Keeping New Mexico Tech Strong

by

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1 Background

At the May meeting of the Regents of New Mexico Tech, Regent Carpenter asked that the faculty point of view be represented at the retreat sessions scheduled in August of 2013. President Lopez asked that the material be focused. The faculty senate chair was directed to pull together material for the meeting, and invite an appropriate set of faculty to present and support the material. Those faculty are listed as the joint authors of this report.

Also in May of 2013, the NMT chapter of the American Association of University Professors (AAUP) completed a second survey of the climate among NMT faculty. The 2013 Faculty Survey was completed by 58 faculty. Graph 4 of the survey (Figure 1) shows that thirty-one % of respondents (18 faculty) were Very Seriously considering employment elsewhere. Those who selected this choice were assumed to at least already have CVs out (see footnote). Also forty-two % of respondents (24 faculty) were Moderately Seriously considering leaving1. (Moderately serious faculty would presumably respond favorably to a recruitment effort by another institution.) Also of concern, Graph 5 of the survey shows that 40 of the 51 faculty that took both the 2011 and 2013 surveys said their satisfaction was Worse or Much Worse in 2013 while none said it was Better or Much Better. Of course one cannot act to improve satisfaction without understanding the root of the problem. This committee felt that corrective actions would be more successful if we provided this report to expand on the survey and provide examples of the issues raised.

Further, New Mexico Tech is in the early stages of a new strategic plan. At least some of the corrective measures regarding faculty satisfaction are natural

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1The survey question defined Very Seriously to mean that one had been on interviews and Moderately Seriously that job ads were being scanned.
items to include in such a plan. In this regard it must be noted that these are suggestions of the committee and not the Faculty Senate (FS) as a body, because there have been no FS meetings since it was learned that strategic planning is under way. We expect these suggestions to evolve as broader faculty input is gathered.

This report is the result of eight weeks of planning, several meetings, e-mails and considerable review by the authors and others. We hope that it contributes to a helpful dialog.

2 Roles & Responsibilities in Governance

Direct communication between faculty and governing boards is relatively common in American higher education. Eighty-seven % of higher-ed institutions include faculty presentations on board meeting agendas, while twenty-seven % include faculty as governing board members, and fifty-six % include faculty on board committees. At New Mexico Tech it has not been customary for the faculty to report directly to the governing board of the Institute, but the authors of this report enthusiastically support this new initiative by our Regents.

It is also not unusual for the Faculty Senate to be involved in facilitating faculty/board communications. Some schools have a Regents-Faculty Conference committee, and indeed, such a committee could be formed at New Mexico Tech. In the interim, the ad-hoc committee that authored this report stands as the Regents-Faculty Conference committee.

It is traditional for faculty to have authority in areas of academic governance, while the President and Board are the financial stewards of the institution. This report does explicitly step into the area of financial governance, because the current financial constraints at NMT are impacting primary missions of the University.

3 Survey Discussion

3.1 Theme I: Salary inequity

The salary inequity compared to our sister institutions is presumably well known to our Regents. President Lopez explicitly warned the governing board of the salary problem in the discussion section of the 2012 audit report compiled by Atkinson of Albuquerque. To quote from page 13 of that report:

“The New Mexico Tech staff has been very cooperative in complying

Statistic from 2009 survey of college presidents by Association of Governing Boards of Universities and Colleges (AGB). Quoted by AAUP in its document “Best Practices in Faculty Board Communications”
with the budget cuts. The reductions in funds have required everyone to pick up additional duties to deliver the educational mission. However, pressure is beginning to grow for faculty and staff because no salary increases have been given.

Per graph 21 of the survey, faculty are also well-aware that they are underpaid relative to their colleagues at other New Mexico institutions. A comprehensive study was undertaken in 2012 by a committee of senior faculty. Two graphs from this report are included below as exemplars. The salaries indicated are for the 9-month academic year. (Externally-funded faculty can earn additional summer salary if their grants are written to support it.) The vertical bars in Figure 2 show the range within each department, while the dot shows the mean salary. Note that Associate Professors at Tech are paid less than Assistant Professors at our sister institutions, while Full Professors at Tech are paid similarly to Associate Professors at UNM. Electrical Engineering and Mathematics are shown, but the trend holds across departments (the full study is appended to this package.) Some have argued that the cost of living is lower in Socorro than Albuquerque; however, published analyses put the difference at roughly eight %, while the salary difference between NMT and UNM is roughly twenty %. Further, compensation is often interpreted as representing an employee’s value to their organization. Tech faculty are proud that we are the primary contributors to the widely-accepted quality of our school, and do not understand why this contribution merits less compensation than our UNM peers.

To avoid redundancy, this report does not reproduce every graph it refers to. The reader is referred to the full faculty survey for the graphics.


Some have stated that UNM and NMT are closer than they appear when the relative success of attracting summer salary by NMT faculty is factored in. We consider this argument specious. Faculty are contracted for 9-months. The choice by some to do additional work, and pay a large overhead to the institute to boot, should not be used as an argument against justifiable raises.
Figure 2: Average 9-month salaries in a department are shown as a dot. The vertical bars reach to the very highest and very lowest salary in the given department. At the time of this study, the NMT departments shown did not currently have any Assistant Professors in their ranks.

Figure 2 is presented to reinforce that the difference is both persistent and dramatic. In our view, the pressure our President mentioned in his management discussion has grown to the point where prompt action is necessary to address the salary problem. We will return to this point in the strategic plan section of
3.2 Theme II: Unrewarded growth

Figure 3 shows that Tech achieved its previous strategic goal of enrollment growth. The increase from 2001 to 2012 is from 1300 to 1800 students (roughly a forty % increase). The increase in student numbers was intended to increase the instructional portion of the budget with tuition and state formula funds. Sadly, owing to continuing cuts in formula funding, the effect of the increased student population was only to decrease faculty numbers and hold compensation flat. While the faculty understand why they obtained no benefit from student growth, it is a discouraging outcome.

All departments have been affected by the rising student population. The recently popular majors (e.g. Mechanical Engineering) have an influx of eager

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6Numbers are taken from the NMT common data set, which counts student population as Full-time + Part-time/3.
7Presumably faculty numbers and budgets would have contracted more in the absence of this growth.
majors. The Humanities and Sciences departments have a larger load in their required service courses. Figure 4 is from a 2010 study by the faculty-senate budget committee. It shows instructional budgets increasing for the growing majors (CSE, ME), that are roughly compensated by a fall in budgets for less-favored majors\textsuperscript{8}. It makes perfect sense to increase faculty numbers in highly impacted departments. However, in a zero sum university, strength in one area comes only by weakening another area. In recent years, the sciences and humanities have generally been weakened to allow the engineering departments to grow stronger in faculty numbers. While the faculty understand the arithmetic of a zero-sum game, it is not healthy for the institute. The science departments in particular are generally older than engineering departments and have had more time to establish nationally competitive research programs. As we will show, “robbing Peter to pay Paul” on the academic side leads to a weakening of research programs that have been established over decades.

\textsuperscript{8}The budget committee has funding over time data for all departments. We omitted from this graph departments who remained essentially flat over time.
Figure 4: Academic budgets were growing from 2001–2007. Tech entered zero-growth mode in 2007 so that growth in departments with high student demand (Mech. Eng, Comp. Sci. and Mgment) came at the expense of contraction in Arts and Sciences (Biology, E&ES, and CLASS).

The hiring freeze of recent years has of course lead to a rising Student to Faculty Ratio (SFR). As shown by the blue bars in Figure 5, this ratio increased from a historical average of roughly 12:1 to 14:1 in the past three years. Figure 5 shows two ratios. The smaller SFR (red bars), has increased from roughly 11:1 to 12:1. The red bars represent total students over total faculty, including part-time instructors and non-tenure line faculty. The blue bars count only tenure-line faculty. We do not demean the talents or importance of our non-tenure-line peers. We make the distinction between contingent and tenure-line faculty in our analysis because the research and service missions of NMT are primarily served by tenure-line faculty, and the increasing ratio is harmful to these missions. Further, low-student faculty ratios are one of the distinguishing

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9 This smaller (red) ratio is the one reported in Tech’s common data set.
features of NMT, are very important for strong student outcomes, and are also an excellent student-recruitment tool.

The strongest evidence currently available for the contention that decreasing tenure-lines and increasing student numbers are unhealthy for research can be found in Figure 6, which graphs external funding vs. time. The bottom line here is that the red-bars, representing faculty grant expenditures, have been falling since 2011.

The graphs in Figure 6 show restricted funds expenditures each year. EM-RTC (dark blue bars) consistently dominates these expenditures every year. Note that restricted funds expenditures generate substantial overhead for the University. The red bars represent total faculty grant expenditures in all departments which include Langmuir, the Cave & Karst Institute and the IRIS/PASSCAL facility. The goldenrod bars are Tech’s several “bureaus”, such as Geology and Mines (PRRC and Tech Transfer are also included here). The turquoise bars are...
attributed by Tech’s restricted funds accountants to various Vice Presidents. In general, the VPRED is raising most of this money, though recently the VPAA and the VPSUR have started to contribute substantial grant lines as well.

While EMRTC appears to dominate the funding picture and they are an extremely faithful and valued contributor to Tech’s success, faculty typically pay in excess of 50% overhead on their funding while EMRTC pays a rate closer to 15%. Thus, the much smaller red-bars for faculty (and Bureaus and VPs) represent at least as large a contribution to institute overhead as does EMRTC. One should also note that faculty and bureau funding lines are the most stable over time.

Note the substantial drop in external contract expenditures between 2011 and 2013 in three of the four chart categories. All are familiar with the increasing squeeze on funding agencies at the national level, and the dramatic drop in funding for the EMRTC cluster of activities (blue bars) is likely attributable to these cuts, particularly in defense areas. However, we propose an additional, local factor to consider in analyzing the drop seen in faculty restricted funds expenditures since 2011. Since grants are funded in typical 3–4 year cycles, a drop in successful grant proposals will show up a couple of years later as a loss of external funding. The drop in funding over the past two years is consistent with an expectation of less funding success by smaller numbers of tenure-line faculty with larger work-loads. If our theory is correct, this number will not recover until at least a few years after faculty numbers recover.
Figure 6: External funding over time (in millions of dollars). EMRTC (blue bars) represents EMRTC, Playas, IERA and ICASA. Bureau (goldenrod) includes Bureaus of Geology and Mines as well as PRRC. Red bars are all faculty across campus, while turquoise bars are attributed to various VPs, primarily the VPRED, but also VP Finance, VPAA and VPSUR. Note that external contracts are much larger than the bars as these only denote expenditures each year rather than total contracts.

Figure 7 shows the composition (and total numbers) of tenure-line faculty. Note that numbers are slightly down in recent years, and that the numbers of younger faculty have fallen off. Any organization with a hiring freeze will tend to age in place, so this increasingly top-heavy faculty structure is not a surprise. However, there is a vitality of younger faculty that is important to maintain.
Figure 7: The red bars show total (tenure-line) faculty at all ranks and show a gradual decrease over time. The yellow and two blue bars sum to the red bars and give the breakdown by faculty rank. The effect of the hiring freeze is seen in an increase in average academic rank of remaining faculty.

Figure 8 shows total faculty salary budget over time (red bars) and total Tech salary budget minus the EMRTC budget (blue bars). The blue bars include salary for tenure-line faculty, instructors, administrators, and support staff. They also include salary for Tech’s affiliated organizations, such as the Bureau of Geology, PRRC and IRIS-PASSCAL. However, the blue bars do not include EMRTC, ILEA, ICASA and Playas (which collectively add about another $10,000,000/annum) One notes that Tech’s total salary budget decreased noticeably in the lean years after 2008. Somewhat surprisingly, in 2012 it bounced back to prior levels. The faculty salary budget however, has not recovered\textsuperscript{10}.

\textsuperscript{10}Data for this figure was obtained from importing Tech’s salary data into Excel and applying various filters based on job title and reporting structure.
Figure 8: Total tenure-line faculty salaries (red bars) have continued to decrease since the recession of 2008. The blue bars represent total salaries in all faculty, staff, management and affiliated organizations (except EMRTC). Note that the higher blue bar in 2012 represents an increase in salary expenditures entirely outside of faculty ranks.

In addition to pay, faculty have expressed concerns over student quality. Faculty surveyed had a general sense that our students were increasingly poorly prepared and needed more, not less, of our attention. Data on sophomore retention and 6-year graduation rate were pulled from Tech’s common data set and Figure 9 shows a ten-year trend. Given the generally lengthy teaching experience of Tech faculty and the broad perception of weaker incoming students, our committee expected to see a detectable drop in retention or graduation rates, yet the data show essentially no change over the past decade. We can speculate that the recent Department of Education grants and related efforts are playing a role in preventing the declines that would be expected based on increasing student-faculty ratios.
Figure 9: Student retention and 6-year graduation rate show no decrease over the past decade.

3.3 Theme III: Weak shared governance and opaque processes

The survey clearly shows a concern with transparency. Many faculty perceive capricious management decisions. Faculty are aware that management may work with undisclosed data, but a lack of communication of clear principles behind important decisions contributes to a sense that management is improvising. Many of the decisions at New Mexico Tech that are least popular with faculty are presumably driven by a lack of funding. While Tech needs to work on the funding as well, transparency, in-itself, costs (relatively) little.
Theme III appears dramatically on the first and third lines of Graph 22 of the survey. On the first line of Graph 22, Eighty-eight percent of faculty selected that the administration was not responsive or barely responsive to its faculty. On the third line, only a tiny fraction of participants agreed that administrators worked together with faculty to resolve issues openly and fairly.

Also, in graph 12 of the survey (reproduced as Figure 10 in this report), only eleven % thought faculty had input on most matters, while forty-eight % thought that shared governance was either cosmetic only or non-existent (they selected None in answer to the question). In what follows we will provide some examples that may be behind this perception of weak shared governance.

The management issue also appears in Graph 19 of the survey (Figure 11), particularly in the weak showing of Academic Affairs (AA). In fairness to Academic Affairs, they are the administrative department with the most extensive faculty interaction, and thus they are the source of the majority of the “no” answers that faculty with issues get. The permanent residence of AA at Tech is between a rock and a hard place. Nonetheless, there are reasons for the concern about capriciousness.
Figure 11: Satisfaction with support obtained from various administrative divisions of the institute. Scales range from excellent (deep blue) to disappointed (light turquoise). The orange colored region is for “does not apply/do not know”. SPRD is a new office at Tech under Academic Affairs. Most faculty did not recognize its acronym, or by its official name (Strategic Planning & Research Dept), accounting for a large N/A bar.

3.3.1 Undefined hiring process

Hiring is a very significant contributor to faculty dissatisfaction. There appears to be no institute-wide hiring plan, nor are there clear criteria (that faculty are cognizant of) for when a new position will be created or a departure replaced. Negotiations are done individually by departments with the VPAA. The lack of published and consistent criteria leads to a sense that a decision is made and then ad-hoc criteria are used to justify it. For example, Physics was told it could not regain a lost position until it grew its graduate program (like E&ES), while E&ES was told it could not replace a position until it had more undergraduate majors (like Physics). Often, Academic Affairs promises a new or a replacement position, then fails to deliver\textsuperscript{11}. Faculty do understand that continuing budget troubles can be behind failed promises, but repeated disappointments compound over time and erode confidence in the AA office.

A more troubling facet of hiring is seen when faculty searches are cancelled after advertisements are out, or after interviews have begun\textsuperscript{12}, or after a short list has been generated, or in rare circumstances after a verbal offer has been

\textsuperscript{11}CLASS was promised a writing/composition tenure line in 2012, then it was taken away. 
\textsuperscript{12}In 2013, CLASS lost a visiting professor position after applications were received, while EE lost one of two tenure-line positions after interviews had already begun.
made\textsuperscript{13}. While Tech is not legally liable for closing a position before a written offer has been tendered, it is poor practice. Closing a position with a verbal offer out or after interviews have begun damages our Institute’s reputation at a national level in the surprisingly small world of academe. Faculty have a hard time understanding that our budget situation could be so uncertain that commitment to a single position cannot last the few months it takes to make a hire.

3.3.2 Faculty retention efforts perceived as weak or non-existent

We appreciate that our president is philosophically opposed to layoffs at all levels; a humane and increasingly rare policy in modern America. We speculate that this policy, ironically, creates a disincentive to retain disgruntled faculty (as every departing faculty member frees up a valuable tenure line for redeployment).

We have observed instances in which faculty who bring an alternate job offer to the table, or express some dissatisfaction with our school are encouraged to leave. Faculty who bring warnings that continuing the \textit{status quo} can result in more departures have been told “the good faculty have already left”. This is not a strategy for long-term success. These verified anecdotes have spread widely through the faculty and in our view, contribute to having a mere nine \% of faculty who had anything positive to say about institute morale\textsuperscript{14}.

3.3.3 Academic decisions made without faculty input

Entire academic programs, such as the very valuable alternative licensure program, were discontinued without consulting faculty\textsuperscript{15}. Faculty who questioned this were made aware that the situation was more complex than it seemed, but proper procedure was simply not followed.

In April of 2013, (responding to an administration concern that incoming students would have few choices in classes) 100-level courses in CLASS were closed to seniors without consulting the chair of CLASS, who does not have enough faculty to provide courses for graduating seniors at the upper-class levels.

3.3.4 Long-running facilities issues are not addressed

Facilities problems can be expensive to fix. On the other hand, a sound physical plant is a fundamental need of any researcher (and an assumption by their funding agency). Figure 12 shows water pouring into a Biology lab as a result of burst pipes. (Severe flooding has also occurred for various reasons in PRRC, \textsuperscript{13}All of the above have happened to E&ES \textsuperscript{14}Line 2, Graph 22 of survey report \textsuperscript{15}This is unusual given that ALP was identified in Tech’s year 2000 “excellence in education” strategic plan document.
Materials, Chemistry and Physics labs.) The same biology laboratories were flooded multiple times over consecutive winters, resulting in lost specimens, lost data, lost research time and lost grants. Further, janitorial staff sent in to clean up were at risk as the flood routinely compromised multiple areas where pathogenic bacteria are stored and used. In another instance, in the Materials department located in Jones, flooding produced standing water in a room containing an energized electron microscope with a potentially lethal high-voltage power supply.

Every building has quirks, but long-term facilities staff can get to know and anticipate problems. For similar failures to occur multiple times in multiple buildings over years suggests that Tech’s facilities department has lost key expertise to allow it to be proactive. While insurance in principle pays for lost equipment, this does not account for the lost data, the large amount of faculty and staff time taken to file and track claims, and the opportunity cost of this distraction. Maybe faculty have not successfully communicated to management just how destructive these events are.

Figure 12: Flood in Jones Annex.
3.3.5 Administrator-created committees (and not faculty senate committees) advise on decisions

Another area which likely leads to faculty’s skepticism about management’s interest in their opinion are the Faculty Senate standing committees. For example, space-allocation decisions are made by various executives without an announced overall plan, transparency, or regard to the Facilities committee input.

The Faculty Senate also has a Benefits committee. It met extensively with providers in 2012 and recommended that Tech expand its pool as the best protection against ever higher rates. Our president disagreed with this idea and continued with the self-insurance policy. After the 2012 disagreement, the committee was removed from the decision loop in 2013. We do not dispute that our President has the last word in such matters, but the result certainly make the interested faculty feel that they had wasted a considerable amount of time for no purpose.

3.3.6 Closely held accreditation reports

Accreditation is a huge effort for the involved faculty and administrators, yet it is also an opportunity for us to reflect on our practice and improve. Several faculty have served on accreditation panels at other schools and we know that these panels usually have the best interests of the institution at heart. Accreditation reports should be circulated. At Tech, the last accreditation report (at least) was not. This wastes an opportunity for improvement, and gives less charitable faculty a sense that our management is hiding unpleasant facts from us.

3.3.7 Strategic planning is top-down

Finally, the most recent (2006) strategic plan had a large number of committees providing input. However, the coordinated document was written by a senior administrator with no opportunity for faculty comment at the draft level. The final document bore little resemblance to the faculty input. Modern management theory states that organizational plans without buy-in from those who must implement them have little value. An important goal of our committee in creating the document you are reading is to prevent this form of strategic plan management from recurring.

3.4 Case Studies

Here are two case studies of departments affected by the issues outlined so far:

\[\text{\textsuperscript{16}}\text{For the impressive list of participants, see http://www.nmt.edu/strategic-plans}\]
3.4.1 Case Study I: Department of Psychology

The Psychology department, home of Dr. Etsorn, father of Tech’s largest endowment, has been under the shadow of closure for several years. The VPAA stated in a faculty senate meeting in 2011 that the department was important, but actions continue to suggest otherwise. With three faculty members (at maximum), Psychology would not be expensive to fully staff. One professor did not retire until he was promised a replacement. Yet, after a search commenced, the position was withdrawn. This department is down to two faculty, one of whom is also eligible to retire. In order to increase its financial contribution to Tech and further justify a replacement position, the Psychology chair agreed to absorb NM Tech’s Master’s of Science Teaching into his job responsibilities. No replacement appears to be forthcoming.

Over Christmas break (December 2011), the only teaching laboratory for the department of Psychology was confiscated by the VPAA in order to create a new engineering laboratory. While the new engineering lab is a showcase for new technology and was much needed by our engineering school, the reassignment bypassed the faculty senate space-planning committee, and left the Psychology Department with no place to give laboratory instruction. Realizing they were on their own, the Psychology Department, aided by other faculty, located and equipped for their purposes an older laboratory in the Gold building vacated by a retired faculty member. Psychology spent a significant time and resources refurbishing the space to make it functional, and taught one semester in it, the summer of 2012. As the fall semester approached, the VP of Finance announced that the space was to be assigned to the Information Services Department (ISD). This reassignment, once again, bypassed the faculty senate space-planning committee, and the reassigned space is being used as storage at the time of this writing. Psychology does not deny the legitimacy of the needs of either engineering or ISD, but the assignment by executive fiat approach illustrated here is counterproductive (and wasteful of facilities budgets). Further, these sorts of events lead psychology department members (and their students) to feel their department is not at all valued and validates their fears of closure.

Despite having only two remaining faculty, Psychology currently has 25 majors and is graduating half a dozen students a year. The department believes it has lost additional majors due to its loss of faculty. The view that psychology remains a critical department in a science and engineering school is supported by national numbers showing high demand for psychology, neuroscience, cognitive science and a wealth of new disciplines between engineering, neuroscience, physics, biology, and computation. Further evidence that the department is valued by fellow chairs can be seen in the offer by the Biology Chair to defer a badly needed Biology hire to Psychology or to hire jointly in the field of neuroscience. The example of Psychology demonstrates that an endlessly-financially-

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17 MST is the largest graduate program on campus, and contributes about a million dollars a year to Tech’s operating budget.
18 See report entitled The Importance of the New Mexico Tech Psychology Department.
constrained environment can drive functioning and valuable departments into a
death spiral. At the point of dysfunction closure might appear a rational deci-
sion, when in fact the targeted department had been set up to fail by years of
focused prior neglect. This committee chose Psychology as a case study because
their small size makes them a *canary in a coal-mine* (e.g. a leading indicator of
what unrelenting financial stress can do to departments.)

3.4.2 Case Study II: Earth and Environmental Sciences (E&ES)

Earth and Environmental Sciences (E&ES) has generated on average 3 Ph.D.s
and 8 MS degrees for each of the past five years. E&ES is also the #1 producer
of external grants by an academic department. E&ES faculty spend roughly
$2,000,000/year in sponsored research (generating nearly a million dollars in
overhead for the institute). Further an additional $1-2,000,000/year of overhead
is generated by the IRIS PASSCAL Instrument Center.

National excellence is recognized with nationally funded centers. Just as
the vast NRAO complex is an outgrowth of a strong physics department and
the vision of Stirling Colgate, IRIS would not be here without E&ES, and in
particular without Professor Richard Aster.

Like several departments on campus, E&ES has an aging faculty. Sadly, fol-
lowing the deaths of two faculty members during the recent period of state con-
traction, negotiations with the administration failed to replace the lost faculty
members. Since then, additional faculty members have retired or departed with-
out replacement. Further, lack of confidence in Tech’s administration caused a
young faculty member who had already integrated well with E&ES, Physics
and Electrical Engineering faculty to resign suddenly. Finally, in May 2013, Dr.
Aster, arguably the most fiscally productive regular faculty member at New
Mexico Tech, became discouraged after years of fruitless negotiations to restore
his department to strength and accepted a position at a competing institution.

As department chair, Dr. Aster routinely suffered the frustrations of incon-
sistent New Mexico Tech processes. Lab fees built up as funding for field-camp
had a tendency to disappear year after year into the academic affairs budget
until all carryforward was “swept” in 2012, leaving the camp too short to pay
advances on lodging, repair/replace essential equipment, hire needed temporary
instructors, etc. A negotiation was needed to clarify the situation for a new
bookkeeper, and the E&ES department was accused of financial mismanage-
ment. (Dr. Lopez graciously stepped in and funded the shortfall so the 2013
field camp ran successfully, and a new accounting rubric will be developed to
eliminate this problem in future years.)

A litany of such problems is beyond the scope of this report. However,
Dr. Aster reported to interested faculty that the event that broke his resolve
to stay at Tech was when the salary for a staff member who supported their
computing operations was summarily eliminated. On the one hand one can
understand that the employee, paid jointly by GRC, AA and President’s funds
(which are all in short supply, especially GRC as a “special project”), seemed to be an easier termination to the administration than a faculty member (several of whom are also paid by AA + GRC). Dr. Aster’s counter-argument was that the department generated so much overhead (the defunded position provided support for both research and teaching computing) that there simply must be somewhere else to find the funding, despite GRC issues.

E&ES had tried previously to use student employees for computing support, but they generally lacked the needed expertise and available time. The department then tried to fund this position through grants, but the accounting, required by new NMT policies, to separate the employee’s time into research vs. teaching-related, was impractical. Dr. Aster saw the decision to cut the position as a final confirmation that management did not value the contribution of E&ES to Tech’s reputation or bottom line. While the computer tech was “the straw that broke the camel’s back”, the overwhelming issues in EES were about faculty and staff losses. The argument Dr. Aster continued to lose regarding faculty positions was as follows: E&ES faculty is thirty % reduced relative to 2008. The simple argument about why this is not a problem is that thirty % larger teaching loads in E&ES are a burden, but not a disaster. Given that E&ES is continually pushed to increase its undergrad enrollment, one can only conclude that continued failure to restaff E&ES is predicated primarily on precisely this viewpoint that undergrad enrollments and teaching loads should drive staffing. However it is dangerously misguided to only consider undergrad enrollments in evaluating departments. It completely ignores the needs of a research-oriented academic department and a research university. Research is a complex enterprise, and its ultimate value to society and advertising value for the host institution is notoriously difficult to quantify on a balance sheet (although the fiscal benefits of research overhead to NMT are clear). Research is also very expensive and is a partial driver behind the dramatic tuition increases at private institutions. However, research is what Tech features and is in fact our main product differentiator in an increasingly competitive marketplace. Research is what suffers first when departments are thinned, specialities are lost and collaborations are broken. Community colleges CAN deliver lower-level classwork less expensively than schools with research programs. Tech could continue to contract and indeed become a community college, or an undergrad only institution, and it would be much cheaper to operate. We believe that it is not the intent of management to foster the transformation of NMT from research school to undergrad-only institution, so we have highlighted Dr. Aster’s losing argument in this report.

\[19\] In addition, E&ES support staff is about half what it was in 2008, workload that has largely fallen on the shoulders of the remaining faculty.

\[20\] It is not even financially prudent, as the formula funding for graduate students is substantially larger than that for undergraduates.

\[21\] For an excellent discussion of “cost bundling” at research universities, see University Tuition, Consumer Choice and College Affordability … by the National Association of State Universities and Land-Grant Colleges (NASULGC).
4 Strategic Plan Suggestions

All themes of the faculty survey break down to two categories, lack of transparency and lack of funding. Given the current funding, Tech’s management is doing a good job keeping the institute solvent and within budget. However there are risks to low funding beyond bankruptcy, and this committee hopes that this report and the surveys that it amplifies have convinced you that the effects of low funding are a clear and present threat. If departments and research programs continue to contract, Tech will lose its greatest strength. Thus the strongest strategy needs to be directed at increasing the available budget so that Tech exits its current contraction mode. Accordingly, our first suggestions are about how to raise money, and the second set concern transparency and other issues. These are not exhaustive. They represent initial input from a panel of faculty that has been meeting for eight weeks.

4.1 Raise money beyond what the state legislature will provide

Faculty have begun to realize that the financial compression of the last few years was more than a bad patch but is actually predictive of the future. Accordingly we cannot afford to wait for New Mexico’s finances to improve, but must rather at least plan for the possibility that our budget will be flat or decreasing for the foreseeable future. The state of Colorado is “ahead” of New Mexico in this respect. The President of Colorado State University is forecasting zero state support (in Colorado) by 2020. Thomas Mortenson, in his article “State Funding: A Race to the Bottom,” writes, “Based on the trends since 1980, average state fiscal support for higher education will reach zero by 2059, although it could happen much sooner in some states and later in others. Public higher education is gradually being privatized.”

4.1.1 Focus on fund-raising and alumni relationship management

In business, Customer Relationship Management (CRM) is a well-known focus area and source of additional funding. New Mexico Tech has a very small development department and has not historically raised much money from its alums. When our committee began discussing this, it was suggested that a fund-raising professional could be required to “earn X-times their salary” to stay employed. However further study of this issue lead us to the conclusion that this is considered an unethical business practice and that the industry approved approach is to pay an outside professional with a proven track record a competitive rate (which might be rather high for New Mexico) and then evaluate

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22See Funding Public Institutions without Government Support in a Decade’s Time in your packet.
them carefully and let them go if a bump in fundraising is not forthcoming in a reasonable time.

Committing to increasing the bond with alums and asking for their help (and not just financially) should yield long-term benefits for Tech. On the non-financial side, good things happen when we go beyond activities at 49ers and invite distinguished faculty back to give presentations\(^{23}\) and creating alumni review panels (in the same mode, or perhaps as part of the industrial review panels that our engineering departments are creating). It is well known that increasing the “skin” that alums have into Tech via non-financial activities might well ALSO increase the likelihood that they would contribute to capital campaigns. While fund-raising is unlikely to ever yield a large fraction of Tech’s costs, targeting at least two new endowed chairs in the next strategic plan seems a very worthy endeavor.

### 4.1.2 Further develop a business incubator/model for faculty entrepreneurship

Across this country, large and small universities are realizing that home-grown intellectual property can be translated into considerable benefits for the school, the inventors and the society at large. Wise investments into patenting and commercialization of promising discoveries ought to be seriously explored and developed at NMT as one approach towards an increased independence from state funding\(^{24}\).

UNM has an active business incubator which, according to Van Romero, is modeled on Tech’s Research Park. UNM’s incubator is beginning to pay off for that University. Tech had a spectacularly successful experience with faculty entrepreneurship in Dr. Etscorn’s nicotine patch.

NMT should push the faculty entrepreneurship model it pioneered for New Mexico and make faculty generally aware of ways that the University could support them in patenting or starting a business.

There are already faculty on campus who are selling Tech-designed instruments internationally, and paying overhead on these sales. The overhead generated for this internal entrepreneurship is a clear win for Tech. Developing an infrastructure to encourage other faculty to sell tangible products (that are defensibly related to either the research, education or public-service missions of Tech) while using campus services could result in an entrepreneurial funding line for Tech.

\(^{23}\)Recently, distinguished alum Dr. Raul Deju returned and significantly assisted Tech with creating an entrepreneurial program.

4.1.3 Increase tuition

Figure 13: Blue boxes are undergrad room and board over time, while the shorter red boxes represent annual tuition. Tech is increasing tuition by $260/yr on average. This still makes us a very good deal compared to peer institutions in-state and out of state.

Figure 13 shows our tuition history. Tuition increases have averaged $260/yr for the past decade. The faculty recognizes the hardship imposed by tuition increases, but we think they should continue to be considered. Note that New Mexico Tech’s 2013 tuition is a full $1000 behind UNM, and when cost of lodging/food is taken into account, a year at Tech is $2000 less than a year at UNM. National studies have shown that reputation figures more heavily in student’s college choice than tuition. If higher tuition is needed to maintain Tech’s quality, it should be on the table. According to Tech’s Public Information Officer, our school still ranks an incredible 3rd in the nation in low cost for in-state education25.

4.1.4 Increase recruitment of out-of-state students

UCLA was listed in the tuition table to represent any of the University of California schools. UC’s all have the same tuition. Note that the cost to attend New Mexico Tech as an out-of-state student is comparable to the in-state fees in

\[25\text{Press release 6/4/2013, by Thom Guengerich}\]
<table>
<thead>
<tr>
<th>School</th>
<th>Tuition &amp; Fees 2012</th>
<th>Tuition &amp; Fees 2013</th>
<th>Tuition, Room/Board 2012</th>
<th>Tuition, Room/Board 2013</th>
</tr>
</thead>
<tbody>
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<tr>
<td>NMT (out-state)</td>
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</tr>
<tr>
<td>ENMU</td>
<td>$4350</td>
<td>$4560</td>
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</tr>
</tbody>
</table>

Table 1: Comparison of annual undergraduate costs at NM Tech and our sister institutions. Data at UCLA is presented to represent all University of California Schools for the purpose of discussing the recruitment of California students.

California. All of the UC’s are large and none provide the intimate environment of New Mexico Tech. Thus, students of a caliber to attend a UC campus represent a pool of students that might respond favorably to recruitment by Tech.

Tech also has several students from Alaska. The high cost of living in Alaska, the remoteness of much of Alaska (like New Mexico) and the substantial improvement in sun in New Mexico seems to make NMT appealing to students from this state.

4.1.5 Expand Masters of Science Teaching (MST)

Dr. Lopez has always been a strong supporter of MST, which has enabled NMT to do well financially, while doing substantial good for K-12 public education in the state. The Master of Science Teaching (MST) Program at New Mexico Tech was initiated in 1969 at the urging of the Governor of New Mexico to improve precollege science and mathematics instruction in the state. Since 1970, it has awarded 350+ MST degrees and $4,000,000 in scholarships. We currently have about 150 teachers seeking a MST Degree plus another 100 teachers taking courses for professional development. Due to formula funding by the state, for every $1000 of scholarship money spent on tuition and fees, NMT receives approximately $3500 in revenue (net, already accounting for instructor salaries). On average, MST brings $1,000,000/year into NMT’s unrestricted budget, yet it seems to be an orphan with no faculty assigned to it and its coordinator constantly begging for Master’s degree committee members. Based on the critical need for development of STEM teachers in New Mexico, there is no reason this program could not be expanded by a factor of two or more, bringing much needed additional revenue to NMT’s academic program while benefitting the

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26California is a WICHE state, meaning that up to 10 students can attend Tech at only 1.5X in-state tuition. For these students, Tech is a particularly good choice, and even an additional 50% tuition is helpful to our bottom line.
state. This assumes faculty are interested in teaching these additional courses.

4.1.6 Create more graduate scholarships

The discussion of expanding MST as a way of improving our finances applies to graduate programs in general. At least under current funding formulae, a small increase in graduate program enrollment can noticeably improve I&G funding. Of course graduate education (done with proper diligence) requires considerably more faculty time per student than undergraduate education, so graduate programs cannot be arbitrarily expanded. A survey of departments by the graduate division indicated that most would like to grow their graduate programs, but are constrained by funding from doing so. To grow graduate programs with the strongest possible students, it would be extremely helpful to have additional graduate scholarships available. The standard argument offered by the VPAA against this growth has been that the scholarships are an upfront expense and that additional formula funding comes with a multi-year time-lag. Given that over time this growth IS a net benefit to the health of research and Tech’s bottom line, it seems to the committee that such an investment might appropriately be funded by the Tech Foundation.

4.2 Increase transparency and other suggestions

4.2.1 Develop a participative strategic plan

Faculty feel we need a strategic plan. They want to participate extensively and on at least equal footing with the business side of the school. A senior faculty member who had participated in a strategic plan completed in the early 1990’s said

It was a very positive experience for two reasons. We generated a number of good ideas for Tech which, for a time, were implemented. Also, the experience of producing the plan lead to a wonderful collegial feeling between faculty, staff and management, a true sense that we were all pulling for the institute. For me, a positive appreciation for Dr. Lopez has persisted through the decades, and I am very sorry to see that the collegiality between faculty and administration has been lost in the interim. Precisely because faculty and administration no longer trust each other, I recommend that a neutral and experienced outside consultant to run the process is critical to a successful plan.

The plan should become the blueprint for hiring and targeted growth. Recognizing that not all areas can grow in the near term, it is probable that faculty would buy in to targeting strategic areas (as has been suggested by research VP Dr. Van Romero in the run-up to this report) and would support interdepartmental research collaboration and inter-disciplinary teaching.
4.2.2 Commit to shared governance

Shared governance should be written into the strategic plan. Some positive developments in this area are the recent commitment to create a Dean of Arts and Sciences parallel to the Dean of Engineering. Also, recent moves by the Regents to enhanced dialog with the faculty are very positive in this direction.

4.2.3 Improve IT support

The 2013–2014 budget includes $1,300,000 for software. Perhaps it is intended to improve IT support at NMT. The lack of such support is widely recognized, not just by faculty, but by essentially all staff who need ready access to data in the course of their daily work. Work flows at Tech are still often paper-based, impeding the efficiency of the bureaucracy and causing needless friction between support staff and their “customers” (students and faculty). The distress of support staff is understandable; they are working very hard and still get complaints from those they serve. However, from the customers point of view, the system does not work well. Reimbursements are slow, paperwork must be repeated multiple times, and required documentation seems to shift depending on who one asks. All agree that office automation (accounting for adequate input from those who are customers for Tech business processes) would be a great investment.

4.2.4 Strengthen Institutional Research Office and data collection efforts

The institutional data provided by the one-person institutional research office (and informally by numerous other offices) is critical for planning. While this committee was very pleased with the level of support provided around campus in gathering the data for this report, much of this data required original research. It was often in paper form and had to be laboriously entered into a spreadsheet. It seems basic data on staffing and salary trends should be easy to get to and part of management’s tool set. The faculty would probably support requests by management for better database tools, and even for additional staffing of institutional research functions.

4.2.5 Adjust salaries

We see no reason that the salary differences indicated in section 3.1 should be allowed to continue\(^2\). They cannot be fixed overnight, but fixing them should be a part of the strategic plan. A committee of senior faculty did a thorough review in 2013. They found that a few faculty were paid at competitive (for

\(^2\)It is assumed that staff are also undercompensated, but no formal review has been done by our committee.
New Mexico) rates, while most were well below our sister institutions as already documented. This committee took into account research and teaching productivity as indicated by annual reviews and came up with concrete adjustments for every faculty member. Their review has not yet passed the faculty senate or the council of chairs, but it is evidence of the sort of rational approach that is needed to make compensation more fair. It is worth noting that eliminating even the grossest inequities would add $1,200,000 to Tech’s annual compensation budget.

4.2.6 Extend staff tuition waivers beyond NMT

New Mexico Tech faculty and staff are grateful that they can take courses or have family members attend our institute with tuition waivers. This is no small benefit. It would be worth investigating whether UNM, NMSU and NMT could agree to honor tuition waivers for employees across institutions. This might cost Tech little, or even net more well-prepared students of University staff around New Mexico.

4.2.7 Restore alternative licensure (ALP)

There is ample evidence that New Mexico Tech graduates who step into science classrooms upon graduation are some of the strongest teachers in the state. Our President has defended this small program against those in the education departments of our sister schools and emerged victorious based on the relative quality of our graduates. Some efforts are already underway to find external funding to reinvigorate this program. The SPRD and Center for Graduate Studies have been working with the Psychology/Education Department to identify appropriate funding streams.

Faculty are aware of the recent challenges this program has faced but are strongly in support of finding a way to resurrect and strengthen this important service to our graduates and New Mexico.

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28It should be noted that this survey and its methods have not been widely exposed to faculty nor endorsed by department chairs. Also, the survey was not lush as its only goal was to bring compensation equal to an average of UNM and NMSU. We provide this information now to give an approximate sense of the size of a bill needed to fix the grossest problems.
5 Conclusion

Two cheers for democracy; One because it admits variety and two because it permits criticism. – E.M. Forster

Though there is much in this report that is critical of the status quo, faculty are fully cognizant of the strengths of our small school. The quality and collegiality of our faculty and the individual attention and research experience that we can offer our students are what has kept Tech special through the years. Our quality continues to be recognized nationally. We thank our administration and governing board for this opportunity for direct dialog, and we hope the substantial effort this committee has put into this document is of some benefit.

Our school is at a crossroads, but we are confident that if we act now to address the issues raised in this report and the faculty survey, we can maintain and grow the institution we love for the benefit of future generations of New Mexico techies.

\footnote{See NMT press release date June 4, 2013.}