

2019 HOUSE INDUSTRY, BUSINESS AND LABOR COMMITTEE

HB 1387

2019 HOUSE STANDING COMMITTEE MINUTES

Industry, Business and Labor Committee Peace Garden Room, State Capitol

HB 1387
1/22/2019
31247

- Subcommittee
 Conference Committee

Committee Clerk: Ellen LeTang

Explanation or reason for introduction of bill/resolution:

Qualifications of land surveyor interns & regulation of land surveyors & land surveyor intern.

Minutes:

Attachment 1, 2, 3, 4, 5, 6, 7

Chairman Keiser: Opens the hearing on HB 1387.

Rep Beadle: Introduces HB 1387. This bill is to make sure that we have proper training for land surveyors & a cleanup bill.

4:15

Rep Adams: On section 5, it has an effective date of July 1, 2028.

Rep Beadle: On section 2 & 5, are related. Currently, there is the internship process where they have eight years to go through out the following process. The delayed effective date, really is to make sure that anyone in the pipeline now, that nothing changes in your current process.

Rep Adams: If I start this program two years from now, am I under the new standard?

Rep Beadle: No.

Mike Krumwiede~Representing the ND Society of Professional Land Surveyors or NDSPLS: Attachment 1.

11:15

Rep M Nelson: We are going to have section 2 being amended some but basically we are going to have a period of time where both section 2 & 3. There will be two paths. Eventually, section 2 goes away & then you do section 3. We are modeling what they are doing in Montana & theirs will go into effect in 2022.

Mike Krumwiede: That's correct.

Rep P Anderson: What prompted this bill?

Mike Krumwiede: We are getting less & less professional land surveyors. We want to get some more qualified surveyors. Reciprocity, there will be no change.

Rep C Johnson: This is just specifically for land interns; how long will it take to become a professional land surveyor? Is there another exam?

Mike Krumwiede: There is four years of experience once you are an intern, pass another test, & then become a land surveyor.

Chairman Keiser: We keep increasing standards, that effects reciprocity.

Mike Krumwiede: We are far below & we are coming up with standards. If you are a LSI in another state, they can easily move because it's a national certification.

Aaron Hummert~Legislative Co-chair for ND Society of Professional Land Surveyors:
Attachments 2, 3, 4.

25:00

Rep M Nelson: Can an engineer survey?

Aaron Hummert: They can do an engineering survey defined in statute. When it comes to land boundaries determinations, no.

Rep M Nelson: You can't use a GPS to determine?

Aaron Hummert: That's correct. There's more to it than the equipment.

Rep Richter: What is the age categories of the ones that goes with the experience?

Aaron Hummert: It's all over the map. I can't say.

Matt Weeks~Professional Land Surveyor in ND: Attachment 5.

30:15

Rep D Ruby: Can you explain the certification?

Matt Weeks: You need 8 years of experience. This bill requires an education portion of the 8 years.

Rep D Ruby: Certification, what would that entail?

Matt Weeks: The minimum some surveying education & 4 years of experience.

Rep D Ruby: Do those classes exist right now?

Matt Weeks: They are available on line through Wyoming & Oklahoma. At NDSSSS, they are there but they haven't been updated for the past couple of years.

Rep Schauer: Why are we seeing these surveyors shrink & is it safe?

Matt Weeks: Technology is replacing the people.

Bonnie Staiger~Representing American Council of Engineering Companies: We are in support of the legislation.

Holly Beck~President-Elect of ND members of the American council of Engineering Companies (ACEC): Attachment 6.

Michael Gunsch~Representing ND Society of Professional Engineer as Legislative Committee Co-Chair: Attachment 7.

40:17

Rep Richter: If I get an associate's degree & work for a surveying company for 5, 6, 7 years, do I have to take the class work or simply take the test?

Michael Gunsch: The way I understand is that once you have your 4 years of experience, you can take your LS exam. Now, as this bill changes, you are going to have to have the education requirement in order to take the exam. That is why the end date is 2028. If you are going to do this, you need the educational aspect

Chairman Keiser: Anyone else here to testify in support of HB 1387, opposition, neutral? Closes the hearing. What are the wishes of the committee?

Vice Chairman Lefor: Moves a Do Pass.

Rep Bosch: Second.

Chairman Keiser: Further discussion?

Chairman Keiser: I don't know if we are making it harder or easier to get into this field? I like the way it gives people the chance in the pipe stream & I agree with the educational requirements.

Roll was taken for a Do Pass on HB 1387 with 11 yes, 1 no, 2 absent & Rep M Nelson is the carrier.

Date: Feb 22, 2019

Roll Call Vote #: 1

2019 HOUSE STANDING COMMITTEE
ROLL CALL VOTES

BILL/RESOLUTION NO. 1387

House _____ Industry, Business and Labor _____ Committee

Subcommittee

Amendment LC# or Description: _____

Recommendation

- Adopt Amendment
- Do Pass Do Not Pass Without Committee Recommendation
- As Amended Rerefer to Appropriations
- Place on Consent Calendar

Other Actions Reconsider _____

Motion Made by Rep Lefor Seconded By Rep Bosch

Representatives	Yes	No	Representatives	Yes	No
Chairman Keiser	x		Rep O'Brien	x	
Vice Chairman Lefor	x		Rep Richter	x	
Rep Bosch	x		Rep Ruby		x
Rep C Johnson	x		Rep Schauer	x	
Rep Kasper	Ab		Rep Adams	x	
Rep Laning	Ab		Rep P Anderson	x	
Rep Louser	x		Rep M Nelson	x	

Total (Yes) 11 No 1

Absent 2

Floor Assignment Rep Nelson

REPORT OF STANDING COMMITTEE

HB 1387: Industry, Business and Labor Committee (Rep. Keiser, Chairman)
recommends **DO PASS** (11 YEAS, 1 NAYS, 2 ABSENT AND NOT VOTING).
HB 1387 was placed on the Eleventh order on the calendar.

2019 SENATE INDUSTRY, BUSINESS AND LABOR

HB 1387

2019 SENATE STANDING COMMITTEE MINUTES

Industry, Business and Labor Committee Roosevelt Park Room, State Capitol

HB 1387
3/6/2019
Job #33264

- Subcommittee
 Conference Committee

Committee Clerk: Amy Crane

Explanation or reason for introduction of bill/resolution:

Relating to qualifications of land surveyor interns; relating to regulation of land surveyors and land surveyor interns; relating to qualifications of land surveyor interns; and to provide an effective date.

Minutes:

Att. #1-7

Chairman Klein: Opened the hearing on HB 1387. All members were present.

Mike Krumwiede, North Dakota Society of Professional Land Surveyors: see attachment #1 for testimony in support of the bill.

Aaron Hummert, Co-Chair of Legislative Committee, North Dakota Society of Professional Land Surveyors: see attachment #2 for testimony in support.

Aaron also handed out testimony (**see attachment #3**) on behalf of Kenneth Link, Retired Land Surveyor, and Rolly Ackerman, Chairman, North Dakota State Board of Registration for Professional Engineers and Land Surveyors (**see attachment #4**) in support of the bill.

Chairman Klein: Would two years of schooling make any difference? There are certain projects that schooling isn't gonna help you solve, as opposed to on the job training? A lot of what you've learned, you did so on the job, right?

Aaron: Correct. This isn't circumventing the experience but we think we need the foundation of schooling as well.

Chairman Klein: Do you have enough land surveyors?

Aaron: Our numbers are declining. Right now without education they aren't passing the test, so that's another thing. This really is to give people the tools they need to pass the test.

Chairman Klein: What would excite me to tell my son or daughter to go to be a land surveyor?

Aaron: I can share what I find exciting about the job, one is the historical aspect. Finding original markers from the late 1800s as pretty as can be. And artifacts that nobody else knew were out there.

Chairman Klein: What I'm suggesting is how do we entice people to go out for land surveying?

Aaron: Our society is actively pursuing that. We've given out over \$100,000 in scholarships. We're active at conventions. We pay for the students free and clear to come, we pay their hotel rooms and meals to get them to come see what we're doing.

Senator Burckhard: What does LIDAR mean?

Aaron: I don't entirely know the acronym. It's similar to radar, it sends out a sensing wave and bounces back and collects. They can do it from the ground LIDAR and it senses the room. You can do it from a plane or a helicopter.

Senator Kreun: For a while they used it to determine flood plains.

Senator Burckhard: How do you get distances within one 100th of a foot?

Aaron: GPS tolerances, you do it through redundant measurements and choosing the right instrument for the job. You know a GPS and using the it properly. Or robotic total stations or whatever else you need to do to get that precision and to know that that precision is correct you need that educational component from the statistics standpoint.

Vice Chairman Vedaa: How did that guy that came over from Norway get within 1/100th of a foot?

Aaron: That's the balance. Our measurements today we have to report to that level of precision. When they were doing the general land office surveys, there was distance error with chains and solar compasses and magnetic compasses. We don't redo the measurements if the original stone was two feet from the chain age or five feet, that's our marker so the measurement that we retrace from 1890 is different than what we have to perpetuate. Our measurement on that today needs to be very close.

Chairman Klein: I think the question that we're all going to ask is we're building a fence and the fence needs to be pretty solid today so we're counting on you to put the markers in the right spot. And that's why you believe additional education is necessary? A two-year program? That's available at two of our institutions?

Aaron: As far as the fence building aspect, North Dakota is the lowest requirement. Minnesota is a four-year degree. Montana is implemented at associates degree. I believe South Dakota is a certain level of credits. So actually the fences are built around North Dakota for us to get out.

Chairman Klein: So you have the training so that you can practice in a variety of states and that's cause of your educational background?

Aaron: Correct I'm licensed in Minnesota currently. As far as the bill, I have a flow chart you'll see it on the testimony. And actually the minimum requirement is a certificate. And appended to my testimony you'll see four curriculums. One from the North Dakota school of Science Wahpeton, one from Bismarck State, those are these associates degree programs that are offered in North Dakota currently, and there's two online programs I believe from the University of Wyoming in Laramie, there's one from Oklahoma that's offered online. And actually I needed to supplement my education, I got that online as well. So with this online education, we really believe that there are a lot of opportunities.

Chairman Klein: So you wouldn't have to sit through a two-year program, do the English and the Math, you can go online to a school that provides that training and that would qualify to get you over the educational component that we are looking for?

Aaron: That's what our hope is, granted, each curriculum would need to be approved by our board even. And too, you'll even read that in the board's statement.

Senator Kreun: In this study in the curriculum, you say it isn't going to change anything as far as the internship, but are you going into geospatial technical aspect of surveying as well? Are you gonna hire those individuals that come through those programs?

Aaron: Ideally that's who we would hire. Are you talking like GIS type stuff?

Senator Kreun: There are new programs out there called geotechnical space studies and they use all kinds of drones and geospatial technical aspects out of there in with your other components that you're already doing. If they had those degrees already would they be able to surpass the internship stuff and go on to that next level. Because in their studies they've already been doing that work out in the field. is that part of what you're looking at in those educational aspects?

Aaron: To speak to that point, there's a sunset out to 2028 so the sole purpose of that is to not shut anybody out. So essentially up until that point you can do the LSI two and a half times over in that time, so anybody that might have an alternative educational path, we can get them in that system.

Senator Kreun: That opens a door that's pretty new technology that's going on, usually only used in the military.

Senator Roers: Why are you sun setting the internship program? Why is that?

Aaron: The sunset is on the current experience only requirement, so they are still gonna be a land survey intern.

Chairman Klein: So after 2028 you're gonna need an educational background as well? But up to this point all those folks that still want to be a surveyor can do it by experience.

Aaron: We're not trying to shut anybody out.

Senator Piepkorn: What's the main crux of the bill?

Chairman Klein: The educational component. We're looking to provide this highly new technology assistance so that these students of land surveying after 2028 will need an educational component in addition to the experiential. That's the biggest part that I see.

Aaron: That's correct. And we're putting a sunset on to it and in 2028 the certificate would be the minimum level of education.

Senator Roers: When we get to 2028 and they need this certificate, is there an in house opportunity to train them and get that certificate or is it only through these certified institutions that they can get this from? Like I know electricians like to train their own, would you do something like that?

Aaron: Not now, we'd be looking at an accredited program.

Matt Weeks, Professional Land Surveyor: see attachment #5 for testimony in support.

Senator Burckhard: With 25 years of experience you couldn't get a job in Minnesota? They wouldn't grandfather you in with your years of experience?

Matt: They would not.

Chairman Klein: If you're coming from Minnesota, could you get a job in North Dakota?

Matt: If I'm registered in Minnesota, but I could not stamp and sign my name saying I'm the person in responsible charge.

Chairman Klein: I've heard some of you state that could go to South Dakota, can the South Dakota folks come to North Dakota or would they have to do something extra?

Matt: They can, they would need to go through a process. They need to become registered in North Dakota, that involves a state specific exam. Our laws are different than all of the other states. That's a two-hour exam, it can take roughly 3-6 weeks. So in that time you could be in responsible charge in North Dakota.

Chairman Klein: In my experience with the surveyor, the most difficult part is finding a reliable starting point.

Matt: Most of the people that you see out surveying are the technicians, it may be the intern, very seldom is it the registered land surveyor, the PLS. Our job is to oversee all of that other work. Additionally, to convince your child to become a land surveyor, if they're a high school senior, fill out an application and you will automatically get money to go to school. About the pass rate, the success rate of first time people taking the exam without education, there is a 70% failure rate, the second time is even less.

Senator Piepkorn: Is there a concern that the current professional land surveyors with the rapid pace of advancement in technology, and you have to sign off on this stuff. Do the current

professional land surveyors have the skills, knowledge, math, technology understanding, to properly train or approve the interns?

Matt: In Certain aspects, yes. In photogrammetry, I would not sign off on that. I don't have the knowledge there. In the GPS, I feel I have the knowledge yes. That technology changes rapidly. We have a requirement for 15 hours of continuing education each year. 30 hours for a biennium. Our license renews every year so we need 30 hours in that time frame.

Holly Beck, President-Elect of ACEC: testified in support of the bill. Just wanted to inform you that ACEC is in support of this bill. And as the owner of a small surveying and engineering company, I also support this bill.

Senator Piepkorn: Talk to me about technology and continuing education so on and so forth.

Holly: I hired technicians right out of the four-year program, I also hire technicians out of the two-year program. I've also hired a few that didn't have any education at all. They learned from the bottom up and worked on a surveying crew. Those that don't have education do have problems with the trigonometry and math of the job. The education requirement would allow them to get a better education. I don't have time to teach them math in addition to all of the other things I'm teaching them. I also have a handout with the education requirements of the neighboring states here. See attachment #6.

Chairman Klein: closed the hearing on HB 1387.

See attachment #7 for additional testimony submitted to the committee.

Senator Piepkorn: Going back to Vice Chairman Vedaa's observation about the early land surveyors, got me wondering what committee those Norwegian Viking surveyors had to testify in to be able to lay those old stone markers?

Senator Burckhard: Moved a Do Pass.

Senator Kreun: Seconded.

Chairman Klein: For you folks that are still here in 2028, you'll have to look at this again and see how it's going. Who knows what technology will be like by then.

Senator Kreun: Your testimony fits right in to what is going on in this arena. This geospatial program is a two-year program right now and they are coming out with a lot more information, the people that I know that went through it are now in the military because military people want them. I think we should look at that group, and if we're talking about paying for school, a prime example would be to pay for these guys to do this and have them come out with a two-year degree and they get all that field study and everything.

**A Roll Call Vote Was Taken: 6 yeas, 0 nays, 0 absent.
Motion Carried.
Senator Kreun will carry the bill.**

REPORT OF STANDING COMMITTEE

HB 1387: Industry, Business and Labor Committee (Sen. Klein, Chairman) recommends **DO PASS** (6 YEAS, 0 NAYS, 0 ABSENT AND NOT VOTING). HB 1387 was placed on the Fourteenth order on the calendar.

2019 TESTIMONY

HB 1387



NDSPLS ADMINISTRATIVE OFFICE
 PO Box 7370, Bismarck, ND 58507
 Phone: 701-223-3184
 E-mail: info@ndspls.org
 Website: www.ndspls.org
 Date: January 22, 2019

Support HB 1387

Chairman Keiser, Members of the House Industry, Business, and Labor Committee.

For the record, my name is Mike Krumwiede, and I'm here today representing the North Dakota Society of Professional Land Surveyors or NDSPLS, who are here today in support of HB 1387. This bill essentially does two things. It changes the minimum requirement for registration as a Land Surveyor Intern. The bill also establishes a timeframe where an individual can become a Land Surveyor Intern by the existing requirements, or by the new proposed requirements. In the year 2028 the experience only option of obtaining a Land Surveyor Intern designation will no longer be available.

You will hear today from some of our members why this change is important to the Land Surveying Industry. But first, I'd like to give a background on exactly which people in the surveying industry this bill will affect.

Currently, there are typically three stages in the progression of becoming a Professional Land Surveyor. The person we most readily see out and about surveying in the field is usually a field technician, above the field technician is the Land Survey Intern, and then there is the Professional Land Surveyor.

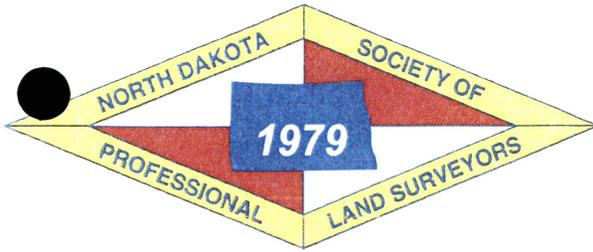
Let's start with the field technicians, field technical staff are crew chiefs, field assistants, and instrument operators. Essentially, these individuals can do whatever their supervisor - the PLS - is comfortable with them doing (i.e staking construction sites, the recovery of survey monuments, setting monuments, topographic mapping for design, courthouse research, etc.). Granted, this all gets done under the Professional Land Surveyor's direction. The office technical staff are drafters and clerical staff. On the office side, these tasks include drafting plats, assisting clients with zoning applications, researching land records, administrative tasks, etc. Both office and field technicians do not need any more education than what their employer requires. These positions do not require a license permitting there is a Professional Land Surveyor in responsible charge of the project. Furthermore, these positions can be every bit as lucrative as a Professional Land Surveyor if the technician is accomplished at what they do.

A Land Surveyor Intern (LSI) is the first step in a twostep process of getting licensed. The experience gained as an LSI in preparation for becoming a professional land surveyor must get progressively more intense. LSIs typically work as senior survey crew chiefs and/or drafters. Typically, their role will become more of a junior survey manager with increasing autonomy to prepare them for the next step.

The next step is a Professional Land Surveyor or PLS. A PLS must be in responsible charge of survey projects, meaning that all survey work done must be reviewed and approved by the PLS. A Professional Land Surveyor is only person who can make a legal land boundary determination used for the transfer of real property. This means they must approve all the work done under their seal.

HB 1387 is a change to the requirement for becoming a Land Surveyor Intern. This only affects those looking to move ahead and take their first step towards becoming a Professional Land Surveyor. This change comes from the advances in technology that now require per North Dakota Century Code that survey distances be calculated within 1/100th of a foot. The math skills and technical knowledge needed to perform accurate land surveys are extremely difficult to obtain without some education component.

For these reasons, we respectfully request a Do Pass Recommendation on HB 1387. It's now my pleasure to ask some of our NDSPLS members to provide some more technical, detailed testimony on why we support HB 1387. Thank you for your time.



NDSPLS ADMINISTRATIVE OFFICE
 PO Box 7370
 Bismarck, ND 58507
 Phone: 701-223-3184
 E-mail: info@ndspls.org
 Website: www.ndspls.org
 Date: January 22, 2019

To: Chairman Keiser, Members of the House Industry, Business, and Labor Committee.

NDSPLS is made up of over 340 members, of which some 122 are Registered Professional Land Surveyors, who live and practice in this state. There are approximately 500 Registered Land Surveyors who are licensed to practice in ND. We are licensed and regulated by the North Dakota State Board of Registration for Professional Engineers and Professional Land Surveyors. Our mission and objective is: to unite all of the Professional Land Surveyors in the State of North Dakota; to elevate the standards of the surveying profession; to establish basic minimum standards and requirements for surveys; to assist in promoting legislative and educational programs to improve the professional status of the Land Surveyor; to work in cooperation with local, county, state, federal and tribal governments in our field of endeavor; to uphold a rigid code of ethics; to strive to improve our relations with our clients and the public by doing our work with precision and integrity; and to maintain a good relationship between Land Surveyors and Engineers.

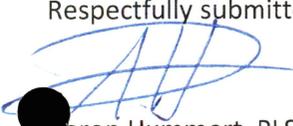
The North Dakota Society of Professional Land Surveyors is in FAVOR of House Bill No. 1387.

The basic component of any profession is specialized training and education. Currently, education is not a requirement for registration as a Land Surveyor Intern (LSI) in this state. With the continued development of technology, the rapid increase of land values, and the overall complexity of the projects that Land Surveyors are licensed to perform, now more than ever, an educational background is needed. NDSPLS has studied the educational requirements of many states along with the model law developed by the National Council of Examiners of Engineering and Surveying (NCEES) over the past five years. The proposed bill has been developed by a collaborative effort of a committee facilitated by the North Dakota Board of Registration for Professional Engineers and Professional Land Surveyors and was made up of representatives from the NDSPLS, the North Dakota Society of Professional Engineers (NDSPE), and the American Council of Engineering Companies of North Dakota (ACEC/ND).

Under the proposed law, there are four pathways to licensure. The minimum requirement will be a certificate in land surveying along with four years of satisfactory land surveying experience. The existing curriculums offered at NDSCS – Wahpeton and Bismarck State College will be compliant programs. In addition, there are several options for online education that will meet the proposed requirements. Due to the availability of several existing curriculums, this bill will not create a need for additional programs. This bill provides for a sunset period of the existing law until 2028. The reason for this is so there is ample time for those who have started on the existing pathway to complete this process. NDSPLS believes that the proposed education requirement will better prepare applicants to pass the exams and will provide them with the education they will need to protect their clients and prevent liability for themselves. This bill does not bar technicians that work under the responsible charge of professional land surveyors from working in technical capacities in any way. Ultimately, NDSPLS believes this bill provides for an adequate, yet reasonable and obtainable level of education.

Therefore, NDSPLS urges a DO PASS on House Bill No. 1387.

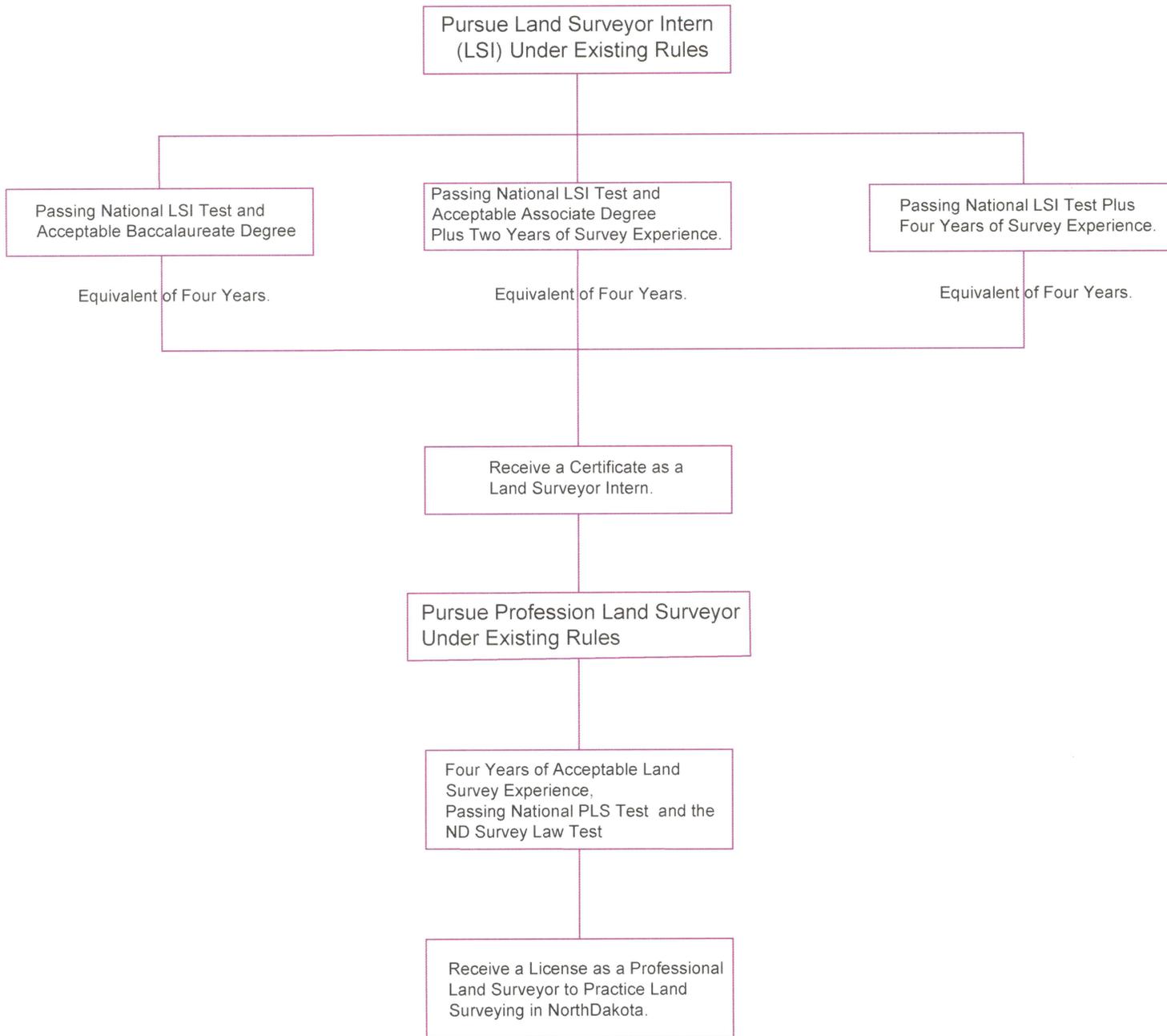
Respectfully submitted,


 Aaron Hummert, PLS

Co-Chair of the Legislative Committee

North Dakota Society of Professional Land Surveyors

EXISTING LAW



2

HB 1387

Attachment 3
Jan 22, 2019

HOUSE BILL 1387 PROPOSED NEW LAW

Pursue Land Surveyor Intern

Pass National LSI Test
Certificate in Land Surveying
Plus Four Years of Survey Experience

Pass National LSI Test
Associate Degree in Land Surveying
Plus Two Years of Survey Experience

Pass National LSI Test
Baccalaureate Degree Related to Land Surveying
Plus Educational Training in Land Surveying
Plus Two Years of Survey Experience

Pass National LSI Test
Baccalaureate Degree in Surveying

Receive a Certificate as a
Land Surveyor Intern

Pursue
Professional Land Surveyor

Four Years of Survey Experience
Pass National PLS Test (6 hour)
ND Survey State-Specific Test (2 hour)

Receive a License as a Professional
Land Surveyor to Practice Land
Surveying in North Dakota

HB 1387

Attachment 2
Jan 22, 2019

W



Land Surveying and Civil Engineering Technology

Land Surveying and Civil Engineering Technology

► **Contact Information**

Jeff Jelinek, program coordinator
Jeff.jelinek@ndscs.edu
701-671-2268
Horton Hall 242

► **Delivery Methods**

Face-to-Face: Wahpeton
Online: Some classes

The Land Surveying and Civil Engineering Technology program is designed to prepare students for work as engineering and surveying technicians in construction-related industries, allowing graduates to work in a broad range of jobs such as surveying, drafting and material testing. Upon graduation, students can be employed with state, county and city engineering offices as well as private agencies such as consulting engineers, land surveyors and construction contractors. Some jobs are in fixed locations, while others require limited to extensive travel.

Students are provided with experiences emphasizing surveying, drafting and materials testing. Surveying courses give students the opportunity to learn how to operate the latest instruments used in distance and angle measurement. Surveying drawings and maps are developed using enhanced computer-aided drafting programs (CAD). Courses in soil testing, water-quality management, concrete and asphalt provide students with hands-on experience in materials testing. In addition, students take courses in communications, human relations, computers and technical mathematics, which will help provide them the skills to advance in their careers.

Green and/or sustainable construction is covered at an awareness level in the materials testing classes and the design classes.

While students are fully employable upon completion of this program, students interested in pursuing an advanced degree will find the Associate in Applied Science degree in Land Surveying and Civil Engineering Technology provides transfer options to four-year colleges and universities in related fields such as land surveying and construction management.

NOTE: This program requires the purchase of a notebook computer. The cost will be approximately \$1,800. For further information, call Jeff Jelinek, Land Surveying and Civil Engineering Technology program coordinator, at 701-671-2268.

Course Code	Course Title	Credits
CAD 120	Introduction to AutoCAD	3
CT 111	Civil Plans and Specifications	2
CT 113	Introduction to Civil Design Applications	3
CT 121	Plane Surveying	4
CT 122	Advanced Surveying	4
CT 132	Material Testing/Quality Control	4
CT 142	Construction Safety for Civil Technicians	1
CT 211	Introduction to Geographic Information Systems	3
CT 212	GIS Applications	3
CT 214	Highway and Street Design	3
CT 215	Land Use Planning and Development	3
CT 221	Surveying Procedures	4
CT 222	Advanced Surveying Procedures	4
CT 223	Boundary Control and Legal Principles	3
CT 224	Research and Analysis	3
CT 235	Water Resource Technology	3
CT 261	Machine Control and Project Layout	2
UAS 111	Introduction to UAS	2

Related/General Education Courses

ENGL 110	College Composition I	3
English/Communication Elective (choose one)		3
ENGL 105	Technical Communications	
ENGL 120	College Composition II	
ENGL 125	Introduction to Professional Writing	
COMM 110	Fundamentals of Public Speaking	
MATH 130	Technical Mathematics	2
MATH 132	Technical Algebra I	2
MATH 136	Technical Trigonometry	2
FYE 101	Science of Success	1
HPER 210	First Aid and CPR (Professional/Community)	2
Social and Behavioral Sciences, Humanities, History and/or Computer Electives		4
Recommended:		
• CSCI 116 – Business Use of Computers – 3 cr		
• PSYC 100 – Human Relations – 2 cr		

Total Required Credit 73

Admission Requirements*

The applicants must be high school graduates or equivalent. Students considered for acceptance must complete all admission requirements.

Required minimum placement scores:

<u>ACT</u>	<u>ACCUPLACER</u>
Reading – 15	Reading Comp – 61
English – 15	WritePlacer – 3-4
Math – 17	Arithmetic – 51
	Elementary Algebra – 25

Or transfer equivalencies will apply as appropriate

Applicants not meeting the above requirements are encouraged to visit with the academic counselor at 701-671-2257 or the Construction and Design Technology department chair at 701-671-2116 for strategies to meet the admission requirements.

*Program Admission Requirements are subject to revision. Please check the department or program website under Program Admission Requirements for current information.

Award

Upon successful completion of the required courses, students will be awarded an Associate in Applied Science degree in Land Surveying and Civil Engineering Technology.



Engineering Technology
 Associate in Applied Science
 Advising Worksheet* 2018-2019

Prescribed Technical Program	53
<u>General Education</u>	<u>16-18</u>
Total Degree Credits	69-71

1st Year Fall Semester

Prescribed Technical Program Requirements			
ENGR	101	Graphical Communication	3
POLS	116	State and Local Government	3
General Education Courses			
<i>Communications I</i>			
ENGL	110	College Composition I (Required)	3
<i>Business, Math, Science & Technology</i>			
CSCI	101	Introduction to Computers (or higher level CSCI course required)	3
<i>Business, Math, Science & Technology</i> (Select one of the following:)			
MATH	107	Pre-Calculus	
MATH	165	Calculus I	4-6
MATH	103	College Algebra <u>and</u>	
MATH	105	Trigonometry ¹	
Total Credits			16-18

9

2nd Year Fall Semester

Prescribed Technical Program Requirements			
CAD	212	Computer Aided Design II (Fall only)	3
CT	250/250L	Applied Statics and Mechanics of Materials/Lab (Fall only)	4
ENGR	204/204L	Surveying I/Lab (Fall only)	4
GIS	107	GIS Applications	3
General Education Course			
<i>Arts & Humanities/Social & Behavioral Sciences</i>			
SOC	110	Introduction to Sociology	3
Total Credits			17

¹ MATH 103 and MATH 105 are required as a pair to satisfy this degree requirement if either MATH 107 or MATH 165 are not chosen.

Transfer Option: Students who may possibly pursue a four-year degree in Engineering at a later date should consider the following course changes:

Substitute: ENGR 201 Statics (3 credits) and ENGR 203 Mechanics of Materials (3 credits) for CT 250 and CT 250L Applied Statics and Mechanics/Lab (3/1 credits). Students should consult with the Engineering Technology program coordinator prior to this substitution.

*This advising worksheet is unofficial and to be used for class planning purposes only. Please refer to the official catalog at <http://catalog.bismarckstate.edu/> for the complete listing of college degree requirements.

1st Year Spring Semester

Prescribed Technical Program Requirements			
CAD	211	Computer Aided Design I	3
CT	251/251L	Materials Testing/Lab (Spring only)	4
COMM	110	Fundamentals of Public Speaking	3
ECON	201	Principles of Microeconomics	3
GIS	105	Fundamentals of Geographic Information Systems	3
General Education Course			
<i>Communications II</i>			
ENGL	125	Introduction to Professional Writing (Required)	3
Total Credits			19

2nd Year Spring Semester

Prescribed Technical Program Requirements			
CAD	213	Computer Aided Design III (Spring only)	3
CT	228	Boundary and Cadastral Surveying (Spring only)	3
CT	232	Water Management Technology (Spring only)	4
CT	252	Construction Project Management (Spring only)	3
ENGR	205/205L	Surveying II/Lab (Spring only)	4
Total Credits			17

HB 1387

Attachment 2
Jan 22, 2019

Cadastral Surveying Certificate Requirements

Hrs	Course	Name
3	ENTK 1500 or ENTK 1510 or ENTK 2500	Engineering Graphics or Civil Drafting Computer Aided Drafting I - Sheridan College
2	LS 2010 or CE 2072 Or CE 2070	Engineering Surveying Lecture or Engineering Surveying
4	LS 2020 or CE 2090	GPS for Land Surveyors
3	LS 2110 or CE 2050	Real Property Law
2	LS 2400 or CE 2089	Basic Geodesy
2	LS 3100 or CE 2088	Writing Land Descriptions
2	LS 3110 or CE 3750	Surveying Evidence
2	LS 3120 or CE 3740	Survey Boundary Control
3	LS 3130 or CE 2085	Public Land Surveys
3	LS 3200 or CE 3710	Route Surveying
<u>4</u>	LS 3210 or CE 3720	Advanced Surveying
30	Total Hours	

Students must be properly admitted as undergraduate students through the University of Wyoming Admissions Office to be eligible for this certificate. You will NOT BE ELIGIBLE to earn the Cadastral Surveying Certificate if you were admitted with a "Quick Admit" through the Out Reach School.

This certificate will require a minimum of 30 semester hours as listed above, 21 which must be successfully completed at the University of Wyoming. All transfer credit is subject to review by the UW Land Surveying Director. A grade of C or better must be earned in each course to be eligible for this certificate.

This certificate meets the Wyoming Board of Registration's requirements for the surveying specific course work required to be a Land Surveyor in Training (LSIT).

Students earning the Cadastral Surveying Certificate are NOT eligible for Federal Financial Aid (FFA). Students may utilize private student loan programs available through the Student Financial Aid Office to help fund the cost of the certificate program.

The admission acceptance requirements for this program are a working knowledge of algebra and trigonometry.

SURVEYING CORE TECHNICAL CERTIFICATE**Degree Sheet**

2018-2019 Catalog

Technical Occupational Specialty			27 Credit Hours	Credit Hours	Prerequisites
SURV	1133	Fundamentals of GIS		3	None
SURV	2232	Route Surveying		2	SURV 2614
SURV	2233	Civil CAD Drafting I		3	None
SURV	2423	Photogrammetry		3	SURV 2614
SURV	2614	Surveying I		4	Pre/CoReq: MATH 1613
SURV	2623	Legal Principles of Surveying I		3	Pre/CoReq: SURV 2614
SURV	2633	Legal Principles of Surveying II		3	SURV 2633
SURV	2643	Advanced Surveying I		3	SURV 2614
SURV	2743	Fundamentals of GPS		3	SURV 2614

Total to Graduate 27

The courses in this certificate program are embedded within the Surveying Technology A.A.S. degree.

ADDITIONAL GRADUATION REQUIREMENTS:

2.0 Graduation/Retention GPA

8 credit hours earned in residence at OSU-OKC

Degree Audit is not final until approved by the Office of the Registrar.

NOTES LEGEND:

FA= Fall, SP=Spring, SU=Summer

[R] Reading Proficiency/Placement

[W] Writing Proficiency/Placement

[M] Math Proficiency/Placement

HB 1387

22
January 21, 2019

Chairman Keiser and Members of the House Industry, Business and Labor Committee:

I am writing on behalf of the North Dakota State Board of Registration for Professional Engineers and Land Surveyors to express the Board's support of HB 1387 which would create a minimum education requirement for registration as a Land Surveyor Intern. The Board considered many factors including benefits to the public, education cost, and necessity before voting unanimously to support this bill.

Over the past twenty years registrations for Professional Land Surveyors have declined significantly. In North Dakota, a Professional Land Surveyor is the only person who can make a legal land boundary determination used for the transfer of real property, so a declining population of competent professionals is a very serious concern. In 2013, the President of the National Council of Examiners for Engineers and Surveyors (NCEES) found the decline to be so significant that he created the Future of Surveying Task Force. The primary charge to this task force was to determine the factors contributing to the decline.

One finding of the task force was that the profession of land surveying has become more technical and sophisticated over the years. The advent of new technology is a contributing factor. For example, North Dakota Century Code 40-50.1-*Platting of Townsites*, requires survey distances to be within 1/100th of a foot. The math skills and technical knowledge needed to perform accurate land surveys are extremely difficult to obtain without some college education.

There are two nationally accepted exams required to become licensed as a Professional Land Surveyor. The first is the Fundamentals of Surveying (FS) exam and the second is the Principles and Practice of Surveying (PS) exam. These two exams are offered by NCEES and required in all U.S. states with Texas being the only exception. Texas has its own state specific FS exam. National statistics for the FS exam clearly demonstrate that individuals with no post-high school education have a significantly lower pass rate than other individuals who have a least a modest amount of post-high school education. A chart with the actual statistics is attached.

North Dakota has not required education for registration as a land surveyor intern in the past and does not have a competency problem with its current population of registered land surveyors. However, the technical requirements at the time of their examination were not as stringent as they are now. Professional Land surveyors have had to make a determined effort to continue their education to remain proficient and keep pace with the rapid advancement of technology. At the present time, the foundation of their lifetime of learning is now tested in the national entry level FS exam. As the statistics show, without education less than 3 of 10 candidates have the technical knowledge to pass the exam.

Attachment 3
Jan 22, 2019

The bill being proposed by the North Dakota Society of Professional Land Surveyors contains several options for acquiring the additional education. For the traditional on-campus route, North Dakota has two excellent colleges with two-year programs; the North Dakota State College of Science and Bismarck State College. For the non-traditional route, there are multiple certification and distance learning programs that will allow an individual to obtain education without relocating and remain working full time. It is important to note that the proposed bill requires education, not a degree.

In summary, the Board of Registration is in support of this bill because it offers flexibility in methods of obtaining education, offers a common-sense cost-effective alternative to traditional on-campus degree programs and, most importantly, provides an individual with the tools needed to successfully complete the entry level FS examination and begin a successful and rewarding career as a Professional Land Surveyor.

The North Dakota State Board of Registration for Professional Engineers and Land Surveyors unanimously supports HB 1387 and asks for a "Do Pass" vote.

Respectfully Submitted,

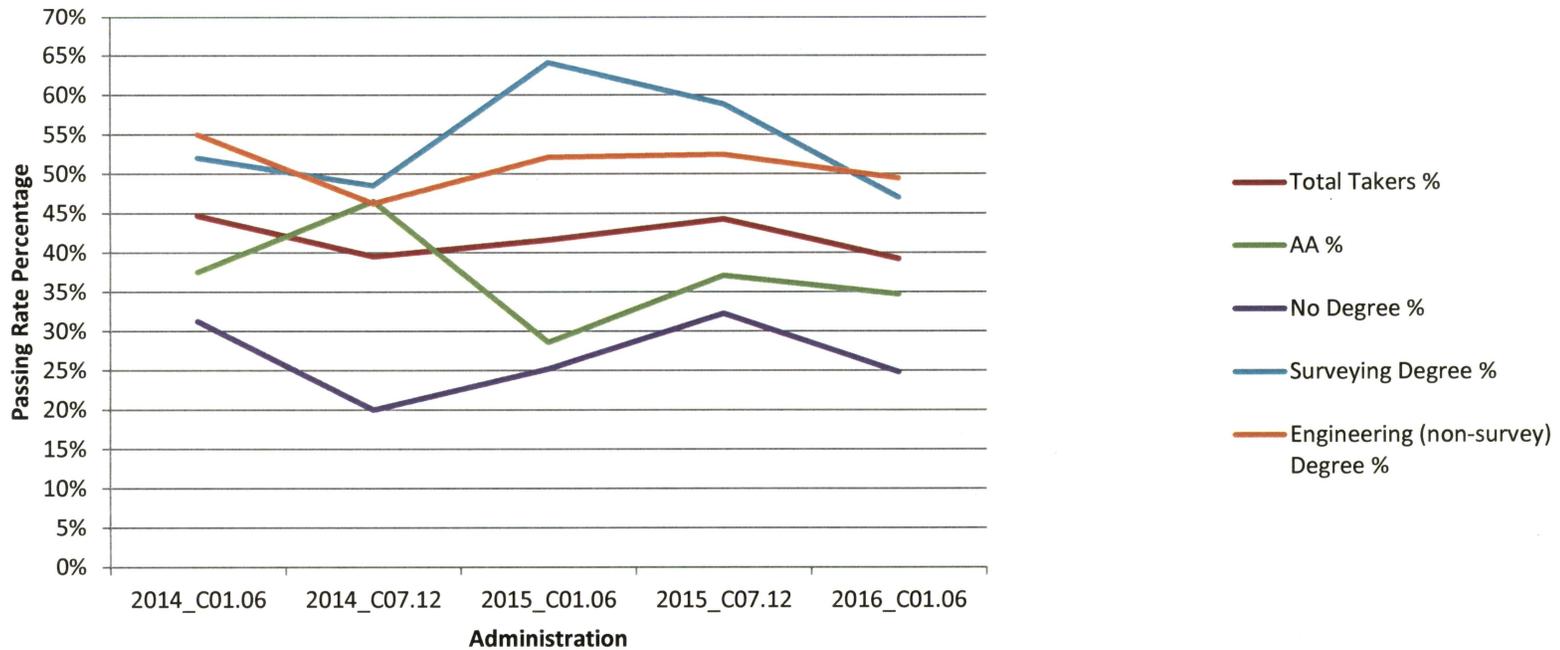


Rolly Ackerman, P.L.S.
Chairman

Administration	Total Takers	Total Takers %	AA Degree Only	AA %	No Degree	No Degree %	Surveying Degree (1)	Surveying Degree %	Engineering (non-survey) Degree	Engineering (non-survey) Degree %	Non-Engineering Degree (2)	Non-Engineering Degree %
2014_C01.06	367	45%	80	38%	96	31%	50	52%	140	55%	1	100%
2014_C07.12	377	40%	86	47%	100	20%	33	48%	160	46%	0	0%
2015_C01.06	447	42%	98	29%	119	25%	64	64%	165	52%	1	100%
2015_C07.12	427	44%	89	37%	124	32%	51	59%	162	52%	1	100%
2016_C01.06	543	39%	124	35%	145	25%	83	47%	190	49%	1	100%

Notes 1. "Surveying Degree" includes BS, MS or PhD in Geographic Information Science, Geomatics, Geomatics Engineering, Land Surveying and Mapping Science, Other Surveying, Surveying, Surveying and Mapping, or Surveying Engineering.
 2. Non-Engineering Degree is any degree not in engineering or surveying.

FS Exam Results versus Education



3

HB 1387

Attachment 3
Jan 22, 2019



HB 1387

Attachment 4
Jan 22, 2019

NDSPLS ADMINISTRATIVE OFFICE
PO Box 7370
Bismarck, ND 58507
Phone: 701-223-3184
E-mail: info@ndspls.org
Website: www.ndspls.org

Chairman Keiser, Members of the Industry, Business and Labor Committee.

My name is Kenneth J. Link,

My back ground is:

- Resident of Hazen ND.
- After college I worked in the surveying and mapping field for 45 years, mostly in the Coal Industry.
- Retired in 2017.

I am a Professional Land Surveyor licensed in North Dakota, South Dakota, Wyoming and Colorado. I am a charter member of the North Dakota Society of Professional Land Surveyors (NDSPLS).

I SUPPORT this House Bill No. 1387 for the following reasons.

Society had always adapted to needed changes in our life style, (Changing Times). Many times changes are not easy to accept.

Example #1 A North Dakota drivers license, years ago, could be obtained by passing a written test and a "Behind the Wheel Test".

Today our society has determined that a **third** element needed to be added to the process. This is the applicant must pass a "**Drivers Education Course**" (Changing Times).

Example #2 A North Dakota resident could obtain a Hunting Permits for Upland Game, Waterfowl and Deer, by going to a local store and purchasing these permits.

Today our society has determined that before a Hunting Permit may be issued the applicant must pass a "**Hunter Safety Class**" (Changing Times).

I would suspect there are many more example of new laws due to "Changing Times".

This House Bill 1387 is another example of "Changing Times". The two attached Flow Charts show the different between the existing law, Experience Only and Testing, and the proposed new law.

The bill simply removes the "Experience Only" element and splices the "Experience Only" into education and experience and the testing remains in place.

I would be open to try to answer any questions at any time.

Again, I do support HB 1387 and am hoping you do also.

Respectfully submitted,

Kenneth J. link January 16, 2019

HB 1387

Attachment 5
Jan 22, 2019

Matthew Weeks, PLS
3131 Arizona Dr.
Bismarck, ND 58503
701-471-8973

Chairman Keiser, Members of the House Industry, Business, and Labor Committee.

My name is Matt Weeks, I have been registered as a Professional Land Surveyor in North Dakota for over 25 years. I am also a professional Land Surveyor in South Dakota, Wyoming and Montana.

I am here to support HB 1387.

In years past, an individual would work on a three or even four man survey crew, this person would work their way up, all the while being mentored along the way. With today's technology most survey crews are much smaller, often times the individuals are working alone. While this technology has made many aspects of the profession more efficient it has taken away the mentoring opportunities that have historically occurred. HB 1387 will help fill this void.

Land surveying is becoming increasingly complex. GPS has now become GNSS, GNSS uses Russian and Chinese satellites, UAV's /or drones, weren't even available five years ago. These advancements in technology require new, additional, knowledge and education. Not just which button to push or when to push it, but rather the in-depth knowledge of the underlying concepts. Knowledge necessary to achieve the high levels of accuracy and precision required of today's surveys.

HB 1387 will go a long way to ensuring that the North Dakota Land Survey Intern has this necessary education.

The National Council of Examiners for Engineering and Surveying (NCEES) is the organization that developed, administers and scores the national exams required for licensure in the United States. Although it is left up to the specific states, NCEES has developed what they consider minimum education requirements. HB 1387 will put the North Dakota Land Survey Intern more in line with the NCEES Model Law, thus allowing for a more mobile workforce.

Again, I support HB 1387 and hope that you will do the same.

Respectfully submitted



Matthew Weeks, PLS



3320 Hamilton Street, Unit 3
Bismarck, ND 58503
Phone: 701.223.3546

Email: hollybeck@hollybecksurveying.com

January 22, 2019

House Bill #1387 Testimony

Chairperson Keiser and Committee Members of the House Industry Business and Labor Committee:

My name is Holly Beck. I am currently President-Elect of the North Dakota members of the American Council of Engineering Companies (ACEC) and I am here on their behalf to testify in favor of this Bill. ACEC is all about the business of engineering. Our primary mission is to strengthen the business environment for our member firms through government advocacy, political action and business education.

I am the owner of Holly Beck Surveying & Engineering here in Bismarck. Our firm currently has nine full time employees, two of which are licensed professional land surveyors who oversee all survey work. We also have five employees who are technicians that work under the direction of the licensed professionals.

This Bill will require the proper education to determine the minimum qualifications for registration as a Land Survey Intern which is the first big step towards becoming a Professional Land Surveyor. By requiring education as part of the registration process, it is not just about learning the technical aspects of how to run the incredibly expensive equipment, it is about learning written and verbal communication skills. It is also about learning the mathematics of surveying and boundary laws that are the foundation of surveying. The sharing of knowledge and information brought about by education is very valuable in the performance of any profession, especially the Professional Land Surveyor who often deals with boundary laws, public policy and community development in addition to supervising a team of technicians.

As a business owner, I would expect North Dakota to align with the education requirements of our neighboring states so that our licensed professionals will be qualified to be licensed in the neighboring states.

I urge you to support House Bill #1387.

Thank you.

Holly Beck, PLS/PE #4934



Advocacy. Access. Education.



HB 1387

Attachment 6
Jan 22, 2019

Education Requirements of Neighboring States:

Minnesota

A Bachelor's degree in a surveying curriculum or
A Bachelor's curriculum with 22 semester credits in land surveying

South Dakota

An advanced degree with 18 credits of surveying

Montana

An Associate degree

1

Industry, Business and Labor Committee
HB1387 – Hearing January 22, 2019 – 2:30 pm

Good Morning Chairman Keiser, and members of the committee, I am Michael Gunsch, a Professional Engineer, licensed in North Dakota, here today representing the North Dakota Society of Professional Engineers as their Legislative Committee Chairman. We stand in support of HB1387:

It was not that many years ago that our organization (NDPSE) supported changes to the North Dakota Century Code related to implementing requirements for continuing education for professional engineers. Since their implementation, we believe this has maintained if not increased the overall competency and quality of services in our profession. It has not been a burden to these professionals, with the exception being the two hours or so completing the Professional Development Hours form, if you waited till the end of the year.

Prior to the last legislative session, the North Dakota Society of Professional Engineers participated in a collaborative effort with the North Dakota Society of Professional Land Surveyors and North Dakota Board of Registration for Engineering and Land Surveyors to evaluate the existing land surveying educational requirements. I was NDSPE's representative on that committee and found it to be an enlightening experience. It was a critical overview of the educational requirements of other states, along with a global view of the changing times within the land surveying profession, along with practice and industry standards.

The technical nature of the land surveying profession, as with many professions, has evolved over the years, meaning it is more and more important that those entering the profession be adequately trained through a defined educational process. HB1387 sets forth a clear vision regarding the basis for the competency necessary to pursue registration and licensure. The ability to enter the profession and the needs of the professional providing these services is important to be regulated in the public's interests. We believe HB1387 is a reasonable and prudent approach to achieving that objective.

In conclusion, we respectfully request that you support HB1387 and recommend a "DO PASS". I stand for any questions.

Michael H. Gunsch, PE, CFM

North Dakota Society of Professional Engineers

mgunsch@outlook.com
701-527-2134 (cell)



HB 1387 3/6/19 ATT#1

NDSPLS ADMINISTRATIVE OFFICE
PO Box 7370
Bismarck, ND 58507
Phone: 701-223-3184
E-mail: info@ndspls.org
Website: www.ndspls.org
Date: March 6, 2019

Senate Industry, Business, and Labor Committee

Support HB 1387

Chairman Klein, Members of the Senate Industry, Business, and Labor Committee.

For the record, my name is Mike Krumwiede, and I'm here today representing the North Dakota Society of Professional Land Surveyors or NDSPLS. We are here today in support of HB 1387. This bill essentially does one thing. It changes the minimum requirement for registration as a Land Surveyor Intern. The bill also establishes a timeframe where an individual can become a Land Surveyor Intern by the existing requirements, or by the new proposed requirements. In the year 2028 the experience only option of obtaining a Land Surveying Intern designation will no longer be available.

You will here today from some of our members why this change is important to the Land Surveying Industry. But first, I'd like to give a background on exactly which people in the surveying industry this bill will affect.

Currently, there are typically three stages in the progression of becoming a Professional Land Surveyor. The person we most readily see out and about surveying in the field is usually a field technician, above the field technician is the Land Survey Intern, and then there is the Professional Land Surveyor.

Let's start with the field technicians, field technical staff are crew chiefs, field assistants, and instrument operators. Essentially, these individuals can do whatever their supervisor - the PLS - is comfortable with them doing (i.e staking construction sites, the recovery of survey monuments, setting monuments, topographic mapping for design, courthouse research, etc.). Granted, this all gets done under the professional land surveyor's direction. The office technical staff are drafters and clerical staff. On the office side, these tasks include drafting plats, assisting clients with zoning applications, researching land records, administrative tasks, etc. Both office and field technicians do not need any more education than what their employer requires. These positions do not require a license permitting there is a Professional Land Surveyor in responsible charge of the project. Furthermore, these positions can be every bit as lucrative as a professional land surveyor if the technician is accomplished at what they do.

A Land Surveyor Intern (LSI) is the first step in a two step process of getting licensed. The experience gained as an LSI in preparation for becoming a professional land surveyor must get progressively more intense. LSIs typically work as senior survey crew chiefs and/or drafters. Typically, their role will become more of a junior survey manager with increasing autonomy to prepare them for the next step.

HB 1387 3/6/19
Att #1

The next step is a Professional Land Surveyor or PLS. A PLS must be in responsible charge of survey projects, meaning that all survey work done must be reviewed and approved by the PLS. A Professional Land Surveyor is only person who can make a legal land boundary determination used for the transfer of real property. This means they must approve all the work done under their seal.

HB 1387 is a change to the requirement for becoming a Land Survey Intern. This only affects those looking to move ahead and take their first step towards becoming a Professional Land Surveyor. This change comes from the advances in technology that now require survey distances to be within 1/100th of a foot. The math skills and technical knowledge needed to perform accurate land surveys are extremely difficult to obtain with out some education component.

For these reasons, we respectfully request a Do Pass Recommendation on HB 1387. It's now my pleasure to ask some of our NDSPLS members to provide some more technical, detailed testimony on why we support HB 1387. Thank you for your time.



NDSPLS ADMINISTRATIVE OFFICE
PO Box 7370
Bismarck, ND 58507
Phone: 701-223-3184
E-mail: info@ndspls.org
Website: www.ndspls.org
Date: March 6, 2019

To: Chairman Klein, Members of the Senate Industry, Business, and Labor Committee.

NDSPLS is made up of over 245 members, of which some 122 are Registered Professional Land Surveyors, who live and practice in this state. There are approximately 500 Registered Land Surveyors who are licensed to practice in ND. We are licensed and regulated by the North Dakota State Board of Registration for Professional Engineers and Professional Land Surveyors. Our mission and objective is: to unite all of the Professional Land Surveyors in the State of North Dakota; to elevate the standards of the surveying profession; to establish basic minimum standards and requirements for surveys; to assist in promoting legislative and educational programs to improve the professional status of the Land Surveyor; to work in cooperation with local, county, state, federal and tribal governments in our field of endeavor; to uphold a rigid code of ethics; to strive to improve our relations with our clients and the public by doing our work with precision and integrity; and to maintain a good relationship between Land Surveyors and Engineers.

The North Dakota Society of Professional Land Surveyors is in FAVOR of House Bill No. 1387.

The basic component of any profession is specialized training and education. Currently, education is not a requirement for registration as a Land Surveyor Intern (LSI) in this state. With the continued development of technology, the rapid increase of land values, and the overall complexity of the projects that Land Surveyors are licensed to perform, now more than ever, an educational background is needed. NDSPLS has studied the educational requirements of many states along with the model law developed by the National Council of Examiners of Engineering and Surveying (NCEES) over the past five years. The proposed bill has been developed by a collaborative effort of a committee facilitated by the North Dakota Board of Registration for Professional Engineers and Professional Land Surveyors and was made up of representatives from the NDSPLS, the North Dakota Society of Professional Engineers (NDSPE), and the American Council of Engineering Companies of North Dakota (ACEC/ND).

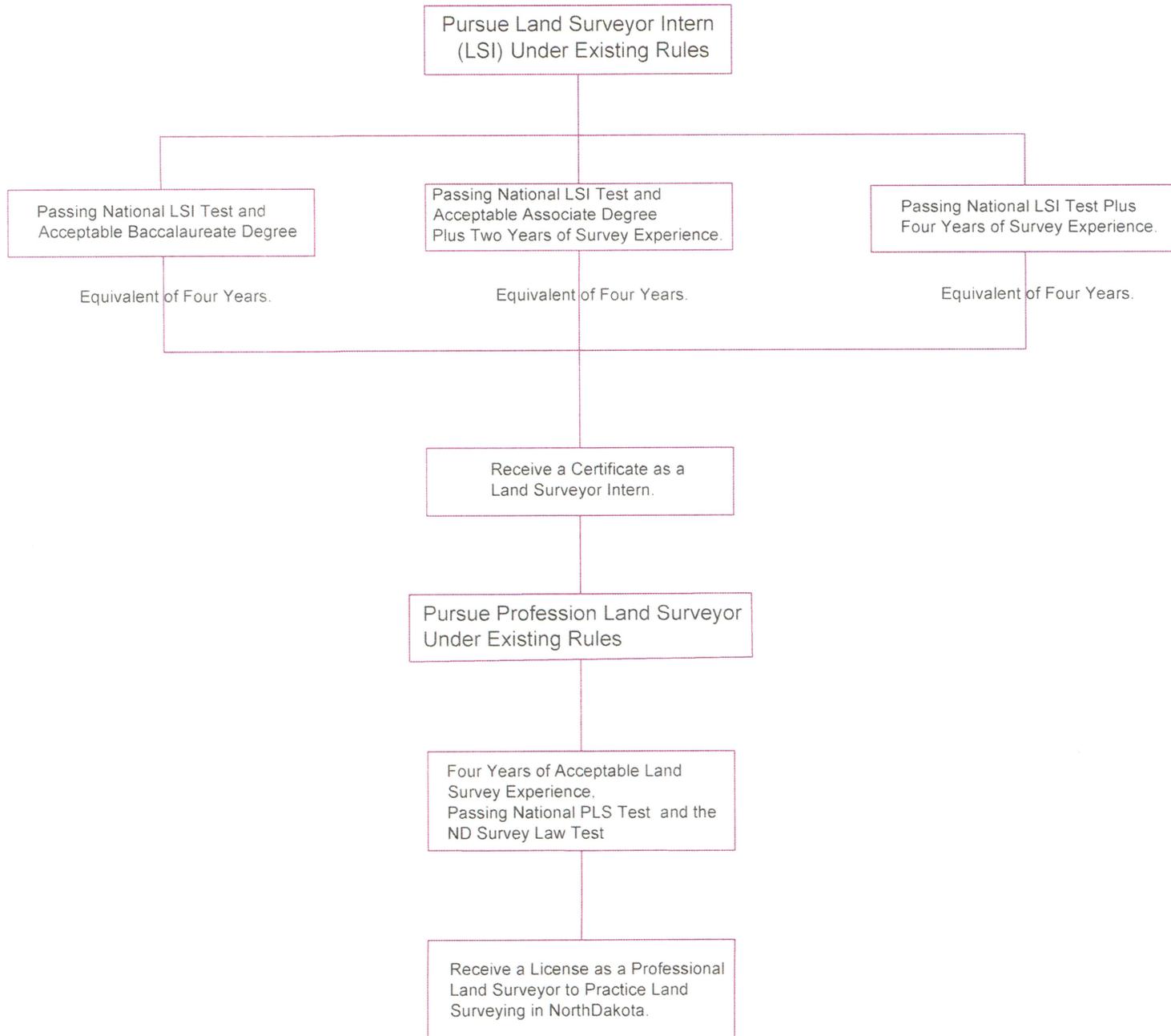
Under the proposed law, there are four pathways to licensure. The minimum requirement will be a certificate in land surveying along with four years of satisfactory land surveying experience. The existing curriculums offered at NDSCS – Wahpeton and Bismarck State College will be compliant programs. In addition, there are several options for online education that will meet the proposed requirements. Due to the availability of several existing curriculums, this bill will not create a need for additional programs. This bill provides for a sunset period of the existing law until 2028. The reason for this is so there is ample time for those who have started on the existing pathway to complete this process. NDSPLS believes that the proposed education requirement will better prepare applicants to pass the exams and will provide them with the education they will need to protect their clients and prevent liability for themselves. This bill does not bar technicians that work under the responsible charge of professional land surveyors from working in technical capacities in any way. Ultimately, NDSPLS believes this bill provides for an adequate, yet reasonable and obtainable level of education.

Therefore, NDSPLS urges a DO PASS on House Bill No. 1387.

Respectfully submitted,

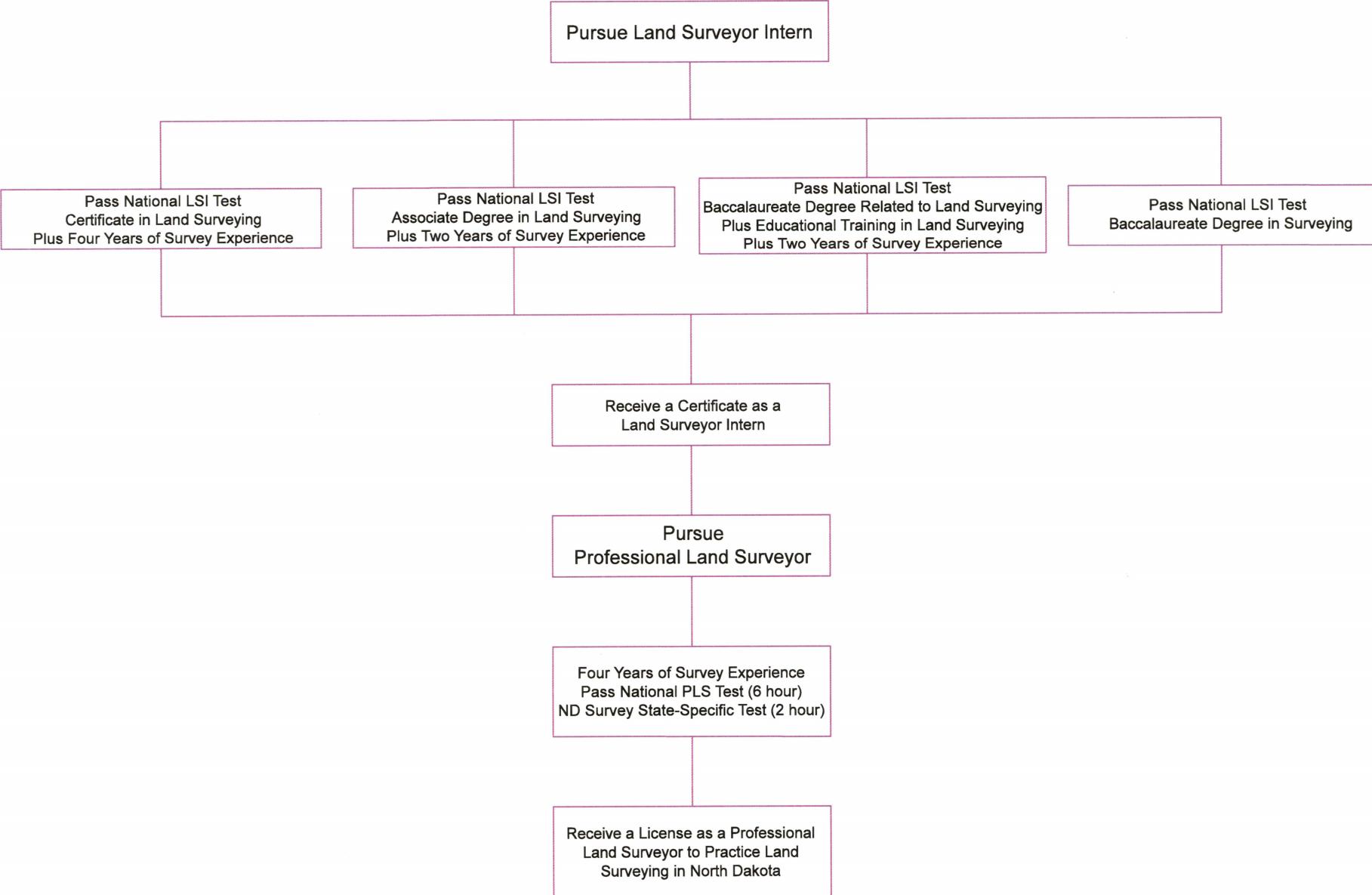
Aaron Hummert, PLS
Co-Chair of the Legislative Committee
North Dakota Society of Professional Land Surveyors

EXISTING LAW



HB 1387 3/6/19 AH #2 p.2

HOUSE BILL 1387 PROPOSED NEW LAW



HB 1387 3/10/19 A11# 2 p.3



Land Surveying and Civil Engineering Technology

► **Contact Information**

Jeff Jelinek, program coordinator
 Jeff.jelinek@ndscs.edu
 701-671-2268
 Horton Hall 242

► **Delivery Methods**

Face-to-Face: Wahpeton
 Online: Some classes

The Land Surveying and Civil Engineering Technology program is designed to prepare students for work as engineering and surveying technicians in construction-related industries, allowing graduates to work in a broad range of jobs such as surveying, drafting and material testing. Upon graduation, students can be employed with state, county and city engineering offices as well as private agencies such as consulting engineers, land surveyors and construction contractors. Some jobs are in fixed locations, while others require limited to extensive travel.

Students are provided with experiences emphasizing surveying, drafting and materials testing. Surveying courses give students the opportunity to learn how to operate the latest instruments used in distance and angle measurement. Surveying drawings and maps are developed using enhanced computer-aided drafting programs (CAD). Courses in soil testing, water-quality management, concrete and asphalt provide students with hands-on experience in materials testing. In addition, students take courses in communications, human relations, computers and technical mathematics, which will help provide them the skills to advance in their careers.

Green and/or sustainable construction is covered at an awareness level in the materials testing classes and the design classes.

While students are fully employable upon completion of this program, students interested in pursuing an advanced degree will find the Associate in Applied Science degree in Land Surveying and Civil Engineering Technology provides transfer options to four-year colleges and universities in related fields such as land surveying and construction management.

NOTE: This program requires the purchase of a notebook computer. The cost will be approximately \$1,800. For further information, call Jeff Jelinek, Land Surveying and Civil Engineering Technology program coordinator, at 701-671-2268.

Admission Requirements*

The applicants must be high school graduates or equivalent. Students considered for acceptance must complete all admission requirements.

Required minimum placement scores:

<u>ACT</u>	<u>ACCUPLACER</u>
Reading – 15	Reading Comp – 61
English – 15	WritePlacer – 3-4
Math – 17	Arithmetic – 51
	Elementary Algebra – 25

Or transfer equivalencies will apply as appropriate

Applicants not meeting the above requirements are encouraged to visit with the academic counselor at 701-671-2257 or the Construction and Design Technology department chair at 701-671-2116 for strategies to meet the admission requirements.

*Program Admission Requirements are subject to revision. Please check the department or program website under Program Admission Requirements for current information.

Course Code	Course Title	Credits
CAD 120	Introduction to AutoCAD	3
CT 111	Civil Plans and Specifications	2
CT 113	Introduction to Civil Design Applications	3
CT 121	Plane Surveying	4
CT 122	Advanced Surveying	4
CT 132	Material Testing/Quality Control	4
CT 142	Construction Safety for Civil Technicians	1
CT 211	Introduction to Geographic Information Systems	3
CT 212	GIS Applications	3
CT 214	Highway and Street Design	3
CT 215	Land Use Planning and Development	3
CT 221	Surveying Procedures	4
CT 222	Advanced Surveying Procedures	4
CT 223	Boundary Control and Legal Principles	3
CT 224	Research and Analysis	3
CT 235	Water Resource Technology	3
CT 261	Machine Control and Project Layout	2
UAS 111	Introduction to UAS	2

Related/General Education Courses

ENGL 110	College Composition I	3
English/Communication Elective (choose one)		3
ENGL 105	Technical Communications	
ENGL 120	College Composition II	
ENGL 125	Introduction to Professional Writing	
COMM 110	Fundamentals of Public Speaking	
MATH 130	Technical Mathematics	2
MATH 132	Technical Algebra I	2
MATH 136	Technical Trigonometry	2
FYE 101	Science of Success	1
HPER 210	First Aid and CPR (Professional/Community)	2
Social and Behavioral Sciences, Humanities, History and/or Computer Electives		4
Recommended:		
• CSCI 116 – Business Use of Computers – 3 cr		
• PSYC 100 – Human Relations – 2 cr		

Total Required Credit **73**

Award

Upon successful completion of the required courses, students will be awarded an Associate in Applied Science degree in Land Surveying and Civil Engineering Technology.



Engineering Technology
 Associate in Applied Science
 Advising Worksheet* 2018-2019

Prescribed Technical Program	53
General Education	16-18
Total Degree Credits	69-71

1st Year Fall Semester

Prescribed Technical Program Requirements			
ENGR	101	Graphical Communication	3
POLS	116	State and Local Government	3
General Education Courses			
<i>Communications I</i>			
ENGL	110	College Composition I (Required)	3
<i>Business, Math, Science & Technology</i>			
CSCI	101	Introduction to Computers (or higher level CSCI course required)	3
<i>Business, Math, Science & Technology</i> (Select one of the following:)			
MATH	107	Pre-Calculus	
MATH	165	Calculus I	4-6
MATH	103	College Algebra <u>and</u>	
MATH	105	Trigonometry ¹	
Total Credits			16-18

2nd Year Fall Semester

Prescribed Technical Program Requirements			
CAD	212	Computer Aided Design II (Fall only)	3
CT	250/250L	Applied Statics and Mechanics of Materials/Lab (Fall only)	4
ENGR	204/204L	Surveying I/Lab (Fall only)	4
GIS	107	GIS Applications	3
General Education Course			
<i>Arts & Humanities/Social & Behavioral Sciences</i>			
SOC	110	Introduction to Sociology	3
Total Credits			17

¹ MATH 103 and MATH 105 are required as a pair to satisfy this degree requirement if either MATH 107 or MATH 165 are not chosen.

Transfer Option: Students who may possibly pursue a four-year degree in Engineering at a later date should consider the following course changes:

Substitute: ENGR 201 Statics (3 credits) and ENGR 203 Mechanics of Materials (3 credits) for CT 250 and CT 250L Applied Statics and Mechanics/Lab (3/1 credits). Students should consult with the Engineering Technology program coordinator prior to this substitution.

*This advising worksheet is unofficial and to be used for class planning purposes only. Please refer to the official catalog at <http://catalog.bismarckstate.edu/> for the complete listing of college degree requirements.

1st Year Spring Semester

Prescribed Technical Program Requirements			
CAD	211	Computer Aided Design I	3
CT	251/251L	Materials Testing/Lab (Spring only)	4
COMM	110	Fundamentals of Public Speaking	3
ECON	201	Principles of Microeconomics	3
GIS	105	Fundamentals of Geographic Information Systems	3
General Education Course			
<i>Communications II</i>			
ENGL	125	Introduction to Professional Writing (Required)	3
Total Credits			19

2nd Year Spring Semester

Prescribed Technical Program Requirements			
CAD	213	Computer Aided Design III (Spring only)	3
CT	228	Boundary and Cadastral Surveying (Spring only)	3
CT	232	Water Management Technology (Spring only)	4
CT	252	Construction Project Management (Spring only)	3
ENGR	205/205L	Surveying II/Lab (Spring only)	4
Total Credits			17

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Cadastral Surveying Certificate Requirements

Hrs	Course	Name
3	ENTK 1500 or ENTK 1510 or ENTK 2500	Engineering Graphics or Civil Drafting Computer Aided Drafting I - Sheridan College
2	LS 2010 or CE 2072 Or CE 2070	Engineering Surveying Lecture or Engineering Surveying
4	LS 2020 or CE 2090	GPS for Land Surveyors
3	LS 2110 or CE 2050	Real Property Law
2	LS 2400 or CE 2089	Basic Geodesy
2	LS 3100 or CE 2088	Writing Land Descriptions
2	LS 3110 or CE 3750	Surveying Evidence
2	LS 3120 or CE 3740	Survey Boundary Control
3	LS 3130 or CE 2085	Public Land Surveys
3	LS 3200 or CE 3710	Route Surveying
<u>4</u>	LS 3210 or CE 3720	Advanced Surveying
30	Total Hours	

Students must be properly admitted as undergraduate students through the University of Wyoming Admissions Office to be eligible for this certificate. You will NOT BE ELIGIBLE to earn the Cadastral Surveying Certificate if you were admitted with a "Quick Admit" through the Out Reach School.

This certificate will require a minimum of 30 semester hours as listed above, 21 which must be successfully completed at the University of Wyoming. All transfer credit is subject to review by the UW Land Surveying Director. A grade of C or better must be earned in each course to be eligible for this certificate.

This certificate meets the Wyoming Board of Registration's requirements for the surveying specific course work required to be a Land Surveyor in Training (LSIT).

Students earning the Cadastral Surveying Certificate are NOT eligible for Federal Financial Aid (FFA). Students may utilize private student loan programs available through the Student Financial Aid Office to help fund the cost of the certificate program.

The admission acceptance requirements for this program are a working knowledge of algebra and trigonometry.

SURVEYING CORE TECHNICAL CERTIFICATE**Degree Sheet**

2018-2019 Catalog

Technical Occupational Specialty			27 Credit Hours	Credit Hours	Prerequisites
SURV	1133	Fundamentals of GIS		3	None
SURV	2232	Route Surveying		2	SURV 2614
SURV	2233	Civil CAD Drafting I		3	None
SURV	2423	Photogrammetry		3	SURV 2614
SURV	2614	Surveying I		4	Pre/CoReq: MATH 1613
SURV	2623	Legal Principles of Surveying I		3	Pre/CoReq: SURV 2614
SURV	2633	Legal Principles of Surveying II		3	SURV 2633
SURV	2643	Advanced Surveying I		3	SURV 2614
SURV	2743	Fundamentals of GPS		3	SURV 2614

Total to Graduate 27

The courses in this certificate program are embedded within the Surveying Technology A.A.S. degree.

ADDITIONAL GRADUATION REQUIREMENTS:

2.0 Graduation/Retention GPA

8 credit hours earned in residence at OSU-OKC

Degree Audit is not final until approved by the Office of the Registrar.

NOTES LEGEND:

FA= Fall, SP=Spring, SU=Summer

[R] Reading Proficiency/Placement

[W] Writing Proficiency/Placement

[M] Math Proficiency/Placement



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NDSPLS ADMINISTRATIVE OFFICE
PO Box 7370
Bismarck, ND 58507
Phone: 701-223-3184
E-mail: info@ndspls.org
Website: www.ndspls.org

Chairman Klein, Members of the Industry, Business and Labor Committee.

My name is Kenneth J. Link,

My back ground is:

- Resident of Hazen ND.
- After college I worked in the surveying and mapping field for 45 years, mostly in the Coal Industry.
- Retired in 2017.

I am a Professional Land Surveyor licensed in North Dakota, South Dakota, Wyoming and Colorado. I am a charter member of the North Dakota Society of Professional Land Surveyors (NDSPLS).

I SUPPORT this House Bill No. 1387 for the following reasons.

Society had always adapted to needed changes in our life style, (Changing Times). Many times changes are not easy to accept.

Example #1 A North Dakota drivers license, years ago, could be obtained by passing a written test and a "Behind the Wheel Test".

Today our society has determined that a **third** element needed to be added to the process. This is the applicant must pass a "**Drivers Education Course**" (Changing Times).

Example #2 A North Dakota resident could obtain a Hunting Permits for Upland Game, Waterfowl and Deer, by going to a local store and purchasing these permits.

Today our society has determined that before a Hunting Permit may be issued the applicant must pass a "**Hunter Safety Class**" (Changing Times).

I would suspect there are many more examples of new laws due to "Changing Times".

This House Bill 1387 is another example of "Changing Times". The two attached Flow Charts show the difference between the existing law, Experience Only and Testing, and the proposed new law.

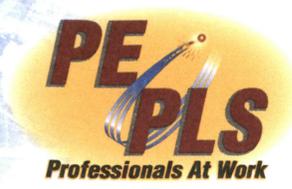
The bill simply removes the "Experience Only" element and splices the "Experience Only" into education and experience and the testing remains in place.

I would be open to try to answer any questions at any time.

Again, I do support HB 1387 and am hoping you do also.

Respectfully submitted,

Kenneth J. Link February 28, 2019



Testimony of
Rolly Ackerman, P.L.S., Chairman
North Dakota State Board of Registration for Professional Engineers & Land Surveyors
In support of HB 1387

Senate Industry, Business and Labor Committee
Senator Jerry Klein Chairman
Esteemed Members of the Committee:

I am writing on behalf of the North Dakota State Board of Registration for Professional Engineers and Land Surveyors to express the Board's support of HB 1387 which would create a minimum education requirement for registration as a Land Surveyor Intern. The Board considered many factors including benefits to the public, education cost, and necessity before voting unanimously to support this bill.

Over the past twenty years registrations for Professional Land Surveyors have declined significantly. In North Dakota, a Professional Land Surveyor is the only person who can make a legal land boundary determination used for the transfer of real property, so a declining population of competent professionals is a very serious concern. In 2013, the President of the National Council of Examiners for Engineers and Surveyors (NCEES) found the decline to be so significant that he created the Future of Surveying Task Force. The primary charge to this task force was to determine the factors contributing to the decline.

One finding of the task force was that the profession of land surveying has become more technical and sophisticated over the years. The advent of new technology is a contributing factor. For example, North Dakota Century Code 40-50.1-Platting of Townsites, requires survey distances to be within 1/100th of a foot. The math skills and technical knowledge needed to perform accurate land surveys are extremely difficult to obtain without some college education.

There are two nationally accepted exams required to become licensed as a Professional Land Surveyor. The first is the Fundamentals of Surveying (FS) exam and the second is the Principles and Practice of Surveying (PS) exam. These two exams are offered by NCEES and required in all U.S. states with Texas being the only exception. Texas has its own state specific FS exam. National statistics for the FS exam clearly demonstrate that individuals with no post-high school education have a significantly lower pass rate than other individuals who have a least a modest amount of post-high school education. A chart with the actual statistics is attached.

North Dakota has not required education for registration as a land surveyor intern in the past and does not have a competency problem with its current population of registered land surveyors. However, the technical requirements at the time of their examination were not as stringent as they are now. Professional Land surveyors have had to make a determined



PHOTO COURTESY: CARRIE L. BURNETT, NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

effort to continue their education to remain proficient and keep pace with the rapid advancement of technology. At the present time, the foundation of their lifetime of learning is now tested in the national entry level FS exam. As the statistics show, without education less than 3 of 10 candidates have the technical knowledge to pass the exam.

The bill being proposed by the North Dakota Society of Professional Land Surveyors contains several options for acquiring the additional education. For the traditional on-campus route, North Dakota has two excellent colleges with two-year programs; the North Dakota State College of Science and Bismarck State College. For the non-traditional route, there are multiple certification and distance learning programs that will allow an individual to obtain education without relocating and remain working full time. It is important to note that the proposed bill requires education, not a degree.

In summary, the Board of Registration is in support of this bill because it offers flexibility in methods of obtaining education, offers a common-sense cost-effective alternative to traditional on-campus degree programs and, most importantly, provides an individual with the tools needed to successfully complete the entry level FS examination and begin a successful and rewarding career as a Professional Land Surveyor.

The North Dakota State Board of Registration for Professional Engineers and Land Surveyors unanimously supports HB 1387 and asks for a "Do Pass" vote.

Respectfully submitted,



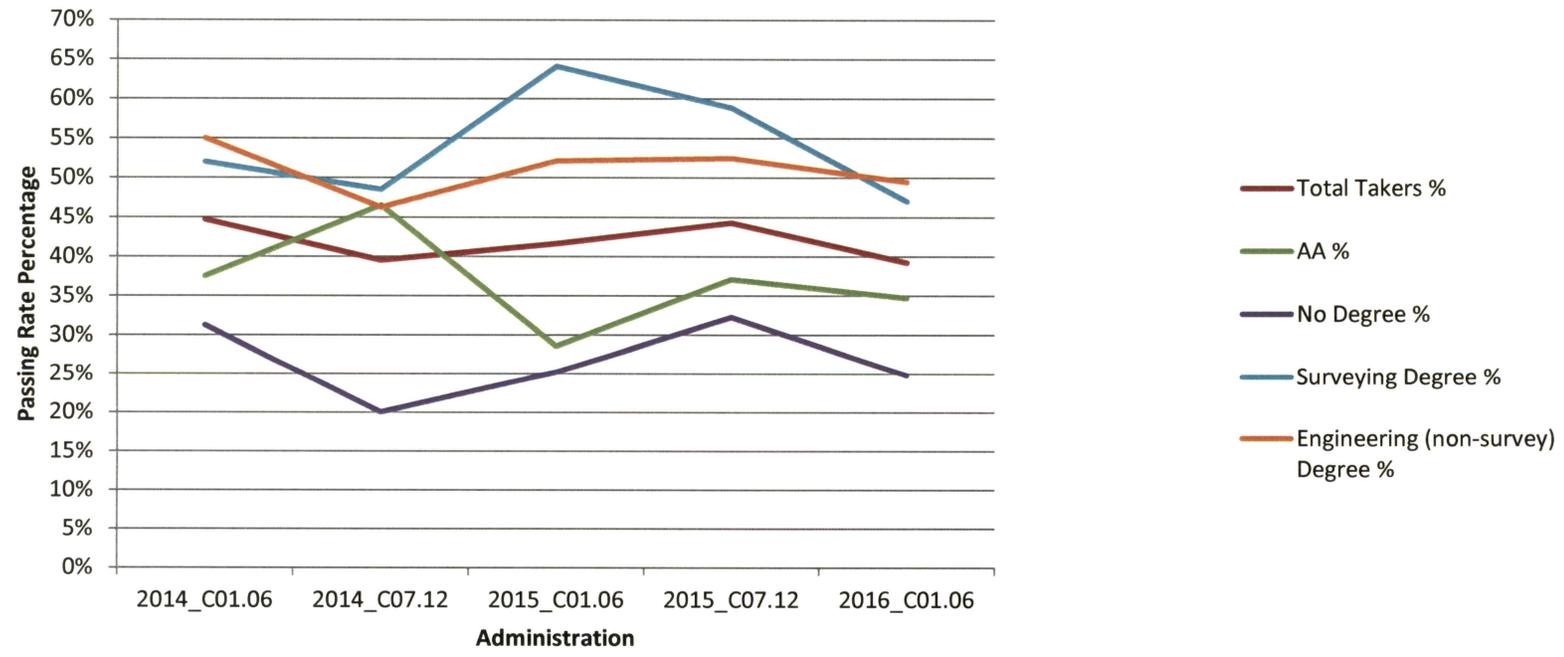
Rolly Ackerman, P.L.S.
Chairman

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Administration	Total Takers	Total Takers %	AA Degree Only	AA %	No Degree	No Degree %	Surveying Degree (1)	Surveying Degree %	Engineering (non-survey) Degree	Engineering (non-survey) Degree %	Non-Engineering Degree (2)	Non-Engineering Degree %
2014_C01.06	367	45%	80	38%	96	31%	50	52%	140	55%	1	100%
2014_C07.12	377	40%	86	47%	100	20%	33	48%	160	46%	0	0%
2015_C01.06	447	42%	98	29%	119	25%	64	64%	165	52%	1	100%
2015_C07.12	427	44%	89	37%	124	32%	51	59%	162	52%	1	100%
2016_C01.06	543	39%	124	35%	145	25%	83	47%	190	49%	1	100%

Notes 1. "Surveying Degree" includes BS, MS or PhD in Geographic Information Science, Geomatics, Geomatics Engineering, Land Surveying and Mapping Science, Other Surveying, Surveying, Surveying and Mapping, or Surveying Engineering.
 2. Non-Engineering Degree is any degree not in engineering or surveying.

FS Exam Results versus Education



Matthew Weeks, PLS
3131 Arizona Dr.
Bismarck, ND 58503
701-471-8973

Chairman Klein, Members of the Senate Industry, Business, and Labor Committee.

My name is Matt Weeks, I have been registered as a Professional Land Surveyor in North Dakota for over 25 years. I am also a professional Land Surveyor in South Dakota, Wyoming and Montana.

I am here to support HB 1387.

In years past, an individual would work on a three or even four man survey crew, this person would work their way up, all the while being mentored along the way. With today's technology most survey crews are much smaller, often times the individuals are working alone. While this technology has made many aspects of the profession more efficient it has taken away the mentoring opportunities that have historically occurred. HB 1387 will help fill this void.

Land surveying is becoming increasingly complex. GPS has now become GNSS, GNSS uses Russian and Chinese satellites, UAV's /or drones, weren't even available five years ago. These advancements in technology require new, additional, knowledge and education. Not just which button to push or when to push it, but rather the in-depth knowledge of the underlying concepts. Knowledge necessary to achieve the high levels of accuracy and precision required of today's surveys.

HB 1387 will go a long way to ensuring that the North Dakota Land Survey Intern has this necessary education.

The National Council of Examiners for Engineering and Surveying (NCEES) is the organization that developed, administers and scores the national exams required for licensure in the United States. Although it is left up to the specific states, NCEES has developed what they consider minimum education requirements. HB 1387 will put the North Dakota Land Survey Intern more in line with the NCEES Model Law, thus allowing for a more mobile workforce.

Again, I support HB 1387 and hope that you will do the same.

Respectfully submitted



Matthew Weeks, PLS

HB 1387 3/6/19 Att #6

Education Requirements of Neighboring States:

Minnesota

A Bachelor's degree in a surveying curriculum or
A Bachelor's curriculum with 22 semester credits in land surveying

South Dakota

An advanced degree with 18 credits of surveying

Montana

An Associate degree

TESTIMONY IN FAVOR OF HOUSE BILL NO. 1387

Gregory L. Johnson RPLS
6404 Deerewood Lane
Bismarck, North Dakota 58503
701-220-2494

March 6, 2019

Chairman Klein, and Members of the Senate Industry, Business and Labor Committee

I am here to support HB 1387

My name is Greg Johnson, I am a licensed and registered Professional Land Surveyor since 1980 and have lived in North Dakota for most of my 68 years. I am licensed in South Dakota, and Montana, I am also a US Army Artillery veteran 1970-73. I have over 45 years of land surveying experience, and I continue to run my own private practice of surveying here in Bismarck.

Over the years in working with private consultants before retiring I have had the opportunity to mentor over a dozen up and coming land surveyors in various capacities running 3 and 4 survey crews each having 2 to 3 members on each crew. I would estimate that of those mentors 50% went on to become licensed surveyors either in North Dakota or other states. That was the way surveying was 25 years ago. In the last 10 years I have not had the opportunity to mentor because of the type, style and innovations in surveying equipment and the way work is administered in the field. This leaves a terrible gap for those who want to become Land Surveyor Interns, because of a lack of opportunity. Mentoring records are closely watched by licensing boards, and 8 hours in the field get reduced to 5 or 6 hours a day of actual surveying.

With the ever changing technologies in surveying and mapping it became very clear to surveyors and industry in this state that there was a need to improve educational opportunities and standards for those desiring to become a licensed surveyor in this state. All construction projects, developments, energy, mapping, easements, right of ways, and boundaries start and end with the surveyor being on the ground first. Surveyors work with various federal, state, and tribal agencies and divisions, utility companies, oil companies, land owners, title people, county recorders and commissions, judges, attorney's and anyone involved with land ownerships and issues, and serve as expert witnesses as needed in land issues. Doing all of these jobs it is necessary to have educational experience to have the knowledge and tools to make proper decisions and judgements, utilizing boundary law and other subjects and equipment necessary to proper surveying.

This bill will give our applicants a baseline to measure educational levels of those desiring to become Interns or registered land surveyors and give those applicants a clear path to achieve those educational requirements. This bill will not require the new development of any special college programs in the ND University system as the course work for these programs are already in place. This bill still leaves a 10 year window open for those who have begun their experience only surveying experience. Having some Board approved educational experience along with qualifying land surveying experience is key to this bill and is needed in North Dakota both in industry and the private sector.

To conclude, I do support this HB 1387 and ask for this committee's support by a do pass vote.

Thank you for your time and review of this testimony.

Gregory Johnson RPLS

