The take-away message: The company we keep shows us in the top 25 most desirable small schools and makes NO MENTION of cost. However, NMT’s position remains in jeopardy; we cannot sustain the past level of performance on ever decreasing budgets.

Budget & Revenue Comparisons
Let’s look at the numbers and compare NMT’s overall revenue budget with in-state research universities along with comparably sized smaller colleges and STEM focused universities. As shown in the first pie chart, NMT’s tuition revenue comprises 6% of the overall budget. The 15% state appropriations represents a declining figure as years prior show support upwards of 20% or better. Is a 6% tuition revenue component a sustainable revenue model for NMT? Given its smaller enrollment and 13:1 student to faculty ratio, the college is in closer alignment to a smaller liberal arts college where 8:1 ratios typically occur.

New Mexico Tech: Revenue Budget

- Tuition and Fees: 6%
- Grants and Contracts: 45%
- Private gifts: 24%
- State appropriations: 15%
- Other: 4%
- Sales & Services: 5%

Decreasing State Appropriations
Tuition: in-state $5,714 / out-of-state $17,073 (2014)

Student: Faculty ratio 13:1 (2014)
Student: Faculty ratio 12:1 (2013)
Student: Faculty ratio 11:1 (2012)
Student: Faculty ratio 11:1 (2011)
Student: Faculty ratio 11:1 (2010)
Student: Faculty ratio 11:1 (2009)
Student: Faculty ratio 11:1 (2008)
Student: Faculty ratio 12:1 (2007)
Student: Faculty ratio 11:1 (2006)
Student: Faculty ratio 12:1 (2005)
Student: Faculty ratio 12:1 (2004)
Student: Faculty ratio 11:1 (2003)

Whereas UNM displays a match between tuition and state appropriations, colleges such as Colorado School of Mines derive 71% of its revenue from tuition. Michigan Tech a comparably sized STEM institution also draws 71% of its revenue from tuition. Also,
Michigan Tech derives 3X the state revenue from tuition, while CSM derives a miniscule reaction (less than 3%) from the state of Colorado. **Why does NMT derive less than half as much revenue from tuition as from NM State appropriations?** A Case study of CSM and its challenges with Colorado HED and ultimate success in overcoming the state financial crisis is presented below.

**UNM Budget: Revenue**

- Tuition/Fees: 30%
- State Appropriation: 30%
- Govt. Appropriations: 16%
- Grants/Contracts: 24%

Student: Faculty ratio 23:1

**GA Tech Budget Revenue**

- Tuition/fees: 19%
- State Appropriations: 16%
- Giving/operations: 26%
- Grants/Contracts: 39%

Student: Faculty ratio 24:1
Student: Faculty ratio 19:1

Student: Faculty ratio 19:1

Student: Faculty ratio 13:1
Case Study 3. Colorado School of Mines and Declining State Appropriations
Subject - Fiscal Year 2011 Operating Budget

“With the national economy beginning to show signs of stress in early 2008, many states quickly began forecasting their own financial pressures. Colorado’s economists reflected Colorado’s first sign of economic stress in December, 2008. As with many states, throughout 2009 and continuing today, Colorado’s economic projections reflect a loss of state revenue, primarily from loss of personal income tax and capital gains tax. With higher education in Colorado being one of only a few unrestricted budgets for the state (in addition to the department of corrections and health care), higher education was and continues to be a source of funds to resolve the state’s budget deficit.

In fiscal year 2009, the state initially funded all higher education institutions in the amount of $706 million. With the looming budget deficit, the higher education budget was reduced in fiscal year 2009 and again in 2010. The state has used, however, federal State Fiscal Stabilization Funds (SFSF) to “keep higher education whole” for those two years. The state’s use of SFSF for higher education will run out in fiscal year 2011 which will leave only state general fund to support higher education. However, the state is required pursuant to the SFSF rules, to keep higher education funded at the fiscal year 2006 level through fiscal year 2011.

With a current projected state budget deficit of over $1.5 billion in fiscal year 2012, the state is anticipating further higher education cuts in fiscal year 2012 by at least $300 million from the fiscal year 2011 level.

The Colorado School of Mines’ portion of the overall budget is approximately 3%. For the fiscal year that we are just ending, fiscal year 2010, we are being funded with both state funds and SFSF at a level of $23.3 million. With SFSF being removed next year, we anticipate to be funded by the state in fiscal year 2011 at $18.8 million. IF the state projections remain, likely best case scenario for the School would be a reduction of another $13.2 million in fiscal year 2012 to $5.5 million. Below is a chart that depicts state (and SFSF) funding for Mines over the past ten years and what is predicted over the next few years”

Since 2011 CSM implemented 10% tuition increases on an annual basis. Revenue increases for 2011 alone resulted in $7.8 million due to the tuition increases and assumes an incoming class of freshman and transfers of 950 students and 58 new graduate students. As a result of this annual increase, CMS finds itself in good financial shape with a growing student body and new faculty hires to accommodate the increased demand in degrees offered.

The take-away message: For whatever reasons NMT has feared dramatic tuition increases. The data above shows that we are very low in tuition by various measures and we MUST increase it dramatically to sustain our quality. It worked for CSM, it can work for NMT.
Discussion:
The threat of MOOCs is real. If one considers a generic freshman physics/chemistry or mathematics course, there is little reason not to take such a course as a distance offering from a more prestigious institution than Tech (e.g. Stanford, MIT, Harvard). We again reference the quote by Jim Lerman:

The most vulnerable, according to Jim Lerman of Kean University in New Jersey, are the “middle-tier institutions, which produce America’s teachers, middle managers and administrators”. They could be replaced in greater part by online courses, he suggests...."

Please note: the quote above does NOT mention that lab sciences and STEM research are at risk. The threat of MOOCs in higher ed. is analogous to the threat of off-shoring in industry. If a job can be done as well or better off-shore, American industries cannot compete. However the fix for American industry and the fix for New Mexico Tech are similar. We need to offer something that CANNOT be offered via distance education, and we already do. What Tech offers to all students is meaningful, hands-on, research. To the extent that we can protect and strengthen our research (and advanced laboratory coursework) we can protect ourselves from MOOCs, and we can provide a product that students are willing to pay for. In fact, we can leverage MOOCs and use them to provide pure academic content from other institutions while our faculty focus on the hands-on course components.

Goals and Objectives:
Over the past decade, New Mexico Tech has maintained a balanced budget while weakening its academic and research programs overall. Balancing a budget is not enough. Without significant new revenue sources, Tech will lose its historical differentiators of rigor, individual attention, meaningful research. Furthermore, Tech will not be able to maintain a modern infrastructure, nor grow into emerging disciplines.

We believe we have justified the following statements:
TECH CAN ACCESS UNTAPPED SAVINGS WITHOUT GROWING REVENUE
We need to grow revenue of course (the subject of all the other conclusions) but there are savings to be had.
1) In response to the Community Task Force: Create a formal dual-career hiring policy. If faculty/staff spouses are preferred for hiring, the entire family can benefit despite inevitably low Tech salaries. We cannot hire unqualified spouses, but equally qualified spouses should have a leg up in interviews and there should be a clear reason NOT to hire them if they are qualified.
2) Create more transparent budgets (this WILL save money ... see bullet item on “create financial model of university) Institute bottom-up budgeting.
3) Allow departments to carry forward cost savings indefinitely. At the departmental level, frugality should be rewarded. A department can save money even on meager existing budgets if it realizes this will buy it freedom down the road. At present, departments often see budget savings swept away by an academic VP. This causes them to spend money in a way that is not ideal merely to prevent it from being confiscated.
4) Drexel University had the right idea by asking all departments for money-saving ideas. They are out there. Fleshing them out requires that employees trust the administration. Tech should engage in this activity before we are that desperate.
TUITION INCOME NEEDS TO RISE IN THE NEAR TERM

1) From the above revenue budget comparisons: Tuition income at the very least should match state appropriations if not exceed them.
2) In-state tuition should be on-par or 10% above UNM and NMSU.
3) New Mexico Tech needs to double the current number of out-of-state students over the next five years.
4) New Mexico Tech should seek to triple the current number of international students over the next five years. Expansion of distance education programs can help us to achieve these goals.

To do this we must aggressively recruit in California and the West and also in China. If Admissions needs additional staff to do this, they should be hired, on short-term contracts, so that they can demonstrate their effectiveness.

IN TEN YEARS, 20% of OUR INCOME NEEDS TO COME FROM NEW SOURCES
Unlike most other schools, Tech has not raised tuition significantly in recent years. It has had a flat $260 a year increase for the past three years (so a diminishing percentage increase every year). For this reason we can use the tuition lever now, but in ten years we will have tapped that out. By that time, our endowments, intellectual property and entrepreneurial endeavors needs to be able to take up the slack to allow us to continue to keep pace with shrinking state contributions.

DONATION INCOME NEEDS TO RISE

1) The Development Office Budget needs to grow continuously so long as the return on investment remains above four to one. There is no down side to this for Tech, so long as careful attention is paid to show that development staff remain productive. Development positions do not have to come with tenure. Three to five year contracts could be offered to allow staff to be reduced if the strong correlation between staffing and fundraising saturates.

a) Faculty should be required to participate in sourcing of donors or in giving talks or other activities that lead to increased donations. Where appropriate, faculty should be compensated for their time in these extra-curricular activities.

A FINANCIAL MODEL OF THE UNIVERSITY NEEDS TO BE DEVELOPED
Faculty and Administrators should develop and have access to a transparent financial model of the entire university that allows cost/benefit analysis to be done rapidly and effectively. This might conceivably be the multi-year task of a new faculty member.

Revisit Merit Pay at all levels: Merit pay SHOULD be based on productivity. Low research faculty should have higher teaching loads. Low performers should not get raises.
4. Entrepreneurship

ENTREPRENEURSHIP NEEDS TO BE REWARDED AND EXPANDED.

New Mexico Tech allows only 15 days per academic year (two semesters). The consulting policy for faculty at Stanford University allows 39 days (for three quarters), and we can assume their faculty are good teachers and researchers as well. We recommend that allowed consulting be expanded to 30 days per academic year. Stanford further specifies that for telephone consulting a “day” corresponds to 10 hours, Tech could do the same. Tech has members of staff at other bureaus/divisions, and their consulting policy should also be revisited. Decisions should be made in such a way as to prevent faculty or staff from ignoring their normal job responsibilities in favor of consulting, but should otherwise be minimally restrictive.

The existing consulting policy encourages faculty to consult via standard grants, but this is not always possible or desirable. For one thing, the 50% overhead is quite burdensome to a private contractor, but faculty who elect to consult on their own SHOULD be asked to give back to the University. A 15% rate could result in extra income for Tech without greatly burdening the clients of faculty and staff. The 15% return could be split three ways between the home department, the research VP and the academic VP. Faculty engaged in consulting should not make substantial use of Tech facilities, and cannot make use of Tech students or staff.

One should distinguish between consulting and private grants. A grant from a private foundation need not be treated differently than a government grant. In this case standard grants policies apply. This is not consulting.

Faculty could use some support in consulting. For example, New Mexico Tax code is not simple for consultants. A resource center to prevent consultants from getting in trouble would be helpful. While this might seem to benefit individual faculty and not the institution as a whole it IS a benefit to the institute as a whole. Encouraging consulting income allows faculty to make a good living on salaries that will be far lower than the national average for the forseeable future. This allows retention of strong people, and it also filters for more entrepreneurial faculty, which will be of benefit to Tech.

ENTREPRENEURSHIP NEEDS TO BE REWARDED AND EXPANDED.

At present, Tech allows Faculty to keep 50% of the revenues earned from any patent activity. This is a strong position and should encourage entrepreneurship.

The Management Department at New Mexico Tech has started the “Center for Leadership in Technology Commercialization”. This is a wonderful initiative and can be expanded.

Per the experience of other schools with entrepreneurship programs, the CLTC (or some other center) should have a full time faculty member experienced with technology transfer and an administrative assistant. With dedicated staff, the center could provide some or all of the following services.
1a) Maintain/Develop list of venture capitalists and setup VC reviews as often as needed to unite fresh ideas with capital.

1b) Help faculty navigate the SBIR (Small business loans) program.

2) Curate a list of Intellectual Property (IP) and promote its licensing.

3) Provide a clear path to patents for interested faculty/staff. This path should include a formal disclosure process and a review process with an identified review committee that selects which disclosures should proceed to patent. (This is the standard operating procedure in most technology companies).

4) Provide/coordinate incubator space to nascent start-ups.

5) Create an entrepreneurship certificate program (or a minor) for interested students.

6) Make better use of senior projects in engineering. Many departments already have capstone projects. With more focus, many of these could become businesses, spin-offs or salable IP. Some departments (for example EE) already solicit project "sponsors". A more formal CLTC could more aggressively seek sponsors to yield more business-ready projects.

7) Create a “hatchery” program which consists of regular meetings of students/faculty in brainstorming mode along with outside speakers to help them form up their ideas. CLTC has sponsored summer “boot camps” in innovation. This could go with the hatchery program.

8) Aim to develop a small internal grants programs to get ideas from hatchery to incubator. These grants are expected to be paid back. Some schools say that students should return 1% of revenues to the program until they have paid back their loans.

9) Develop a “technology pull” program where management students try to develop market ideas as part of an entrepreneurship class. These students can present to interested faculty staff who might elect to develop a technology based on a documented market need.

[There are two business development models:

Technology “Push” comes from a faculty member who has an exciting new technology or idea. They must then seek to develop a business plan and a market for their idea. This is time consuming and not necessarily a faculty/staff skill.

Technology “Pull” comes when a group develops market ideas. They then seek someone to develop supporting technology. In this way, much of the “business” ground work is laid in advance and it can guide more efficient development.]

10) Tech needs a way to harvest funding from faculty/staff/student entrepreneurship. Tech already gets half of patent revenues. Here is a typical VC “terms sheet”
- Seeking $2 million on a $4 million pre-money valuation;
- Warrant coverage for early investors;
- 1x liquidation preference (not participating);
- Series A gets one board seat and the common stock elects the other two Five board members: Two company employees, two representatives of Series A investors and one outside director selected by both company and investors
- Covenants to restrict govern how money is spent;
- CEO and CTO get 25% of their shares up front to reflect value already created, the rest vests monthly over three years
- Founder and CEO immediately starts paying himself a $125,000 annual cash salary;
- Founder and CEO will not reimburse himself for legal expenses;
- Option pool is 25% of the common stock

Tech cannot afford to be a VC at this time, but could take 10% of (non-diluted) shares of startup companies with a 3-year non-sale clause. If the company fails, Tech gets no money, but Tech also put no money in upfront.

5. Intercolligate Athletics at NMT

As this topic may well be the least likely to come to realization, the Task Force includes subject matter since Group B of the Strategic Planning committee listed athletics as a potential revenue source and student input during the town hall meetings requested, "Give us something to cheer about." The task force views this component only from the standpoint of a potential revenue source and offers the following positive trends in NCAA revenue to college athletics. As an extreme example, the Southeastern Conference shows a dramatic increase in revenue distribution. And a number of websites offer revenue distributions for comparison of smaller athletic programs. The US map below indicates NCAA revenue by region. Albeit a smaller dollar amount than Big 10, Pac 12 and SEC regions, the Mountain West region does show potentially higher athletic revenue than other regions of the country.

While intercollegiate sports at NMT would likely be a money-losing or break-even venture at best, the intangibles such as school pride, alumni donorship and recruiting ability are potential pluses in efforts to compete for other sources of revenue. Task
force recommendations

(1) To look further into this aspect include invitations to involve NMT’s sports directors: Melissa Begaye and Dave Wheelock for their perspectives on student interest in sports participation.

(2) Meet and discuss with other small college programs such as Northern New Mexico College where intercollegiate basketball is their college’s sole sport focus.

(3) Invite participants from the local community to explore NMT sports/interest. Recent renovations in Socorro’s multi-field Soccer venue could be utilized given the NMT campus limitations.

To see a short clip of CSM athletic programs and student athlete philosophy:
http://www.youtube.com/watch?v=jeVtvHQTf5g&list=PLD3A7AA2B37225456

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Case Study 4.
Here’s How Much Money Some Small Colleges Make To Get Embarrassed In Football –by Dylan Murphy (Sports Grid news).

“We already knew that smaller schools received money on behalf of their bruised egos, but the dollar amounts are really getting up there. Here’s a brief sampling of how much each football powerhouse paid their less profitable and successful underlings, via Darren Rovell:

Oklahoma State vs. Savannah State (Week 1, 84-0): $385,000

Florida State vs. Murray State (Week 1, 69-3): $450,000

Pittsburgh vs. Youngstown State (Week 1, 31-17 – UPSET!): 400,000

Florida State vs. Savannah State (Week 2): $475,000

Oklahoma vs. Florida A&M (Week 2): $650,000
Alabama vs. Western Kentucky (Week 2): $1,000,000

Arkansas vs. Louisiana-Monroe (Week 2): $500,000 – part of $3,000,000, six-game deal

Virginia Tech vs. Austin Peay (Week 2): $318,750

Tennessee vs. Georgia State (Week 2): $500,000

Those are some large chunks of change, by my count. From the perspective of the small school, such as Savannah State, which will have earned $860,000 from six hours of misery, such large profits must be understood within the context of the profitability of their football program as a whole – it made $874 last year. Dollars. So swallowing a few non-conference punches in the mouth is ultimately worth it to keep their program afloat. Schools like Alabama, meanwhile, are shelling out $1 million for the chance to stomp all over some unnamed small school.”

References:
   (1) http://www.economist.com/node/21605899/print
   (2) “Recent Deep State Higher Education Cuts May Harm Students and the Economy for Years to Come” Phil Oliff, Vincent Palacios, Ingrid Johnson, and Michael Leachman; Center on Budget and Policy Priorities” March, 2013, 1-20.
   (3) “Fiscal Year 2011 Operating Budget” Colorado School of Mines Board of Trustees Report, Kristen Volpi, 2010.