

Engineering Presentation

Charge: Identify and assess pros and cons of most viable options to achieve goals including a single school of two schools.

Goal: Expand enrollment, reduce cost, maintain/improve quality.



UNIVERSITY
of ALASKA
Many Traditions One Alaska

August 17, 2016

Team Members

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Key Stakeholders

- ▶ Engineering Students – Existing and Potential / Perspective
- ▶ Industry – anyone who employs STEM, resource dev. Support industry, Health Care, Oil & Gas, Telecom
- ▶ State of Alaska – government, legislature
- ▶ Parents of Students
- ▶ University faculty, staff, and professors/instructors
- ▶ Alumni



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Options – Engineering Education

- ▶ 1 – Status Quo
- ▶ 2 – One College, One Location, One Administration
- ▶ 3 – One College, Two Locations, One Administration
- ▶ 4 – Collaborative Alignment

Evaluation of Structural Options



Options – Engineering Research

- ▶ A – Status Quo
- ▶ B – Merged Colleges; One Research Entity, Research at One Location
- ▶ C – Merged Colleges; One Research Administration, Research at Two Locations
- ▶ D – Two Colleges; One Research Administration; Research at Two Locations
- ▶ E – Collaborative Alignment; Two Colleges; Two Research Entities; Research at Two Locations + Increased Collaboration



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Option 3 – One College, Two Locations, One Administration

One college of engineering with faculty and staff at two locations. One dean with redefined administration positions.

- ▶ Maintain existing programs and offerings.
- ▶ Changes in access for students will be unchanged for programs. Access to college leadership is significantly limited.
- ▶ Employee changes (staff and faculty) will be minimal; budget driven.
- ▶ Changes in administration may include identifying new positions and/or redesigning existing positions, roles and responsibilities.
- ▶ No changes in use of facilities or technology are anticipated.
- ▶ Resources needed to (1) plan transition, (2) define unified mission, vision, and strategic goals, and (3) identify, prioritize, and optimize existing systems and resources.

Pros and Cons of Option 3

Pros

- ▶ A combined structure would save a portion of one of the dean's salaries and send that individual back to the teaching faculty.
- ▶ Potential economies of scale where staff can be shared effectively across multiple locations.
- ▶ Department Chairs empowered with more authority, potentially resulting in stronger departments. (Note: this may require a change to the bargaining agreement with the Union).

Cons

- ▶ Potential to cost more due to impact on structure of faculty supervision and mentoring.
- ▶ Potential to seriously jeopardize the ABET accreditation of engineering programs on both campuses.
- ▶ Ineffective Leadership: Leading two large organizations separated by such a great distance will be difficult for one individual to accomplish.

Option 4 – Collaborative Alignment

Two engineering colleges with separate engineering programs and separate administrations maintained at both campuses, with a quantitative focus on increased collaboration, course sharing, and efficiency measures to reduce costs.

- ▶ Enhance programs with inter-campus collaboration.
- ▶ Students would have access to a broader array of courses as a result of course sharing.
- ▶ Reductions in faculty positions could occur by sharing courses across campuses
- ▶ Enhanced use of distance delivery classrooms and laboratories.
- ▶ Admin changes will be minimal; budget driven.
- ▶ Front end investment is minimal with investment in distance delivery given facilities available in new engineering buildings.



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Pros and Cons of Option 4

Pros

- ▶ Potential to increase student enrollment as a result of collaboration and resulting programmatic strength.
- ▶ This structure has the potential to substantially reduce academic costs as a result of course sharing.
- ▶ Local supervision of faculty would be maintained in this model, with no need to delegate supervision to department chairs.

Cons

- ▶ Collaboration and course sharing are currently hindered by the different teaching schedules at UAF and UAA.
- ▶ Additional technology may be needed as the number of shared courses grows.
- ▶ Ensuring the quality of distance education can be challenging.



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Option C – Merged Colleges under one Dean; One Research Admin; Research at two Locations

Faculty, staff, and students at one location obtain research support from remote location. One dean. Single limited submission proposal.

- ▶ Changes to programs and offerings would be unknown.
- ▶ No change to facilities and technology.
- ▶ Staffing changes would be budget and productivity driven.
- ▶ One single research administration serving two locations.
- ▶ Students would have limited access, especially for undergrads; due to limited administrative support.
- ▶ Front-end investment includes program restructuring costs.

Pros and Cons of Option C

Pros

- ▶ Merging engineering research could allow all UA researchers access to more comprehensive services for proposal submission and grant management.
- ▶ This is a structural change that might satisfy some of those calling for more UAF/UAA interaction on research.
- ▶ Crystal clear order of authority, leadership, and decision making.

Cons

- ▶ Reduces income potential for UA engineering research because many grants have institutional limits (e.g., NSF MRI).
- ▶ Significant negative impacts on faculty morale as concerns or perceptions of unfairness take hold in the satellite parts of the university system.
- ▶ Minimal savings of administrative costs.

Option D – Two Colleges; One Research Admin; Research at two Locations

Faculty, staff, and students at one location obtain research support from remote locations. Two deans. Dual limited submission proposal.

- ▶ Minimal changes to program offerings.
- ▶ No change to facilities and technology.
- ▶ Staffing changes would be budget and productivity driven.
- ▶ One single research administration serving two locations.
- ▶ Students would have limited access, especially for undergrads; due to limited administrative support.
- ▶ Front-end investment includes program restructuring costs.

Pros and Cons of Option D

Pros

- ▶ Merging engineering research could allow all UA researchers access to more comprehensive services for proposal submission and grant management.
- ▶ This is a structural change that might satisfy some of those calling for more UAF/UAA interaction on research.
- ▶ Crystal clear order of authority, leadership, and decision making.

Cons

- ▶ Implementation challenges; for example different federally approved F&A rates.
- ▶ Faculty on one campus would be working under a combined research institute, but evaluated by the Dean on their local or home campus.
- ▶ Implementation would have little (if any) cost savings.

Option E – Collaborative Alignment

Two Colleges; Two Research Entities; Research at two Locations + increased collaboration

Research council + “Institutes without borders” to increase collaboration. Two deans. Dual limited submission proposal.

- ▶ Minimal changes to program offerings.
- ▶ No change to facilities and technology, access for students, or administration.
- ▶ Staffing changes would be minimal; budget driven.
- ▶ Front-end investment may include some costs for aligned collaboration.



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Pros and Cons of Option E

Pros

- ▶ The state’s best engineering research minds will be better enabled to work together collaboratively.
- ▶ Local customer service to each Principal Investigator (PI) maximizes their ability to focus on research and proposal writing, while minimizing the time they spend on administrative details.
- ▶ Reduced future redundancy in equipment, facilities, and faculty as enhanced collaboration between the two campus locations sparks fiscal creativity.

Cons

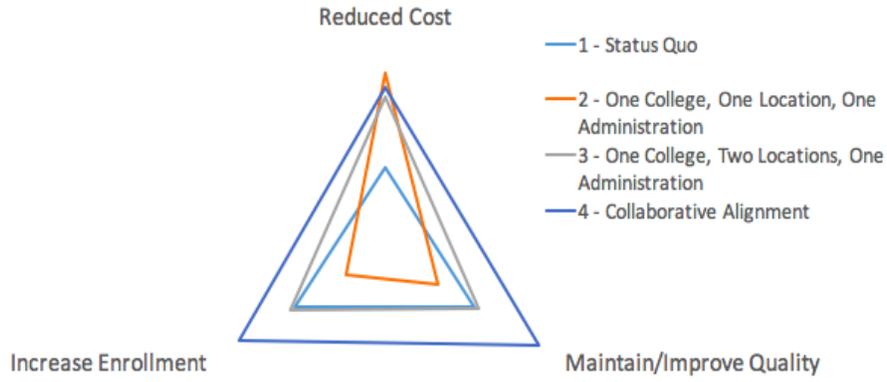
- ▶ Financial or other mechanisms may initially be required to incentivize collaboration.
- ▶ Maintaining a collaborative alignment will take a constant concerted effort from the research administration and the faculty at both campuses otherwise both campuses may slip back into the current minimally collaborative environment.



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Committee Qualitative Analysis

Evaluation of Structural Options



Q&A

**Strategic Pathways
Streamlining Engineering Education in Alaska**

August 17, 2016

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Options for Structuring Engineering Education at the University of Alaska

Executive Summary:

Earlier this year, the UA Board of Regents initiated the Strategic Pathways (SP) planning process, which involved the formation of Review Teams for several academic areas, including Engineering. The first meeting of the Engineering Review Team occurred in Fairbanks on June 20, 2016. Subsequent discussions continued throughout the month of July. This document represents the culmination of that Team's work on a comprehensive analysis of the various options for transforming engineering education in Alaska.

A continuing supply of new, home grown engineering professionals is vital to the state of Alaska. In recent years, the engineering industry and UA system have worked together to establish an initiative designed to dramatically increase the number of engineering graduates in the state. That initiative is mirrored in the Strategic Pathways goals, which aspires to "Increase graduates in the STEM fields from 38/1,000 to 59/1,000 (1.5 x increase)." The initiative is working, with the number of engineering graduates annually produced by the UA system more than doubling compared to ten years ago. The majority of these graduates go to work for Alaskan companies; they are in high demand and will continue to be for the foreseeable future. The potential cost of hiring engineers from outside Alaska is often high given the lack of education these engineers have in arctic engineering. This cost is not only for recruiting, moving, and training these engineers in arctic engineering, but there can also be a cost associated with substandard and inadequate designs due to lack of arctic engineering knowledge. Furthermore, engineers recruited from outside Alaska commonly only remain in the State for a few years before moving back to a warmer climate.

A foundation of this initiative's success is the high level of collaboration between UAF's College of Engineering and Mines (CEM) and UAA's College of Engineering (CoEng). This collaboration played an important role in securing new engineering buildings on both campuses, and has laid the groundwork for significant opportunities for increased efficiency.

It is in this spirit and collaborative atmosphere that the committee considered a number of different structural approaches for organizing the two colleges including:

- 1) Status Quo;
- 2) One College, One Location, One Administration;
- 3) One College, Two Locations, One Administration; and
- 4) Collaborative Alignment.

The relative pros and cons of these different options are outlined in great detail in the full report.

After a series of detailed discussions, the consensus of the committee is that Option 4, "Collaborative Alignment," is the right structural choice for the state of Alaska. Both campuses have large, strong, nationally accredited and well-run engineering programs which collaborate with each other, and effectively serve distinct markets and needs within the state of Alaska. While the committee developed several recommendations to enhance overall efficiency under this approach, it became clear that the other organizational structures pose too great a risk of damaging the significant progress that has been

made over the past few years towards meeting stakeholders' needs. This detailed analysis also revealed that external revenue to both engineering colleges is growing significantly, and the other options presented in this report would create significant risks to those revenue streams. By embracing two engineering colleges with separate engineering programs and separate administrations maintained at both UAF and UAA, while employing a quantitative focus on enhanced collaboration, course sharing, and efficiency, the Collaborative Alignment approach will maintain momentum, expand enrollment, and improve the overall quality of engineering education in Alaska. The creation of a Deans' council, composed of the deans and associate deans from the two engineering colleges, is proposed as an effective way to facilitate collaboration and promote efficiencies under this structure. This option best meets the charge and goals assigned to the committee because it will continue the current trend of expanding enrollment and awards that engineering education in Alaska is currently experiencing, reduce the cost, and maintain or improve the overall quality of engineering education.

Engineering research in Alaska is imperative because it is critical to solve key problems that the state of Alaska will face. Without this research the likelihood of catastrophic infrastructure failure will increase and many of the problems that we currently face will go unresolved. It is also a core part of the education process for students who are the future of our state. With that in mind the committee also evaluated a range of possibilities for organizing the administration of engineering research at UA. The options considered include:

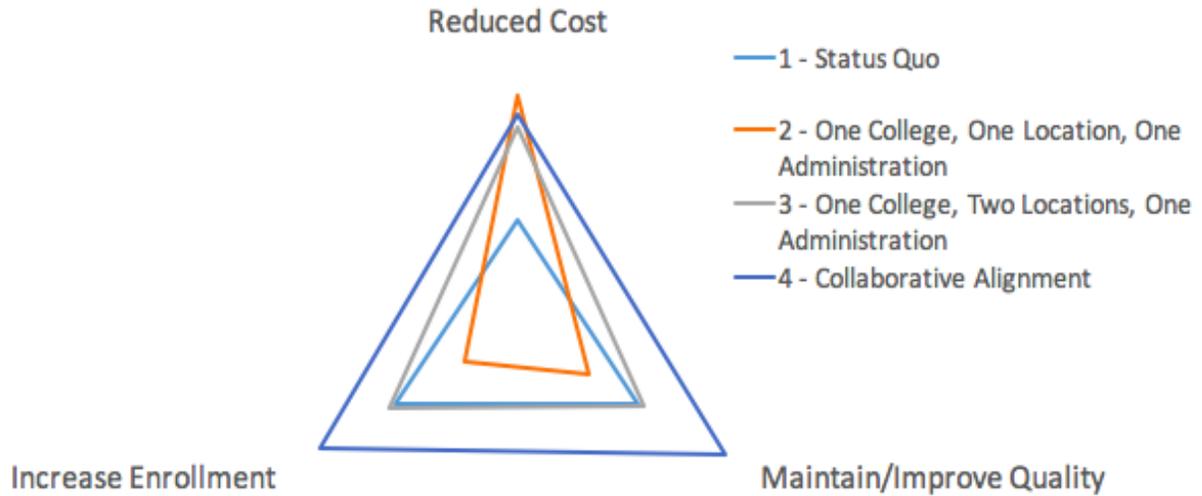
- A. Status Quo;
- B. Merged Colleges under one Dean; One Research Entity; Research at one Location;
- C. Merged Colleges under one Dean; One Research Administration; Research at two Locations;
- D. Two Colleges; One Research Administration; Research at two Locations; and
- E. Two Colleges; Two Research Entities; Research at two Locations + increased collaboration (Collaborative Alignment).

Given the significant research infrastructure and work which already exists on both campuses, the consensus of the committee is that Option E, Collaborative Alignment, is the right choice for the state of Alaska. Both campuses are actively engaged in research work specifically targeted at solving key problems facing Alaskans. For example, the Alaska Center for Energy and Power (ACEP) led from UAF, is making significant progress towards developing sustainable and cost effective energy solutions. Likewise, a team of UAA researchers is working to develop clean water and sanitation solutions to meet the needs of rural Alaskans. There are also a number of existing joint projects, where researchers from UAA and UAF are already working together to solve practical problems. With strong research programs at both colleges, our challenge is to build on these current successes without jeopardizing the revenue they represent. Therefore, the consensus of the committee is that Collaborative Alignment between the two colleges of engineering, two engineering research entities, and a newly created "Research Council" (in addition to the Deans' Council) will be the most effective approach to addressing current budgetary challenges.

The Research Council will be co-chaired by the Institute for Northern Engineering (INE) director and the associate dean for research at UAA. It will also include an equal number of researchers from UAA and UAF. By meeting on a regular basis, this council will expand collaboration and ensure coordination to maximize both overall efficiency and research revenue for the entire UA system, while creating an

exciting “think tank” atmosphere for utilization of existing expertise on both campuses to create new research innovations and opportunities.

Evaluation of Structural Options



Bigger is better regarding Triangle Size
Criteria were scored from (1) Very Unfavorable
to (5) Very Favorable.

Background:

Earlier this year the UA Board of Regents, initiated the Strategic Pathways (SP) planning process, which involved the formation of Review Teams for several academic areas, including engineering. The first meeting of the Review Teams, including the Engineering Review Team, occurred in Fairbanks on June 20, 2016. This document is designed to be a summary of the committee’s deliberations in response to various options proposed for transforming engineering education in Alaska.

Engineering Education Options with High-level Description of Structural Elements

	Status Quo (1)	One College, One Location, One Administration (2)	One College, Two Locations, One Administration (3)	Collaborative Alignment (4)
Brief Description	No-change scenario; current alignment and collaboration with two separate colleges at UAF and UAA.	One college of engineering in one location for the entire state of Alaska with faculty, staff and administration at a single location.	One college of engineering with faculty and staff at two locations. One dean with redefined administration positions.	Two engineering colleges with separate engineering programs and separate administrations maintained at both campuses, with a quantitative focus on increased collaboration, course sharing, and efficiency measures to reduce costs.
Program/ Offering Changes	None.	Eliminate one location.	Maintain existing programs.	Enhance programs with inter-campus collaboration.
Employee Changes (staff and faculty)	Minimal; budget driven.	Eliminate all employees at one location.	Minimal; budget driven.	Reductions in faculty positions could occur by sharing courses across campuses.
Changes in use of Facilities or Technology	None anticipated.	Repurpose facilities and technology at eliminated location.	None anticipated.	Enhanced use of distance delivery classrooms and laboratories.

Changes in access for Students	Minimal; budget driven.	Dramatically reduce student access to the remaining location.	Access to programs is unchanged. Access to college leadership is significantly limited.	Access to a broader array of courses would be facilitated by course sharing.
Changes in admin	Minimal; budget driven.	One single administration at one location.	May include identifying new positions and/or redesigning existing positions, roles and responsibilities.	Minimal; budget driven.
Front End Investment Requirement	None.	Resources needed to assess which college to eliminate, and wind down selected college. Multi-year teach-out process.	Resources needed to (1) plan transition, (2) define unified mission, vision, and strategic goals, and (3) identify, prioritize, and optimize existing systems and resources.	Minimal investment in distance delivery given facilities available in new engineering buildings.

Structural Options for Engineering Education, Pros/Cons, and Suggestions for Consideration:

- 1) **Status Quo:** No-change scenario; current alignment and collaboration with two separate colleges at UAF and UAA.
 - a. Pros:
 - i. Minimal impact on current CEM or CoEng operations and students.
 - ii. No need to coordinate course offerings or research activities.
 - iii. Continued level of program quality to the extent allowed by reduced budgets.
 - iv. No additional planning or implementation time required.
 - v. Predictable outcome if sustainable budget.
 - b. Cons:
 - i. Since it proposes no changes, this option does not address any of the efficiency, cost reduction, or quality improvement measures discussed in Strategic Pathways.
 - ii. Does not provide any effective mechanism for dealing with ongoing downward budget pressure at the campuses.
 - iii. Given ii. above, the Status Quo scenario is not a viable option, since adjustments must be made to account for reduced budgets.
 - iv. The result will be an unpredictable outcome if continuing budget reductions make this option unsustainable.
 - v. Missed opportunity for increased collaboration.
 - vi. Faculty recruitment and retention becomes more difficult if there is a sense that the colleges are not proactively dealing with budgetary pressures.

Considerations:

The Status Quo, do-nothing scenario is not realistic given the current mandates coming from the Strategic Pathways planning process in response to ongoing budget reductions at the campuses. This path forward would not allow the two colleges to maintain (let alone improve) the quality and accessibility of engineering education in Alaska.

For these reasons, both CEM and CoEng have already moved beyond the Status Quo scenario, making further discussion or consideration of this option a moot point. One member of the CoEng Advisory board noted that “collaboration between the two colleges is at an all-time high” since the two colleges’ advisory boards and deans are already working together effectively.

- 2) **One College, One Location, One Administration:** One college of engineering in one location for the entire state of Alaska with faculty, staff and administration at a single location.
- a. Pro:
 - i. Significant cost savings (state dollars).
 - b. Con:
 - i. Revenue from the eliminated location is lost, including tuition, research, and alumni giving. Some of this may be recaptured at the surviving location, but likely under 25%.
 - ii. This option will result in predictable enrollment declines and will not maintain/improve the quality of the remaining programs.
 - iii. Minimal alignment with Charge/Goal for UA Strategic Pathways due to the significant enrollment declines at the site of the eliminated college.
 - iv. There is a need (by Regents policy) to teach out any programs that are cancelled.
 - v. When UA engineering programs are eliminated the results will include:
 - 1. Less efficient in use of facilities.
 - 2. Negative community impact.
 - 3. Negative impact on faculty and staff recruitment.
 - 4. Reduced fundraising.
 - 5. Negative impact on Alaska’s need for engineers.
 - 6. Fewer students served.
 - 7. Negative impact on the quality of student experience.

Considerations:

While the committee considered this option, there was widespread agreement that, given the needs of the state of Alaska, this option is not viable. Shutting down either site throws away decades of investment in hundreds of students, alumni, and faculty, who are place-committed; and hundreds of millions of dollars in buildings and equipment. Shutting down either site hence does not help meet the needs of the state of Alaska.

As a result, following the June 20th 2016 meeting, the University of Alaska disseminated a press release (dated 6/20/2016) which stated:

“Several other key points made in the early review group discussions included clear understanding and agreement that:

- The engineering program will exist at both UAA and UAF”

The committee, therefore, dismissed this option from further consideration.

A more extreme example of a one college of engineering option would be training Alaskan engineers via pure distance delivery. Distance delivery is a means to reach students in every part of the state, but distance delivery is a poor way to deliver hands-on engineering courses, especially labs which require access to equipment--for example, a three-phase high voltage power lab is difficult and dangerous to ship to students. It is also challenging to achieve good degree completion rates via distance: some students do very poorly via distance.

Our specialized accreditation organization ABET indicates "The vast majority of ABET-accredited programs are offered mostly on-site." A few ABET accredited programs are entirely distance, but developing such a program to meet Alaska's needs would require significant investment, and may not be possible for some engineering disciplines.

- 3) **One College, Two Locations, One Administration:** One college of engineering with faculty and staff at two locations. One dean with redefined administration positions.
 - a. Pros:
 - i. A combined structure would save a portion of one of the dean's salaries and send that individual back to the teaching faculty.
 - ii. Collaboration might be enhanced through centralized leadership.
 - iii. The remaining college would have a common mission, vision, goals, and objectives with consistent expectations.
 - iv. Potential improved speed for business decisions
 - v. Potential economies of scale where staff can be shared effectively across multiple locations.
 - vi. Unified recruiting, branding, and marketing.
 - vii. Greater Depth and Breadth of resources might be possible in a single administration.
 - viii. With strength and diversity comes a greater ability to attract talent and resources - Students, Staff, Faculty, Grants, Alumni, Industry Partners, and Donors.
 - ix. Single point of contact (at the highest level; i.e. dean) for community outreach, business, and industry.
 - x. Department Chairs empowered with more authority, potentially resulting in stronger departments. (Note: this may require a change to the bargaining agreement with the Union)
 - b. Cons:
 - i. Potential risk to quality of program at the campus perceived to be a satellite.
 - ii. Risk and time in aligning to a single mission, vision, goals, and objectives with those of UA, UAF, and UAA.
 - iii. The dean has the potential of answering to two provosts and aligning with different sets of constituents at the two locations.

- iv. Potentially increases dean workload by double (or more) unless roles and responsibilities are reassessed and redistributed to associate deans or department heads.
- v. Internal complexity of long-distance management and related requirement for additional travel resources.
- vi. Potential employee dissatisfaction and low morale if management is not excellent and responsive at both locations.
- vii. Risk of dean as a figurehead as opposed to faculty supervisor and lead financial/program manager.
- viii. Potential to cost more due to impact on structure of faculty supervision and mentoring.
- ix. Reduced community outreach by the dean at satellite campus (e.g. campus where dean does not reside locally).
- x. Reduced access to the dean by business and industry, and students and staffing.
- xi. High risk to colleges with poor management due to single point of administrative failure combined with the challenges of managing at a distance.
- xii. May build unrealistic expectations of increased efficiency that would be hard to realize.
- xiii. Common mission and vision may not adequately address the unique differences of our communities.
- xiv. Potential risk for unsuccessful implementation: it is difficult to accurately predict the final structure and overall impact of this approach.
- xv. Risk to ABET accreditation: Perhaps the most significant issue with this approach is that it has the potential to seriously jeopardize the ABET accreditation of engineering programs on both campuses. ABET specifically requires that, "Institutional support and leadership must be adequate to ensure the quality and continuity of the program.", and one leader stationed more than 300 miles away from one of the two campuses would likely be viewed as inadequate.
- xvi. Inadequate Administration: Currently, there is only one administrator or "manager" at each campus who serves in each respective deans' position. If we eliminate one of these positions, there will be no local administrative leadership at one of the two locations. Most other higher education systems have two layers of management, using supervisory models that include department heads or chairs. However, due to the increased workload involved, those chairs are paid at a considerably higher rate than chairs in the UA system. Were we to enable department chairs to supervise faculty at UAA CoEng, we estimate there would be an additional labor cost of approximately \$350,000 per year. A comparable cost would be required to implement placing department chairs in a supervisory role on the UAF campus. This approach would be more costly than our current system and the union contract bars UA faculty chairs from assuming any managerial roles with respect to other faculty.

- xvii. Significant increase in travel expenses. The remaining dean would need to spend significant amounts of time and money travelling back and forth between the two campuses. Three or four campus visits a month would create an annual cost of approximately \$20,000. Video conferencing could be used in some cases; realistically, however, some face-to-face meetings would still be required.
- xviii. Under the current system both deans plan to reduce their working hours in the summer time in order to save money during a time of reduced work load. For FY17, that approach would save approximately \$25,000. However, this cost savings would likely be impossible if the colleges are combined.
- xix. Ineffective Leadership: Leading two large organizations separated by such a great distance will be difficult for one individual to accomplish. The result will likely be one over-stretched, ineffective leader, with a number of serious consequences for both campus locations including:
 - 1. Student customer service would likely decline. In some cases, students want or need to speak with the dean, and this proposed structure would make that much more difficult.
 - 2. An inability to effectively respond to and properly manage Title IX complaints. Compliance has already become a serious problem in the UA system, and this proposed structure would likely exacerbate the problem.
 - 3. Assurance of basic safety and security for the two campus facilities. This would be particularly challenging for laboratory safety, given the hazardous materials that are used in some engineering laboratories.
 - 4. Ineffective oversight of financial transactions and use of restricted funds.
 - 5. Some tasks are time constrained. For example, per the union collective bargaining agreement, the dean is given one month to complete faculty annual evaluations. One individual completing these tasks for both campuses in the time allowed would be challenging.
- xx. Increased challenge hiring an effective dean: Managing both campuses would represent a roughly 100% increase in workload for a single dean. Given that the UA system already struggles to hire effective engineering deans, this structure would make it even more difficult to hire and retain effective leadership. Given that most people are unwilling to double their workload for the same salary, it would also likely lead to higher personnel costs.
- xxi. Risk to tenure and promotion process: Each dean is responsible for reviewing faculty input and making tenure and promotion recommendations. At most institutions, the dean's input carries significant weight towards this roughly three million dollar decision. Given the great distance between the two campuses, it will be difficult for one individual to get to know all of the faculty well enough to make wise decisions on individual cases.

- xxii. The campus location that would not have a resident dean (in effect, a “satellite campus,”) would likely become viewed as a lesser quality program. That perception would have a number of serious consequences:
 - 1. It is already difficult to hire talented faculty members willing to stay in Alaska long term. The perception of a “second class” campus will exacerbate that problem.
 - 2. Retention of the existing engineering faculty will likely become challenging. It is important to realize that most engineering faculty members can find employment in industry or at other universities. The perception that Alaska is divesting its focus on its engineering programs will likely lead to some top faculty members finding alternative employment. In July of 2016, two engineering faculty members on the UAA campus resigned effective immediately; as the academic hiring cycle begins again in late fall, the rate of resignations will likely accelerate if the two colleges are combined.
 - 3. Research revenue and tuition revenue will likely fall as the overall perception of the “satellite campus” declines. Just a 1% drop in enrollment and, therefore, tuition revenue, would represent a loss of \$53,000.
- xxiii. Coordination and outreach to the campus’ local communities will likely decrease. Community leaders need to be able to deal directly with college leadership, and one dean cannot be as effective in two separate locations as two deans.
- xxiv. Development revenue to the combined college will likely fall relative to that of the two separate colleges. Most donors give to one college or the other because they have a sense of connection to that individual college. Alumni have already expressed concerns with respect to a combined college and the loss of identity. In FY15, the combined giving to both colleges totaled more than \$5 million.

Considerations:

Some believe this approach might appear to save money, based on the UA “nursing model” of one central administration and a variety of community locations. However, nursing is fundamentally different from engineering. Although nursing includes one main location with a number of much smaller community locations, by contrast, both engineering campuses are large, complex organizations with their own unique strengths and character. Both campuses have large complementary academic programs and unique research strengths, making them much more difficult to manage from a central location as in the “nursing model”.

Again, more closely examining the nursing model, nursing education is led from and centered in Anchorage because that’s where the large hospitals and critical mass of health-related infrastructure is located. Likewise, although the majority of engineers and engineering companies are located in Southcentral Alaska, there are significant customer bases for engineering education in both Anchorage and Fairbanks. These differences mean that the nursing model does not translate well to engineering education.

The state also has significant investment in engineering infrastructure at both campus locations, and engineering has been identified as a critical need for the state of Alaska. Both programs are successful and are currently meeting key educational needs for different constituents and stakeholders who are vastly separated by distance, culture, and needs. Therefore, the committee concludes that potential benefits of this approach are far overshadowed by the costs and potential risks to the engineering programs at both UAA and UAF.

- 4) **Collaborative Alignment:** Two engineering colleges with separate engineering programs and separate administrations maintained at both campuses, with a quantitative focus on increased collaboration, course sharing, and efficiency measures to reduce costs.
- a. Pros:
 - i. Greater Depth and Breadth of resources available to students at both campuses.
 - ii. Opens the door for collaboration between people who haven't collaborated before.
 - iii. Serves the diversity of unique community, cultural, geographic and business interests.
 - iv. Potential for better degree completion rates due to enhanced course availability.
 - v. Potential to increase student enrollment as a result of collaboration and resulting programmatic strength.
 - vi. Better perception of a quality and collaborative program; attracting more students and improved system-wide private fundraising.
 - vii. Improved employee morale upon successful implementation.
 - viii. High likelihood of successful and fast implementation.
 - ix. This structure has the potential to substantially reduce academic costs as a result of course sharing.
 - x. Unified recruiting, branding, and marketing through collaboration.
 - xi. Collaboration: Increased collaboration between UAA and UAF engineering faculty would have benefits beyond shared teaching, generating new ideas and helping to facilitate more collaborative research and co-supervision of graduate students.
 - xii. Local supervision: Local supervision of faculty would be maintained in this model, with no need to delegate supervision to department chairs (currently not allowed by our structure, since department chairs are not administrators, but maintain their faculty status) or other local administrators.
 - xiii. Consistent sharing of curriculum between engineering programs would likely result in better curricular alignment between the UAA and UAF programs.
 - xiv. Course sharing: A well-developed system of course sharing would improve program availability on both campuses by allowing UAA programs (Geomatics, for example) to be delivered in a seamless fashion to UAF students, and UAF programs (Petroleum Engineering, for example) to be delivered to UAA

students. Course sharing will also result in increased collaborations between faculty members at both campuses as the faculty become better acquainted.

b. Cons:

- i. Requires effort, planning, and resources for successful implementation.
- ii. Collaboration and course sharing are currently hindered by the different teaching schedules at UAF and UAA.
- iii. Faculty will need additional training and access to the appropriate teaching facilities and instructional systems in order to deliver course materials to students at multiple sites. Increased support for teaching assistants may also be required.
- iv. Distance education may reduce interaction between instructors and students, depending on implementation plan.
- v. Additional technology may be needed as the number of shared courses grows.
- vi. Ensure quality of distance education: An expanded system of course oversight may be needed to ensure the quality of distance-delivered course materials. However, this concern and the challenge of interaction between instructors and students could be alleviated through the creation of a Deans' council. That body could be composed of the deans and associate deans from the two engineering colleges, and would meet regularly to discuss these issues and facilitate collaboration.

Considerations:

Collaborative Alignment between two colleges which maintain local management, but closely cooperate towards common goals has the potential to create significant efficiencies, without the risks inherent in the other possible structures. This option would allow both campus locations to decrease their dependence on state resources, without risking and, in fact, potentially growing, the current revenue streams which currently exist. Through the sharing of courses, enhanced collaboration and coordination, the overall cost of engineering education in Alaska would be reduced.

Summary:

While the committee considered four (4) options for the overall structure of engineering education in Alaska, the consensus of the committee is that a strategy of Collaborative Alignment makes the most sense. That strategy embraces two engineering colleges with separate engineering programs and separate administrations, maintained at both UAF and UAA, with a quantitative focus on more collaboration, course sharing and efficiency measures to reduce costs. The creation of a Deans' council, composed of the deans and associate deans from the two engineering colleges, would be an effective way to facilitate collaboration and promote efficiencies under this structure.

Options for Engineering Research at the University of Alaska

Background:

Engineering research represents a key mission to both colleges and plays a critical role in Alaska's economic, industrial, and environmental development. UA engineering research contributed to development of the Trans Alaska Pipeline System, development and improvement of infrastructure in urban and rural Alaska, long term environmental planning and management, and countless other areas necessary for progress. Our engineering research focuses on issues observed throughout Alaska, and UA engineering researchers are the leading source of cold region academic expertise in the nation. Moreover, externally funded research is a significant and important source of revenue for the University of Alaska. Expansion of engineering research funding at both UAA and UAF would help alleviate the current pressure on the UA budget.

Individual engineering researchers at UAF and UAA have been successfully collaborating with each other for years and the quality and quantity of engineering research conducted in the University of Alaska system could be further enhanced through increased collaboration. As part of the Strategic Pathways process, this section seeks to present the "pros" and "cons" of Five (5) options (A to E) for advancing research collaboration. It also identifies modes, mechanisms, and/or obstacles to be considered with respect to promoting increased research collaborations between these entities.

Identification of Research Options:

At the 6/20/16 Strategic Pathways meeting, the Engineering focus group identified five potential modes of research collaboration and four potential models for overall organization of the two colleges as described previously. In this section, research options are discussed using nomenclature designed to be consistent and compatible with the overall organizational modes for the engineering Colleges as a whole. For these purposes, Engineering Education Option #4, representing two separate colleges with enhanced collaboration, is subdivided into one option with a merged research entity (D), and one option with separate research entities (E).

Engineering Research Options with High-level Description of Structural Elements

	Status Quo (A)	Merged Colleges under one Dean; One Research Entity; Research at one Location (B)	Merged Colleges under one Dean; One Research Admin; Research at two Locations (C)	Two Colleges; One Research Admin; Research at two Locations (D)	Two Colleges; Two Research Entities; Research at two Locations + increased collaboration (Collaborative Alignment) (E)
Brief Description	No-change scenario.	Faculty, staff, and students conducting research at only one location. One dean. Single limited submission proposal.	Faculty, staff, and students at one location obtain research support from remote location. One dean. Single limited submission proposal.	Faculty, staff, and students at one location obtain research support from remote locations. Two deans. Dual limited submission proposal.	Research council + “Institutes without borders” to increase collaboration. Two deans. Dual limited submission proposal.
Program/ Offering Changes	None.	Research eliminated at remote location. Loss of some graduate programs.	Unknown.	Minimal changes to program offerings	Minimal changes to program offerings
Staffing Changes	Minimal; budget driven	Eliminate all research staff at one location.	Budget and productivity driven.	Budget and productivity driven	Minimal; budget driven
Changes in use of Facilities or Technology	No change.	Repurpose all facilities and technology that support engineering research at one location.	No change.	No change.	No change.
Changes in access for Students	No change.	No student access for research at one location.	Limited student access, especially for undergrads, due to limited administrative support.	Limited student access, especially for undergrads, due to limited administrative support.	No change.
Changes in admin	No change.	One single administration at one location.	Single research administration serving two locations.	Single research administration serving two locations.	No change.

Front End Investment Requirement	None.	Resources needed to assess which research functionality to eliminate. Cost of repurposing equipment and facilities.	Program restructuring costs.	Program restructuring costs.	Some for aligned collaboration.
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Structural Options for Engineering Research, Pros/Cons, and Suggestions for Consideration:

(A) **Status Quo:** No change scenario (two colleges / two research entities).

- a. Pros:
 - i. Easy to implement. Requires no upfront costs.
 - ii. Functionally viable; the current system is working.
- b. Cons:
 - i. Does not optimize collaboration between the UAA and UAF campuses.
 - ii. Misses opportunities for growth
 - iii. Misses opportunities for increased visibility and status for Alaskan engineering researches.
 - iv. May lead to unnecessary redundancy in terms of equipment, facilities and faculty when collaborative opportunities are missed.
 - v. Without UAF and UAA research coordination and collaboration, both campuses might reach out to the same entity; creating confusion and “customer” dissatisfaction. The “customer” may feel negatively towards the overall UA system, since contacting the same entity might create the perception of a lack of communication between engineering campuses, thus causing a diminished quality of service.

Considerations:

Given the current climate of necessary budget reductions, the committee realizes that business as usual is not a viable option, and that both colleges can be more effective through enhanced alignment and collaboration.

(B) **A single College under one Dean; One Research Entity; Research at one Location:** Faculty, staff, and students conducting research at only one location.

As previously stated, since the single campus model does not meet the needs of Alaska, nor for that matter, the needs of students at both campuses, this will not be described in further detail. The committee unanimously recommends the rejection of this option.

(C) Merged Colleges under one Dean; One Research Administration; Research at two Locations: Research faculty, staff, and students at one lead campus obtain research support from the satellite campus. One dean. Single limited submission proposal.

a. Pros:

- i. Merging UAA and UAF engineering research into a single entity could bring the state's best engineering research minds together under the same tent.
- ii. Merging engineering research could allow all UA researchers access to more comprehensive services for proposal submission and grant management.
- iii. This is a structural change that might satisfy some of those calling for more UAF/UAA interaction on research.
- iv. Crystal clear order of authority, leadership, and decision making.

b. Cons:

- i. Reduces income potential for UA engineering research because many grants have institutional limits (e.g., NSF MRI). A merger would reduce the number of institutions in the UA system from 2 to 1 and reduce the opportunity for important grant funding proportionately.
- ii. Reduces creative opportunities for UA engineering research by dampening the status and entrepreneurial spirit of faculty at the satellite campus
- iii. Significant negative impacts on faculty morale as concerns or perceptions of unfairness take hold in the satellite parts of the university system.
- iv. If only one application for a grant is allowed because of institutional limits, the question of which location gets to apply becomes very prominent.
- v. Negatively impact research performance as enthusiasm and creativity at satellite campuses wane.
- vi. Minimal savings of administrative costs. At both colleges, interactions between the college level administration and the centralized administration is almost entirely remote (email or phone).
- vii. Still requires personnel situated on both campuses to provide adequate unit-level research administration. Functions such as proposal coordination and grant management are more effective when conducted by staff working face-to-face with researchers.

Considerations:

This option is clearly regressive and is not recommended by the committee.

(D) Two Colleges; One Research Administration; Research at two Locations: Faculty, staff, and students at one location obtain research support from remote locations. Two deans. Dual limited submission proposal.

a. Pros: All of the Pros of Option (C) apply

b. Cons: All of the Cons of Option (C) apply. Additionally,

- i. Implementation of this would be challenging since UAA and UAF have different federally approved F&A rates.

- ii. Implementation could be problematic since faculty on one campus would be working under a combined research institute, but they would be evaluated for promotion and tenure by the faculty and Dean on their local or home campus.
- iii. Implementation would have little (if any) cost savings since in some cases the staff (fiscal officer, travel support, personnel officer) also work to support the administration of the teaching function. Indeed, implementation would likely require marginally higher costs for the single research administration unit, as that unit would likely have to add staff in order to provide both campuses with the same level of service that the current campuses require.
- iv. Implementation could negatively impact the synergies that are developing on both campuses and could lead to lower research performance.

Considerations:

From a logistical perspective, this is equivalent to the University of Michigan providing research administration to the University of Kentucky. Those two institutions are actually slightly closer together geographically than the UAA and UAF campuses. That is relevant because providing excellent customer service on a daily basis over such a vast distance is challenging. If faculty members are not able to access adequate support, the real or perceived hurdles associated with conducting research will increase and research revenue to the state of Alaska could decrease.

(E) **“Collaborative Alignment” - Two Colleges; Two Research Entities; Research at two Locations + increased collaboration:** Research council + “Institutes without borders” to increase collaboration. Two deans. Dual limited submission proposal.

a. Pros:

- i. The state’s best engineering research minds will be better enabled to work together collaboratively.
- ii. Crystal clear order of authority, leadership, and decision making.
- iii. Simpler administration at the College campus. Local customer service to each Principal Investigator (PI) maximizes their ability to focus on research and proposal writing, while minimizing the time they spend on administrative details. This ultimately enhances the quantity and quality of research.
- iv. Reduced future redundancy in equipment, facilities, and faculty as enhanced collaboration between the two campus locations sparks fiscal creativity.
- v. A “matrix approach” – used by successful consulting firms – can be utilized in which a PI in any location can readily build the best possible team by pulling contributors from a range of locations, bringing the state’s best engineering research minds together to more successfully compete with researchers outside of Alaska. An added benefit will be reduced competition between UAA and UAF.
- vi. This organizational model could also employ an “Institute Without Borders” approach, whereby researchers from either entity could perform research as PI or Co-I through the other entity, to encourage collaboration and streamline administrative hurdles. This would require pre-negotiated, transparent, and fair financial arrangements.

- vii. Increased research collaboration would increase revenue opportunities and potentially open access to industries in ways not yet realized for both campuses as they work more closely together.
- b. Cons:
- i. Maintaining independent research structures will require concerted efforts from both campuses to diminish the historical “family first” attitudes present at each institution. Thus, financial or other mechanisms may initially be required to incentivize collaboration.
 - ii. Maintaining a collaborative alignment will take a constant concerted effort from the research administration and the faculty at both campuses otherwise both campuses may slip back into the current minimally collaborative environment. Such effort may require additional expenditure for travel between campuses and faculty workshops meant to build collaborations.

Considerations:

Any credible effort to increase collaboration will likely require some adjustment in research administration procedures (or business practices) to simplify mechanisms for establishing and conducting collaborative research projects (involving UAA and UAF colleges). “LEAN” techniques could perhaps be applied to achieve this end.

Financial incentives which encourage PI’s from one Major Academic Unit (MAU) to initiate collaborative research with the other MAU might also be helpful. For example, external research projects incorporating both UAF and UAA senior personnel might be established to grant a higher Indirect Cost Rate (ICR) return from the statewide administration, and individual researchers might be rewarded by a higher level of PI overhead return compared to non-collaborative projects.

Increased research collaboration will require a focused effort to learn more about each other’s expertise and to identify areas of mutual and/or complementary interest. To achieve collaborative efficiencies under almost any structural scenario, a survey of faculty research interests/expertise on both campuses should be completed. This would likely reveal areas of specialized expertise, common interests and experience which should prove valuable to the system as a whole.

Another strategy for encouraging collaboration is to establish a “researcher swap” program, whereby selected faculty from one MAU would spend time at the other MAU, and vice versa. While this can be done on an ad hoc basis in the performance of collaborative projects, a college-level sponsored program may increase collaboration to a greater extent.

Summary:

Engineering research programs at both UAA CoEng and UAF CEM are enjoying forward momentum and growth, and any proposed changes that might disrupt that momentum must be considered carefully. Constraining engineering research support to a single campus would likely jeopardize research revenues at the remote campus. Thus, we seek to develop a mechanism for increasing collaboration, while allowing each campus to retain the support staff they require to conduct research. Option E, “Collaborative Alignment” is a path to this positive outcome.

Currently the engineering research programs at both UAA and UAF are growing both in income and in stature. UAA's CoEng research performance is enjoying great momentum and improving rapidly as sponsored research awards has doubled in the past two years. Significantly, UAA CoEng's recent move into a new well-equipped facility, as well as the naming of an associate dean for research, has increased its physical and organizational capacity to conduct cutting edge research and has led to increased research funding. Likewise, INE's organizational infrastructure continues to build upon a very long history of success, and the Fairbanks faculty stands ready to occupy new research facilities in calendar year 2018 which will further enhance CEM research capabilities. Our challenge is to build on these current levels of success without jeopardizing the revenue they represent.

We believe that increased collaboration will enhance our collective research capacity, as it will allow each campus to contribute specific areas of expertise to mutual benefit. Increased research capacity at both campuses will increase revenue distribution and expands on additional revenue opportunities.

The consensus of the committee is that collaborative alignment between two colleges of engineering, two research entities and a newly created "Research Council" offers the most benefit at the lowest cost. The Research Council will be co-chaired by the INE director and the associate dean for research from UAA. It will also include an equal number of researchers from UAA and UAF. By meeting on a regular basis, this council will expand collaboration and ensure coordination to maximize both overall efficiency and research revenue to the UA system. As a first step, the Research Council would evaluate development of the Institute Without Borders concept for the two engineering colleges. If enacted, this model could reduce duplication of support effort on collaborative projects, thus decreasing the combined support workload.