

Graduate Degrees in Highway Engineering as Related to Other Majors in Civil Engineering

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● **ENROLLMENTS** at engineering colleges for the master and doctor degrees are materially greater than they were prior to World War II. There are many indications that these enrollments will continue to increase, both in numbers as well as in percentage of undergraduate enrollment. College administrations are stressing graduate work; industry is paying an attractive starting salary differential to holders of the master and doctor degrees; and students themselves are realizing that the standard 4-year curriculum does not give them the depth or specialization of education they desire.

The numbers of civil engineering bachelor graduates who enroll for graduate degrees and whether they undertake their further education in subject areas specifically related to highway engineering are important considerations to the employers of highway and bridge engineers.

Reports of engineering enrollment and numbers of graduates that appear in the Journal of Engineering Education and in publications of the U. S. Office of Education generally itemize by the major departments of engineering such as ceramic, civil, electrical, mechanical, etc. Such reports are useful to employers of civil engineers, but of even greater usefulness would be reports showing the subdivision of the graduate enrollment and degrees by major subject within civil engineering. By mail questionnaire of October 22, 1956, an attempt to gather such statistics was undertaken. The information, together with other available information on enrollment and number of degrees is presented in this paper.

Before presenting the statistical tables on enrollments and degrees it is well to mention that numerical information on college enrollments, numbers of degrees conferred, and curricula offered is most difficult to collect. Further, once collected the information may be at difference with other reports. Contributing to these discrepancies are differences in the reporting dates, sources of information, and interpretations of what is wanted by those supplying the information. College enrollments change each day of the school year. Many special and unclassified students enroll for short periods or long periods. Degrees are conferred on graduating groups in official ceremonies two to five times a year and to individuals at other times. Specific curricula are offered in the catalog but draw no students or no student graduates in a specific curriculum in a given year. Because of these differences, the reader is cautioned not to be concerned with apparent discrepancies found in the tables (Table 4, for instance) presented.

ENROLLMENTS AND NUMBERS OF GRADUATES

The number of institutions enrolling students in undergraduate, master, and doctor programs is given in Table 1 for the years of 1950 to 1956. For the graduate degrees, not all of the institutions offering graduate degrees graduate students each year. Therefore, the number of schools graduating masters or doctors in a given year may be less than the number of schools offering work leading to such degrees and also less than the number of schools enrolling students for these degrees. In 1956, out of 37 schools enrolling students in a doctors program, only 20 conferred such degree.

Of recent years the number of colleges accredited in civil engineering by the Engineering Council for Professional Development (Table 2) has been about 80 percent of all schools granting the bachelor degree in civil engineering. These schools, however, conferred about 90 percent of the total number of first degrees.

Table 2 shows that the peak of post-war bachelor degrees came in the 1949-50 school year with 7,772 degrees awarded. The number then decreased to a low of

TABLE 1
NUMBER OF COLLEGES AND UNIVERSITIES ENROLLING STUDENTS IN
CIVIL ENGINEERING BY DEGREE - FALL 1956¹

Fall of	Schools with Civil Engineering enrollment by degree		
	B. S.	M. S.	PhD.
1956	168	93	37
1955	167	95	35
1954	166	98	36
1953	169	90	32
1952	161	90	28
1951	159	88	30
1950	153	90	30

¹ Includes building engineering and construction, and transportation engineering.

TABLE 2
NUMBER OF DEGREES IN CIVIL ENGINEERING

Year	Number of Schools and BS Degrees						Number M. S. Degrees	Number PhD. Degrees
	Accredited		Not Accredited		Total			
	Schools	Degrees	Schools	Degrees	Schools	Degrees		
1955-56	130	3,825	38	402	168	4,227	822	59
1954-55	129	3,492	32	350	161	3,868	683	29
1953-54	129	3,532	32	424	161	3,955	560	43
1952-53	131	3,375	27	358	158	4,400	560	32
1951-52	131	4,868	27	486	158	5,354	571	43
1950-51	130	6,450	25	616	155	7,060	658	51
1949-50	125	7,265	21	507	146	7,772	709	32
1948-49	-	-	-	-	-	6,400	743	34
1947-48	-	-	-	-	-	3,271	897	53
1946-47	-	-	-	-	-	3,658	555	26
1945-46	-	-	-	-	-	900	1,486	17
1944-45	-	-	-	-	-	644	49	10
1943-44	-	-	-	-	-	1,479	---	--
1942-43	-	-	-	-	-	1,758	100	14
1941-42	-	-	-	-	-	-----	---	--
1940-41	-	-	-	-	-	1,430	239	26
1939-40	-	-	-	-	-	-----	300	9
1938-39	-	-	-	-	-	-----	---	--
1937-38	-	-	-	-	-	1,572	---	--

3,868 in 1954-55. College enrollments and numbers of graduations are now increasing primarily because of increase in the birth rate following the depression period in the 1930's. The heavy birth rate of the post-war period starting in 1946 will be a strong factor in reaching new highs in civil engineering bachelor degrees by 1970.

The peak of the number of master degrees came in 1945-46 with 1,486, which reflects the unusually large number of graduates who returned to college immediately after World War II for graduate work. A secondary peak of 897 was reached in 1947-48. From 1948 to 1951 the master degrees were about 10 percent of the bachelors. For the past three years, however, this percentage has averaged about 16 percent. From other sources there is indication that the number of bachelor graduates who return for graduate work is still on the increase. Prospective employers of civil engineering graduates, then, need to realize that roughly 15 percent of the bachelor

TABLE 3
CLASSIFICATION OF STUDENTS ENROLLED FOR GRADUATE WORK IN
CIVIL ENGINEERING - FALL 1956
 (Summary of Tables 4 and 5)

Civil Engineering Subject Major	Percentage Enrolled in Subject Major	
	M. S. Candidates	PhD. Candidates
1. Structures	47.22	36.75
2. Soils	10.53	14.13
3. Highways	9.76	4.95
4. Sanitation	9.13	15.20
5. Hydraulics	8.04	13.43
6. General	4.79	.35
7. Engineering Mechanics	3.13	8.48
8. Municipal	2.11	-----
9. Irrigation	1.91	2.47
10. Construction	1.85	-----
11. Materials	.83	1.06
12. Surveying	.38	.35
13. Fluid Mechanics	.32	2.83
Total	100.00	100.00

Questionnaire study:		
Number of schools reporting	75	32
Number of graduate students reported	1,567	283
Preliminary Report, U. S. Office of Education:		
Number of schools enrolling graduate students	93	37
Number of graduate students enrolled	2,314	259

graduates are not available for employment for another year or two after their first degree. Further, when they are available with graduate degrees, higher salaries will be in order and a higher level of specialized assignments will be expected.

The doctors degrees 1950-51 to 1955-56 averaged slightly less than 1 percent of the bachelors degrees and about 7 percent of the masters. With the increased weight the college administrations are giving doctors degrees as a qualification for a teaching position, it may be expected that the number of degrees at the doctors level will increase somewhat.

Usable returns were received from 75 schools reporting enrollments of master degree students and 32 schools enrolling doctor degree students in the fall of 1956. The possible total number of schools was 93 for the master and 37 for the doctor degrees. Total enrollment (Table 6) in the fall of 1956 was 2,314 for the master degree and 259 for the doctors degree. The questionnaire returns included 1,567 master degree students and 283 doctors candidates, or a percentage of 68 and 109, respectively, of the total enrollments in all schools.

In Table 3 is summarized by percentage the enrollments in the separate majors within civil engineering as obtained by questionnaire. Structural engineering is by far the leader with 47.22 percent at the masters level and 36.75 percent at the doctors. Soils and highways are second and third, respectively, in the masters and third and

TABLE 4
NUMBER OF MS CANDIDATES IN THE VARIOUS CIVIL ENGINEERING
SPECIALTIES - FALL 1956

State	Institution	Enrollment reported by U S Office Ed	Total	Enrollment Reported from HRB Questionnaire Study												
				Structures	Soils	Highways	Sanitation	Hydraulics	General Engineering	Mechanics	Municipal	Irrigation	Construction	Materials	Surveying	Fluid Mechanics
				1	2	3	4	5	6	7	8	9	10	11	12	13
Ala	Alabama Poly	8	10	1	1	2	2	1	-	3	-	-	-	-	-	-
	Univ Alabama	5	6	4	-	2	-	-	-	-	-	-	-	-	-	-
Ariz	Univ Arizona	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-
Ark	Univ Arkansas	2	2	-	-	-	1	-	1	-	-	-	-	-	-	-
Calif	California Tech	15	16	3	1	-	1	1	10	-	-	-	-	-	-	-
	Stanford	60	50	21	-	1	-	6	5	-	-	-	17	-	-	-
	Univ California	35	73	35	1	20	13	2	-	-	-	2	-	-	-	-
Colo	Colorado A and M	6	34	-	-	-	-	-	6	-	-	-	28	-	-	-
	Univ Colorado	77	33	23	-	-	-	10	-	-	-	-	-	-	-	-
	Univ Denver	3	3	3	-	-	-	-	-	-	-	-	-	-	-	-
Conn	Yale	18	17	10	-	-	-	-	7	-	-	-	-	-	-	-
Dela	Univ Delaware	4	8	8	-	-	-	-	-	-	-	-	-	-	-	-
Fla	Univ Florida	8	11	3	1	2	1	-	4	-	-	-	-	-	-	-
Ga	Georgia Tech	25	38	12	8	2	3	5	-	-	8 ¹	-	-	-	-	-
Idaho	Univ Idaho	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-
Ill	Illinois Inst Tech	47	22	16	1	-	4	-	-	-	1 ²	-	-	-	-	-
	Northwestern	43	21	10	6	-	4	-	1	-	-	-	-	-	-	-
	Univ Illinois	107	111	91	3	7	5	4	-	-	-	-	-	-	1	-
Ind	Notre Dame	5	3	3	-	-	-	-	-	-	-	-	-	-	-	-
	Purdue	60	71	17	3	33	9	2	-	-	-	-	-	7	-	-
Iowa	Iowa St Coll	26	34	7	18	7	1	-	-	-	1	-	-	-	-	-
	St Univ Iowa	6	25	3	-	-	3	19	-	-	-	-	-	-	-	-
Kan	Kansas State Coll	7	5	2	-	2	-	-	-	-	-	-	-	-	1	-
	Univ Kansas	30	9	6	-	-	2	-	1	-	-	-	-	-	-	-
Ky	Univ Kentucky	18	18	11	1	6	-	-	-	-	-	-	-	-	-	-
La	Tulane	19	18	18	-	-	-	-	-	-	-	-	-	-	-	-
Maine	Univ Maine	3	2	-	1	-	1	-	-	-	-	-	-	-	-	-
Md	Johns Hopkins	10	3	1	-	-	-	-	-	-	-	-	-	-	-	2
	Univ Maryland	4	4	2	-	1	-	-	-	-	-	-	-	1	-	-
Mass	Harvard	10	21	3	7	-	10	-	-	-	1	-	-	-	-	-
	Mass Inst Tech	57	61	18	13	4	-	11	13	-	-	-	-	-	2	-
	Northeastern	67	11	10	-	-	1	-	-	-	-	-	-	-	-	-
	Univ Massachusetts	9	4	4	-	-	-	-	-	-	-	-	-	-	-	-
Mich	Michigan M and T	4	5	2	-	-	-	-	-	-	3 ²	-	-	-	-	-
	Michigan State Univ	17	20	5	3	3	5	-	-	-	-	-	4	-	-	-
	Univ Mich	54	54	30	3	5	5	3	5	-	-	-	3	-	-	-
	Wayne Univ	29	28	18	-	-	1	-	7	-	1	-	1	-	-	-
Minn	Univ Minnesota	31	50	24	4	3	7	12	-	-	-	-	-	-	-	-
Miss	Mississippi St Coll	2	3	2	-	-	1	-	-	-	-	-	-	-	-	-
Mo	Missouri Mines	17	18	2	1	7	2	1	-	-	-	-	2	3	-	-
	Wash Univ (St L)	8	10	10	-	-	-	-	-	-	-	-	-	-	-	-
Mont	Montana St Coll	4	1	1	-	-	-	-	-	-	-	-	-	-	-	-
Neb	Univ of Nebraska	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-
N J	Rutgers	2	5	1	1	-	3	-	-	-	-	-	-	-	-	-
	Stevens	4	8	2	-	-	-	-	4	-	-	-	-	-	-	2
N Mex	New Mexico A and M	6	8	2	-	-	1	-	5	-	-	-	-	-	-	-
	Univ N Mexico	15	10	-	-	-	-	10	-	-	-	-	-	-	-	-
N Y	Clarkson	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-
	Columbia	100	183	115	48	1 ²	-	12	6	-	-	-	-	-	-	1
	Cornell	17	26	13	1	6	1	3	2	-	-	-	-	-	-	-
	Rensselaer	25	24	18	6	-	-	-	-	-	-	-	-	-	-	-
	Syracuse	2	4	2	1	1	-	-	-	-	-	-	-	-	-	-
N C	North Carolina St Coll	16	17	5	2	3	5	-	-	-	2	-	-	-	-	-
N Dak	Univ North Dakota	8	8	5	-	-	3	-	-	-	-	-	-	-	-	-
Ohio	Case	31	19	12	-	-	4	-	1	2 ²	-	-	-	-	-	-
	Ohio St Univ	16	19	6	4	4	3	1	-	-	-	-	1	-	-	-
Okla	Oklahoma A and M	17	20	11	-	8	-	1	-	-	-	-	-	-	-	-
Ore	Oregon State	7	7	2	-	1	2	2	-	-	-	-	-	-	-	-
Pa	Bucknell	2	2	-	-	-	-	1	1	-	-	-	-	-	-	-
	Drexel	27	30	15	6	3	-	-	6	-	-	-	-	-	-	-
	Pa State Univ	9	11	4	-	-	6	1	-	-	-	-	-	-	-	-
	Univ Pittsburgh	28	26	12	7	-	-	7 ¹	-	-	-	-	-	-	-	-
R I	Univ Rhode Island	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
S Dak	South Dakota St Coll	3	3	-	-	2	1	-	-	-	-	-	-	-	-	-
Tenn	Univ Tennessee	12	14	3	-	2	3	1	5	-	-	-	-	-	-	-
Texas	Univ Houston	14	18	8	6	-	-	4	-	-	-	-	-	-	-	-
	Univ Texas	27	13	5	2	1	3	2	-	-	-	-	-	-	-	-
Utah	Utah St Ag Coll	2	6	-	-	-	-	5	-	-	-	-	-	1	-	-
Va	Univ of Virginia	3	3	1	-	1	-	-	-	-	-	-	-	1	-	-
	Virginia Poly	15	15	9	-	-	4	-	1	-	1	-	-	-	-	-
Wash	Univ Washington	50	39	20	5	5	6	3	-	-	-	-	-	-	-	-
	Washington St Coll	2	2	-	-	-	1	1	-	-	-	-	-	-	-	-
Wisc	Univ Wisconsin	56	71	14	-	7	15	6	-	15	13	-	-	-	1	-
Wyo	Univ Wyoming	9	8	4	-	-	-	3	-	-	-	-	1	-	-	-
D C	Catholic Univ	17	9	8	-	-	-	-	1	-	-	-	-	-	-	-
Total		1,509	1,567	740	166	153	143	126	75	49	33	30	29	13	5	5

¹ Candidates for M S in Water Power and Supply

² Candidates for M S in City Planning

³ Candidate for M S in Transportation

TABLE 5
NUMBER OF PhD CANDIDATES ENROLLED IN THE VARIOUS CIVIL ENGINEERING SPECIALTIES
FALL 1956

State	Institution	Enrollment reported by U. S. Office Ed.	Enrollment Reported from HRB Questionnaire Study													
			Total	Structures	Soils	Highways	Sanitation	Hydraulics	General	Engineering Mechanics	Municipal	Irrigation	Construction	Materials	Surveying	Fluid Mechanics
				1	2	3	4	5	6	7	8	9	10	11	12	13
Calif	California Tech	2	2	-	1	-	1	-	-	-	-	-	-	-	-	-
	Stanford	7	9	6	-	-	-	3	-	-	-	-	-	-	-	-
	Univ Calif	16	20	6	-	5	6	2	-	-	-	1	-	-	-	-
Colo	Colorado A and M	-	6	-	-	-	-	-	-	-	6	-	-	-	-	-
	Univ Colorado	1	3	3	-	-	-	-	-	-	-	-	-	-	-	-
Conn	Yale	6	6	2	-	-	-	-	-	4	-	-	-	-	-	-
Fla	Univ Florida	4	5	2	-	-	3	-	-	-	-	-	-	-	-	-
Iowa	Iowa St Coll	13	14	4	8	-	2	-	-	-	-	-	-	-	-	-
	St Univ Iowa	3	13	-	-	-	2	10	1	-	-	-	-	-	-	-
Ill	Illinois Inst Tech	6	3	2	1	-	-	-	-	-	-	-	-	-	-	-
	Northwestern	8	14	5	6	-	2	-	-	-	-	-	-	-	-	1
	Univ Illinois	38	42	30	5	1	2	4	-	-	-	-	-	-	-	-
Ind	Purdue	16	18	4	5	4	2	-	-	-	-	-	-	3	-	-
Md	Johns Hopkins	4	5	2	-	-	-	-	-	-	-	-	-	-	-	3
Mass	Harvard	4	9	-	4	-	4	1	-	-	-	-	-	-	-	-
	Mass Inst Tech	23	23	11	3	1	-	8	-	-	-	-	-	-	-	-
Mich	Michigan State	-	4	2	1	1	-	-	-	-	-	-	-	-	-	-
	Univ Mich	15	15	13	-	-	2	-	-	-	-	-	-	-	-	-
Minn	Univ Minnesota	5	13	4	1	-	3	5	-	-	-	-	-	-	-	-
Mo	Washington Univ (St L)	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
N J	Stevens Inst	-	2	-	-	-	-	-	-	-	-	-	-	-	-	2
N Y	Columbia	13	18	-	2	-	-	-	-	14	-	-	-	-	-	2
	Cornell	7	5	2	-	-	1	1	-	-	-	-	-	-	1	-
	Rensselaer	2	1	-	-	-	1	-	-	-	-	-	-	-	-	-
Ohio	Ohio State Univ	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-
Okla	Oklahoma A and M	1	2	2	-	-	-	-	-	-	-	-	-	-	-	-
Ore	Oregon State	1	1	-	-	-	1	-	-	-	-	-	-	-	-	-
Pa	Pennsylvania State	2	2	-	-	1	1	-	-	-	-	-	-	-	-	-
Texas	Univ Texas	4	2	-	-	-	2	-	-	-	-	-	-	-	-	-
Va	Virginia Poly	1	3	-	1	-	2	-	-	-	-	-	-	-	-	-
Wash	Univ Washington	2	2	1	1	-	-	-	-	-	-	-	-	-	-	-
Wisc	Univ Wisconsin	13	19	2	-	1	6	4	-	6	-	-	-	-	-	-
Total		220	283	104	40	14	43	38	1	24	0	7	0	3	1	8

sixth in the doctors listing. Because soils engineering is closely related to highway engineering, the combination of the two would provide a total percentage of 20.29 masters and 19.08 doctors of all civil engineering graduate majors available for the highway field. Many of the structural majors would also be available for highway bridge engineering. Over-all, whether the graduate degree candidate elects to remain in educational pursuits or to enter the noneducation field, the highway industry has a good opportunity to obtain a fair share of those who are awarded graduate degrees.

Tables 4 and 5 present the data summarized in Table 3, institution by institution, for the 75 which returned the questionnaire. These tables indicate the high degree of specialization of graduate enrollment. Many of the schools have their one or two majors which attract most of their graduate students. For instance, at the University of California, 68 out of 73 master degree students are majoring in structures, highways,

TABLE 6

CIVIL ENGINEERING ENROLLMENTS AND DEGREES IN THE UNITED STATES
AND OUTLYING PARTS, BY LEVEL AND BY INSTITUTION 1956

U. S. Department of Health, Education, and Welfare - Office of Education

Institution	Enrollment Fall 1956			Degrees 1955-56		
	B. S.	M. S. ²	PhD.	B. S.	M. S.	PhD.
Civil - Grand Total	28,312	2,314	259	4,227	822	59
Alabama	469	13	-	64	1	-
¹ Ala Poly	314	8	-	40	-	-
¹ Ala Univ	155	5	-	24	-	-
Arizona	223	3	-	16	3	-
¹ Ariz Univ	223	3	-	16	3	-
Arkansas	166	2	-	19	3	-
¹ Ark Univ	166	2	-	19	3	-
California	1,222	255	25	255	115	4
¹ Calif Tech	20	15	2	11	20	1
Coll of the Pacif	40	-	-	2	-	-
Fresno St Coll	110	-	-	9	-	-
Loyola Univ	32	-	-	5	-	-
San Jose St Coll	91	-	-	16	-	-
¹ Santa Clara	92	-	-	20	-	-
¹ Stanford	131	60	7	36	31	-
¹ Univ Calif	381	35	16	106	34	3
¹ Univ So Calif	325	145	-	50	30	-
Colorado	619	86	1	89	10	1
¹ Colo A and M	91	6	-	18	-	-
Colo Coll	4	-	-	3	-	-
¹ Colo Univ	469	77	1	50	10	1
¹ Univ Denver	55	3	1	18	-	-
Connecticut	96	28	6	34	9	-
¹ Conn Univ	48	10	-	19	3	-
¹ Yale	48	18	6	15	6	-
Delaware	73	4	-	15	5	-
¹ Univ Dela	73	4	-	15	5	-
Florida	394	8	4	66	6	-
¹ Univ Fla	133	8	4	38	6	-
Univ Miami	261	-	-	28	-	-
Georgia	417	25	1	73	11	-
¹ Ga Tech	417	25	1	73	11	-
Idaho	149	1	-	25	-	-
¹ Idaho Univ	149	1	-	25	-	-
Illinois	1,099	198	52	149	110	10
Bradley	148	1	-	12	-	-
¹ Ill Inst Tech	141	47	6	22	5	-
¹ Northwestern	84	43	8	14	16	-
¹ Ill Univ	726	107	38	101	89	10
Indiana	1,236	65	16	270	36	5
Evansville	7	-	-	-	-	-
Ind Tech	286	-	-	47	-	-

Table 6 continued

Institution	Enrollment Fall 1956			Degrees 1955-56		
	B. S.	M. S.	PhD.	B. S.	M. S.	PhD.
Indiana (continued)						
¹ Notre Dame	175	5	-	33	1	-
¹ Purdue	416	60	16	109	35	5
¹ Rose Poly	39	-	-	14	-	-
Tri-State Coll	210	-	-	57	-	-
Valparaiso	103	-	-	10	-	-
Iowa	500	32	16	72	28	2
¹ Iowa St Coll	370	26	13	59	28	2
¹ St Univ Iowa	130	6	3	13	-	-
Kansas	533	37	-	49	3	-
¹ Kansas St Coll	265	7	-	30	1	-
Mun Univ Wichita	101	-	-	2	-	-
¹ Univ Kansas	167	30	-	17	2	-
Kentucky	580	37	-	69	11	-
¹ Univ Ky	548	18	-	59	10	-
¹ Univ Louisville	32	19	-	10	1	-
Louisiana	385	48	-	56	2	-
¹ La Poly	133	-	-	10	-	-
¹ La St Univ	117	29	-	22	2	-
¹ S W La Inst	66	-	-	7	-	-
¹ Tulane	69	19	-	17	-	-
Maine	119	3	-	25	2	-
¹ Maine Univ	119	3	-	25	2	-
Maryland	361	14	4	55	8	2
¹ Johns Hopkins	137	10	4	25	6	2
¹ Univ Md	224	4	-	30	2	-
Massachusetts	854	143	27	174	63	3
Bradford Durfee	31	-	-	4	-	-
Harvard	-	10	4	-	12	-
¹ Mass Inst Tech	173	57	23	52	39	3
Merrimack Coll	54	-	-	6	-	-
¹ Univ Mass	96	9	-	17	-	-
¹ Northeastern	335	67	-	59	12	-
¹ Tufts Univ	71	-	-	26	-	-
¹ Worcester	94	-	-	10	-	-
Michigan	1,485	104	15	179	73	6
Detroit Inst	69	-	-	7	-	-
¹ Detroit Univ	182	-	-	30	-	-
Lawrence Inst	147	-	-	5	-	-
¹ Mich M and T	384	4	-	48	1	-
¹ Mich St Univ	300	17	-	40	8	-
¹ Mich Univ	238	54	15	37	62	6
¹ Wayne Univ	165	29	-	12	2	-
Minnesota	359	31	5	39	23	6
¹ Univ Minn	359	31	5	39	23	6
Mississippi	442	3	-	40	3	-
¹ Miss St Coll	362	2	-	29	3	-
¹ Univ Miss	80	1	-	11	-	-

Table 6 continued

Institution	Enrollment Fall 1956			Degrees 1955-56		
	B. S.	M. S.	PhD.	B. S.	M. S.	PhD.
Missouri	890	42	4	100	11	-
¹ Mo Mines	427	17	-	44	2	-
¹ Univ of Mo	292	17	3	34	7	-
St Louis Univ	54	-	-	4	-	-
¹ Wash Univ (St L)	117	8	1	18	2	-
Montana	154	4	-	19	1	-
¹ Mont St Coll	154	4	-	19	1	-
Nebraska	170	-	-	37	1	-
¹ Univ of Neb	170	-	-	37	1	-
Nevada	142	2	-	15	1	-
¹ Univ of Nev	142	2	-	15	1	-
New Hampshire	180	-	-	15	-	-
¹ Dartmouth	51	-	-	4	-	-
¹ Univ N H	129	-	-	11	-	-
New Jersey	325	75	-	79	29	-
¹ Newark	246	56	-	51	15	-
¹ Princeton	42	13	-	14	12	-
¹ Rutgers	37	2	-	14	2	-
Stevens	-	4	-	-	-	-
New Mexico	213	21	-	34	1	-
¹ New Mex A and M	127	6	-	10	1	-
¹ Univ N Mex	86	15	-	24	-	-
New York	2,699	428	36	450	113	3
¹ Brooklyn Poly	367	140	-	57	20	-
¹ City Coll of N Y	696	78	-	84	10	-
¹ Clarkson	196	-	-	30	-	-
¹ Columbia	68	100	13	17	34	1
¹ Cooper Union	100	-	-	19	-	-
¹ Cornell	281	17	-	41	12	-
¹ Manhattan Coll	377	-	-	77	-	-
¹ N Y Univ	227	66	13	35	19	1
¹ Rensselaer	242	25	2	70	15	1
Syracuse	86	2	1	11	3	-
¹ Union Coll	59	-	-	9	-	-
North Carolina	694	16	-	83	6	-
¹ Duke Univ	76	-	-	25	-	-
¹ N C State Coll	618	16	-	58	6	-
North Dakota	241	8	-	45	4	-
¹ N Dak Ag Coll	155	-	-	30	-	-
¹ Univ N Dak	86	8	-	15	4	-
Ohio	1,150	47	2	165	1	-
Antioch	10	-	-	2	-	-
¹ Case	123	31	-	30	-	-
¹ Fenn Coll	47	-	-	19	-	-
¹ Ohio Northern	82	-	-	7	-	-
¹ Ohio State Univ	250	16	2	29	1	-
¹ Ohio Univ	118	-	-	24	-	-
¹ Univ Akron	20	-	-	3	-	-

Table 6 continued

	Enrollment Fall 1956			Degrees 1955-56		
	B. S.	M. S.	PhD.	B. S.	M. S.	PhD.
Ohio (continued)						
¹ Univ Cincinnati	150	-	-	21	-	-
¹ Univ Dayton	124	-	-	10	-	-
¹ Univ Toledo	91	-	-	10	-	-
Youngstown	135	-	-	10	-	-
Oklahoma	320	30	1	25	10	-
¹ Okla A and M	172	17	1	11	4	-
¹ Univ Okla	148	13	-	14	6	-
Oregon	158	7	1	24	2	1
¹ Ore State	158	7	1	24	2	1
Pennsylvania	1,751	181	21	321	44	9
¹ Bucknell	109	2	-	20	1	-
¹ Carnegie	238	31	3	41	-	3
¹ Drexel	270	27	-	49	2	-
¹ Lafayette	101	-	-	18	-	-
¹ Lehigh	111	39	13	34	18	5
Pa Mil College	47	-	-	13	-	-
¹ Pa State Univ	442	9	2	68	8	-
¹ Swarthmore	12	-	-	5	-	-
¹ Univ Penn	73	45	3	13	10	1
¹ Univ Pittsburgh	237	28	-	27	5	-
¹ Villanova	111	-	-	33	-	-
Rhode Island	95	3	-	23	-	-
¹ Brown	5	-	-	6	-	-
¹ Univ RI	90	3	-	17	-	-
South Carolina	675	-	-	101	2	-
¹ Citadel	308	-	-	42	-	-
¹ Clemson	200	-	-	36	2	-
S C State Coll	6	-	-	2	-	-
¹ Univ S C	161	-	-	21	-	-
South Dakota	186	3	-	41	-	-
¹ S Dak Mines	122	-	-	20	-	-
¹ S Dak St Coll	64	3	-	21	-	-
Tennessee	528	12	-	64	1	-
Tenn Ag and Ind	77	-	-	5	-	-
Tenn Poly	104	-	-	5	-	-
¹ Univ Tenn	188	12	-	24	1	-
¹ Vanderbilt	159	-	-	30	-	-
Texas	1,586	140	6	192	35	3
Lamar St Tech	136	-	-	8	-	-
Prairie View	14	-	-	3	-	-
¹ Rice Inst	33	-	-	7	-	-
¹ Southern Meth	115	63	-	9	1	-
¹ Tex A and M	329	36	2	86	21	2
¹ Tex Tech	205	-	-	27	-	-
Tex Western	145	-	-	10	-	-
Univ Houston	253	14	-	7	2	-
¹ Univ Texas	356	27	4	35	11	1

Table 6 continued

	Enrollment Fall 1956			Degrees 1955-56		
	B. S.	M. S.	PhD.	B. S.	M. S.	PhD.
Utah	569	3	-	59	2	-
Brigham Young	184	-	-	4	-	-
¹ Univ Utah	138	1	-	18	2	-
¹ Utah St Ag Coll	247	2	-	37	-	-
Vermont	216	-	-	24	-	-
¹ Norwich	117	-	-	15	-	-
¹ Univ Vermont	99	-	-	9	-	-
Virginia	879	18	1	117	5	-
¹ Univ of Va	121	3	-	18	1	-
¹ Va Military Inst	305	-	-	65	-	-
¹ Va Poly	453	15	1	34	4	-
Washington	603	52	2	93	9	-
Gonzaga	70	-	-	5	-	-
St Martins	26	-	-	5	-	-
Seattle	68	-	-	10	-	-
¹ Univ Wash	225	50	2	51	7	-
Walla Walla	20	-	-	-	-	-
¹ Wash St Coll	194	2	-	22	2	-
West Virginia	122	-	-	11	1	-
¹ W Va Univ	122	-	-	11	1	-
Wisconsin	835	56	13	96	11	4
¹ Marquette	195	-	-	34	-	-
¹ Univ Wisc	495	56	13	50	11	4
Wisc Inst Tech	148	-	-	12	-	-
Wyoming	155	9	-	26	4	-
¹ Univ Wyo	155	9	-	26	4	-
Dist of Columbia	292	17	-	26	3	-
Catholic Univ	74	17	-	14	3	-
¹ Geo Wash Univ	107	-	-	7	-	-
¹ Howard Univ	111	-	-	5	-	-
¹ Alaska - U of	91	-	-	4	-	-
¹ Hawaii - U of	425	-	-	46	-	-
Puerto Rico - U of	187	-	-	59	-	-

¹ Undergraduate curriculum accredited by the Engineers' Council for Professional Development.

² Includes Pre-doctoral (professional) degree.

or sanitation. At the University of Illinois, 91 out of 111 masters candidates are majoring in structures. At the State University of Iowa, 10 of 13 doctors are majoring in hydraulics. University of Michigan has 13 out of 15 doctors in structural engineering.

There were reported 32 schools enrolling students for masters degrees in highway engineering and 7 schools for the doctors degrees. Of the 32 schools only 11 enrolled 5 or more students for the masters degree. Of the total 153 students, 33 are enrolled at Purdue University and 20 at the University of California.

There are 11 schools out of 36 enrolling 5 or more students for the masters degree in soils. These 11 schools account for 123 out of the total of 166 students. Columbia

University enrolled 48, Iowa State College 18, and Massachusetts Institute of Technology 13.

At the doctors level only two schools, University of California and Purdue University, have an enrollment in highways of more than one student. In soils, Iowa State College, Northwestern University, University of Illinois, and Purdue University are the only schools enrolling 5 or more candidates for the doctors degree.

The civil engineering enrollments, fall of 1956, by institution and the number of degrees awarded in the 1955-56 school year are given in Table 6. These statistics are from reports of the U. S. Office of Education. As pointed out earlier there are differences in Table 6 and the information reported from the questionnaire study. Table 6 is useful in comparing graduate enrollment in civil engineering with undergraduate enrollment. Also, Table 6 affords opportunity to study the enrollment and numbers of graduates in civil engineering in each of the 168 schools offering civil engineering.

SUMMARY

This study of the number of graduate students in civil engineering indicates that a reasonable percentage are majoring in highway engineering. Although not a complete coverage and a study whose accuracy is questionable in spots, this study does indicate that about 10 percent of the civil engineering graduate students at the masters level and 5 percent at the doctors level are majoring in highway engineering. For the 1955-56 school year these percentages would indicate that about 80 master degrees and 3 doctor degrees were awarded with majors in highway engineering.

In soils engineering, the percentages are about 10 and 14, which would produce for the 1955-56 school year about 80 graduates with masters degrees and 9 with the doctors degree.

With the trend upward in civil engineering enrollments at all class levels, there will be available increasing numbers of civil engineering graduates for entry into highway work.