comparable students who enrolled in an out of state institution. However, the federal department of education publishes information every other year on freshmen who enroll within 12 months of graduation, based on reports collected from the institutions.[3] The department reports cover 1986 and 1988. These show that 5,556 Minnesota students in 1986 and 6,835 in 1988 enrolled out of state within one year of high school graduation. For our purposes, we have taken the midpoint between these figures--6,195--as an estimate for 1987.

[3]Information provided by the Center for Education Statistics from the Integrated Post Secondary Education Data System (IPEDS), 1986 and 1988.

Including the estimate of out of state enrollment, 59% of Minnesota's 1987 public and private high school graduates enrolled in post-secondary institutions immediately after high school. This compares to a national figure of 57% for 1987.[4] Minnesota's enrollment rate is somewhat above the national rate, but it is only slightly higher. (This figure cannot be separated for public and private high school graduates.)

Type of College Attended

Not only do districts differ in their rates of post-secondary attendance, they also differ in the types of post-secondary institutions their students attend. We classified districts by size and location into one of four types to examine these enrollment patterns:

metro -- all districts in the seven-county metro area

urban non-metro -- districts outside the metro area that have an urban area with a population of 5,000 or more

large rural -- districts without an urban area of 5,000 or more, but with enrollment of at least 50 students per secondary grade (in 1986-87)

small rural -- districts without an urban area of 5,000 or more and with enrollment of less than 50 per secondary grade (in 1986-87)

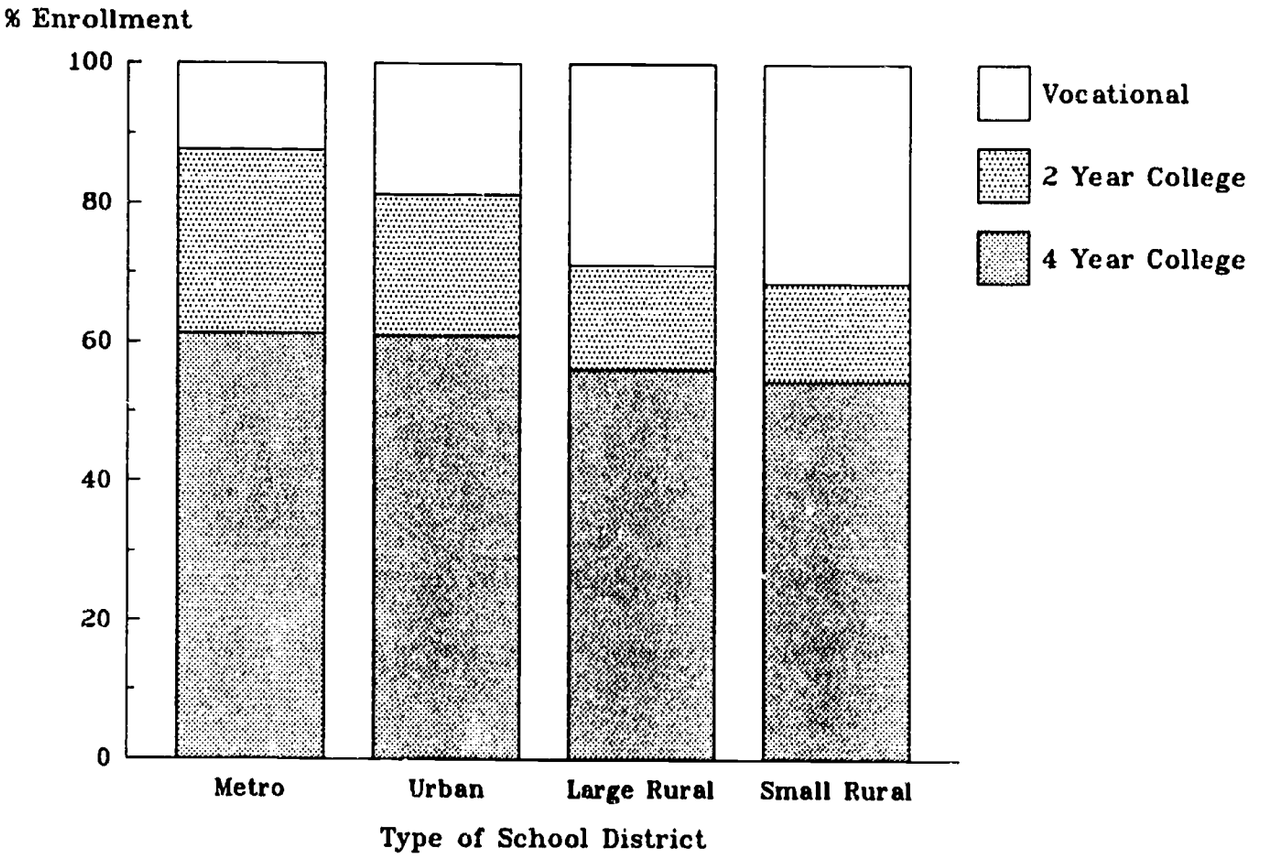
Figure 1 shows the distribution of enrollment across these four types.

The most significant difference among the district types is that rural students are much more likely to enroll in vocational institutions while urban students enroll more in collegiate institutions. Additionally, urban students, especially metro students, enroll much more in two year colleges than do their rural counterparts.

The maps in Appendix A show post-secondary attendance rates for each of the five major post-secondary systems in Minnesota by school district.

[4]National Center for Education Statistics, The Condition of Education, 1990, p. 16.

Fig. 1
Distribution of Post-secondary Enrollment
by Type of School District



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III. Curriculum

One clear link between secondary and post-secondary education is the academic preparation of students in high school. This section examines state board of education requirements and available curricular offerings among Minnesota high schools. Additionally, this section compares high school graduation requirements to the preparation standards of Minnesota colleges.[5]

Curricular Requirements and Offerings

Each school district operating a secondary school is required to offer a minimum number of courses in various subjects. The specific courses offered and the actual number of courses vary significantly from high school to high school.

We reviewed each public high school's curriculum in terms of the post-secondary preparation opportunity it afforded, considering both the number and types of courses available. Our concern was whether the basic minimum courses necessary for college preparation were provided, as well as related courses that would give students more breadth and depth in a subject matter. While the number of courses offered in some schools exceeds the minimum required by the state board of education, the extra courses may be only peripherally related to the subject matter. For example, welding is offered as a math elective in a few schools and driver training is considered as a social studies course in some others. Because of the wide curricular variations, the University of Minnesota is in the process of reviewing curricular offerings at each high school to determine which courses can be used to meet its new preparation standards. This is a useful process both for the high schools which are notified of the results so that they can advise students about course selection, and for education officials who may be able to use this as a basis of comparing curricula.

Following our review, each school was then ranked on a scale from 1 to 3: a score of 1 indicated minimal opportunity for college preparation, 2 meant that a reasonable opportunity was available, and 3 reflected an excellent curricular opportunity.

Table 1 provides an example of the curricular differences between rankings by comparing the

[5]This paper focuses on post-secondary preparation opportunities. For a more complete comparison of Minnesota high schools, see High School Education, Office of the Legislative Auditor, Dec. 1988.

Table 1
Comparative Curricular Offerings - 10th-12th Grades

Subject Area	State Board Req. Offerings	High School #1		High School #2		High School #3	
Art	Visual Arts 240 Clock Hrs/2 crs.	*Art History	1 cr.	Intro. to Art	½ cr.	Drawing & Paint I-IV	½ cr.
				Drawing & Painting	½ cr.	Sculpture, Crafts, & Jewelry	½ cr.
				Ceramics	½ cr.	Adv. Sculpture,Crafts	½ cr.
				Crafts	½ cr.	Sculpture	½ cr.
				Advanced Drawing & Painting	½ cr.	Adv. Sculpture	½ cr.
				Advanced Ceramics	½ cr.	Ceramics I-III	½ cr.
						Calligraphy, Graphic Design & Printmaking	½ cr.
						Adv. Graphic Design & Printmaking	½ cr.
						Theatrical Design	½ cr.
						Art Appreciation	½ cr.
						Adv. Art Studio	1 cr.
						Advertising & Visual Merchandising	½ cr.
English/ Communications	Communication Skills 480 Clock Hrs/4 crs.	English 10	1 cr.	Drama	½ cr.	English 10 - Regular	1 cr.
		English 11	1 cr.	English 10	1 cr.	Basic English 10	1 cr.
		English 12	1 cr.	Am. Literature I, II	½ cr.	Accelerated English 10	1 cr.
		Journalism	½ cr.	Voc. English/Basic Writing	½ cr.	Alternative English	1 cr.
		Mythology	½ cr.	Science Fiction	½ cr.	Writing Lab	½ cr.
				Individualized Reading Ctr.	½ cr.	Fundamental Composition	½ cr.
				Adv. Composition	½ cr.	College Composition	½ cr.
				Selected Readings in Eng.	½ cr.	Creative Writing	½ cr.
				Interpersonal Communication	½ cr.	Technical Writing I, II	½ cr.
				Mass Communication	½ cr.	Advanced Placement: College Composition	½ cr.
				English Literature	½ cr.	Classics in Am. Literature	½ cr.
				Creative Writing	½ cr.	Issues in Am. Literature	½ cr.
				Communications	1 cr.	20th Century Am. Authors	½ cr.
						American Short Story	½ cr.
						Mythology	½ cr.
						Poetry	½ cr.
						Shakespeare	½ cr.
						Speculative Fiction	½ cr.
						Contemporary & Popular Literature	½ cr.
						"How To" Literature	½ cr.
						Adv. Placement: Humanities of the Western World I, II	1 cr.
						Speech	½ cr.
						Debate	½ cr.
						Theatre Arts	½ cr.
						Yearbook	1 cr.
						Newspaper	1 cr.

*Offered via telecommunications only.

Subject Area	State Board Req. Offerings	High School #1		High School #2		High School #3	
Foreign Language	One Modern/Classical Language 240 Clock Hrs/2 crs.	*Spanish I,II *French I	1 cr. 1 cr.	German I-IV Spanish I-IV	1 cr. 1 cr.	French I-IV Accelerated French II-IV German I-IV Japanese Lang. & Culture I, II Russian I, II Spanish I-IV Accelerated Spanish I-IV	1 cr. 1 cr. 1 cr. 1 cr. 1 cr. 1 cr. 1 cr.
Industrial Technology	Industrial Arts 120 Clock Hrs/1 cr.	Shop Auto Mechanics Building Trades	1 cr. 1 cr. 1 cr.	Exploring Transportation, Energy and Power Exploring Communication and Production Small Engine Technology Beginning Drafting Adv. Drafting Metal Technology I Beginning Woodworking Adv. Woodworking Industrial Problem Solving	½ cr. ½ cr. ½ cr. ½ cr. ½ cr. ½ cr. ½ cr. ½ cr. ½ cr.	Auto Mechanics I-II Auto Mechanics III-IV Technical Drawing I Design and Production Architectural Drawing I-III Electricity I, II Electronics I Small Gas Engines I, II Wood I Wood II, III Photography & Video I, II	½ cr. 1 cr. ½ cr. ½ cr. ½ cr. ½ cr. ½ cr. 1 cr. ½ cr. 1 cr. ½ cr.
Math	360 Clock Hrs/3 crs.	Geometry Algebra II Computer Senior Math Business Math	1 cr. 1 cr. 1 cr. 1 cr. 1 cr.	Pre-Algebra Sr. High General Mathematics Algebra I Geometry Algebra II Algebra II Accelerated Trigonometry/Selected Algebra Topics Trigonometry/ Introduction to Calculus Consumer Mathematics Computer Technology I, II	½ cr. ½ cr. 1 cr. 1 cr. 1 cr. 1 cr. 1 cr. 1 cr. ½ cr. ½ cr.	Elementary Algebra and Math Concepts Geometry Algebra II Accelerated Algebra II Trigonometry Accelerated Trigonometry Math Analysis Accelerated Analysis Calculus Probability and Statistics Computer Science 1 (BASIC) Computer Science 2 Computer Science 3 (PASCAL) Business Math I, II	1 cr. 1 cr. 1 cr. 1 cr. 1 cr. 1 cr. 1 cr. 1 cr. 1 cr. 1 cr. ½ cr. ½ cr. ½ cr. ½ cr.

*Offered via telecommunications only.

Subject Area	State Board Req. Offerings	High School #1		High School #2		High School #3	
Music	240 Clock Hrs/2 crs.	Band	1 cr.	Concert Choir	¼ cr.	Beginning Piano	½ cr.
		Choir	1 cr.	Varsity Choir	¼ cr.	Concert Bands	1 cr.
				Wind Ensemble	¼ cr.	Jazz Lab Ensemble I, II	1 cr.
				Concert Band	¼ cr.	Orchestra	1 cr.
				Varsity Band	¼ cr.	Concert Choir	1 cr.
						Madrigal Singers	½ cr.
						Music Theory	½ cr.
						Music History & Appreciation	½ cr
Physical Education/ Health	60 Clock Hrs/1½ crs. Each in Grade 10	Physical Education 10	½ cr.	Physical Education 10	½ cr.	Physical Education 10	1 cr.
		Health 10	½ cr.	Physical Education 11-12	¼ cr.	Team/Dual Sports	½ cr.
				Student Athletic Training Program	¼ cr.	Outdoor Adventures I, II	½ cr.
				Intern Program	¼ cr.	Sports & Fitness	½ cr.
Science	360 Clock Hrs/3 crs.	Biology	1 cr.	General Biology	½ cr.	Biology	1 cr.
		**Chemistry	1 cr.	Advanced Biology	½ cr.	Enriched Biology	½ cr.
		**Physics	1 cr.	General Science	1 cr.	Physiology and Anatomy	1 cr.
				Chemistry	1 cr.	Global Science	½ cr.
				Applied Chemistry	½ cr.	College Prep. Chemistry	1 cr.
				Advanced Chemistry	½ cr.	Applied Chemistry	1 cr.
				Physics	1 cr.	Chemistry	1 cr.
				Applied Physics	½ cr.	Semester Physics	½ cr.
				Human Anatomy & Physiology	½ cr.	Physics	1 cr.
				Microbiology	½ cr.	Adv. Physics	1 cr.
						Science Seminar Internship	½ cr.
Social Studies	360 Clock Hrs/3 crs. 1 credit must be in American studies including history, and 1 credit must be in contemporary world problems.	Social Studies 10	1 cr.	American History I, II	½ cr.	American History	1 cr.
		Economics	1 cr.	World History I, II	½ cr.	Adv. Placement: Am. History	1 cr.
		Amer. Political Behavior	1 cr.	Social Problems	½ cr.	World Studies	1 cr.
		*Sociology	½ cr.	Introduction to Politics	½ cr.	Adv. Placement: Europe History	1 cr.
		*Psychology	½ cr.	World Geography	½ cr.	Modern Problems I, II	½ cr.
				Psychology	½ cr.	Economics	½ cr.
				Advanced Psychology	½ cr.	Philosophy	½ cr.
				Intro. to Economics	½ cr.	Religion in Human Culture	½ cr.
				Interdisciplinary Studies	1 cr.	Psychology	½ cr.
						Sociology	½ cr.
						Political Science	½ cr.
						Adv. Placement: Compar. Government & Politics	½ cr.
						Community Involvement	1 cr.

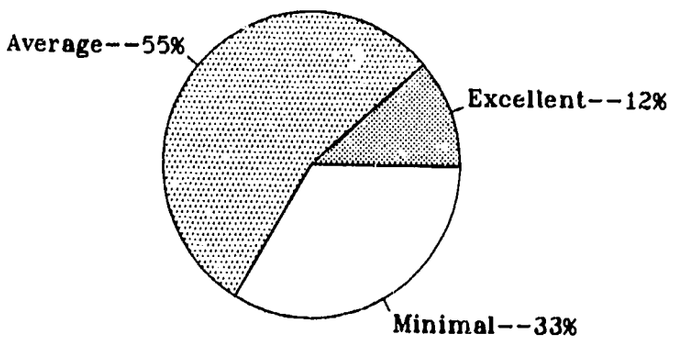
*Offered via telecommunications only.
**Offered in neighboring district through sharing arrangements.

Subject Area	State Board Req. Offerings	High School #1	High School #2	High School #3
Business	None	Typing 1 cr. Office Practice 1 cr. Model Practice 1 cr.	Accounting I, II ½ cr. Recordkeeping ½ cr. Business Law/Personal Law ½ cr. Electronic Office Procedures ½ cr. Business Computers ½ cr. Keyboarding/Typing I, II ½ cr. Adv. Keyboarding/Word Processing ½ cr.	Keyboarding I, II ½ cr. Word Processing ½ cr. Keyboarding for College ½ cr. Wordprocessing for College ½ cr. Accounting I-IV ½ cr. Office Skills Lab I, II ½ cr. Business Applications ½ cr. Information Processing I, II ½ cr. Notetaking and Study Skills ½ cr. Business Management I, II ½ cr. You and the Law I, II ½ cr. Consumers in a Hi-Tech Age ½ cr. Modern Marketing I, II ½ cr. Fashion Merchandising ½ cr. Advertising & Visual Merchandising ½ cr.
Home Economics	None	Home Economics 1 cr.	Foods ½ cr. Clothing I, II ½ cr. Tailoring ½ cr. Outdoor Gear ½ cr. Child Development & Parenting ½ cr. Today's Teen ½ cr. Family Living ½ cr. Managing Your Resources ½ cr.	For Seniors Only: Independent Living ½ cr. Relationships ½ cr. Marriage and Family ½ cr. Child Psychology ½ cr. Child Psychology Intern. ½ cr. Housing and Interior Design ½ cr. Food for Life & Leisure ½ cr. International Foods ½ cr. Fashion Expressions ½ cr. Fashion Merchandising ½ cr. Home Economics Internship ½ cr.
Vocational	None	None	Courses are available through local vocational center.	Programs are available through local Technical College.

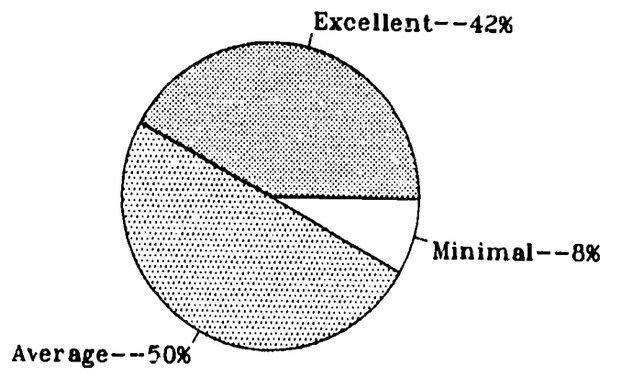
courses available in the 1989-90 school year. High school #1 represents the low end of the continuum; it is among the schools with the least developed curricula. High school #2 represents an average school in the state. High school #3 represents the high end of the continuum by showing a school with one of the best curricular offerings. The state board of education curriculum mandates are also included in the table.

Minnesota high schools are not evenly distributed among these three rankings; the largest number of schools falls in the middle category. Overall, small high schools are more likely to fall at the low end of the scale while large schools are more likely to be at the high end. This is a function of size: large schools are able to offer many courses at different levels because they have enough students to fill them. The pies below show the distribution of high schools and 10th-12th grade students among the three curriculum rankings. As can be seen, the distribution of students, particularly at the low and high end, differs significantly from the distribution of schools.

Fig. 2
High Schools and Students by Curriculum Ranking



High Schools



Students

House Research Graphics

While one-third of the public high schools are providing very limited opportunities for post-secondary preparation, this is affecting about 8% of the public high school students.

Graduation Requirements/Admission Standards

The availability of college preparatory curriculum does not ensure that students will take the courses needed for college. The state board of education sets minimum course requirements for high school graduation. Local school boards can add courses to these requirements. We examined requirements of a sample of 148 high schools (36% of the public schools in the state) to determine any locally added courses. Taken together these demonstrate the minimum secondary preparation a student must complete for graduation.

State graduation requirements fall far below the preparation that most four-year Minnesota colleges expect. Since the large majority of high school students plan to go on to college, graduation requirements can be compared to courses required or recommended for college admission. This is shown in Table 2. While local boards often boost the requirements somewhat, college expectations remain significantly greater. It is up to the student, therefore, to choose the courses necessary for college preparation. In many cases this does not occur, because the student lacks information, has other course preferences, or wishes to avoid some difficult courses.

Concern about the lack of student preparation prompted the 1989 Legislature to ask for a study of this issue by the governing boards of the public colleges that did not have required preparation standards. The legislation stated: "in order to increase students' academic preparation for higher education and to decrease the need for remedial work," the boards for the state universities, community colleges, and technical colleges were to "study and make recommendations on the effects of adopting secondary school preparation requirements for incoming students" (Laws 1989, chapter 293, sec. 8, subd. 5) The report submitted by the three boards never really addressed the Legislature's request. None of the three systems discussed the effects of requiring specific secondary preparation, although they did describe the need for access and remedial programs.

The boards' report states that "all post-secondary systems are currently engaged in activities geared to encouraging students to meet preparation requirements for college-level work." The "preparation requirements" referred to are not identified.

Table 2
Graduation and College Preparation Requirements - 10th-12th Grades

Subject	State Board Grad Requirements	Additional Local School Board Grad. Requirements*	Univ. of MN Prep. Requirements	State Univ. System Prep. Recommendations	Private College Prep. Recommendations
English, Communications	360 Clock Hrs/3 cr.	2% required additional courses; most specifically some of the courses to be taken.	3 Years Emphasis on writing; instruction in reading/ speaking skills and literary understanding/appreciation.	3 Years Writing and grammar; speech/listening/reading skills; analysis of literature.	3 Years
Foreign Language**	None	None	2 Years In a single language.	2 Years	2 Years
Math	None	25% None 71% 1 semester - 1 year 4% more than 1 year	2 Years Geometry Intermediate Algebra	2 Years Geometry Intermediate Algebra	2 Years
Science	None	21% None 76% 1 semester - 1 year 3% more than 1 year	2 Years Including 1 year each Biological Science & Physical Science	2 Years Including a lab	2 Years
Social Studies	240 Clock Hrs/2 cr. One credit must be in American studies, including history; and one credit in contemporary world problems	22% None 78% 1 semester - 1 year	1 Year Including U.S. history	2 Years US/world history; US government	2 Years
Other	60 Clock Hrs/½ cr. 10th grade in health, physical education	24% require some additional courses. Commonly these are typing, speech or another skill.	Visual/performing arts and computer skills are strongly recommended.	**2 Years-visual/perform. arts **½ Year-computer skills	**2 Years-visual/performing arts

*Based on an analysis of a sample of 148 public high schools.
**May be partially completed in ninth grade.

The report concludes that "more needs to be done" and makes four general recommendations with some examples of each. These may have some value, but they do little for the problems associated with limited curriculum or students' choice of courses. The general recommendations include:

A. "**Improve articulation** between and among secondary schools and colleges and universities . . .

B. **Communicate more effectively** to the various educational 'publics' the preparation requirements to do college-level work . . .

C. **Preserve access** through the availability of assessment and developmental services . . .

D. **Replicate successful programs** that help to improve preparation of entering students . . ."

Although the post-secondary systems side-stepped the issue of preparation requirements in their response to the Legislature, the state university system is preparing now to face this issue as part of its "Q7" initiative. A blue ribbon commission, created by the state university to advise the system on standards of quality, strongly recommended the adoption of preparation standards for incoming students. Its report to the state university board states:

> Each entering student will have completed a college preparatory course pattern, including courses in writing, advanced mathematics and science, foreign language, the arts, history and geography, and will have met standards of admissions established by the universities.

The commission based this recommendation on its belief that success in college is dependent, in part, on adequate preparation, and that requiring this preparation would enhance a student's opportunity for success. The commission's report is quite critical of current high school graduation standards:

> At present Minnesota has among the lowest high school graduation requirements in the nation. . . . By comparison, forty-one states require some math and science, five states require foreign language, and eleven require art/music for graduation. It must be clear that a high school diploma alone is not an indication that a student is prepared for college

The state university board plans to act soon on the commission's recommendations. If the board does adopt preparation requirements for incoming students, it will affect the choice of courses for thousands of Minnesota high school students and, in turn, influence the curricular offerings in many high schools in the state.

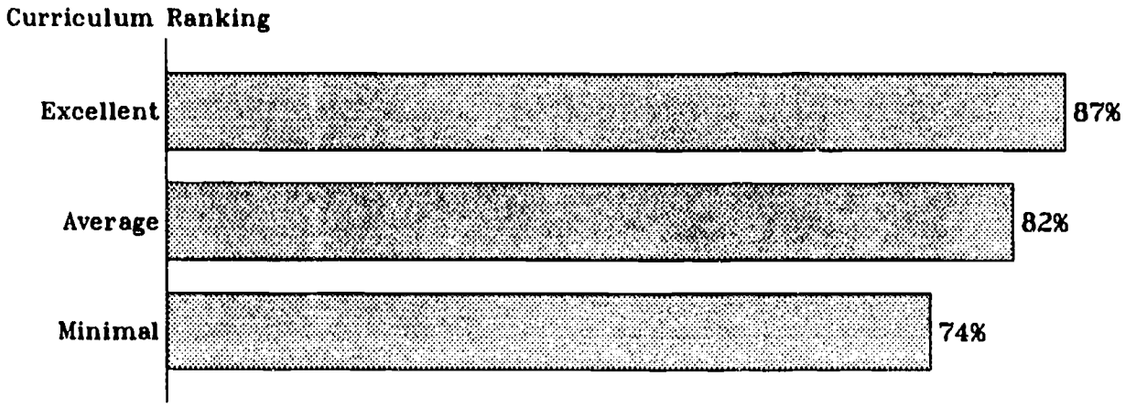
The University of Minnesota has started this movement in the high schools already. Its new preparation requirements have helped to broaden available secondary curriculum. Conversations with secondary school personnel indicate that the requirements have caused students interested in attending the University to enroll in more rigorous high school courses. While the broadened curriculum may provide better preparation opportunities to students planning to attend any post-secondary institution, those not planning to attend the University (or private liberal arts colleges which tend to have similar requirements) are less likely to have felt the need to enroll in these courses. If the state university system joins in this movement, the number of students pursuing a more rigorous high school education will increase significantly.

On the other side of the issue of preparation standards is the concern that students will be unable to study other fields, such as the arts, if too many requirements are in place. Since many high schools operate on a six-class-period day, there is little room for other choices if a student needs to take English, foreign language, math, science and social studies. Related to this is the concern that districts will not be able to provide much in other fields if they must concentrate their resources in these required areas.

Curriculum and College Retention

There is a relationship between the type of curriculum available in a high school and the rate of college retention from that school district. Figure 3 illustrates the percentage of students remaining enrolled after one year in Minnesota's four year colleges. This percentage varies by the opportunity for college preparation in high school.

Fig. 3
Retention of Students in 4 Year Colleges
by Their High School Curriculum Ranking



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As Figure 3 shows, students from high schools that offer minimal preparation are less likely to be retained in a four year college than those from schools with better curricular opportunities.

College Level Courses

The legislature enacted law in 1985 (M.S. 123.3514) to provide students an opportunity to enhance the curriculum available in their high schools. The post-secondary enrollment options program (PSEO) allows high school juniors and seniors to enroll in and receive credit for college courses, at no charge to the students. The PSEO is intended to allow students in all districts, regardless of the type of curriculum available to them at their high schools, to challenge themselves with higher level courses.

In addition to the PSEO, there are other opportunities for high school students to take college level courses. In many cases these courses, which usually carry college credit, are offered in the high schools themselves. This can be done in a number of ways: courses taught by college faculty; courses taught by high school instructors who have received special training from college faculty; interactive television courses; campus extension programs available on weekends or evenings; and correspondence courses. Together with the PSEO, these types of college courses can provide some of the post-secondary preparation opportunities students need, especially in districts with otherwise limited curriculum.

While we do not have data that permit an analysis of individual student participation in particular college level courses, the department of education does compile school district information on the overall enrollment rates in these courses. These rates range from no participation up to 65% of the 12th grade students in some districts. Overall, 78% of districts that have a high school had at least one senior participating in a college level course. Statewide, approximately 4,500 seniors enrolled in one or more college level courses in the 1989-90 school year.

IV. Planning

Post-secondary planning is an important link between high school and college. Just as curricular opportunities vary among school districts, the post-secondary planning opportunities vary. Yet to make good informed decisions about college, a student needs information and advice.

High School Planning Programs

In order to determine the planning programs available in secondary schools, we contacted a sample of 148 high schools by telephone and interviewed a school counselor (or a person acting in this capacity[6]) involved in post-high school planning. The sample included schools of all sizes located in all areas of the state.

This survey confirmed that students' opportunities for planning depend on the secondary school in which they are enrolled. These differences occur in three areas: the personnel involved in post-high school planning, the planning process available in the school, and the planning resources available in the school.

Table 3 summarizes the differences among schools in post-high school planning opportunities. It presents three categories of schools. High school #1 is an example of a school with a very limited post-high school planning program. High school #2 is an "average" school in the state which provides some post-high school planning. High school #3 is an example of the most highly developed planning programs in the state.

[6]The department of education listed 116 districts (117 high schools) without a full or part-time licensed counselor in the 1986-87 school year (the senior year of the students in our study). For the 1989-90 school year, the department reported 94 districts (95 high schools) without a full or part-time licensed counselor.

Table 3
Comparative Post-secondary Planning Programs

	High School #1	High School #2	High School #3
Personnel	No counselor Teacher assigned Minimal hours	Full-time counselor	Full-time counselor Full-time career/college counselor
Process	9-12 No formal process	9th - Careers Unit - 4 yr. planning 10th - Classroom planning visits 11th - College tests - Review test results 12th - Individual counseling sessions with each student regarding post high school planning - 2 excused days for college visits	9th - Careers Unit - 4 yr. planning - Interest surveys - Individual counseling sessions (if interested) - Small group parent sessions 10th - PACT Plus Testing - PSAT Testing - Classroom planning visits 11th - Bus students to college fair - College tests (ACT, PSAT, ASVAB) - Career Planning Program (CPP) - Review test results - Individual 1/2 hr. counseling sessions with all 11th graders - Small group parent sessions - Post-secondary institutions night 12th - Small group planning - Classroom planning visits - Individual counseling sessions - Financial planning night for parents and students - excused days for college visits
Resources	- College catalogs (local colleges only) - Campus reps. (local colleges only) - Financial aid info. - Applications	- Catalogs (All MN, surrounding states) - Campus reps. - Financial aid info. - Applications - Career Fair at high school - Minnesota Career Information System (MCIS) (printed version) - Post-high School Planning Program (PSPP) - Job shadowing	- Catalogs (All MN, regional; many national) - Campus reps. - Financial aid/scholarship info. - Applications - Guidebooks (i.e., Peterson's, Lovejoy's, Orchard) - Chronicle career guidance systems - College board publications - MCIS (computer version) - Campus laser disks - Campus videos - Newsletter to parents, students - PSPP - Career Center

High School #1

Students in high school #1 are left largely on their own to plan for college or careers. This type of school has no "counselor" as such; a teacher or administrator acts in this capacity part of the time. Not all schools without counselors are this limited. In many, the personnel filling the counselor role have enough time and resources to have a planning program of some sort. But in the extreme case of high school #1, the "counselor" is really no more than a teacher who is available to try to answer students' questions should they choose to ask them.

There is no planning "process" in high school #1, nor are many resources available to students. Information on financial aid and college applications is available because the state (largely the Higher Education Coordinating Board) provides these to all high schools in the state. College catalogs are available, but usually only from nearby colleges unless another college has mailed one on its own initiative. Some representatives of nearby colleges visit, but again this is largely at the college's initiative.

A student in a rural area, from a family without college experience, who is attending this type of high school is not likely to have access to adequate information to make informed decisions about whether to go to college, where to go, how much it costs, how to pay for it, or the countless other factors that affect the decision to attend and the student's success once there.

The student in this type of school does have one potential advantage over students in high schools #2 and #3. Since many schools in this first category are quite small, the teachers and administrators are likely to know each student fairly well. They may have known the student for several years and may also know the student's family reasonably well. This personal contact can be very valuable in advising students about future careers and education and, at least in some cases, may overcome the lack of a planning process and college information. Additionally, this personal contact may make the counselor more willing to actually "advise" rather than just provide information. Most counselors, especially in larger schools, appear to believe that advising a student on college choice is overstepping their bounds. Many students, on the other hand, appear to need advice that considers their preparation, performance and interests.

High School #2

The student attending high school #2, the most common type of school in the state, has a better opportunity for planning than those in high school #1. This type of school has a full-time counselor and a true planning "process." Each year at least some time is spent providing students with information and encouraging them to think about their future education and careers. The school has resources available to aid the students in this process including catalogs from Minnesota and nearby states, and organized visits from campus representatives.

Nonetheless, the program at high school #2 has shortcomings. The most serious of these is the time the counselor has available. Most high schools have very high counselor to student ratios. In the schools we contacted, these ranged as high as 1:855. Even with ratios significantly lower, a counselor must engage in a variety of activities. Many of these take precedence over post-high school planning. Much of the time is taken up by class scheduling and registration; priority must also go to students with family or personal problems and discipline cases. This often leaves little time for active post-high school planning.

The lack of counselor time is balanced to an extent by a good availability of resources in these schools. A motivated student can use the information to learn about future choices. However, most students are not very good consumers of information and, without guidance, much of the material is really difficult to weigh since it is often designed with a strong emphasis on public relations. Moreover, the high school environment is so different from many colleges that comprehending it only from written materials can be overwhelming. Two teachers at one school have tried to overcome some of the "foreign" environment of college by conducting their senior classes in ways more like college classes, such as using course syllabi and bluebooks for tests. These types of strategies may make the transition to college much smoother. Obviously, they are not sufficient in and of themselves to overcome a lack of planning resources.

High School #3

High school #3 not only has extensive resources available, often with the latest technology, but also has a sophisticated planning process. This process begins early and continues throughout high school, conducted in classes, small groups and individual sessions. The process involves parents as well which is often a key to dispensing information. Parents are involved early to allow for curriculum planning and financial planning, and are kept involved through the time of testing and actual college choice.

What sets high school #3 apart most clearly is a full-time counselor whose only function is post-high school planning. Very few high schools in Minnesota make this commitment to career and college counseling. Some schools are able to dedicate a portion of one or more counselor's time to this subject; some schools also rely on aides and volunteers for help in this area. A planning program that is as extensive as that in high school #3 requires a significant time commitment if it serves large numbers of students; at the same time, it takes a large number of students to be able to support an extensive planning program. As more students continue their education beyond high school, this type of service becomes more important.

Even in high school #3, however, adequate planning and good decision-making often may not occur. No matter how many people or resources are available, some students do not use them despite the fact that they intend to go to college. Others decide to attend college at the last minute and may have never planned.

State Planning Services

The state provides some special services to assist students and high schools in planning. These include: the Post-high School Planning Program (PSPP), Project Inform, the Minnesota Career Information System (MCIS), and the Post-Secondary Enrollment Options program (PSEO).

PSPP

The Higher Education Coordinating Board (HECB) provides a number of services to high schools and students to assist in planning. For the purposes of this paper, these services are all considered together as part of the Post-high School Planning Program. Minnesota law (M.S. 136A.85-.88) requires the board to provide a voluntary program for students in grades 8-12. The PSPP consists of several parts, including:

- "Future Choices" -- 8th grade -- information and curriculum guide for students to help them plan early and select appropriate high school curriculum
- Career Planning Program -- 11th grade -- instruments to test abilities and interests to help students identify occupations and related education programs
- Plans and Background Questionnaire -- 11th grade -- survey of college and career plans, used primarily for state and post-secondary institutional planning
- College Admissions Testing -- 11th grade -- provision of ACT tests for students planning to attend college
- "Parents" -- information and suggestions for parents to plan financially for college and to assist their children in academic planning
- "Focus on Financial Aid" -- descriptions of all major financial aid programs and application information for students, parents and counselors

In addition to these services, HECB provides information to high school counselors about college admission requirements and program information, test dates, and financial aid in the form of a looseleaf notebook that is given to each high school and updated yearly.

Project Inform

The University of Minnesota coordinates a program for 8th-12th grade students who are interested in continuing their education beyond high school. Minnesota law (Laws 1987, ch. 401, sec. 32) requires the University to develop counseling mechanisms to advise students in conjunction with the University's change in admission standards (as part of its commitment to focus plans). The law requires advising prior to college admission to inform students of all the post-secondary options in the state and to assess students' potential for success within these options. The law requires additionally that the University itself provide this counseling in those high schools which have no counselor.

The University entitled this effort Project Inform and focused its activities particularly on students in high schools without counselors. Staff on the four UM coordinate campuses visit these schools to provide information to students on the college choices available, their admission requirements and their programs. Additionally, they produce and distribute widely a poster describing all the college choices. The program also works with the HECB's eighth grade program to encourage younger students to begin early preparation and to pursue a rigorous high school curriculum.

MCIS

The Minnesota Career Information System is a program of the Department of Education that produces written materials and computer software which are provided for a fee to high schools to aid students in career and education choices. Minnesota law (M.S. 126.67) permits the department to provide this type of information. MCIS includes: tests of interests and abilities; listings of occupations with information on job duties, conditions, pay, and employment outlook; educational program information for all Minnesota post-secondary institutions; descriptions of all Minnesota and about 2,000 national post-secondary institutions including admissions, tuition and enrollment information; and information on financial aid programs and application procedures.

PSEO

Although intended as a means of enhancing curricular opportunities (see previous section), the PSEO also serves as a planning aid. Students can use their experience in this program as an extended orientation session to become familiar with college procedures and expectations.

Many of the high schools in the state have some or all of these state-sponsored services available, although Project Inform activities are concentrated in schools without licensed counselors. We cannot assess how well used these services are, beyond the fact that the PSPP and MCIS are part of the planning process at numerous schools. Students' assessment of the information and services will be presented in a later paper that analyzes survey information from a sample of current and former University of Minnesota and state university students.

V. Remedial/Developmental Programs

One possible outcome of poor student preparation, whether due to unavailability of curriculum, inappropriate choice of courses, or low levels of high school performance is the need for remedial work in college. This may take the form of making up course work in English or math, or it may involve the development of skills useful in college, such as studying skills. While the latter is not truly "remedial," the skills and knowledge involved in these courses are often learned in high school and, at some high schools, are taught as subjects or offered as services.

The HECB published a report on remedial education in 1984. Based on a survey of post-secondary institutions, HECB reported that enrollments in remedial/developmental courses more than doubled between 1972 and 1984. It was beyond the scope of our study to replicate HECB's work; therefore, we cannot update these data here. However, we did collect some information relevant to enrollments and types of courses which is discussed below.

Age of Students

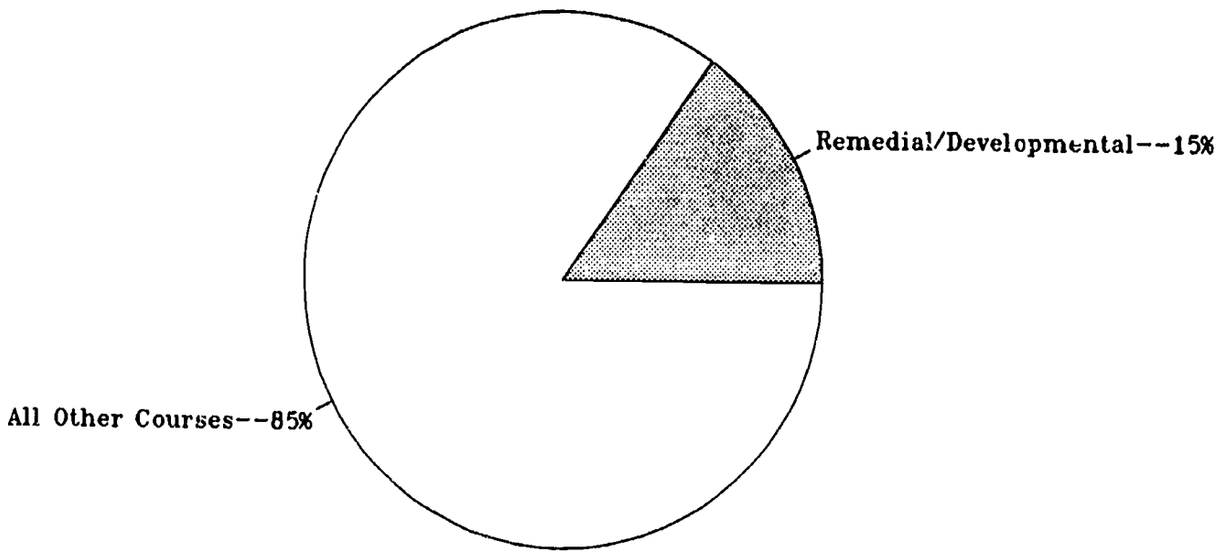
Not all students enrolled in remedial/developmental courses are recent high school graduates. Nontraditional students returning to school after an absence of several years have different needs than those recently in high school. Therefore, age must be considered in examining enrollments in these courses.

Looking only at the number under and over age 25 can be misleading. A 24 year old just starting college has been out of high school several years and is not really comparable to a 24 year old who has been in college for six years. Since a large portion of students take several years to graduate, they can become "nontraditional" along the way (simply by turning 25), even though they began college as traditional students. This "maturation" factor requires some control.

Community colleges are a useful example for remedial/developmental enrollments because they involve briefer enrollments and because they enroll significant numbers of nontraditional students. Moreover, community colleges have a strong role to play in preparing students for further education and providing job skills to those who do not plan to continue school.

The graph below presents the percentage of all students enrolled in remedial/developmental courses in the community college system in the 1988-89 academic year.

Fig. 4
Students in Remedial/Developmental Courses
Community Colleges 1988-89*



(N=50,371)

*Based on end of term data.

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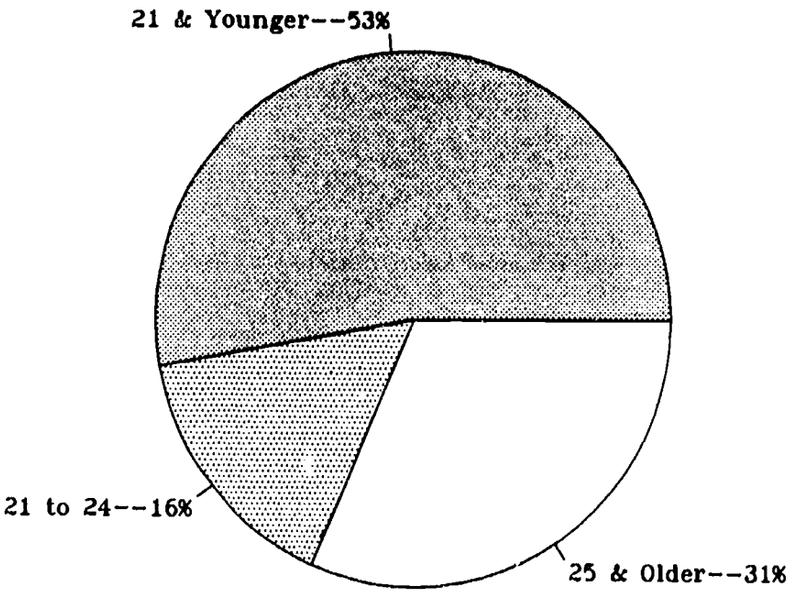
Just over 15% of all community college students in a year are enrolled in courses that the community colleges term remedial/developmental. The students in these classes can be classified as traditional or nontraditional as seen below.

Fig. 5
Traditional and Nontraditional Students in Remedial/Developmental Courses
Community Colleges 1988-1989*



*Based on end of term data.

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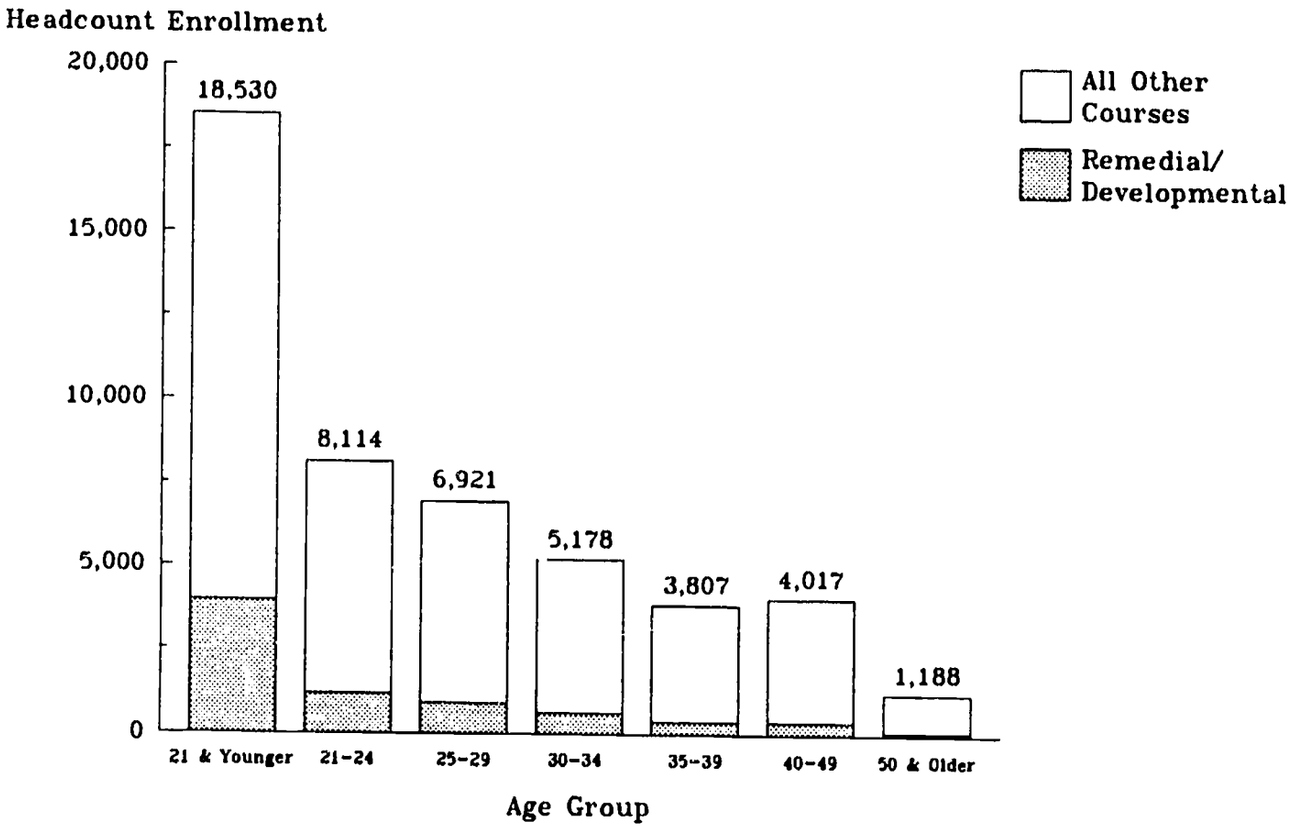
While remedial/developmental courses are serving many nontraditional students, the majority of enrollment is by students who are under 21. This, of course, is affected by the percentage of all students who are in this age category. Figure 6 shows the remedial/developmental enrollment as a proportion of the enrollment for each age group.

Figure 6[7]
Remedial/Developmental Enrollments by Age Categories
Community Colleges 1988-89



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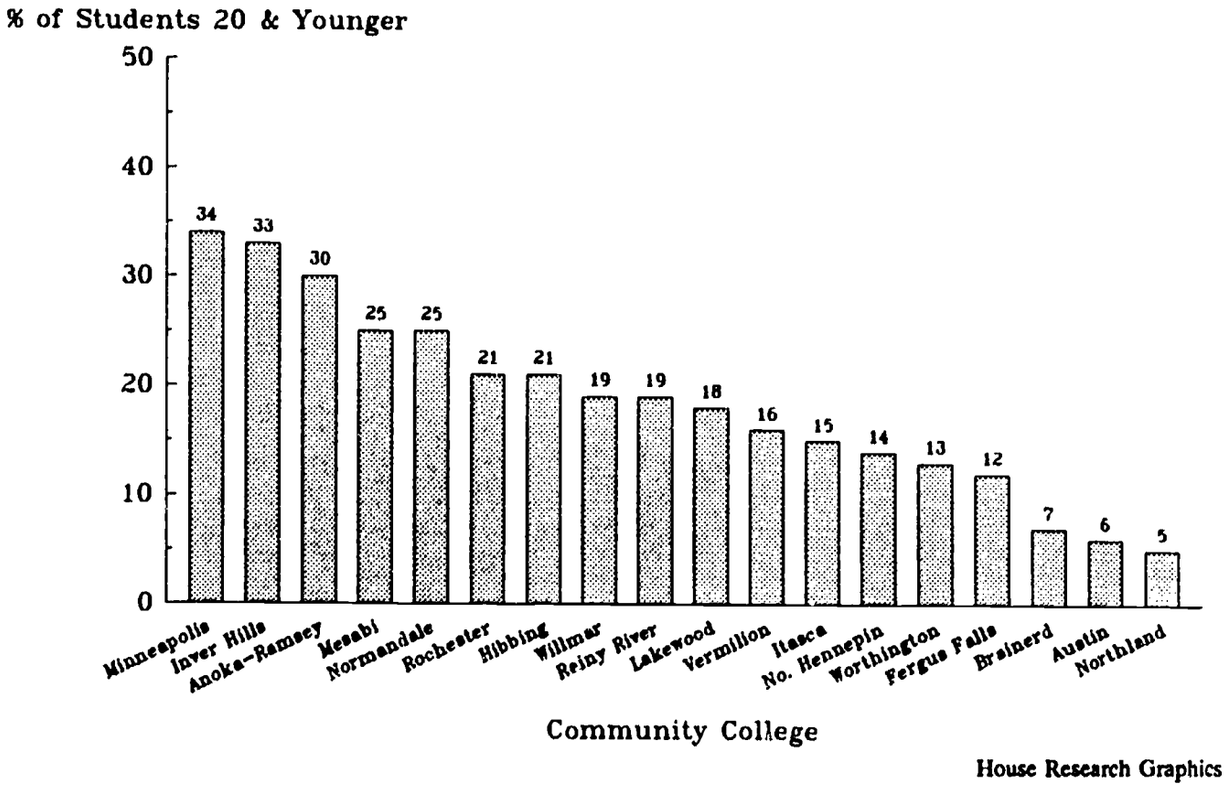
Even when the size of the enrollment pool is controlled, most enrollment in remedial/developmental courses is from students who are very recent high school graduates. This indicates that the colleges are being put in a position of having to provide for students who were not adequately prepared in high school. We do not have data available that would allow an analysis of whether students: (1) did not have the necessary curriculum in the high schools, (2) did not take the courses that were available, (3) took necessary courses but performed poorly, or some combination of these factors. This information is significant in addressing any problems that may exist.

[7]Total headcount is based on 10th day fall enrollment while remedial/developmental headcount is based on end of term enrollment. Thus the two figures are not precisely comparable.

The rates of remedial/developmental enrollment among the most recent high school graduates fluctuate across community college campuses. While the rates for this group are the highest of any category on most of the campuses, they range from 5 percent to 35 percent. The graph below shows the differences in remedial/developmental enrollment rates among students under 21.

Fig. 7
Students Under 21 in Remedial/Developmental Courses by Campus
Community Colleges 1988-87



House Research Graphics

There is no one factor that accounts for these different campus rates. The range of enrollments is related to many differences across the campuses including the type and use of assessment, the high school preparation and performance of students, the availability and services of campus learning centers, and the number and kinds of remedial/development courses offered.

Generally, the greater the use of assessment on a campus, the higher the rate of enrollment in these courses will be. Widespread assessment usually will identify more students with deficiencies which will increase enrollment levels. With a new, uniform set of assessment tools in place on all community college campuses, the enrollment rates in remedial/developmental courses are likely to climb. For those campuses that had little assessment activity in the past, these increases probably will be significant.

Table 4
Community College Remedial/Developmental and Related Courses[1]

	Reading/Writing		Arithmetic	
Remedial/ Developmental Courses[2]	Reading Techniques	2-4 cr.	Basic Math I	1-5 cr.
	College Prep Writing	2-4	Basic Math II	1-3
	College Prep Reading	2-4	Basic Math III	1
	Basic English	2-4	Algebra I	5
	Basic Spelling	1	Algebra II	5
	Developmental Reading I	1	The I Hate Math Course	2-4
	Developmental Reading II	2-4	Arithmetic	2-4
	Sentence Recognition	1	Math for Health Careers	1
	Sentence Composition	1	Computational Math	1
	Sentence Variety	1	Intermediate Algebra	5
	Sentence Strategy	1	Geometry	5
	Refresher English	2-4	How to Study Math	2-4
	Grammar I	1-3		
	Grammar II	2-4		
	Intermediate English	2-4		
	Developmental Writing	2-4		
	Developmental English	2-4		
	Efficient Reading	2-4		
	Vocabulary Building	1-2		
	Intro to College Reading	2-4		

Related Skills Courses[3]	Communications	1-3 cr.	Decision Making	1 cr.
	Human Potential Seminar I and II	1	College Orientation for Personal Enrichment	1
	Study Strategies	1	Career Exploration and Development	1-3
	Stress Management	1	Critical Thinking and Problem Solving	4
	Individualized Study	1	Personal Exploration and Development	2
	How to Study	3	Efficient Reading and Study Skills	4
	How to Take Tests	1	Student Success	2
	College Reading	3	College Survival Skills	2
	Efficient Listening	3	Speed Reading	1
	Individual Skill Development	1-3	Study Skills I, II & III	1
	Changing Horizons	3	Learning Skills	1-3
	Academic Anxiety	1	Effective Notetaking	1
	Leadership Training	1	Reading College Textbooks	3
	Individual Planning	3	Library Orientation	1
	Reading & Study Skills	4	Preparation for Employment	1
	Independent Study	1		
	Improving Reading Rate	1		
	Intro to College	1		
	Prior Learning Orientation	1		

[1]Not all courses are offered on every campus.

[2]For most courses, credits do not apply toward graduation.

[3]For most courses, credits do apply toward graduation.

Course Offerings and Enrollments

A major determinant of remedial/developmental enrollment rates is the type and number of courses offered and how these are defined. Each of the post-secondary systems considers some courses as remedial/developmental and does not define other related courses this way.

Table 4 lists the courses offered by the community colleges (as contained in their catalogs). These are divided into remedial/development courses in math, similar courses in reading/writing, and other skills development courses that generally are not classified as remedial/developmental. The state board for community colleges considers a course to be remedial if it is "instruction needed because the student is functioning below the achievement norms for high school students completing the commonly-taken courses."

The ambiguity of this definition allows some courses to be classified as remedial/developmental while related courses are not classified this way. In the previous figures (pgs. 36-39) community college enrollments are based on only those courses defined by the community colleges as remedial/developmental. Significant enrollments in skills development courses are not counted in those figures.

This classification issue is not limited to the community colleges. There are numerous remedial/developmental courses offered at both the public four-year systems; overall, the state universities have more of these courses than the University of Minnesota. Since the state universities serve the role of community colleges in their immediate region, it is not surprising that they offer more of these courses. The University of Minnesota's courses are targeted at similar students: all of the Twin Cities' listings are in General College and most of UMD's are in its counterpart to General College.

Table 5 shows 1989-90 course offerings and enrollments for the four- year state university and University of Minnesota campuses. Catalog descriptions of these courses can be found in Appendix B.

About half of all the state university and University of Minnesota-Duluth offerings are in math or English, the other half relate to some type of skills development such as career planning, college orientation and study skills. At the Twin Cities campus of the University of Minnesota, the offerings are almost entirely math and English. Part of the variation in the numbers and types of courses is attributable to the historical development of courses and programs on a campus or to local needs of a campus. For example, Moorhead State University has a program for incoming

Table 5
Remedial/Developmental and Related Courses
1989-90 Offerings and Enrollments

UNIVERSITY OF MINNESOTA

Course–Credit	Enrollments
Duluth	
R Intermediate Algebra--5	2
College Reading Strategies--2	64
Writing Strategies--3	118
R Science Skills--3	11
College Study Strategies--2	252
Library Skills--1	19
Personal Development--3	122
Morris	
No courses offered in 1989-1990	
Twin Cities	
R Arithmetic Problem Solving--5	352
R Algebraic Problem Solving I--5	365
R Algebraic Problem Solving II-5	188
R Intermediate Algebraic Problem Solving--5	67
R Elementary Algebra--5	446
R Algebra Review--5	483
R Intermediate Algebra--5	818
R Basic Math I--4	25
R Basic Math--4	53
Learning Strategies: Reading & Study Improvement--2	122
Developing College Writing--3	36
Intro to College Reading & Writing--3	65
Higher Education Survival Seminar--2	190

STATE UNIVERSITIES

Course–Credit	Enrollments
Bemidji	
Basic Algebra--4	52
Basic Writing--4	52
Analytical Reading & Study Skills--2	377
EDC Student Seminar--1	81
Self-expression Group--2	33
Life Career Planning--2	67
Mankato	
R Math Skills I--3	62
R Math Skills II--3	266
Basic Writing--3	106
Library Orientation--1	908
Moorhead	
R Math El Algebra--4	127
R Math I--2	57
Math II--2-4	191
Business Math--4	17
R Basic Grammar--1	75
R Sentence Improvement--2	91
R Reading Development--3	73
Intro to Critical Reading--3	33
Issues in Evaluation--5	68
Group Skills & Democratic Process--5	7
Human Development--4	53
Individual Development--2	243
College Survival Skills--2	104
Listening as Communicating--2	47

Course–Credit	Enrollments
St. Cloud	
R Intro Algebra--4	308
Basic Writing--4	111
Reading/Study Strategies--2	424
Reading Rate Improvement--2	278
Intro to Learning Resources--2	242
Intro to College--1	28
Managing College Experience--2	677
Southwest	
R Intro Algebra--4	65
R Intermediate Algebra--4	167
R Developing Reading Skills--3	46
R Orientation to Higher Ed--1	41
R Developing Reasoning Skills--4	60
R External Studies Planning--1	16
Developing Study Skills--4	378
Intro to Library Resources--1	88
Learning How to Learn--4	47
Educational Planning and the Assessment of Life/Work Experiences--1	16
Placement Skills--1	24
Winona	
R Pre-Algebra--4	43
Intermediate Algebra--4	1691
Improving Reading & Study Skills--2	248
Intro to College Writing--4	347

R = Remedial Course as defined by campus. (Credits generally do not apply toward graduation.)

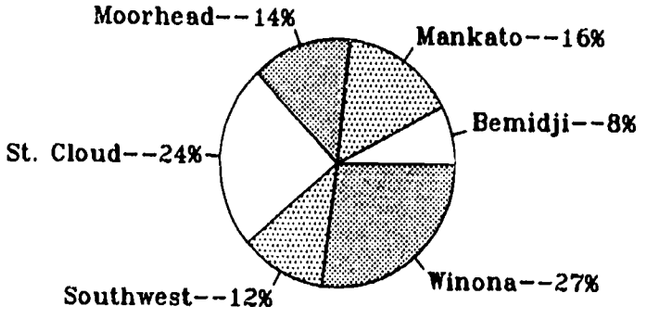
freshmen who do not meet the admission criteria or significantly lack curricular preparation. These students are admitted conditionally and placed in special courses. Most of Moorhead State's remedial/developmental courses are part of this program. The campus variations also relate to activity in a campus learning center. Some campuses rely more on their centers to offer these services; therefore, fewer formal courses are offered. These centers are discussed in the next section.

Remedial/developmental courses generally award credits. In part this is because some financial aid requires a minimum credit load and this allows students in these courses to qualify for aid. Moreover, a course offered for credit is financed through the state's average cost funding formula whereas noncredit courses are not. Usually credits earned by students in courses classified as remedial/developmental do not apply toward the credits they need for graduation, while other skills development courses do.

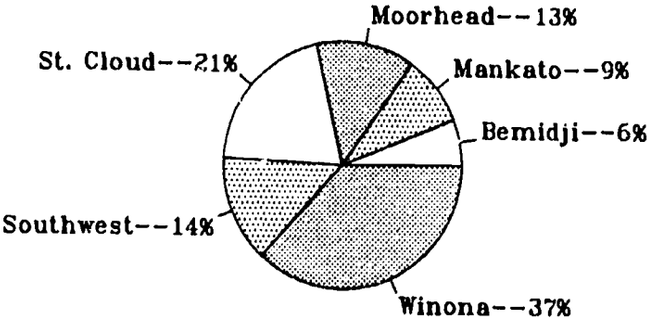
Although most of the courses in Table 5 are not defined as "remedial" by the campuses, none of them really includes the substantive knowledge one usually equates with a college education. In fact, many of these courses (e.g., learning how to learn) involve knowledge or skills that one would expect an incoming freshman to have or to at least develop during the first term or two through taking traditional college courses. Others seem to fall more into support services rather than credit courses (e.g., educational and career planning). To the extent that students substitute credits in these courses for those in substantive courses, their college education is more limited; to the extent that they add these credits on top of those needed for graduation, the length and cost of their college education increases.

As in the community colleges, there is a broad range of enrollment figures across the campuses. These contrasts can be seen clearly within the state university system. They do not directly relate to the number of courses or the enrollment size of a campus. The pie below displays the enrollments and the total credit hours (# credits x enrollment) generated by these courses for each state university campus. The enrollment figures are not necessarily individual students; a student who takes more than one course is counted each time.

Fig. 8
Remedial/Developmental Enrollment and Credit Hours
by Campus
State Universities 1989-90



Enrollment
(N=8,590)



Credit Hours
(N=23,971)

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If these figures are compared to the course listings, the discrepancy between the number of courses on one hand and the enrollments and credit hours on the other is immediately apparent. Winona State has the smallest number of remedial/developmental courses, but has the largest enrollment and, by far, the largest number of credit hours. In terms of total enrollment, Winona is the fourth largest campus, considerably smaller than St. Cloud State or Mankato State, so these course enrollments do not reflect the total size of the campus.

Our data are insufficient to link students' high school preparation to their later remedial work, or to compare campuses by the preparation level of their incoming freshmen. Therefore, we cannot determine whether remedial enrollment levels and differences among campuses are directly due to high school preparation. It is reasonable to assume, however, that students without adequate curriculum (because of availability, class selection, or class performance) are more likely to require additional college preparation.

Campus Learning Centers

Another factor relevant to enrollment in remedial/developmental courses is the role of campus learning centers which are available on all or nearly all campuses in the state. These centers differ in the variety of services available and, in some cases, their accessibility to students. A few campuses limit some or all services to students with particular identified learning needs or to those who are enrolled through a conditional admission program. However, most campuses make these centers available to all students.

Services at a center vary from campus to campus but most offer remedial assistance, skills development, career counseling, general academic and personal counseling. The description below of one center is a typical example:

> The center provides services that allow students to achieve academic success from the time of initial admission through successful completion of a degree. These services include: orientation, academic assessment, mathematics placement exams, tutoring for some disciplines, a writing center, leadership programs, career and placement services, and courses in skills development and personal development.

Many of the remedial/developmental services in a learning center are similar to courses offered on a campus. While students would usually receive the services free of charge, unlike a course offering, they would not earn academic credit for these services as they would in class. On some campuses, the learning center services may replace some courses which would limit developmental enrollments, while on other campuses the services and courses overlap considerably. Course enrollments on this latter type of campus might depend on whether students are more often directed to the center or to courses for services.

VI. Current Policy Directions

This paper has shown that the rates of college attendance and retention vary by the school district, and the type of school district, a student attends. Some schools provide better opportunities for college preparation and students from those schools tend to have higher retention rates after enrolling in college.

It is clear that many students, including some who had opportunities, are attending college without sufficient preparation to do the work required there. This is reflected in the efforts of the University of Minnesota and the state universities in their Commitment to Focus and Q7 efforts, respectively. This situation is likely to worsen as rates of college participation increase: more students with limited preparation opportunities and more students who did not use available opportunities will be enrolling in college. This is an expensive situation for the student and the state since it means more time and money to educate students twice--once in high school and again in college. Additional expenses may also result from students' lengthier enrollments to accommodate these courses and from students who drop out or transfer when they find they are unprepared for college.

One method proposed to ensure better preparation of high school students is to move to a system of "learner outcomes" rather than courses or clock hours completed. The state board of education has endorsed this approach and currently is considering appropriate outcomes within different fields of study. The debate over the value of learner outcomes in improving secondary education is beyond the scope of this paper.

The adoption of this approach will have significant effects on post-secondary education. In reviewing applications for admission, colleges examine the curriculum taken. They depend upon a clock-hours-completed approach to assess whether a student is adequately prepared. This clearly will require change if a learner outcomes approach replaces the traditional curricular requirements.

Additionally, at least some secondary administrators and faculty view the use of learner outcomes as a replacement for the current structure of awarding letter grades. Instead they want to provide written evaluations of the outcomes a student achieves. While this provides more information about student preparation to a college, it does not lend itself readily to the formulas that colleges use to determine admissions. Four-year colleges in Minnesota and other states usually rely on a combination of class rank and standardized test scores to determine a

student's admission. The precise formulas vary, but these two factors are considered the norm in college admission standards. While standardized test scores could remain available under a system of written evaluations, high school rank could not.

Although written evaluations of learner outcomes may be a better measure of student preparation and achievement, colleges are reluctant to abandon their approach to admission. They believe their criteria are good determinants of a student's likelihood for college success.

An example of this potential conflict is occurring currently at the Minnesota arts high school. The school does not want to rely on traditional grades; it uses a written evaluation of the learner outcomes a student achieves. In preparing for its first senior class, the school came up against post-secondary institutions in the state which, for the most part, were unwilling to try to evaluate separately the art school's senior students for admission. The colleges want the school to determine a grading mechanism for its students. This is a school with a unique student body that perhaps needs to be evaluated differently. Moreover, it has a small enrollment (11th grade admissions are limited to 135) that would not place a great burden on college admission officials. But each college is faced with thousands of freshman applications each year and if the art school's plan is multiplied across numerous high schools, the colleges are facing an enormous burden.

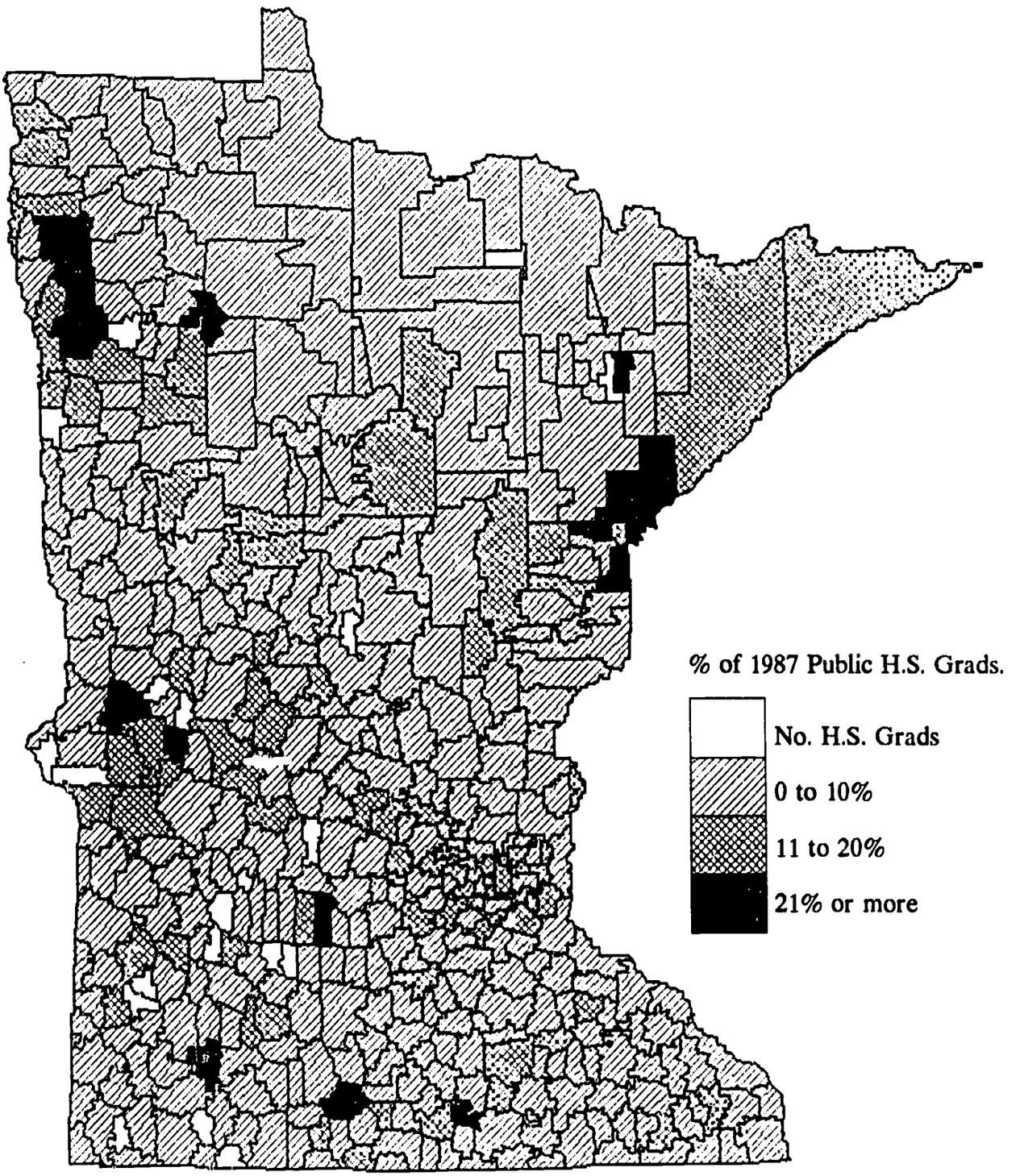
It appears that the K-12 and post-secondary systems are on a collision course, with students caught between them. The state board of education and other education organizations are rushing toward a learner outcome approach and, in the process, moving away from required curriculum. The post-secondary systems, at the same time, are heading toward more specific required coursework to improve college preparation.

Clearly a need exists to improve communications between secondary and post-secondary schools. Students are entering college without adequate preparation and this problem is likely to grow; high schools and colleges are examining ways to improve students' education but neither is prepared to respond to the other's approach. College officials have had little involvement in the development of learner outcomes yet they will receive most of the students who graduate from these programs. Elementary/secondary and post-secondary educational systems could afford greater separation and autonomy when college attendance was the exception; they cannot afford it when college attendance is the rule.

Appendix A

Maps of Post-secondary System Attendance Rates by School District 1987

Map 4
New Entering Freshmen Attending University of Minnesota Campuses in 1987 by School District



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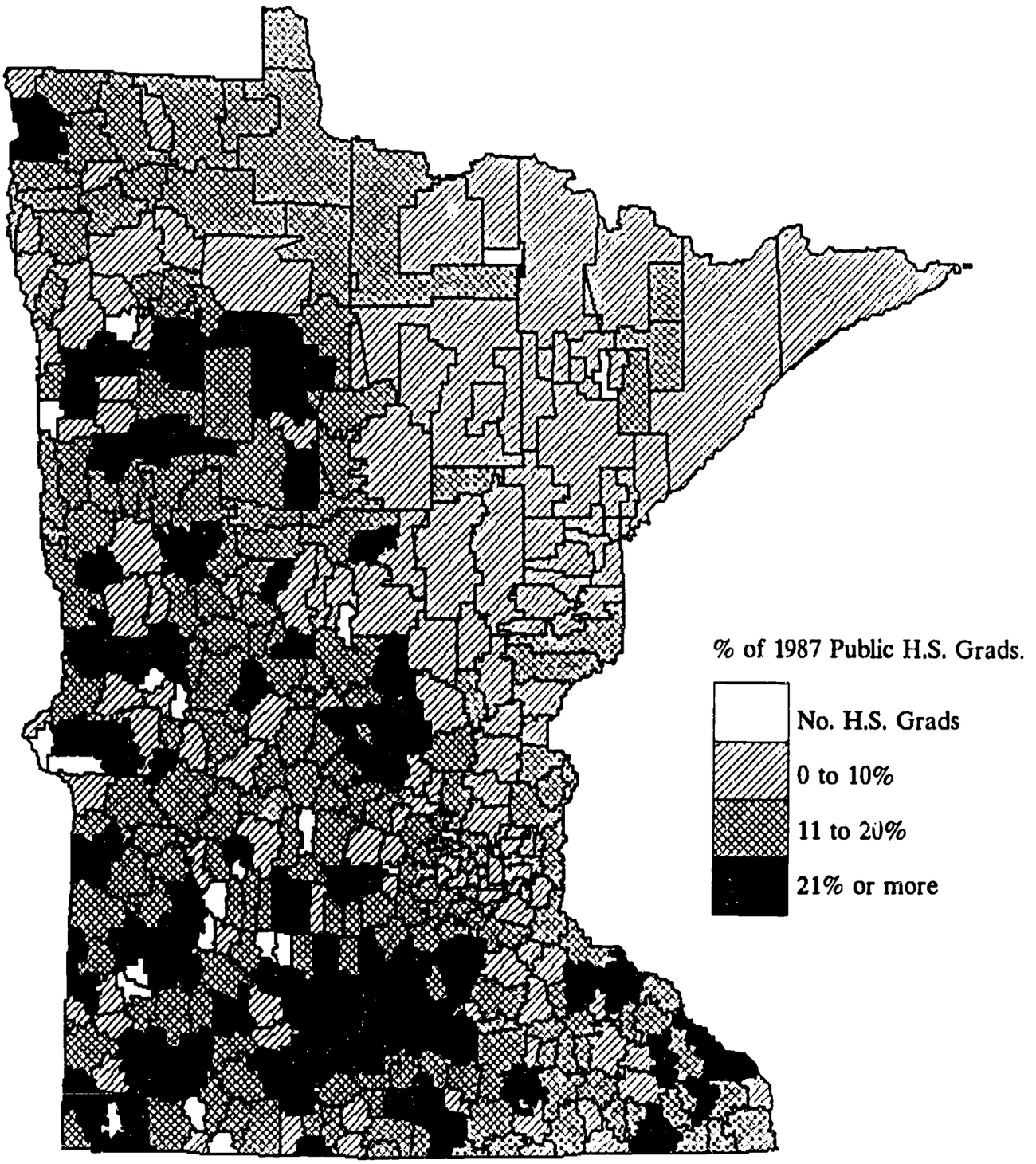
Map 5
New Entering Freshmen Attending State University Campuses in 1987 by School District



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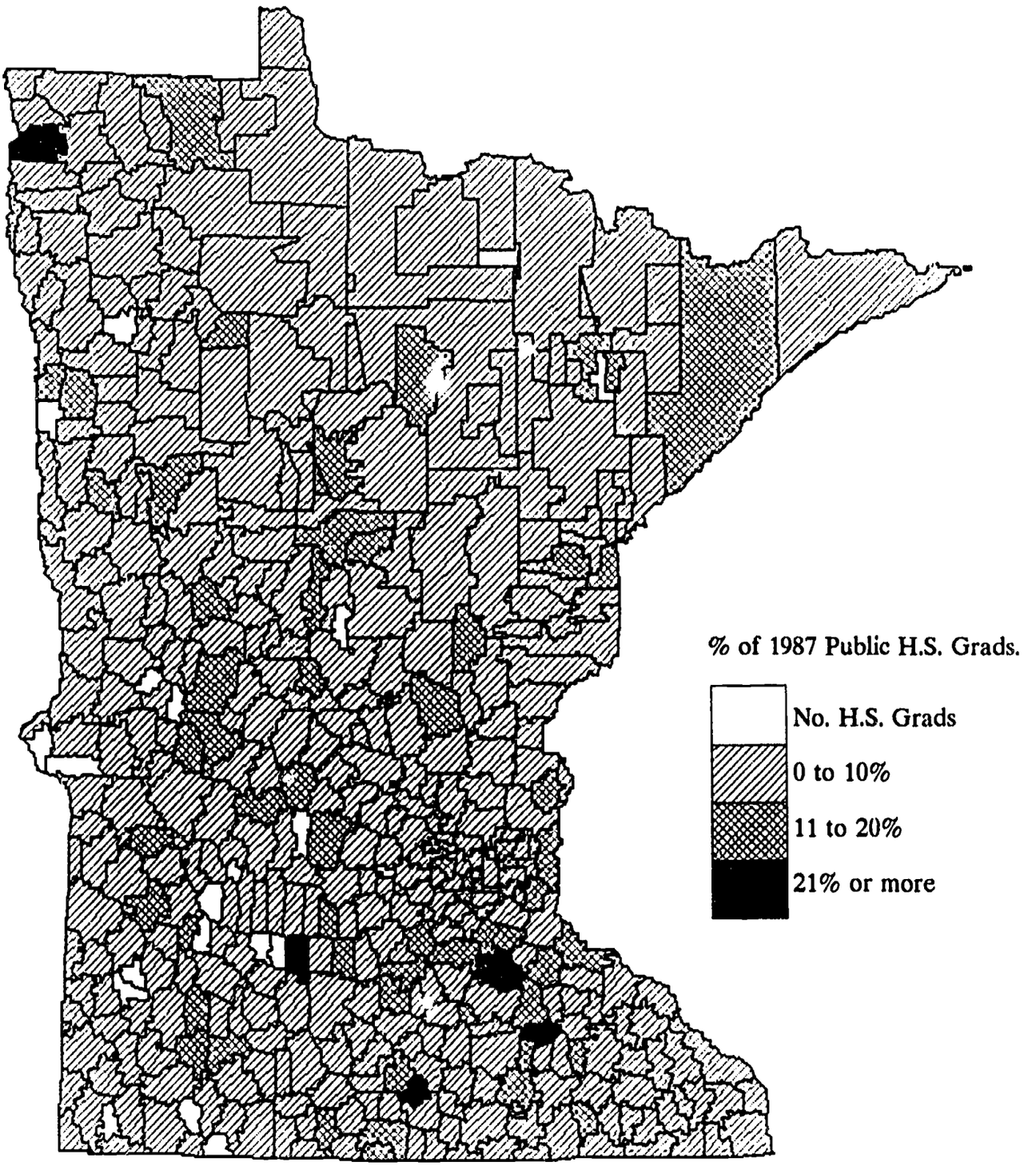
Map 6
New Entering Freshmen Attending Private College Campuses in 1987 by School District



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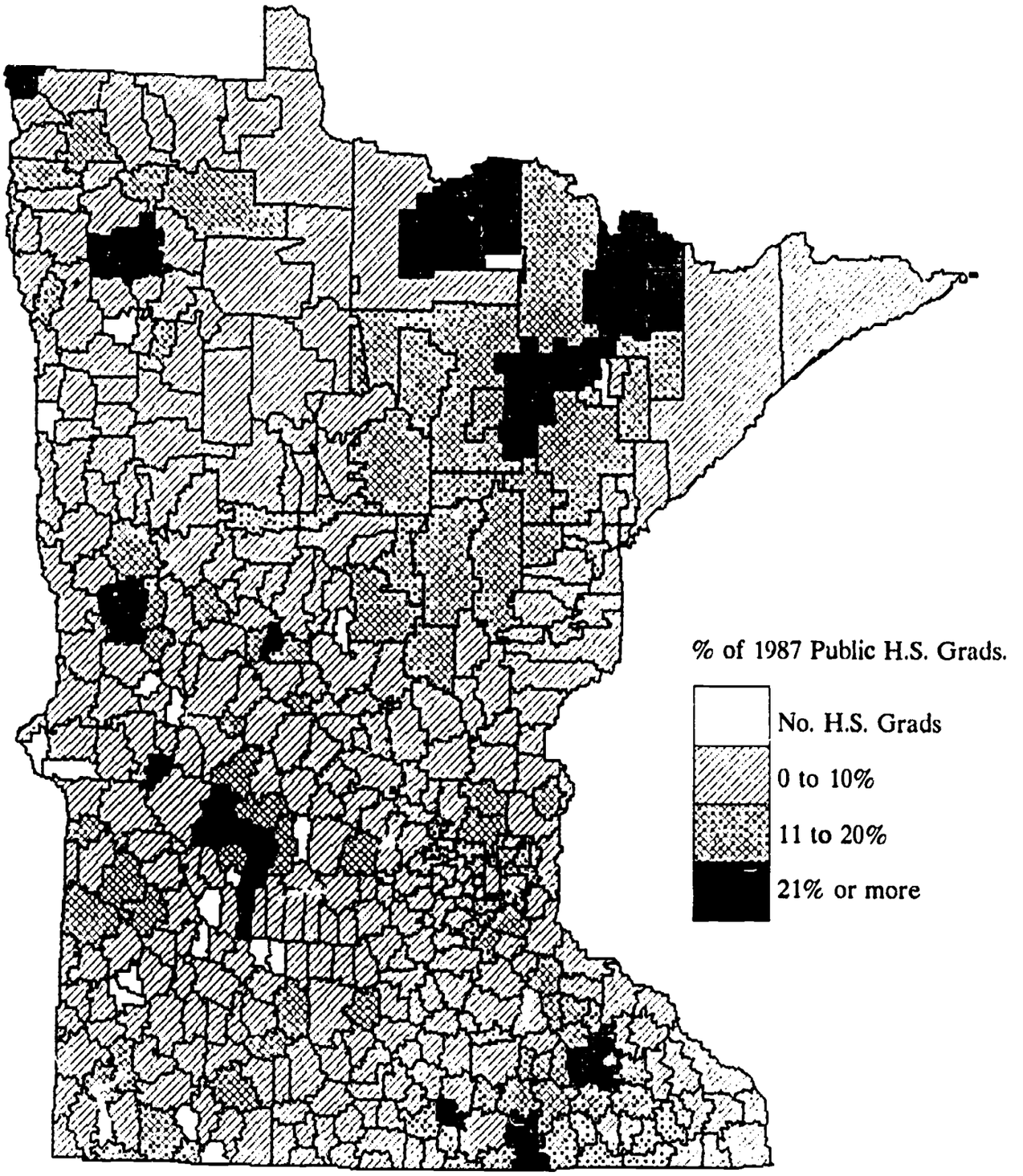
Map 7
New Entering Freshmen Attending Community College Campuses in 1987 by School District



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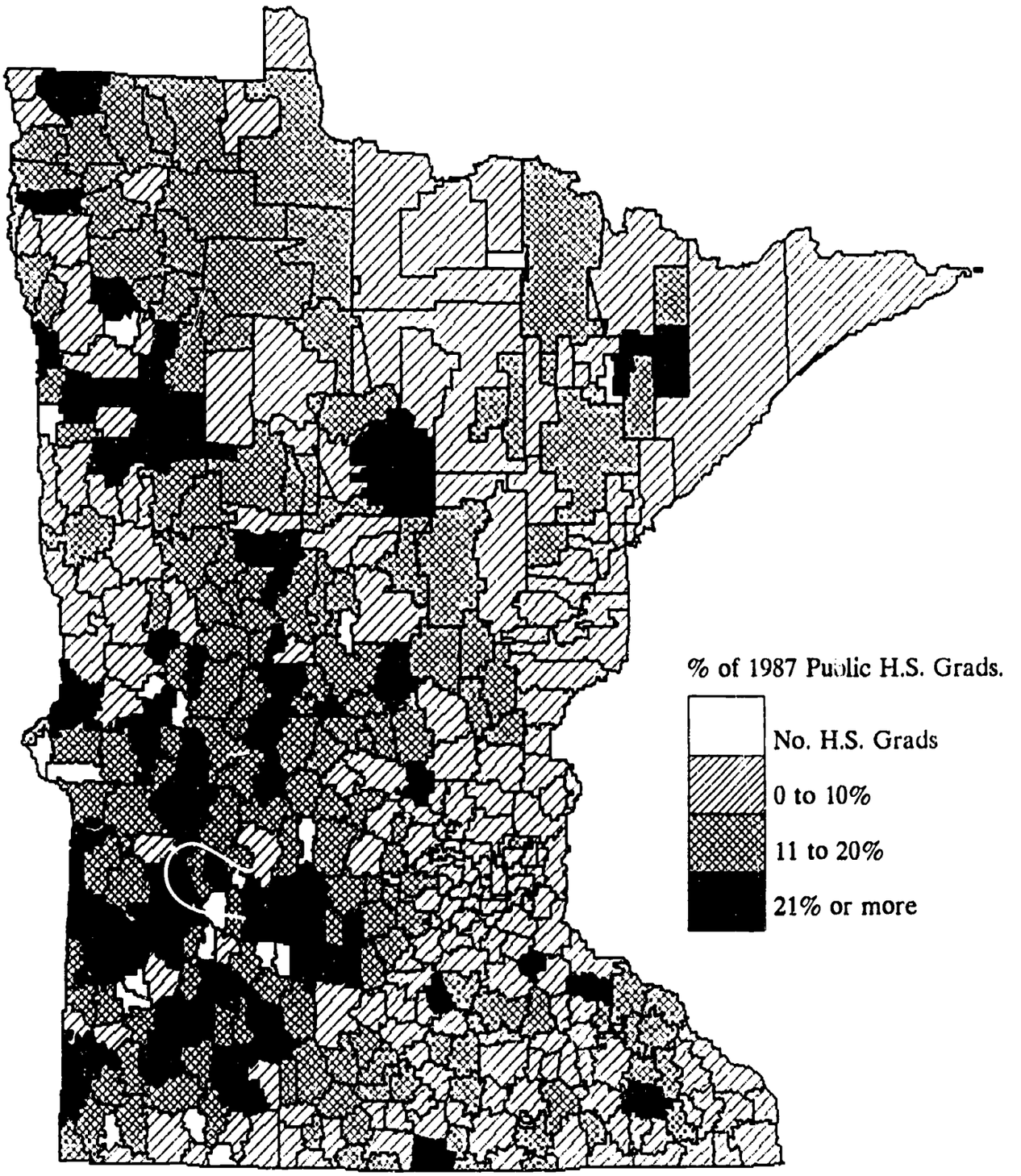
Map 8
New Entering Freshmen Attending Technical College Campuses in 1987 by School District



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Appendix B

Remedial/Developmental Course Descriptions
University of Minnesota
State University System

University of Minnesota

Duluth

1001. Science Skills (3)
Introduction to basic scientific procedures and principles.

1003. Intermediate Algebra (5 cr, no credit toward graduation)
The function concept; inequalities; curve sketching; systems of two and three linear equations; determinants; selected topics from the theory of equations; mathematical introduction; logs, exponents, and radicals; the binomial theorem; combinations and permutations; a brief introduction to mathematical probability; and elementary considerations involving sequences and series.

1051. College Reading Strategies (2)
Development and practice of efficient reading techniques; emphasis placed on vocabulary, comprehension, and flexible reading rate.

1052. Writing Strategies (3)
Individualized approach to learning skills necessary for argumentative writing process, including development of individual writing process, organization of argumentative paragraph and essay, and beginning research/library skills.

1054. College Study Strategies (2)
Introduction to general study skills and attitudes, including time usage, test wiseness, note taking, motivation, concentration, text reading, and library usage.

1060. Library Skills (1)
Development and practice of basic library skills; introduction to basic strategies for library research.

1101. Personal Development (3)
Introduction to some of the components of the human personality and the relationship of the individual to the environment. Primary focus on such topics as human relations, values, interpersonal skills and competencies, decision making, and conflict resolution.

Twin Cities

0615. Arithmetic Problem Solving (5 cr, no credit toward graduation)
For students wanting a problem-solving approach to a review of arithmetic. Mathematical problem solving with fractions, decimals, percents, measurement, geometry, ratio, proportion, estimation, variables, expressions, and equations.

0616. Algebraic Problem Solving I (5 cr, no credit toward gradation)
For students wanting a problem-solving approach to the topics of the first part of elementary algebra. Signed numbers, variables, expressions, equations, inequalities, exponents, polynomials, rational expressions, and applications of these topics to real world problems.

0617. Algebraic Problem Solving II (5 cr, no credit toward graduation)
For students wanting a problem-solving approach to the second part of elementary algebra. Factoring rational expressions, systems of equations with two variables, Cartesian graphing, radicals, quadratic equations, and applications to real world problems.

0618. Intermediate Algebraic Problem Solving (5 cr, no credit toward graduation)
For students who have taken previous problem-solving courses and who want a problem-solving approach to topics in intermediate algebra. First- and second-degree equations and inequalities, rational and radical expressions, graphing, functions, and logarithms.

0621. Elementary Algebra (5 cr, no credit toward graduation)
For students with strong arithmetic background. Sets, properties, signed numbers, equations word problems, inequalities, graphing, polynomials, factoring, fractions, radicals.

0625. Algebra Review (5 cr, no credit toward graduation)
For students needing additional preparation in algebra before Intermediate Algebra. Sets, real numbers, linear equalities, linear inequalities, absolute values, polynomials, rational expressions, exponents, roots, quadratic equations, relations and functions, systems of equations, word problems.

0631. Intermediate Algebra (5 cr, no credit toward graduation)
Basic knowledge of linear and quadratic equations and inequalities, exponents, factoring, roots, and radicals assumed. Rational expressions, radicals, roots, quadratic and rational equations, inequalities, graphing functions and relations, exponential and logarithmic functions.

0641. Basic Mathematics I (5 cr, no credit toward graduation)
Self-paces. Offered through Mathematics Learning and Assessment Center, for students with limited knowledge in arithmetic. Addition, subtraction, multiplication, and division of whole numbers, fractions, and decimals. Elementary word problems stressed.

0643. Basic Mathematics: Programmed Study (5 cr, no credit toward graduation)
With aid of instructor, topics selected from following: whole numbers, fractions, decimals, percents, signed numbers, formulas, simple graphs, ratio and proportion, sets, properties, equations, inequalities, rectangular graphs, polynomials, factoring, rational expressions, radicals. Offered through Mathematics Learning and Assessment Center.

1043. Learning Strategies: Reading and Study Improvement. (2)
Individual course in which students learn and practice reading and study strategies for previewing, reviewing, studying textbooks; memorizing; notetaking; organizing materials. Taught tutorially with content-area reading assignments.

1045. Developing College Writing (3)
Responding to a variety of writing opportunities. Being conscious of audience, substance, and style; developing methods of talking about and revising writing; improving ability to edit writing to conform to principles of standard American English. Individualized, learning center format with tutorial assistance.

1051. Introduction to College Reading and Writing (5)
Understanding relationship between reading and writing. Improving reading comprehension, study skills, and writing skills through individualized attention and small-group work. Organized around broad themes, chosen to aid students' common learning interests.

1086. Higher Education Survival Seminar (2)
Academic copying skills (e.g., study behavior, test-taking, time management, communication skills) and career exploration. Personal issues that may interfere with student progress. University/community resources.

State Universities

Bemidji

100 Basic Algebra (4 credits)
A beginning course designed for students with an insufficient algebraic background for Math 112.

100 Basic Writing (4)
Designed to help students improve or polish their writing skills before entering freshman English. Teaches the process of writing: prewriting, drafting, revising, and editing. Students spend at least half the class time in the Writing Center where they learn to use word processing for writing and where peer tutors are available for help.

101 Analytical Reading and Study Skills (2)
Techniques and practices in study and reading procedures. Skills taught in small groups and applied in the reading laboratory. No tests or examinations. Requirements: one hour in a small group and two hours in laboratory per week.

100 EDC Student Seminar (1) (Description not available.)

102 Self-Expression Group (2)
This course offers students the opportunity to practice various styles of communications and human relations theories. Focuses include self-disclosure, values clarification, cultural awareness and listening techniques.

103 Life Career Planning (2)
Centers around the American-College Testing Program's Career Planning Program (ACTCPP) test and its results. Skill and interest tests provide the student with concrete information based on his/her test results. Values clarification, on-site job exploration, guest speakers, self scored interest test, and job skills are covered. Course helps students gather their thoughts, consider their options, and make effective plans.

Mankato

54:91 Mathematics Skills I (3)
Basic mathematics skills involving the fundamental operations of whole numbers, integers, fractions, decimals and percent. Included are word problem applications related to the above topics. This course does not satisfy graduation requirements.

54:92 Mathematics Skills II (3)
A continuation of Math 91 including algebra, ratio and proportion, the metric system and applications of the preceding topics to word problems. This course does not satisfy graduation requirements.

24:100 Basic Writing (3)
Preparation for Composition I and other college writing.

61:101 Library Orientation (1)
A basic course to help students become familiar with the library of Mankato State University and the use of information resources. May apply toward general education requirement.

Moorhead

Math 090 Elementary Algebra (4)
For students with weak backgrounds in algebra. Not for students having more than one year of algebra in secondary school. Signed numbers, radicals, exponents, products and factoring, solution of linear and quadratic equations.

MDS 093 Mathematics 1 (2)
Designed to correct mathematics deficiencies in order to insure success in areas requiring a good basic math background.

MDS 120 Mathematics II (2-4)
Basic algebra to college algebra.

MDS 121 Business Mathematics (4)
Includes review of math fundamentals, percentages, mark-up and discounting, payroll, taxes, insurance, inventory, etc.

Engl 090 Basic Grammar (1)
Instruction and tutoring in basic writing skills. Open to any student; required of students judged likely to need special assistance in English 101. Combines a weekly lecture on syntax and grammar, weekly grammar workbook assignments, and weekly tutoring in the writing laboratory. Credit not applicable toward graduation.

MDS 090 Sentence Improvement (1-2)
Effective sentence writing skills. Underlying structure of the sentence and its basic patterns.

MDS 092 Reading Development (3)
Vocabulary development, word attack skills, comprehension and concentration skill building and reading rate improvement. Small group and individual activities.

MDS 113 Introduction to Critical Reading (3)
This course enhances college level reading skills in comprehension and vocabulary and introduces the student to critical reading and the analysis of literature.

MDS 104 Issues in Evaluation (5)
Collecting, organizing, and interpreting a variety of information about oneself. Clarifying values and career planning. Perspectives of "human potential."

MDS 105 Group Skills and Democratic Processes (5)
Building effective group membership skills and understanding their relationship to democratic group functioning.

MDS 107 Human Development and Growth in the Modern World (4)
Examines the continuous process of human development and growth, the male and female systems in change, the factors involved in producing positive change, and the search for fulfillment of human potential.

MDS 109 Individual Development Projects (2)
Devoted to the acquisition of skills and techniques necessary to make the successful transition to the university.

MDS 117 College Survival Skills (2)
Management of time, notetaking from textbooks and lectures, effective review, preparing for tests, effective listening and analysis of individual learning styles.

MDS 118 Listening as Communicating (2)
This course is designed to develop critical listening skills.

St. Cloud

051 Introductory Algebra (4)
Topics from beginning algebra. Credits not applicable toward graduation.

160 Basic Writing (4)
Basic skills for inexperienced writers and/or those with diagnosed deficiencies in writing. Course covers rules governing punctuation and grammar, steps in the writing process, strategies for assessing strengths and weaknesses in writing, and strategies for revision. Attention to individual problems.

110 Reading/Study Strategies (2)
Analysis and development of problem solving strategies designed to organize, record, and review information relating to college coursework. Application of problem solving strategies to enhance individual learning experiences and to prepare for examinations in college coursework.

120 Reading Rate Improvement (2)
To enhance critical reading and flexibility of reading through the application of flexibility of reading through the application of efficient comprehension and vocabulary strategies.

104 Introduction to the Learning Resources (2)
The organization of information and learning resources; location and evaluation of information sources through library research skills; needs analysis and search strategy for accessing information.

121 Intro to College (1) (Description not available.)

150 Managing College Experience (2) (Description not available.)

Southwest

010 Introductory Algebra (4)
Arithmetic, geometric and algebraic skills for those who enter college with insufficient mathematics background.

080 Intermediate Algebra (4)
Algebraic skill-building for students anticipating further courses in mathematics or areas using mathematics. Covers linear and quadratic equations and inequalities and their graphs, radicals, and roots.

055 Developing Reading Skills (3)
The course will emphasize improvement of reading skill through the concepts of vocabulary development, reading comprehension, and reading rate flexibility with application to effective study skills.

050 Orientation to Higher Education (1)
This course is for students who are undecided about their major or who need additional time and help in planning for their education. Topics included are potential careers, student interests, study habits and various aspects of pursuing a college education.

070 Developing Reasoning Skills (4)
The course is a remedial level companion course to IDST 270 Learning How to Learn. For students who are deficient it is used to identify and correct learning deficiencies and to develop new skills.

090 External Studies Planning (1)
This course is in preparation for participation in an external degree program. Credit gained does not count toward graduation requirements.

100 Developing Study Skills (4)
The course will focus on thinking as a process that involves collection, manipulation, and use of information to solve problems. This process will be applied to the skills of reading, mathematics, writing, and listening.

101 Introduction to Library Resources (1)
Survey of library services; development of skills in the use of computerized catalog, general reference materials, periodicals and newspaper indices, government documents, and bibliographic and research techniques.

170 Learning How to Learn (4)
A course which develops learning skills and corrects learning deficiencies. Class activities involve the use of a variety of written instruments designed to identify and correct learning deficiencies and to develop new skills.

150 Educational Planning and the Assessment of Life/Work Experiences (1)
An introduction to the concept of educational planning; identification, description and documentation of collegiate level learning by the student; development of a portfolio which describes the learning to be evaluated; and assistance in the selection of appropriate expert evaluators.

091 Placement Skills (1)
Topics include job markets, employment search, resume building, transportation, accommodations, interviewing, fashions, dining etiquette, developing career and executive perspective.

Winona

013 Pre-Algebra (4) (Description not available.)

113 Intermediate Algebra (4)
A study of basic algebra for the student who has not successfully completed two years of high school algebra.

115 Improving Reading and Study Skills (2)
To assist students who may have problems with reading skills and to help them develop efficient habits of study to compete effectively in college level courses.

108 Introduction to College Writing (4)
Intensive writing practice with special focus on the fundamentals of sentence and paragraph structure.