This is a Public Document

# Maine School of Science and Mathematics

Maine's nationally ranked STEM Academy

December 2020

# Today's Agenda

| | | |
|---|---|---|
| ▪ Introductions & Purpose | Coit | 5 minutes |
| ▪ State of MSSM | Pearson | 2 minutes |
| ▪ Maine's STEM economy | Coit | 2 minutes |
| ▪ Business Planning Committee | Coit | 0 minutes |
| ▪ Research findings | Hart | 2 minutes |
| ▪ Vision | Chalmers | 5 minutes |
| ▪ Vision budget | Pearson | 5 minutes |
| ▪ Partnership opportunities | Coit | 2 minutes |

--- discussion ---

# Purpose of Meeting

- Solicit support the new MSSM Vision
  - School size, annual budget, changes to legislation
  - Scope and size of Outreach Programs
- Provide direction on Partnership Options
  - Evaluate the criteria for the Partnership choice
  - Provide guidance for the Partnership discussions
- Define next steps to moving forward
  - Gain support within the Administration
  - Gain support within the Legislature

# State of MSSM

David Pearson

MSSM Executive Director

# MSSM School Profile

- One of 15 state sponsored residential STEM academies
- Ranked #2 of all public high schools by USN&WR in 2019
- Celebrating its 25th Anniversary in 2020
- 140 residential student maximum capacity
- Camps for over 500 STEM middle schoolers each summer
- Graduated over 3,000 of Maines brightest students

# Vision for MSSM

A residential high school providing a nationally recognized academic experience in a safe and supportive environment for many of Maine's highest achieving students, which actively shares its expertise and resources with other schools around the State of Maine.

This is not a Board approved vision, but guidance for the Business Planning process.

# MSSM Students are Different

"Gifted and talented" refers to students "who give evidence of high achievement capabilities in such areas as intellectual, creative, artistic or leadership capacity, or in specific academic fields, and who need services or activities not ordinarily provided by the school in order to fully develop those capabilities."

No Child Left Behind Act

Federal Recognition of unique needs of "GAT" Students.

# MSSM Students are Achievers

| | |
|---|---|
| Kate Reilly deLutio '97 (Bar Harbor)* | Maine State Economist (former) |
| Miles Sweet '97 (Fairfield)* | Rhodes Scholar |
| Jessica Luttrell '11 (Rockland)* | IDEXX Laboratories Engineer |
| Gordon McCulloh '16 (Kennebunk)* | U.S.A.F. A. Cadet of the Year (2019) |

* sending school

MSSM is a launching pad for extraordinary careers.

# MSSM Challenges

- Operating challenges identified by the Board of Trustees
  - 2018/2019 - Strategic Planning Committee
    Aging, shared facilities that MSSM does not control
    Need to fund room & board fees
  - 2019 – established Student Welfare Committee
    Need more significant investment in Social and Emotional Learning ("SEL")
- Financial challenges
  - Flat funding has left legislative mandates unaddressed (e.g. outreach programs)
  - $830 thousand (14%) reduction in 2020/21 budget following loss of intl. students
  - Concerns over state budget cuts in the next biennium

# Student Safety & Welfare

"A consensus study report on advancing health equity among American children published by the National Academy of Sciences, Engineering and Medicine added youths in "high achieving schools" to their list of "at-risk" groups, along with kids living in poverty and foster care, recent immigrants and those with incarcerated parents".

The Washington Post, September 26, 2019

MSSM has its own "special needs" students.

# Vision Objectives

- Safe and Productive Residential Program
  - Safe, healthy learning environment that develops the whole student *
  - Materially increase the number of graduates at a lower cost per student
  - Strengthen Higher Ed. affiliations and grow industry and research partnerships
  - Become Maine's laboratory for best practices in STEM education
- Outreach Program tailored to Maine's Unique Needs
  - Early age identification and support of high-achieving students throughout Maine
  - Support rural schools: teacher training, curriculum design and remote learning
  - Increased partnerships with existing Maine STEM and education organizations

* Portrait of an MSSM Graduate

# Maine STEM Economy

David Coit

Co-chair, Business Planning Committee

# Where Maine ranks Nationally

Maine is the number 8 worst state for science, technology business capabilities, its lowest ranking in 10 years.

2020 Milken Institute State Technology and Science Index

# Maine is Falling Behind

"States like Maine (smaller and mostly rural) are doing well now with budget surpluses and record low unemployment, but they are falling farther and farther behind in overall economic performance."

Paraphrased remarks by Joseph E. Aoun, president of Northeastern University
Roux Center announcement, January 27, 2020

# Maine's STEM Deficit

- Annual R&D spending *
  - Percentage of US GDP 2.80 %
  - Percentage of Maine economy .84 %
- Science & Engineering jobs **
  - Percentage of US jobs 4.89 %
  - Percentage of Maine jobs 3.57 %

* NSF, 2017 data
** NSF, 2018 data

Maine needs to increase the STEM content of its economy.

# Why STEM Matters

- US Domestic job growth projections - 2019 to 2029 *
  - STEM jobs 8.0 %
  - Non-STEM jobs 3.0 %
- US median salaries in 2019 *
  - STEM jobs $84,880
  - Non-STEM jobs $37,020

* Bureau of Labor Statistics

Talent migrates toward job markets where there is more growth and better pay.

# Importance of Human Capital

"Human capital, far more than physical infrastructure, explains which cities succeed."

Edward Glaeser, 2011

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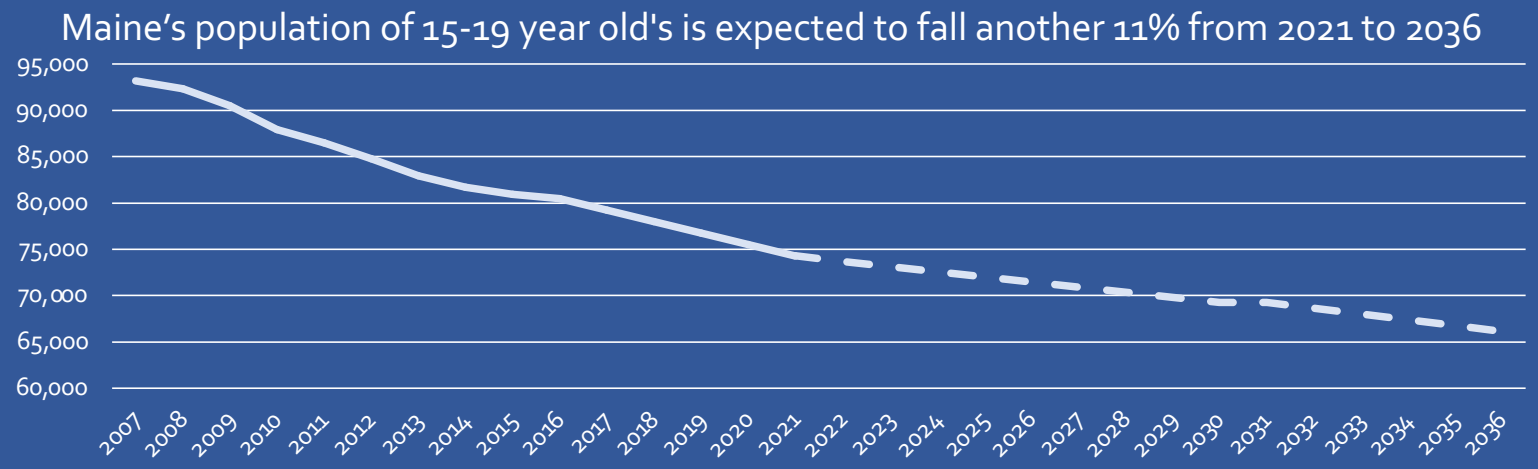
"Productivity isn't everything, but in the long run it is almost everything."

Paul Krugman, 1977

# Maine's Unique Needs

- Increased investment in Maine's "Human Capital"
- More STEM workers for Knowledge Based Economy
- Pathway into STEM careers for Maine's rural students
- K-12 STEM education can set the foundation for a lifetime of economic success for the individual and for the state

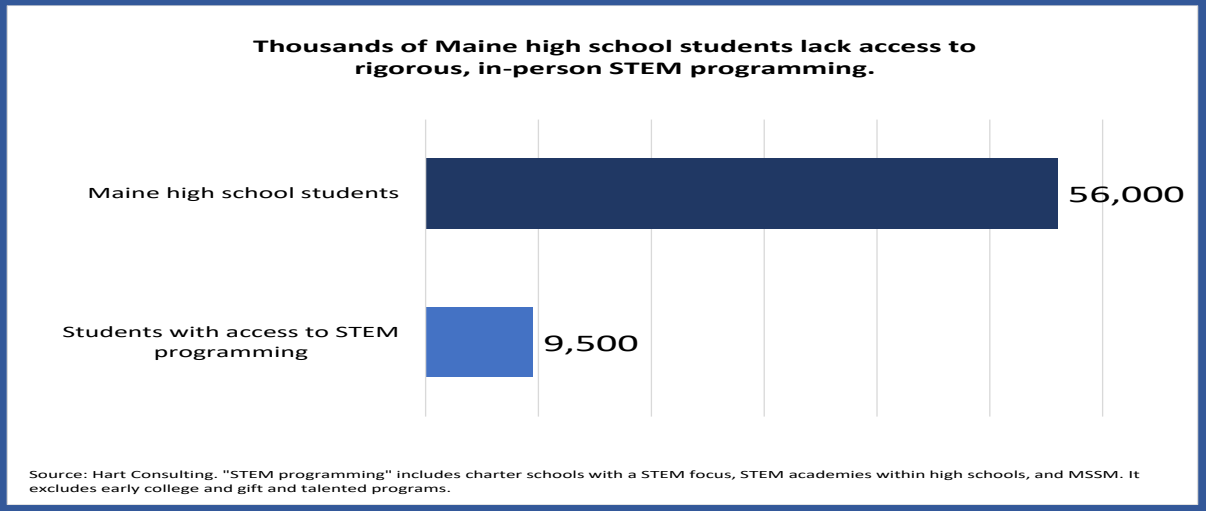
# Shrinking Worker Pipeline




Source: State of Maine, Dept. of Admin. and Fin. Services

Increased productivity of STEM jobs can help offset declines in the workforce.

# Limited Student Access to STEM




Only 17% of Maine High School Students have access to rigorous in-person STEM programming.

# Access Limited by Geography

Access to STEM education is concentrated in more urban and wealthier communities along the I-95 corridor.

Source: MMSA STEM High School landscape analysis

# Maine's Opportunity is NOW!

- Maine's Human Capital Assets are few but world class
  - Jackson Labs, Bigelow Labs, WEX, IDEXX, Maine Health
  - Bates, Bowdoin, Colby, Roux Institute, UMaine Engineering School
- $1 Billion Investment in Education and Research
  - $500 million Alfond Foundation commitment to Maine Institutions
  - Requires match by receiving institutions
- Call to Action for the State of Maine
  - Investment in K-12 STEM education is an essential foundation for success
  - North Carolina example with Research Triangle and first ever STEM Academy
  - Requires visionary leadership and action for Maine's future

# K-12 STEM Education IMPORTANT!

"The biggest challenge to the success of the Roux Institute in Maine is the K-12 feeder system."

Paraphrased remarks by Joseph E. Aoun, president of Northeastern University in discussions with the Alfond Foundation.

# Business Planning Committee

David Coit

Co-chair, Business Planning Committee

# Business Planning Committee

- Business Plan concept introduced at BOT workshop in March 2020
- Business Planning Committee Charter approved by BOT in May 2020
- Objective to assess MSSM's viability, value to Maine and a path forward
- 4 Phases
  - Phase 1: Discovery & Concept - research-based program review
  - Phase 2: Authorization - legislative changes and state funding
  - Phase 3: Business Plan - based on new legislative mandate
  - Phase 4: Implementation

Phase 1 has now been completed.

# Committee Organization

- 12 members representing all key constituencies
  - Unable to fill Legislative member position
- Three sub-committees
  - Partnership: Brainstorm with Maine leaders in academia, research, industry, etc. Identify partner institutions willing to share resources
  - Discovery: Funded research of 15 sister schools - $30K from MCF donor
  - Vision: What an enduring and successful MSSM would look like

# Committee Membership

| Designation | Member |
|---|---|
| Chair of the MSSM Board of Trustees | David Ferguson, lawyer & former parent |
| Executive Director of MSSM | David Pearson, Executive Director |
| Treasurer of the Board of Trustees | Peter Orne, Business Manager-Rockland schools |
| Chair of the Governance Committee | Josh Chalmers, co-chair, Texas Instruments Manager |
| At-large member of the Board of Trustees | David Coit, co-chair, founder North Atlantic Capital |
| Representative of the Maine Dept. of Education | Dan Chuhta, Deputy Commissioner of DOE |
| Representative of Maine Legislature | Not Filled |
| Faculty Representative | Anthony Scott , English teacher |
| Student Representative | William Tun, MSSM senior & student leader |
| Parent Representative | Cris Alverado, parent of current student |
| Alumni Representative | Kate Reilly-deLutio, alum and former Maine State Economist |
| MSSM Foundation Representative | Jeremy Shute, alum and Google executive |
| At-large Member | Ruth Kermish-Allen, MMSA Executive Director |

Designed for broad community engagement.

# Phase 1 – Discovery & Concept

Complete a thorough review of the current state of MSSM and identify opportunities to increase the school's effectiveness in meeting the needs of its students and achieving fundamental value for the State of Maine.

Business Planning Committee

# Maine leadership Outreach

| | |
|---|---|
| Higher Ed: | Bates, Bowdoin, Colby, UMaine System, UMaine, UMPI, USM, Maine Maritime, Thomas College, Unity College |
| Research: | Bigelow Laboratory, Jackson Laboratory, Roux Institute |
| Industry: | IDEXX, WEX, Maine Health, MMG Insurance |
| Foundations: | MCF, BSB Foundation, MSSM Foundation, Alfond Foundation |
| State: | DOE (various) |
| Other: | MMSA, Educate Maine, MEA, Aroostook Partnership |

Brainstormed with leaders of important constituencies.

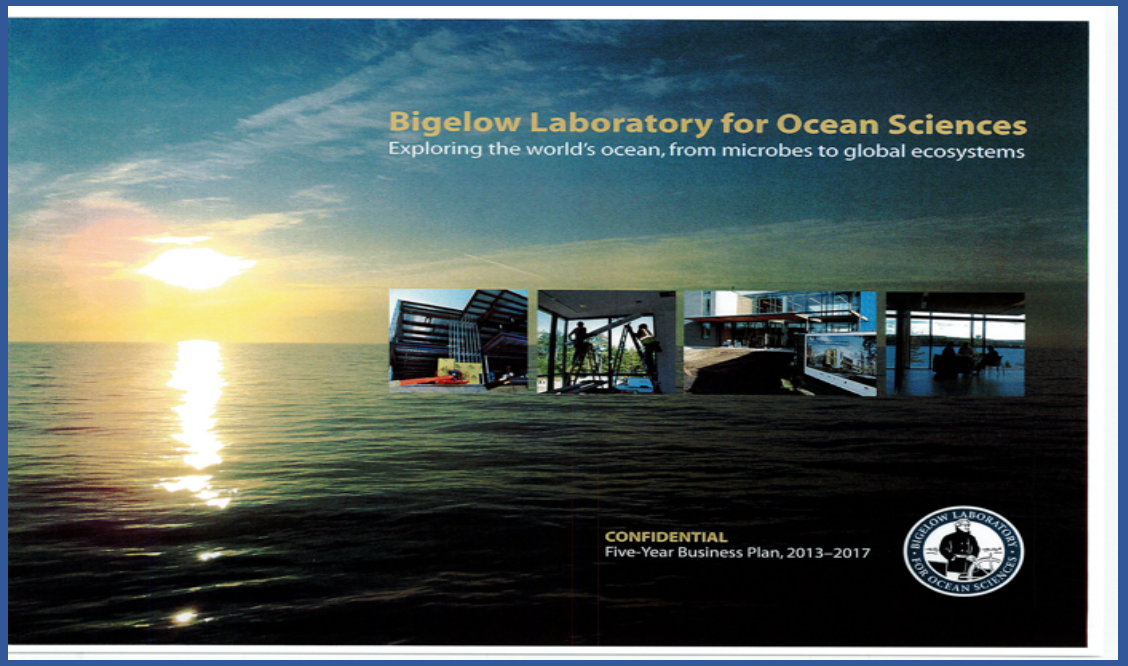
# Phase 2 – Authorization

## Current Phase

Establish consensus with the Mills Administration and the Legislature on the direction, scope and budget for the new Vision for the Maine School of Science and Mathematics.

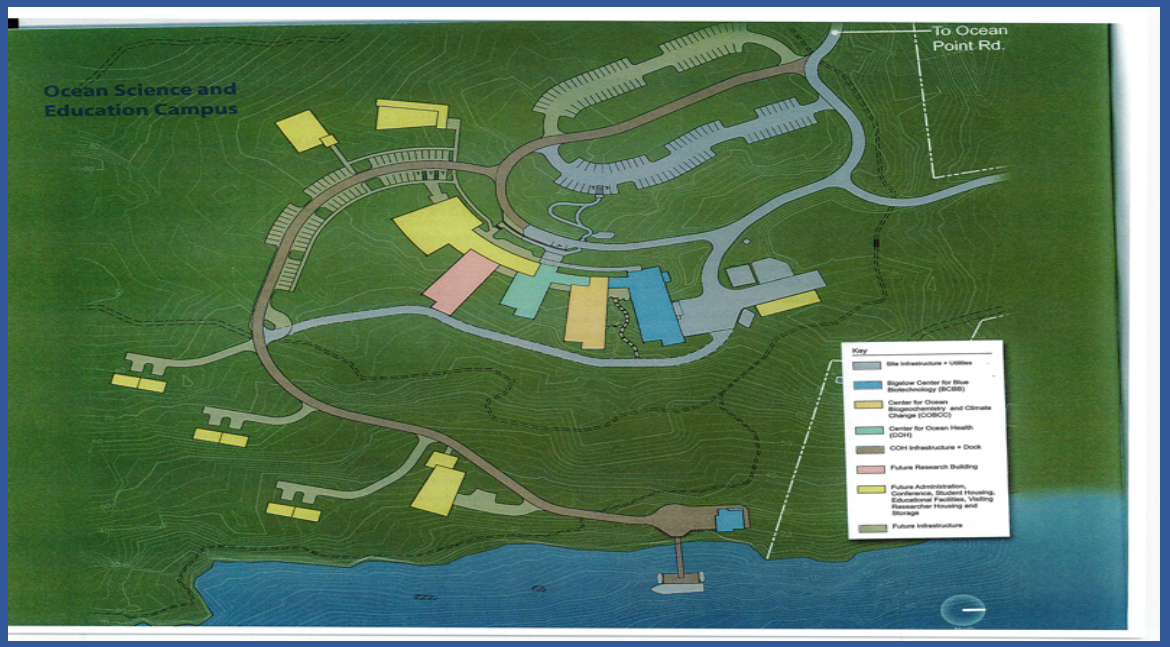
Business Planning Committee

# Phase 3 - Business Plan



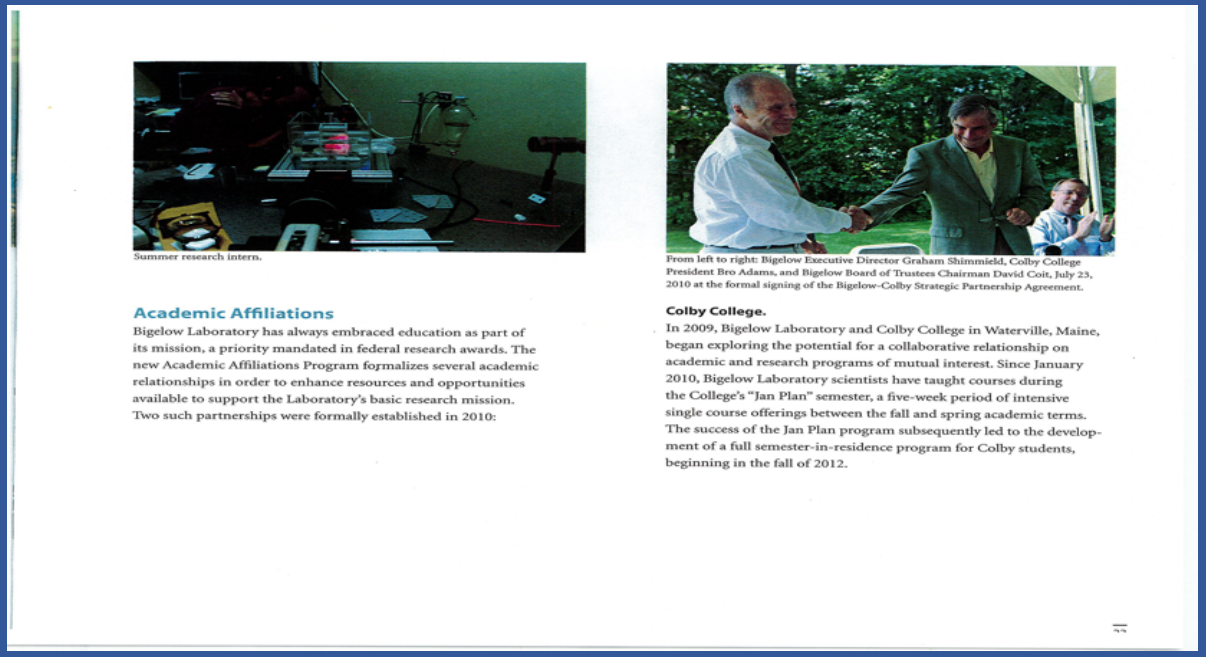

Documentation of MSSM's planned transformation.

# Business Plan – Facilities




Specify the design and cost of Mission Appropriate Facilities.

# Business Plan – Partnerships





Summer research intern.



From left to right: Bigelow Executive Director Graham Shimmield, Colby College President Bro Adams, and Bigelow Board of Trustees Chairman David Coit, July 23, 2010 at the formal signing of the Bigelow-Colby Strategic Partnership Agreement.

**Academic Affiliations**

Bigelow Laboratory has always embraced education as part of its mission, a priority mandated in federal research awards. The new Academic Affiliations Program formalizes several academic relationships in order to enhance resources and opportunities available to support the Laboratory's basic research mission. Two such partnerships were formally established in 2010:

**Colby College.**

In 2009, Bigelow Laboratory and Colby College in Waterville, Maine, began exploring the potential for a collaborative relationship on academic and research programs of mutual interest. Since January 2010, Bigelow Laboratory scientists have taught courses during the College's "Jan Plan" semester, a five-week period of intensive single course offerings between the fall and spring academic terms. The success of the Jan Plan program subsequently led to the development of a full semester-in-residence program for Colby students, beginning in the fall of 2012.

Codify shared roles and responsibilities of key Partnerships.

# Business Plan – Numbers

**Statement of Activities and Changes in Net Assets** *(For fiscal years ended June 30)*

| | Actual 2010 | Actual 2011 | Actual 2012 | Budget 2013 | Forecast 2014 | Forecast 2015 | Forecast 2016 | Forecast 2017 |
|---|---|---|---|---|---|---|---|---|
| **Operating Activities** | | | | | | | | |
| Operating Revenue and Support | | | | | | | | |
| Research Grants | 4,505,832 | 5,005,790 | 3,846,296 | 5,030,819 | 6,114,928 | 7,870,801 | 9,162,412 | 10,870,226 |
| Research Subawards | 932,646 | 364,950 | 60,241 | 60,514 | 100,000 | 100,000 | 100,000 | 100,000 |
| CATT Industry Sponsored Research | 0 | 0 | 0 | 197,885 | 880,000 | 1,440,000 | 2,080,000 | 2,600,000 |
| Other CATT Revenue | 0 | 0 | 1,500 | 66,500 | 151,500 | 206,500 | 321,500 | 350,000 |
| Education Program | 348,841 | 310,327 | 196,792 | 366,914 | 393,343 | 403,884 | 413,333 | 423,894 |
| Contributions to Capital Campaign | 1,514,844 | 886,180 | 2,271,849 | 2,500,000 | 3,500,000 | 4,000,000 | 5,000,000 | 5,000,000 |
| Contributions to Annual Fund | 338,326 | 356,138 | 328,616 | 325,000 | 350,000 | 375,000 | 400,000 | 425,000 |
| Core Facility Revenue | 766,217 | 971,773 | 955,493 | 1,633,412 | 2,197,142 | 2,364,842 | 2,612,512 | 2,614,639 |
| Other revenue | 249,700 | 31,314 | 132,917 | 60,000 | 61,800 | 63,654 | 65,564 | 67,531 |
| **Total Operating Revenue and Support** | 8,656,406 | 7,926,472 | 7,793,704 | 10,241,044 | 13,748,713 | 16,824,681 | 20,155,321 | 22,451,289 |
| Operating Expenses | | | | | | | | |
| Research and Education | 6,152,336 | 6,682,033 | 5,931,801 | 6,008,808 | 9,636,895 | 12,285,883 | 14,409,009 | 15,613,800 |
| Research Subawards | 932,646 | 364,950 | 60,241 | 60,514 | 100,000 | 100,000 | 100,000 | 100,000 |
| Development | 368,396 | 722,512 | 770,571 | 951,337 | 1,127,837 | 1,161,672 | 1,196,522 | 1,232,418 |
| Unallocated management and general | 449,404 | 621,673 | 1,640,350 | 4,955,044 | 3,791,479 | 2,909,730 | 2,399,990 | 2,133,468 |
| **Total Operating Expenses** | 7,902,782 | 8,391,168 | 8,402,963 | 11,975,704 | 14,656,211 | 16,457,285 | 18,105,521 | 19,079,686 |
| Change in Net Assets from Operating Activities | 753,624 | -464,696 | -609,259 | -1,734,660 | -907,497 | 367,396 | 2,049,799 | 3,371,604 |
| **Non-Operating Revenue and Support** | | | | | | | | |
| Working Capital Funds (Sale of Intellectual Property) | 0 | 0 | 0 | 1,000,000 | 0 | 0 | 0 | 0 |
| Grants and Gifts for PPE | 788,806 | 4,836,557 | 10,885,498 | 3,935,428 | 400,000 | 300,000 | 500,000 | 500,000 |
| Change in Net Assets from Non-Operating Activities | 788,806 | 4,836,557 | 10,885,498 | 4,935,428 | 400,000 | 300,000 | 500,000 | 500,000 |
| **Total Change in Net Assets** | 1,542,430 | 4,371,861 | 10,276,239 | 3,200,768 | -507,497 | 667,396 | 2,549,799 | 3,871,604 |

**Statement of Financial Position** *(At June 30)*

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|
| **Assets** | | | | | | | | |
| Cash | 350,481 | 747,540 | 1,429,296 | 594,889 | 641,954 | 400,000 | 500,000 | 525,000 |
| Cash restricted for construction | 0 | 859,086 | 1,137,595 | 0 | 0 | 0 | 0 | 0 |
| Investments | 1,614,537 | 1,277,693 | 1,003,373 | 0 | 0 | 754,832 | 2,560,791 | 5,616,715 |
| PPE Reserve | 0 | 0 | 0 | 0 | 0 | 183,724 | 364,196 | 539,540 |
| Pledges Receivable | 0 | 990,414 | 1,543,316 | 2,176,500 | 3,310,667 | 3,977,333 | 4,810,667 | 5,144,000 |
| Property and Equipment, Net | 6,542,677 | 15,261,099 | 33,803,853 | 38,345,945 | 37,595,417 | 36,744,888 | 36,094,360 | 35,068,832 |
| Other | 2,267,809 | 1,486,675 | 1,451,872 | 789,735 | 601,536 | 695,189 | 791,653 | 891,010 |
| Total Assets | 10,775,504 | 20,622,507 | 40,369,305 | 41,907,069 | 42,149,573 | 42,755,968 | 45,121,667 | 47,785,097 |
| **Liabilities and Net Assets** | | | | | | | | |
| Liabilities, short term | 1,094,214 | 1,040,972 | 2,106,850 | 1,250,000 | 1,000,000 | 1,030,000 | 1,060,900 | 1,092,727 |
| Liabilities, short-term, construction | 0 | 2,523,772 | 2,545,814 | 0 | 0 | 0 | 0 | 0 |
| Mortgage Loan | 0 | 3,004,612 | 11,456,488 | 13,156,911 | 13,156,911 | 13,065,911 | 12,850,911 | 12,610,911 |
| PRI Loan | 0 | 0 | 0 | 0 | 1,000,000 | 1,000,000 | 1,000,000 | 0 |
| Net Assets | | | | | | | | |
| Unrestricted | 6,102,203 | 5,759,150 | 5,352,074 | 6,876,754 | 8,402,283 | 9,927,811 | 11,453,339 | 12,978,867 |
| Temporarily Restricted | 3,376,943 | 8,091,857 | 18,705,936 | 20,421,260 | 18,388,235 | 17,530,102 | 18,554,373 | 20,900,448 |
| Permanently Restricted | 202,144 | 202,144 | 202,144 | 202,144 | 202,144 | 202,144 | 202,144 | 202,144 |
| Total Net Assets | 9,681,290 | 14,053,151 | 24,260,154 | 27,500,158 | 26,992,662 | 27,660,057 | 30,209,856 | 34,081,459 |
| **Total Liabilities and Net Assets** | 10,775,504 | 20,622,507 | 40,369,305 | 41,907,069 | 42,149,573 | 42,755,968 | 45,121,667 | 47,785,097 |

**Notes:** CATT Industry Sponsored Research: CATT stands for the Office of Corporate Alliances and Technology Transfer. Other CATT Revenue: Includes Corporate Alliance Subscriptions and license fees.

Financial roadmap for implementation and funding.

# Phase 4 – Implementation

## Final Phase

Execute the Vision within the agreed upon parameters and resources identified in the Business Plan.

Business Planning Committee

# Discovery Subcommittee

Funded research of 15 sister schools

Pat Hart

Hart Consulting

# Peer School Community

## Web Research and In-depth Interviews

- Arkansas School for Math, Sciences, and the Arts
- Illinois Mathematics and Science Academy
- Louisiana School for Math, Science, and the Arts
- Maine School of Science and Mathematics
- Mississippi School for Mathematics and Science
- North Carolina School of Science and Mathematics
- South Carolina Governor's School for Science and Mathematics

## Web Research Only

- Alabama School of Mathematics and Science
- Gatton Academy of Mathematics and Science in Kentucky
- Georgia Academy of the Arts, Mathematics, Engineering and Science (GA)
- Indiana Academy for Science, Math and Humanities
- Kansas Academy of Mathematics and Science
- Missouri Academy of Science, Mathematics and Computing-CLOSED
- Oklahoma School of Science and Mathematics
- Texas Academy of Mathematics and Science

# Discovery Subcommittee

"The successful schools provide an accelerated course of study to high achieving students in STEM fields, producing STEM graduates which fuels economic development."

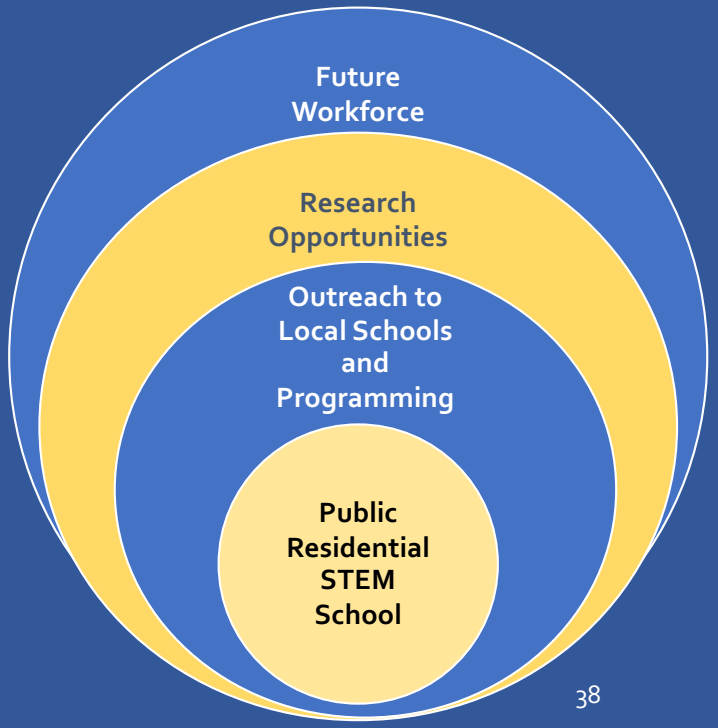
Todd Mann, National Consortium of Specialized STEM Schools

# Peer School Commonalities

## Share Common Mission

- Core program and mission is residential
- All have programs to serve broader state needs
- All have student research & intern programs
- Short-term objective: support STEM education
- Long-term objective: build a STEM workforce to strengthen their state economy

## Multi-level Mission



# Common Themes

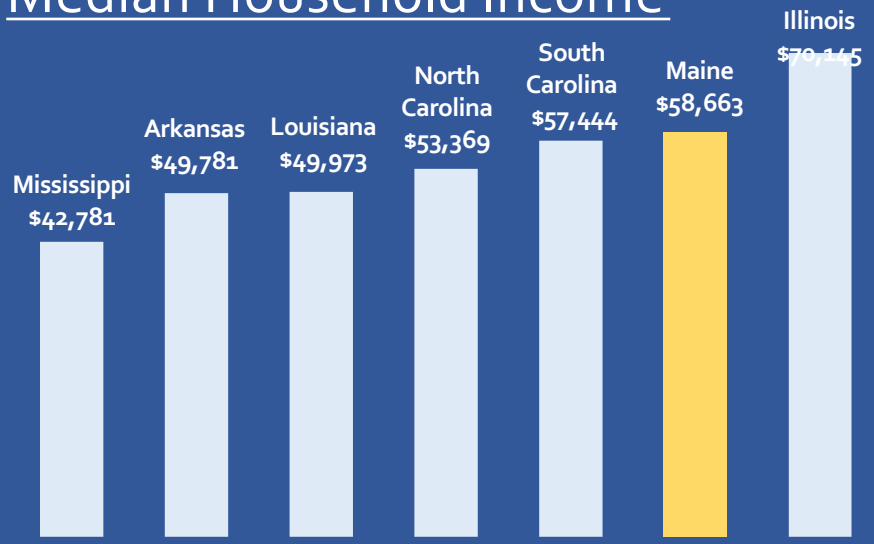
- Student safety and welfare is a fundamental priority
- Strong higher-ed partnerships central to achieving the mission
- Mission appropriate facilities support student welfare and academic success
- Remote location inhibits recruitment, outreach and partnerships
- Outreach and distance learning opportunities exist, especially for rural schools

# Peer School State Comparison

## State Profiles

- Median incomes mostly below national average of $60,293 (2018)
- IL is an outlier with above median income
- All other states are small rural states
- Other than ME & IL, all are southern states
- Many do not have a meaningful technology industrial base (exceptions are NC, IL)

## Median Household Income



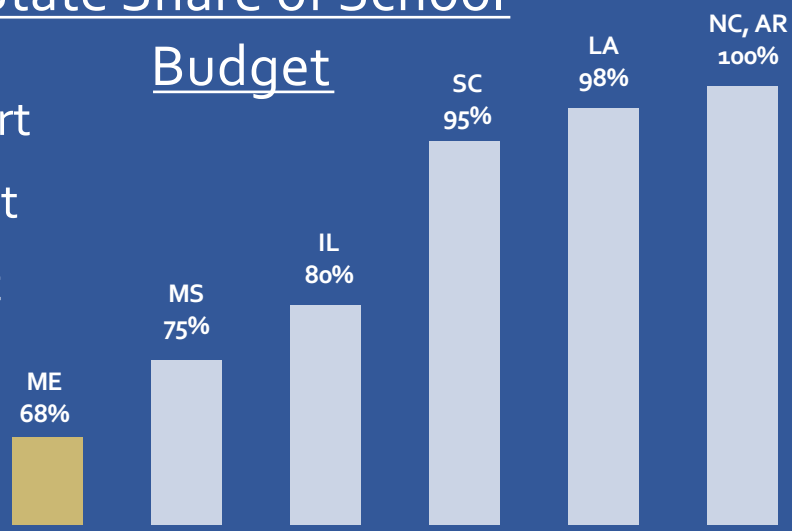

Clear commitment by poor, rural states with STEM deficits.

# State Funding Support

## State Funding Models

- Four schools get 95% or more of budget support
- Schools at 100% are in higher education budget
- MSSM is only school in the PK- 12 state budget
- Most schools are either in the Governor's budget or in the higher education budget

## State Share of School Budget



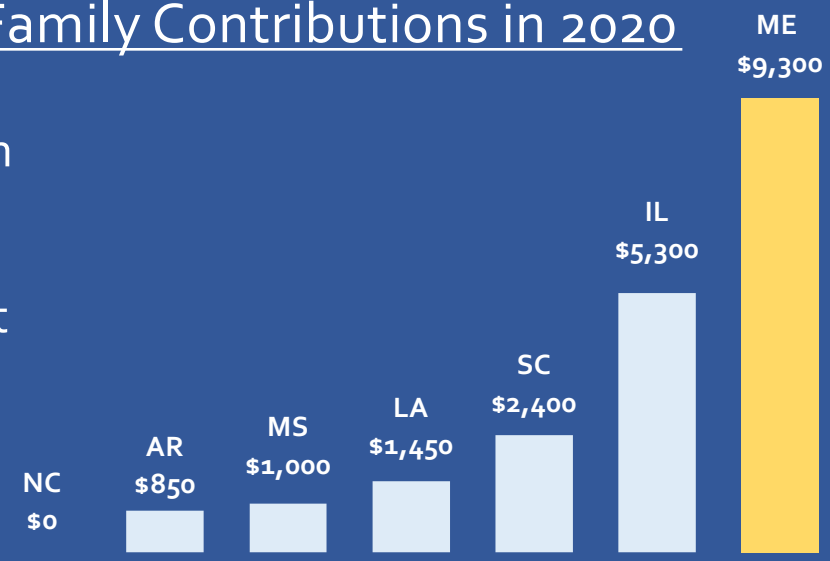

Maine state funding support is lowest by a wide margin.

# Sending Family Costs

## Family Funding Models

- Most states require small family contribution
- Meal fees are the largest family contribution
- Small, rural, southern states charge the least
- All schools provide support to low income students to reduce costs

## Family Contributions in 2020



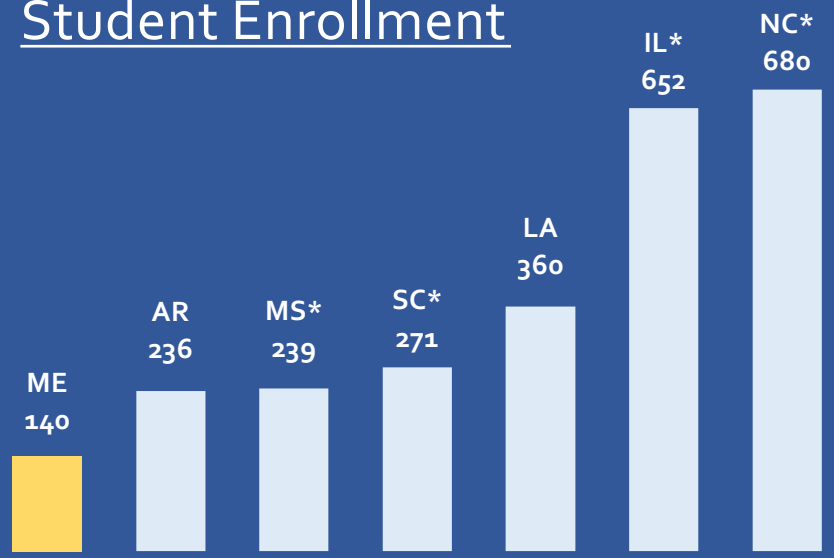

Maine is the only state that charges full room & board.

# Peer School Size

## School Sizes & Profiles

- MSSM is only school with 9th grade
- 4 schools support 11th and 12th grades only
- 2 schools support 10th, 11th & 12th grades
- Too many single points of failure at a school size below 240

## Student Enrollment




* 11th & 12th grades only

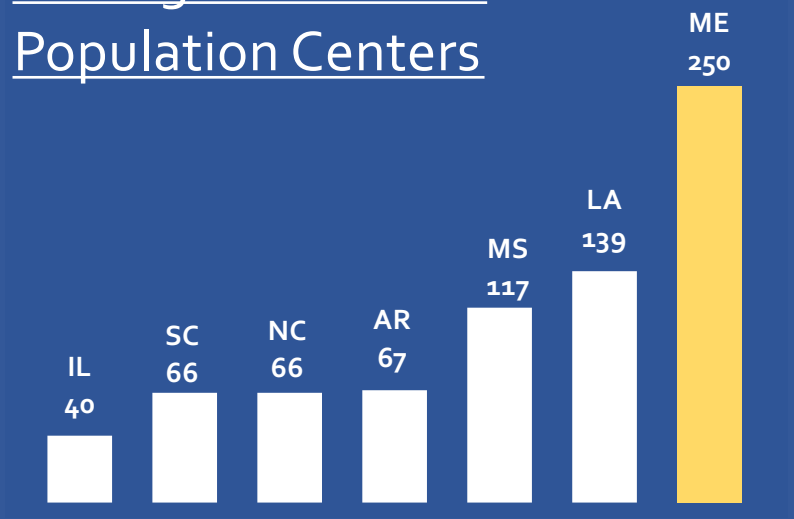
Minimum economic school size is around 240 students.

# Peer School Access

## School Sizes & Profiles

- MSSM is the most remote school by a lot
- Most are centrally located even in rural states
- Distance impacts access to partnerships
- Distance impacts recruitment of students
- Remoteness impacts recruitment of faculty and staff

## Driving Distance to Population Centers



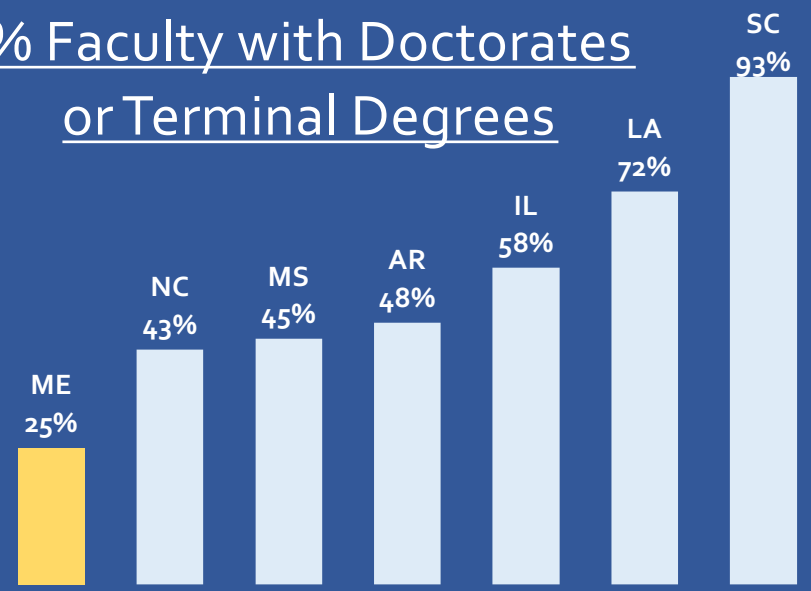

Remoteness impacts recruitment and access to resources.

# Peer School Faculty Profile

## School Faculty Profiles

- AR and NC are part of state university system
- LA and MS are located on host college campus
- IL and SC are stand alone campuses
- MSSM shares its campus with a k-8 school and is distant from major university resources

## % Faculty with Doctorates or Terminal Degrees




Faculty profile is a function of local talent pool.

# Varying Research Offerings

| School | Research Required for Graduation | Placements off Campus with University Faculty | International Opportunities |
|---|---|---|---|
| Arkansas School for Math, Sciences, and the Arts | ✓ | | ✓ |
| Illinois Mathematics and Science Academy | ✓ | ✓ | ✓ |
| Louisiana School for Math, Science, and the Arts | | ✓ | |
| Maine School of Science and Mathematics | | | |
| Mississippi School for Mathematics and Science | | ✓ | |
| North Carolina School of Science and Mathematics | ✓ | ✓ | |
| South Carolina School for Science and Mathematics | ✓ | ✓ | ✓ |

MSSM's research programs fall well short of its peer schools.

# Common Challenges

- Social and Emotional Health of Students
  - Social and emotional health is a nationally recognized challenge for high-achieving students
- Relationships with Sending School
  - Sending schools are often unhappy to give up their high-achieving students
- Faculty Recruiting for Some Courses
  - Recruiting faculty for high level math and physics is challenging, esp. in rural communities
- Advocating for State Funding/Telling Their Stories
  - Importance of advocating for budget and the school's value in front of the legislature

# Discovery Conclusions

- MSSM is similar to its peer STEM schools in some ways
  - Most of the peer schools are located in rural, poor states
  - Residential schools are the foundation for Outreach Programs supporting STEM in their states
- MSSM differs from peer schools in some fundamental ways
  - Peer schools enjoy much higher state funding support
  - Peer schools have larger and more competitive student enrollment
  - Peer schools have strong Higher Ed. partnerships and multiple research opportunities
  - Peer school have robust Outreach Programs to industry and to non-residential STEM students
  - Peer schools have invested significantly in mission appropriate facilities
  - MSSM is co-located in aging facilities with a local K-8 day school
  - Peer schools are located closer to their state's population centers

# Vision Subcommittee

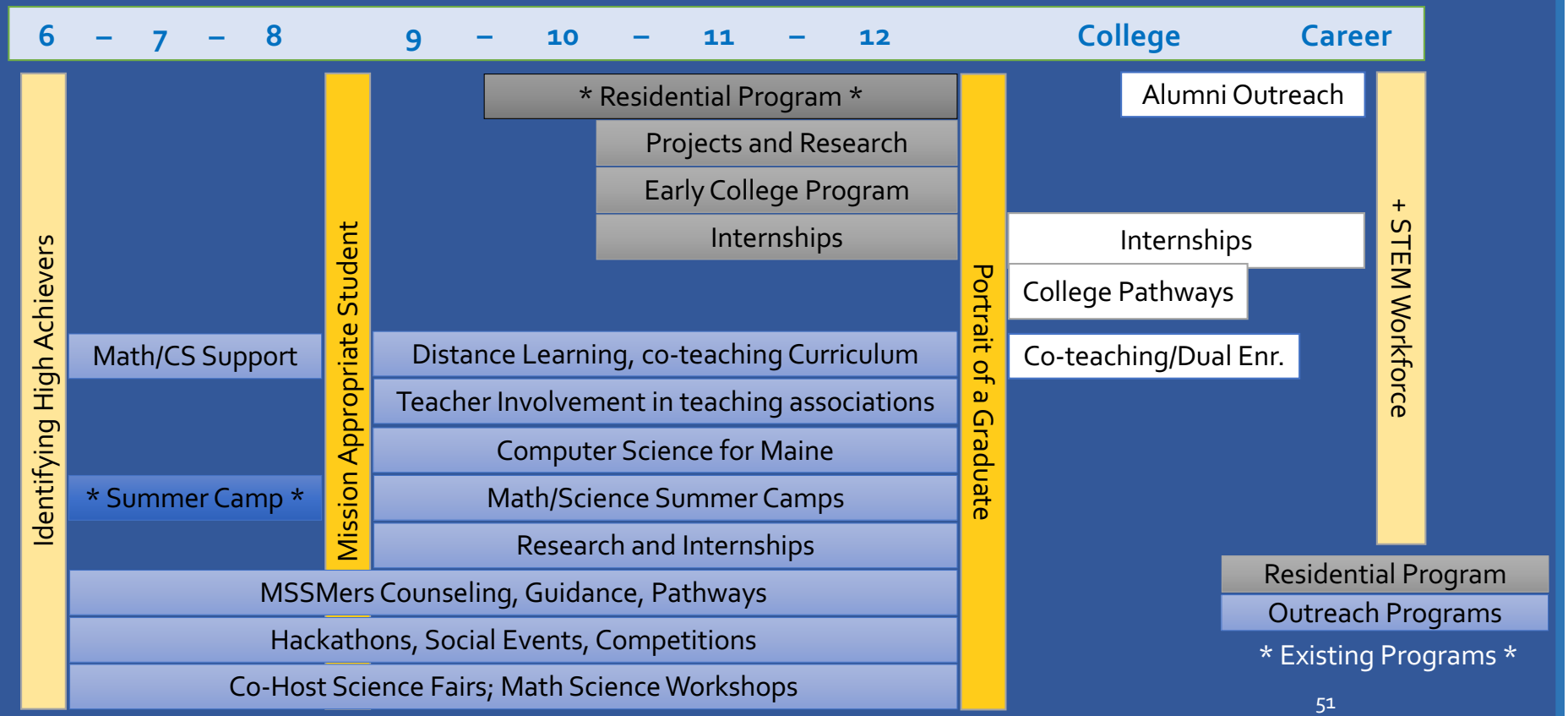
Josh Chalmers

Co-chair, Business Planning Committee

# Vision Subcommittee

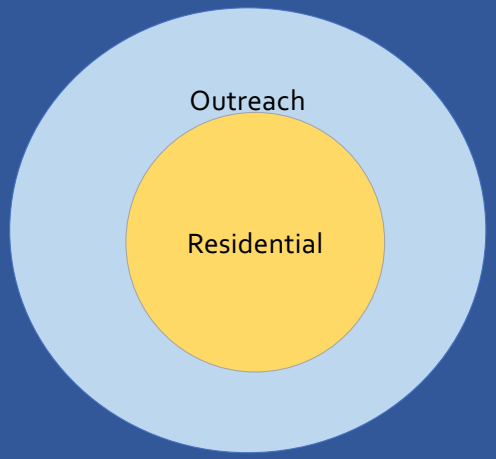
- Combine findings of Partnership & Discovery Committees
- Identify and match programs to Maine's unique needs
- Establish an MSSM Vision for future success
- Prioritize within both Residential and Outreach Programs
- Establish Best ROI against limited financial resources

# Vision - Opportunities



# Residential Feeds Outreach

MSSM's Residential Program is a Community of like-minded, high-achieving students who come together to create a dynamic culture for learning, camaraderie and personal growth. It is the Core strength of MSSM, providing the experience and resources to support an informed Outreach Program.




MSSM's Secret Sauce - *"I have found my people"*

# Residential Vision*

- Enhance Student Safety and Welfare
  - Increase investment in Social & Emotional Learning ("SEL") programs and activities
  - Mission Appropriate Facilities - Residential, Academic, Social & Recreational
- Improve Maine's Return on Investment
  - Increase average annual number of graduates by 150% from 32 to 80
  - Lower annual cost per student from $39,000 to $34,000
- Strengthen Partnerships
  - Expand College and University partnerships to enhance learning opportunities
  - Build partnerships with Research and Industry to stimulate career considerations
- Cultural Commitment to Constant Improvement
  - Maintain a mind-set and programs that emphasize best practices nationally
  - Consistently measure and manage effectiveness of academic and welfare programs

* Approved by MSSM BOT - October 24, 2020

# Outreach Vision*

- Engagement with more of Maine's high-achieving students
  - Summer camps for grades 6 thru high school
  - Counselling, especially for first generation college students and their families
- Support Maine's rural students and schools
  - Teacher training in STEM instruction
  - Remote instruction in math, computer science, etc. to supplement local instruction
- Build a state-wide community of MSSMers
  - Create opportunities for residential and non-residential STEM students to gather
  - Summer camps, online events with the opportunity to reach thousands of Maine STEM students
- Become a resource on best practices for STEM instruction
  - Share programs, tools and experiences for enhanced STEM instruction
  - Share health & welfare program experience and advice for high achieving students

* Approved by MSSM BOT - October 24, 2020

# Office of Outreach

- Sister Schools outreach investment is significant
  - Outreach budgets range from $140k to $4.9 million
  - Fundraising and sponsorships are a large contributor to Outreach Programs
- Outreach benefits to Residential Program
  - Enhances student recruitment, internships, partnerships, etc.
  - Connects residential students to their peers throughout the state
- Financial model for MSSM Outreach Program
  - Staffing: Program Director, Partnership Coordinator, Program Organizer
  - Incremental annual investment of $420k includes salaries, travel, promotion and administration costs

High Return on Investment for all Maine STEM Students.

# Satellite Outreach Example

- Opportunities for Satellite Outreach
  - During Leadership/Partnership meetings multiple opportunities were identified with USM
  - Using USM as a satellite location greatly expands accessibility of MSSM Outreach
- Facilities for summer camps (and more)
  - Dorms, classrooms, science and engineering labs, MIST Center and Maine Robotics
  - Helps meet the goals of expanded MSSM summer camps for high school students
- Further opportunities and ideas
  - Remote hosting site for previously mentioned Outreach Events
  - "Semester Abroad" at USM for MSSMers and other Pipeline programs

Expanded Availability of MSSM Outreach

# Vision - Summary of Actions

- Safety and Welfare
  - Invest more resources in services and programs to ensure student safety & welfare
  - Increase emphasis on SEL as the primary responsibility of a residential school
- New and Larger Mission Appropriate Campus
  - Establish a larger school to serve more graduates at a lower cost per student
  - Find or build a mission appropriate campus to enhance student welfare and academic outcomes
- Increase Student Applicant Pool
  - Identify source(s) of funding for student room & board fees
  - Build more partnerships with academia, industry and research to enhance program offerings
- Outreach
  - Fund and staff an Office of Outreach
  - Provide support for underserved students & under-resourced schools, esp. in rural communities

# Budget Analysis

David Pearson

MSSM Executive Director

# Per Student Residential Costs

| Budget Accounts | Today | Vision | Difference |
|---|---|---|---|
| Instruction | $ 13,310 | $12,083 | $ 1,227 |
| General Administration | $ 1,622 | $ 1,250 | $ 372 |
| Maintenance & Operations * | $ 7,662 | $ 6,667 | $ 995 |
| Student Support | $ 2,453 | $ 2,083 | $ 370 |
| Room & Board | $ 10,666 | $ 9,167 | $ 1,500 |
| Recruitment & Admissions | $ 2,116 | $ 1,667 | $ 450 |
| All Other | $ 995 | $ 750 | $ 245 |
| Total Cost | $ 38,825 | $ 33,667 | $ 5,158 |

* will depend upon partnership/campus decision

Many efficiencies in the cost per student from expanding the school size to 240 students.

# Total Costs for MSSM Vision

| Budget Accounts | Today | Vision | Difference |
|---|---|---|---|
| Instruction | $ 1,597,221 | $2,900,000 | $ 1,302,779 |
| General Administration | $ 194,691 | $ 300,000 | $ 105,309 |
| Maintenance & Operations * | $ 919,420 | $1,600,000 | $ 680,580 |
| Student Support (SEL programs) | $ 294,385 | $ 500,000 | $ 205,615 |
| Room & Board | $1,279,949 | $2,200,000 | $ 920,051 |
| Recruitment & Admissions | $ 253,965 | $ 400,000 | $ 146,035 |
| All Other | $ 119,396 | $ 180,000 | $ 60,604 |
| Total Residential Cost | $ 4,659,025 | $8,080,000 | $ 3,420,975 |
| Outreach Program | $ 313,507 | $ 735,000 | $ 421,493 |
| Total Program Costs | $ 4,972,533 | $ 8,815,000 | $ 3,842,467 |
| Less: family funded room & board | $ 1,116,000 | $ 0 | $ 1,116,000 |
| other revenue sources | $ 566,185 | $ 566,185 | $ 0 |
| Plus: state funded financial aid | $ 325,000 | $ 0 | $ 325,000 |
| Total cost to the State of Maine | $ 3,615,347 | $ 8,248,814 | $ 4,633,467 |

* will depend upon campus decision

$8.25 million annual funding requested to meet the Vision.

# Budget Analysis Summary

- Per student costs consistent with special needs norms
- A bigger school provides efficiencies & a better ROI
- Funding for Outreach Program meets state mandate
- $8.25 million annual budget consistent with sister schools

# Discussion

Residential Vision

Outreach Vision

# Partnership Subcommittee

David Coit

Co-chair, Business Planning Committee

# Partnership Subcommittee

University of Maine at Orono

University of Maine at Presque Isle

Colby College

Unity College

Four institutions have expressed Partnership interest.

# Partnership Criteria*

- Student Safety & Welfare - cultural and environmental fit
- Enhancement of Learning - accessible learning resources
- Student Access - distance from home
- MSSM Faculty & Staff - quality of local talent pool
- Residential Facilities - mission appropriate and accessible
- Academic Facilities - mission appropriate and accessible
- Event Hosting - facilities and experience
- State Funding - amount and form

* prioritized by programmatic importance

# MSSM - Limestone

| Prioritized Criteria | Influencing Factors |
|---|---|
| Student safety & welfare | Increased focus on Student Welfare, need for new facilities |
| Enhancement of learning | Good relationship with UMPI, limited STEM curriculum |
| Student access | Distant from most sending families, 204 miles avg. distance |
| MSSM faculty & staff | Small market, limited opportunities for trailing partners |
| Residential facilities | Need for new mission appropriate residential facilities |
| Academic facilities | Continuation in Limestone facilities & UMPI relationship |
| Hosting facilities | Adequate facilities, would improve with new dormitory |
| State funding - capital | State bond needed to fund new residential facilities |

# UMaine - Orono

| Prioritized Criteria | Influencing Factors |
|---|---|
| Student safety & welfare | Culture concerns, good medical support & Ed. Department |
| Enhancement of learning | Breadth of curriculum and instruction, especially engineering |
| Student access | Central location, visitor support services, 86 miles avg. distance |
| MSSM faculty & staff | Large pool of talent and career enhancement opportunities |
| Residential facilities | Existing on-campus dorms provide little social separation |
| Academic facilities | Considerable resources, how much available to MSSM? |
| Hosting facilities | Considerable facilities for camps and education programs |
| State funding - capital | Improvements to existing dorms, no other investments |

# UMaine – Presque Isle

| Prioritized Criteria | Influencing Factors |
|---|---|
| Student safety & welfare | Scale of campus, access to AMHC & health services, Ed. Dept. |
| Enhancement of learning | Variety of science & research opportunities, computer science |
| Student access | Distant for most students, 186 miles avg. distance |
| MSSM faculty & staff | Modest talent pool, better career opportunities, spouse options |
| Residential facilities | New mission-appropriate dorm, academic spaces, shared cafeteria |
| Academic facilities | More & better resources, scheduling access challenges, esp. labs |
| Hosting facilities | Very good hosting facilities for camps and education programs |
| State funding - capital | Privately funded new dorms, long term lease obligation |

# Colby College - Waterville

| Prioritized Criteria | Influencing Factors |
|---|---|
| Student safety & welfare | Own separate campus, near hospital & student rec. center |
| Enhancement of learning | Strong sciences, growing computer science, no engineering |
| Student access | Central location, visitor support services, 61 miles avg. distance |
| MSSM faculty & staff | Good pool of talent, career enhancement opportunities |
| Residential facilities | New mission-appropriate dormitory, academic and social spaces |
| Academic facilities | Considerable resources, how much available to MSSM? |
| Hosting facilities | Good hosting facilities for camps and education programs |
| State funding - capital | Shared 50-50 with the State of Maine, $25-$30 million each? |

# Unity College - Unity

| Prioritized Criteria | Influencing Factors |
|---|---|
| Student safety & welfare | Scale of campus, somewhat segregated, shared medical services |
| Enhancement of learning | Science oriented curriculum & facilities, no engineering |
| Student access | Central location, visitor support services, 65 miles avg. distance |
| MSSM faculty & staff | Good pool of talent, career enhancement opportunities |
| Residential facilities | Existing dedicated dorms, cafeteria & other spaces |
| Academic facilities | Turnkey dedicated modern classrooms and lab spaces |
| Hosting facilities | Excellent hosting facilities for camps and education programs |
| State funding - capital | Immediate occupancy, no capital cost, short/long lease options |

# Comparison of Campus Options

| Prioritized Criteria | MSSM | UMO | UMPI | Colby | Unity |
|---|---|---|---|---|---|
| Student safety & welfare | Good | Fair | Good | Very Good | Good |
| Enhancement of learning | n.a. | Significant | Modest | Significant | Modest |
| Student access | Distant | Central | Distant | Central | Central |
| MSSM faculty & staff | Limited | Large | Moderate | Large | Large |
| Residential facilities | New * | Existing | New | New | Turnkey |
| Academic facilities | n.a | Extensive | Good | New | Very Good |
| Hosting facilities | Good | Very Good | Very Good | Very Good | Very Good |
| State funding - capital | Bond * | Budget | LT Lease | Shared | Lease |

* assumes new build, but without a specific proposal

# Qualitative Rankings

| Primary Criteria | MSSM | UMO | UMPI | Colby | Unity |
|---|---|---|---|---|---|
| Student safety & welfare | 4 | 5 | 3 | 1 | 2 |
| Enhancement of Learning | 5 | 1 | 3 | 2 | 4 |
| Residential facilities | 4* | 5 | 3 | 1 | 2 |
| Academic facilities | 5 | 3 | 4 | 1 | 2 |
| Cost ** | 3* | 2 | 4 | 5 | 1 |

* assumes new build, but without a specific proposal
** assumptions need to be explored further with prospective partners

Program quality and costs vary widely between options.

# Partnership Considerations

- Safety and welfare of MSSM students
- Contributed value of each partner relationship
- Relative attributes of each campus location
- Up-front investment in new facilities
- Impact on annual operating budget

The objective is to meaningfully improve MSSM.

# Concluding Comments

- Maine has a small but significant complement of world class human capital in its economic ecosystem
- Alfond Foundation and Roux Institute are investing heavily in the state's undergraduate and post-graduate resources
- Primary STEM education needs to participate as a fundamental component to building Maine's human capital over time

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Visionary Leadership is needed for a long-term investment.

# Phase 2 Decisions to be Made

- Support the new MSSM Vision
  - School size, annual budget, changes to legislation
  - Scope and size of Outreach Programs
- Provide direction on Partnership Options
  - Evaluate the criteria for the Partnership choice
  - Provide guidance for the Partnership discussions
- Define next steps to moving forward
  - Gain support within the Administration
  - Gain support within the Legislature

# Discussion

MSSM Vision

Partnership Options

Next Steps