Task Force to Study the Creation of a Comprehensive Career and Technical Education System
Resolve 2023, chapter 92
November 8 – 10 AM
Room 208, Cross State Office Building (EDU Committee Room), Augusta, ME

Agenda: Meeting #2

1. Welcome - Chairs, Senator Joe Rafferty and Representative Kelly Murphy;

Commission member introductions

2. **Presentations:**

Other State Comprehensive Technical High School Models:

- Massachusetts: Erin Orcutt, Business Administrator, Cape Cod Regional Technical High School
- New York: Dr. Jim Niedermeier, Associate Superintendent of Curriculum, Instruction, and Accountability, Questar III BOCES

Four-Year Technical High School Feasibility Study - MidCoast Maine Region

- Shawn Chabot, Superintendent, Region 10 Technical High School
- John Stivers, Assistant Director, Region 10 Technical High School
- John Dorrer, Former Acting Commissioner of the Maine Department of Labor, Labor Economist
- Dana Connors, Former President Maine State Chamber of Commerce, Former Commissioner of the Maine Department of Transportation
- Emma Mohney, Evaluation Associate, Hart Consulting
- Patricia Hart, Principal Consultant, Hart Consulting

3. Commission discussion

Future meetings, plan moving forward, requests for information of OPLA staff

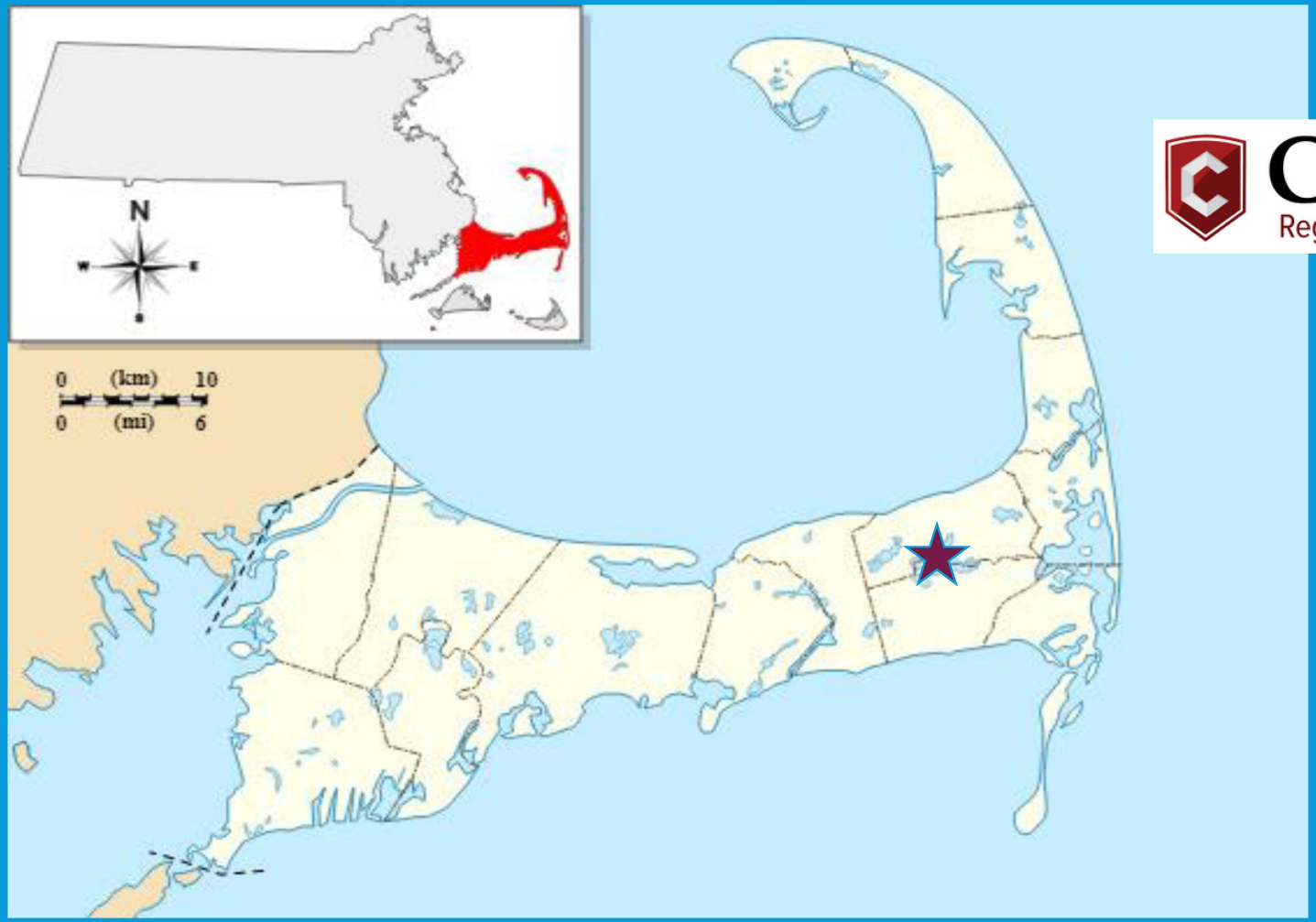
- Next meeting: 10 a.m. Thursday, Nov. 30

OPLA Staff:
Steven Langlin, Legislative Analyst, Steven.Langlin@legislature.maine.gov
Hillary Risler, Legislative Analyst, Hillary.Risler@legislature.maine.gov
207-287-1670

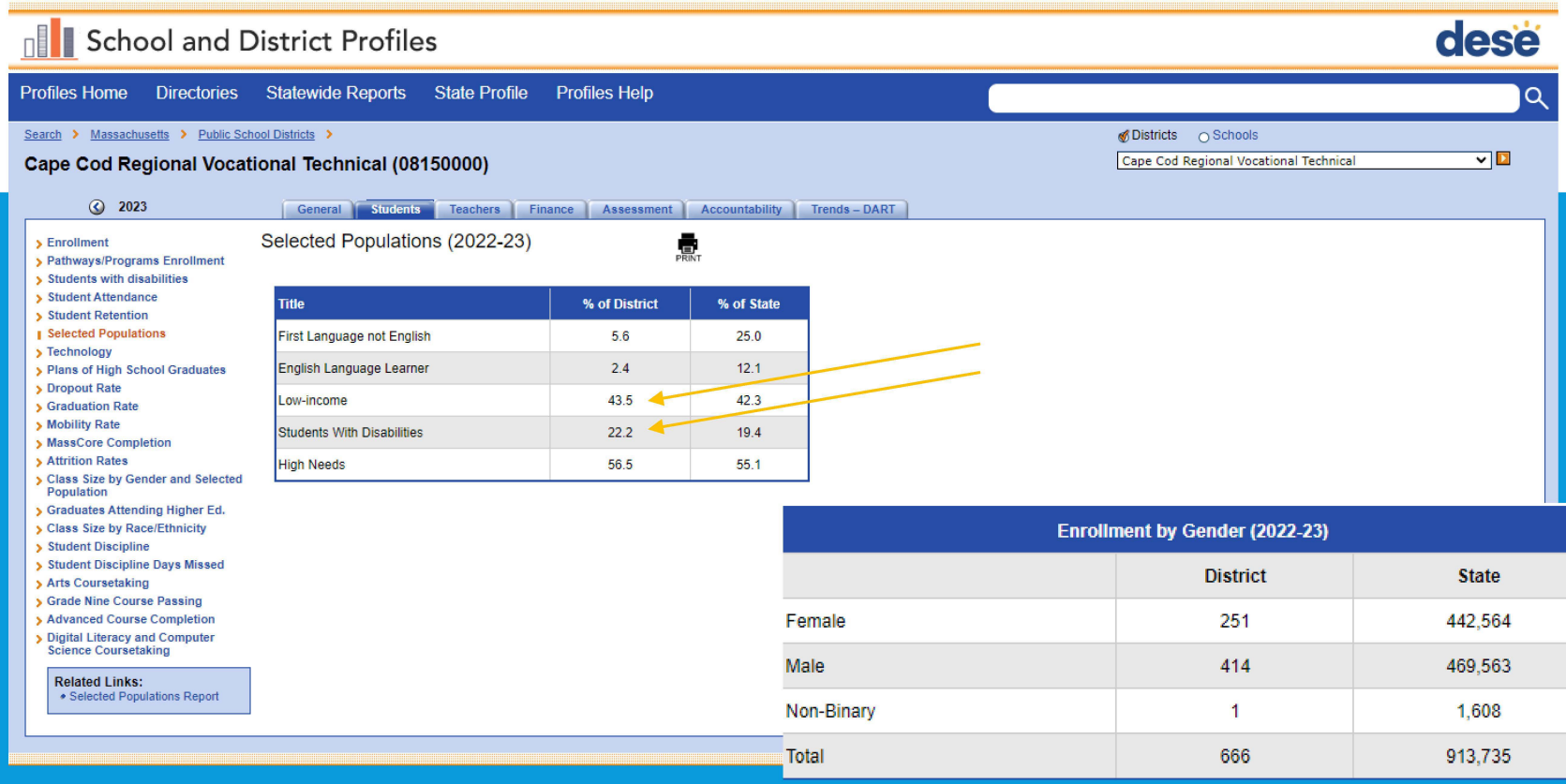
MASSACHUSETTS CTE

CTE: A SNAPSHOT

- **Massachusetts has 28 regional technical/vocational high schools**
  - 3 Agricultural High Schools
  - Forty-seven (47) State approved Chapter 74 programs
  - Individual programs exist in some comprehensive high schools
- Application schools serving grades 9-12+
- Subject to all State graduation requirements, including passing scores on the Massachusetts Comprehensive Assessment System (MCAS) in Mathematics, English Language Arts (ELA), and Science/Technology Education



CAPE COD
Regional Technical High School



Enrollment by Gender (2022-23)		
	District	State
Female	251	442,564
Male	414	469,563
Non-Binary	1	1,608
Total	666	913,735

CAPE COD TECH

- 2-week rotation between academics and "shop"
  - 9/11 and 10/12
  - English & Math are 180-day courses in the 9th and 10th grade
  - Science is a 180-day course in the 9th grade

- Minimum Graduation Credit Requirements
  - Four (4) Years of ELA, Math and Science
  - Three (3) Years of Social Studies/History
  - Physical Education
  - Senior Project – capstone & research paper
  - Passing MCAS scores

- Courses offered at various levels; College Prep, Honors & Advanced Placement
- Students on an IEP receive additional academic support and co-taught courses.

It began with a vision…

Educational Visioning

Cape Cod Technical High School
Harwich, MA

July 2016
Frank Locker Educational Planning

Key Words for Education

Workshop participants each identified one-word or two-word phrases that best represented their individual thoughts about the Educational Deliveries. These words could be the basis of the "elevator speech" describing the future schools.

Their Key Words for education were:

- Collaborative, collaboration
- Relevant
- Integrated

The list of all Key Words is in Appendix Ch 5.3.

School Organization

Visioning Team members reflected on model school organizational structures, and determined these to be the most and least appropriate structures for the CCT:

SCHOOL ORGANIZATIONAL STRUCTURE
Most appropriate:

- Freshman Small Learning Community, followed by thematic, interdisciplinary Small Learning Communities, each with academic Classrooms and career-tech Shops and Labs

Least appropriate:

- Academic departmental model Grades 9-12, tech separate

FACILITY CONCEPTS

Key Words for Facilities

Visioning Team participants were asked to identify one word that best represented their individual thoughts about the future facility.

Only one word was cited by more than one person, and that word was cited a resounding 14 times:

- Flexible, flexibility

For the full listing, see Appendix Ch 5.3.

Places for Learning

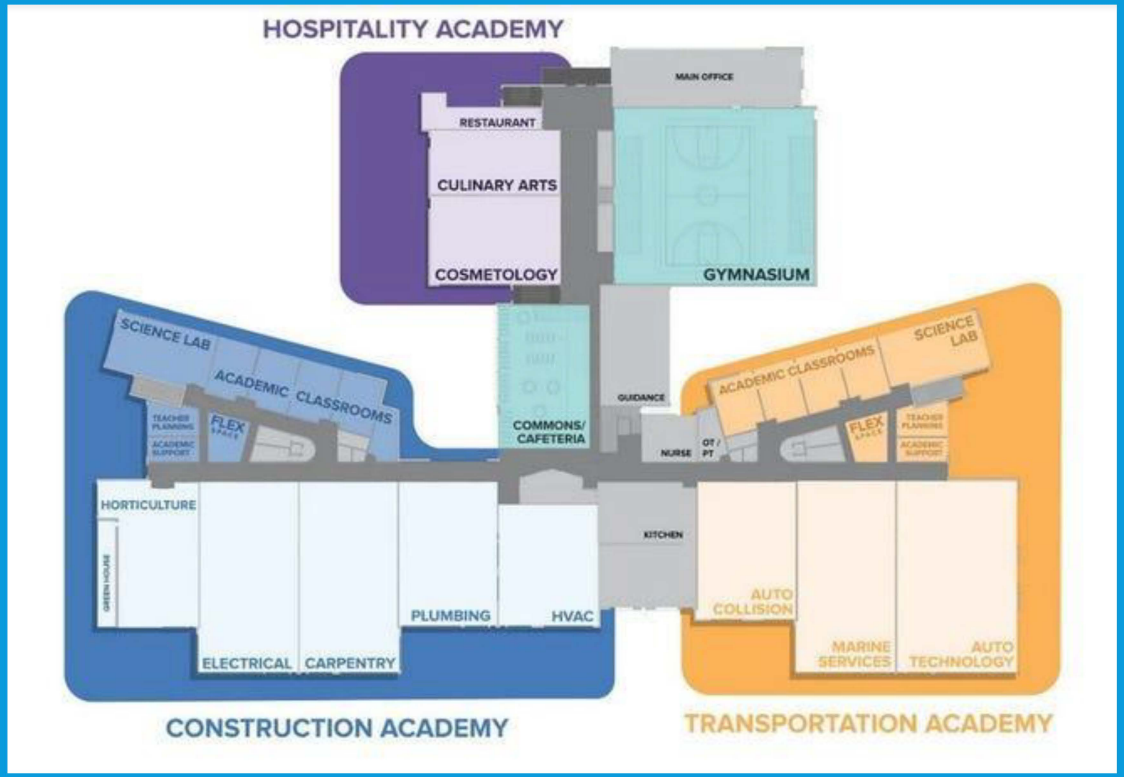
The Visioning Team reviewed thirteen exemplar schools from the USA, the United Kingdom, and Australia. Working in Table Teams they ranked the schools for appropriateness for the future teaching and learning at CCT.

Most of the schools cited as most appropriate shared these essential characteristics:

- Learning spaces arranged as Small Learning Communities
- Classrooms are components of "suites of spaces," supported by other spaces immediately adjacent
- Circulation to be used for learning
- Classrooms are to be flexible, interconnected, and supported by auxiliary spaces including Collaboration/Breakout/Commons Spaces
- Interdisciplinary possibilities
- Open presentation areas

- Variety of furnishings, offering students and teachers more choices in supporting learning
- Possibility of student groups working in multiple places under the guidance of the teacher
- Teacher collaboration supported by the facilities, through connections between the rooms and strategic placement of related functions
- Teacher Planning Centers to support teacher collaboration and sense of community

For a full description of the most appropriate and least appropriate exemplars, with illustrations, see Ch 4 Facility Concepts.



Construction

- Horticulture
- Electrical
- Carpentry
- Plumbing
- HVAC

Hospitality & Human Services

- Culinary Arts
- Cosmetology
- Dental Assisting
- Health Tech

Transportation

- Auto Technology
- Marine Services
- Auto Collision

STEAM

- Info Tech
- Engineering
- Design & Visual Communications & Art

9th Grade Academy

CHALLENGES & TAKEAWAYS

- Scheduling takes creativity
- Technical education is expensive and even more expensive to build!
- Collaboration and professional development are essential
    - Common planning time, academy time, and PLC work
- Community buy-in is essential to your success
- It takes time - but it's worth the effort

THANK YOU FOR YOUR TIME

- Erin Orcutt, Business Administrator, Cape Cod Regional Technical High School (District) – Harwich, Ma.
  - eorcutt@capetech.us
  - Visit us: www.capetech.us

Questar III BOCES

Cooperative Educational Services with:

- **65** years of service
- **300** programs and services
- **400+** business partners
- **690** school districts and BOCES served
- **1,652** square miles in supervisory region
- **28,865** public students served in 3 counties

Career and Technical Education (CTE)

CTE

- ~ **700** students
  - Rural, suburban, urban, high needs, average needs, low needs, poor, average wealth and rich school districts alike
- **24** hands-on programs
  - Ranging from auto and aviation to welding and scientific research and world health
  - Each program has college credits available

CTE

- **30-40** percent of students have an IEP
- **98.2** percent of students graduate with a Regents Diploma
- **60** percent attend post-secondary education

CTE

- **200** partners help us to align curriculum and equipment to industry standards
- **Thousands** of hours of student internships completed
- Launch of a youth apprenticeship program in 2020

New Visions

New Visions

- Business, Finance & Accounting
- Emergency Preparedness, Informatics, Cybersecurity & Homeland Security (University at Albany's College of Emergency Preparedness, Homeland Security & Cybersecurity)
- Medical (Samaritan Hospital)
- Pathways in Education (University at Albany's Main Campus)
- STEM (Rensselaer Polytechnic Institute)
- Scientific Research & World Health (University at Albany's Health Sciences Campus)
- Visual & Performing Arts (The Arts Center of the Capital Region)

Innovative CTE High Schools

Tech Valley High School

- Opened in 2007 and moved to the SUNY Polytechnic Institute (now NYCreates) Campus in 2014
- Joint partnership between Questar III and Capital Region BOCES
- Project-based learning focused
- 30% students with IEPs and 504s
- Students chosen by lottery
- Students must be willing to learn in a collaborative and innovative environment

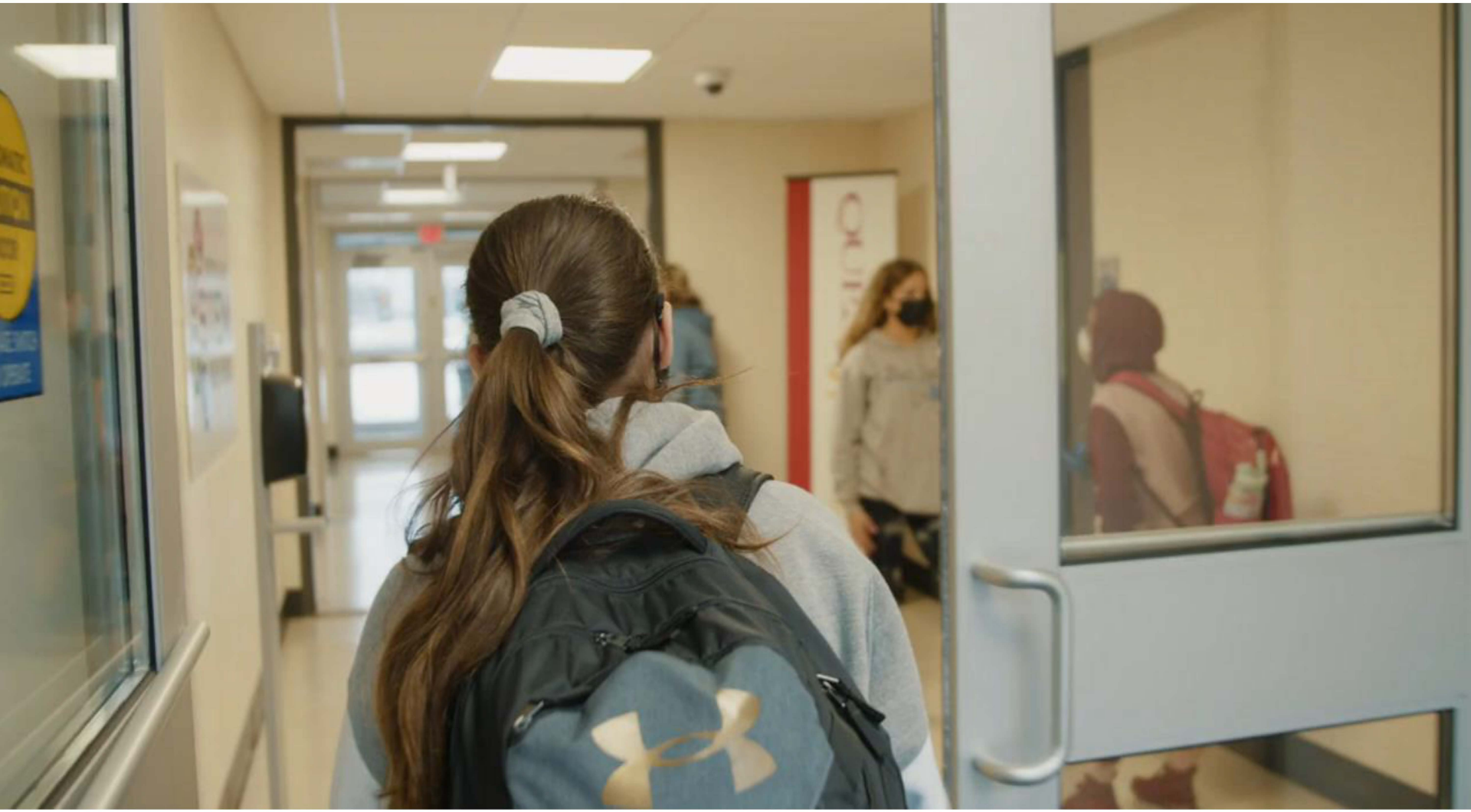
Tech Valley High School

- **150** students from 30 school districts
- **2**-week annual career exploration program (called I-Term)
- **4** years of math and science (and 2+ years of Mandarin Chinese)
- **19** college credits earned, on average, by graduating seniors
- **20+** monthly interactions with business, non-profit and higher education leaders
- **60**-credit associate degree available
- **100** hours of community service required in order to graduate
- **100+** presentations delivered across four years of school
- **466** college credits earned last year

STEM High School

QUESTAR III & HVCC STEM HIGH SCHOOL

- Opened September 2021 on the site of Hudson Valley Community College
- Funded by two state grants – P-TECH and Early College High School
- No cost to students
- Designed to give students historically underrepresented at the post-secondary level a jumpstart on their college education and careers
- Several career pathways including Computer Information Systems, Civil Engineering, Environmental Science and Heath Sciences
- Currently 100 students in grades 9-11
- 169 college credits earned last year



4-Year Technical High School Feasibility Study prepared for Region 10

HART CONSULTING

November 8, 2023

Feasibility Study Background

Hart Consulting – Research Team

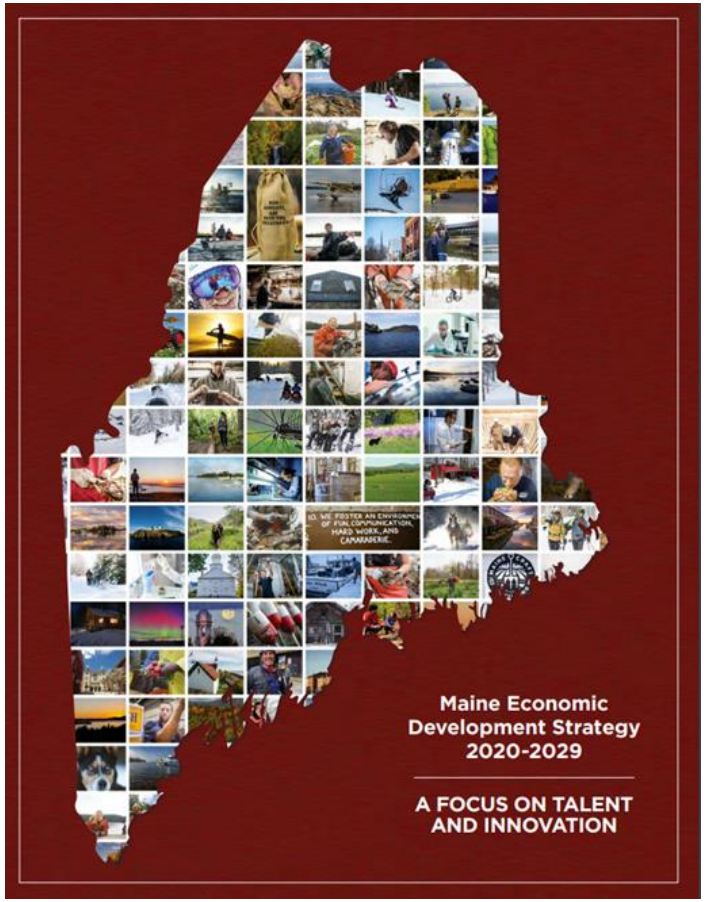
- Consulting firm based in Gardiner
- Patricia Hart, MS, CPH and Emma Mohney project consultants
- Strategic planning, program evaluation, research

Feasibility Study

- Funded by the Harold Alfond Foundation
- Review of governance, programming, finances, student population, employer and partner opportunities
- Extensive stakeholder input from CTE Directors, MACTE Director, students, families, businesses, legislators, trade associations, educators
- Developed a template for replication in other regions

Technical Skills Are Critical To Growing Maine's Economy According To The State's Economic Strategy Plan

- **44.9 vs. 38.2 Median Age** - Maine is the oldest state in the nation.
- **5% Point Drop in Earnings** - Average annual private sector earnings fell from 83% to 78% of the national average over the last 20 years.
- **Identifies four areas** in which Maine has current strengths and opportunities:
  - **Food/Marine**
  - **Forest Products**
  - **Technical Services (energy systems)**
  - **Making/Manufacturing**



Source: Maine Economic Development Strategy 2020 – 2029 | A Focus on Talent and Innovation

Maine CTE's are Doing Good Work

- CTE enrollment is growing in Maine.
- 92.5% of CTE concentrators graduated in four years in 2020-2021[1], compared to 86% of all Maine high schoolers.[2]
- Partner and work closely with sending schools and industry partners
- Adopted one or more national or state-level standards tied to the needs of business and industry
- Provide pathways to employment and further education
- Offer concurrent or dual enrollment for college credit

Maine CTE Challenges

- **Part-time CTE** model leads to scheduling challenges for students and Region 10
- Interruptions to Region 10's schedule occur 33% of a typical school year
- Potential students must be in good academic standing to attend CTE (barriers include credit deficiency, scheduling conflicts, inability for credit recovery)
- A student's sending school determines whether a student can earn specific academic (rather than elective) credit for CTE coursework
- CTEs can only offer academic courses in cases where scheduling conflicts would prohibit a student from attending the CTE
- Limited seats for students in programs, waitlists

Maine Employers Are Actively Filling Workforce and Skills Gaps

- Skills and workforce mismatch
- Employers competing for a fixed pool of talent
- Large employers have stood up deep training programs to attract and prepare workers
- Workers lack “work ready” skills, time management, financial management
- Examples include – Cianbro (welding, pipefitting), Prescott University - EJP(pipe laying), MaineHealth, Pine State Beverage (Driving academy), BIW (drafting, welding), Crooker (building trades)

Many Other Successful Technical High School Models in the US – Models Vary State to State

- Magnet schools – competitive application process
- Co-located with college
- One option out of many in a large school district
- Embedded in a traditional high school
- Some are focused on specific industries such as healthcare

More Opportunities for More Maine Students

Align	Support	Expand
Align a 4-year public school to the needs of the future economy and aspirations of Maine's students	Support students to build foundational skills and more time in developing advanced career skills	Expand the number of students in career focused programs in the state

Working Assumptions for Assessing Feasibility

The proposed school will:

- Be a public day school
- Full-time comprehensive technical high school, with traditional part-time CTE access
- Award high school credits and diplomas
- Located at Brunswick Landing
- Attract at least 300-350 full-time students, according to preliminary research
- Provide all required services and extra-curricular activities (on-site or as cooperatives)
- Inclusive admissions – special education, English as a second language

School Features

- Core academics integrated with technical programs
- Rigorous academic and technical courses (AP, Pre-engineering, Biosciences, Construction Science, Energy Systems)
- Early college experiences
- Guided pathways
- 21st Century Skills/Life and Career Ready Skills
- Hands on learning opportunities with partners (SMCC, UMA, businesses)
- Deep partnerships with businesses, colleges, Maine CTEs, high schools

Student Pathways

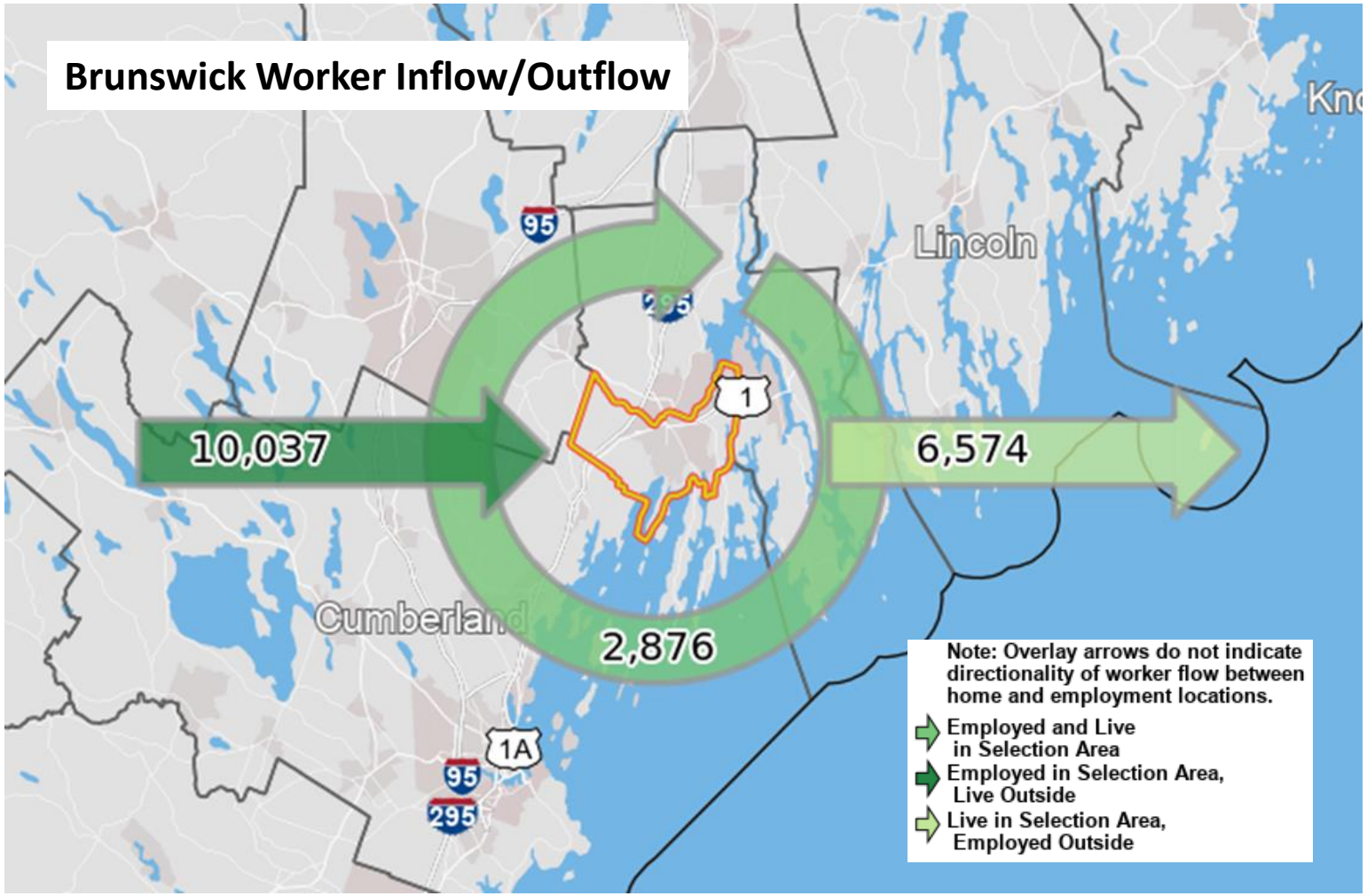
9th Grade	10th Grade	11th Grade	12th Grade
Foundational Coursework	Intermediate Coursework	Advanced Coursework	
		Dual enrollment	
		Work-based learning at job sites	

Mid Maine Area: Student Population and Commute Patterns

Student Population:

- 18,000 high school students in towns within 30 miles of Brunswick
- 3,200 students attend high schools in districts that have large populations commuting to the Brunswick/Bath area

Sources: NCES data for 2020-2021 school year, U.S. Census OnTheMap (data from 2019)

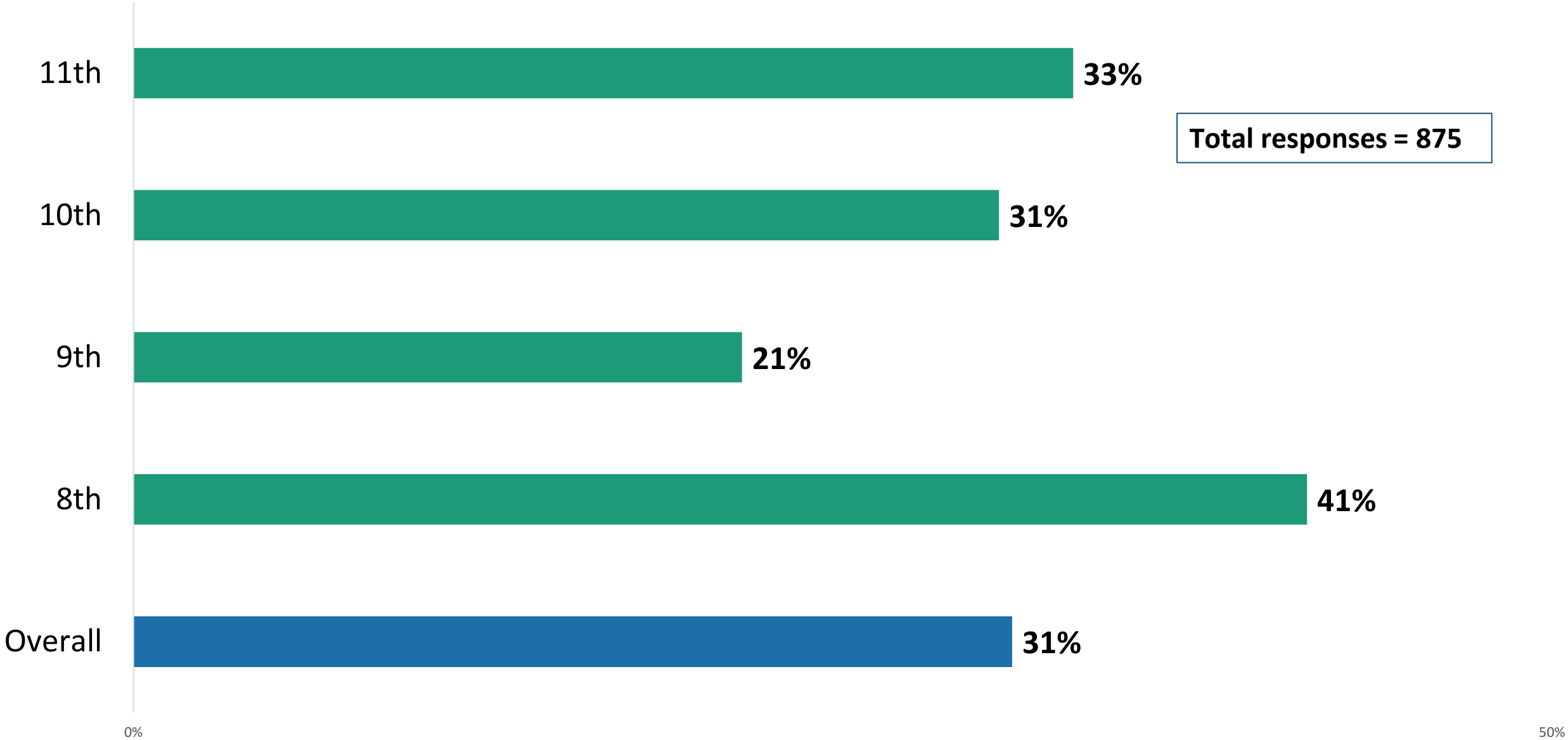


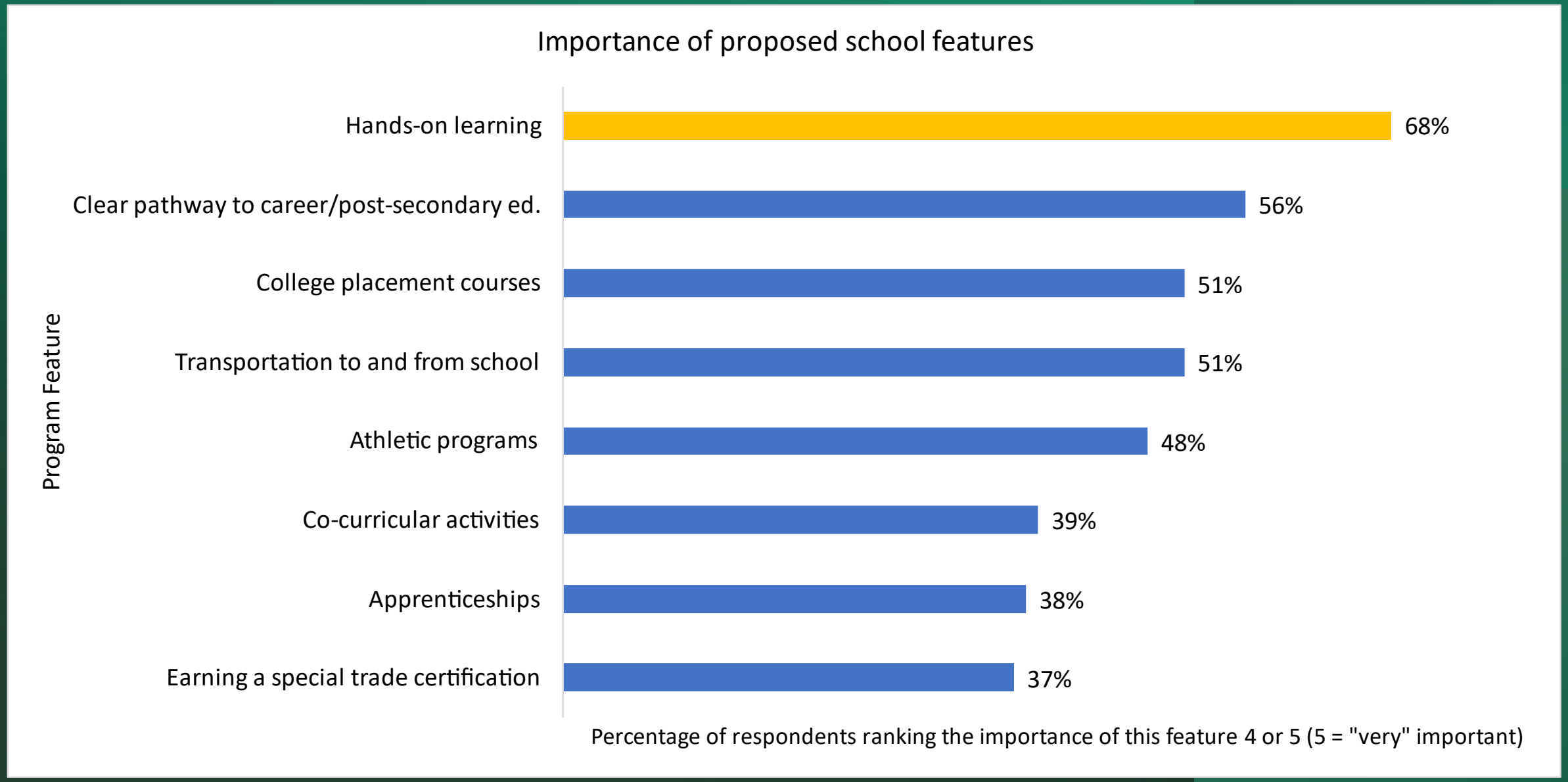
Why Brunswick?

- Brunswick imports 80% of its workforce from outside communities
- Regional commute patterns are dispersed across a wide area
- Opportunity to be on or close to Brunswick Landing
  - 150 companies – focused on manufacturing, energy, aviation, technology and life sciences
  - SMCC, UMA and 4 aviation schools
- Manufacturing, education, aviation, and healthcare are growing sectors
- Public transportation hub

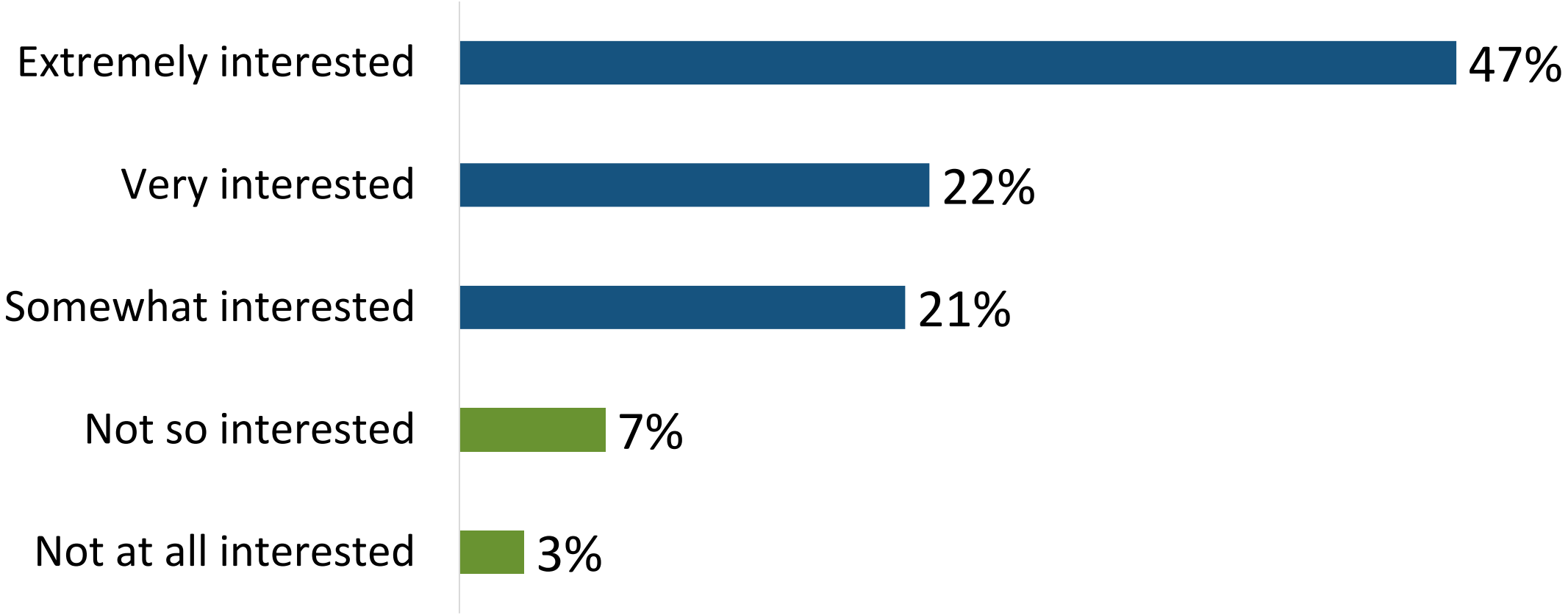
Percentage of respondents interested in attending 4-year full-time technical high school

(rating 4 or 5 on a 5-point scale where 5 is "very interested")




Importance of proposed school features
Program Feature
Hands-on learning
68%
Clear pathway to career/post-secondary ed.
56%
College placement courses
51%
Transportation to and from school
51%
Athletic programs
48%
Co-curricular activities
39%
Apprenticeships
38%
Earning a special trade certification
37%
Percentage of respondents ranking the importance of this feature 4 or 5 (5 = "very" important)

Caregiver Survey “How interested would you be in sending your student(s) to a new, comprehensive technical high school?” (n = 262)



Early Thoughts on Governance – Many Open Questions

- Keep the current governance
  - Region 10 Cooperative Board
  - 9 members from sending school districts' boards
  - Each CTE program has a program advisory board
  - This structure is set in statute and member SAUs are set in statute
- Allow eligibility to attend a CTE center or region for secondary school instruction *(Title 20-A Part 4.2 Chapter 313 subchapter 1 §8305-A. Eligibility)*
  - Requires revision to the admission standards to include standards for attending the 4-year school full time.

Current Funding - $2.8million Budget

- Current Operating funding
  - Provided state funding as a regional CTE per the Maine Department of Education-Essential Programs and Services - CTE funding model
  - Funding is based on the number of students enrolled in each program and the total in the school
  - Transportation funding is only provided as a program expense (i.e. field trips)
  - Currently no special education funding is provided directly to a CTE center/region
  - Total state FY23 allocation as of October 2022: $2,893,205
- Construction funding
  - CTEs can participate in the current Maine DOE major school construction program and other construction funding streams

Potential Additional Funding Needed

Assumptions

- 300 full time students in 4-yr high school
- 100 traditional CTE programming (typically 1-2 years)
- Special Education
- Certified instructors and teachers
- School Counselors
- Adds instruction support from community colleges Aspire Program
- Nutrition program, extra curricular activities, administration
- Transportation

The Additional Funding Need

- $3.6million – 4-year technical high school

Construction Costs - Guess

Assumptions

- 130,500 sq ft
- $60million

Based on Sanford High School and Tech Center (October 2018) construction costs/sq ft inflated 40%

The Big Questions – How Will This Be Funded And How Will It Impact Education Funding Available In The State

Options that Require Incremental Changes to Statutes and Rules

- Fund the part-time CTE programming component as it is today

For the 4-year technical high school

- Change CTE enabling legislation to allow access to funding for regular instruction and special education (general education funding)

Four-Year Technical High School Feasibility

- Strong interest from students, families, and business community
- Addresses current barriers in Maine's part-time CTE system (scheduling, juggling sending school's needs, awarding credit)
- Provides students deeper opportunities for career studies and prepares ***more graduates*** for Maine's workforce
- Provides students with a full-time hands-on alternative to traditional high school
- Preserves the traditional CTE option currently available for students across the state

Challenges

- Requires changes to state statutes
- Identify a funding model that holds other schools harmless
- Need to take bold action to prepare our youth for the jobs of the future

Thank you

Please contact us at – info@HartConsultingInc.com

Four-Year Technical High School Feasibility Study

MidCoast Maine Region

DRAFT FOR DISCUSSION

10.19.23

Prepared by:
Hart Consulting, Inc.
Patricia Hart, MS, CPH
Emma Mohney
Erin Guay, MPH

This study was generously funded by the Harold Alfond Foundation, which made this long-awaited research possible.

We also share our gratitude for the many people who shared their insights and expertise on the potential for opening a four-year, full-time technical high school in Maine's MidCoast region.

Contents

Portrait of a Four-Year Technical High School Graduate

The new school's mission is to provide a supportive environment that values technical and academic learning equally and inspires a community of lifelong learners by providing rigorous and real-life academic opportunities, dynamic partnerships, and engaging practical experiences.

This Portrait describes the values and skills that students will learn as members of the school community and take into the world when they graduate.

Graduates are…

- **Curious** about the world, how things work, and how they could work better
- **Responsible** employees, citizens, and coworkers who can be counted on to show up prepared to contribute to the task at hand
- **Hard-working** and committed to the work they take on
- **Lifelong learners** who are ready to master new skills as their jobs and industries change, and who value opportunities for learning and growth
- **Problem solvers** who think critically, research thoroughly, and propose creative solutions
- **Team players** who know that effective collaboration sometimes involves disagreement, constructive criticism, and compromise
- **Strong communicators** who share their thoughts clearly in writing and in conversation
- **Financially literate** and equipped to make good choices with their money in high school and beyond
- **Confident** in and **proud** of their skills and contributions to our community

Executive Summary

Background

In 2015, a group of local businesspeople, educators, and policy analysts began looking for education and training options to meet growing demand for technical workforce skills in the MidCoast Maine region. Leaders from Region 10 Technical High School, the area's state-designated Career and Technical Education school, facilitated discussions that identified the need for a feasibility study of operating a four-year technical high school with integrated academics in the region as a potential enhanced education option and a workforce solution. The Harold Alfond Foundation awarded the group a grant, and Region 10 hired the team at Hart Consulting to lead the study with a multi-disciplinary team of consultants.

Career and Technical Education (CTE) is a hot topic for leaders in education and workforce development at the local, state, and national levels. School districts, businesses, and legislators are working to shift the conversation about what students can and should do after high school, and there is increasing recognition that for many people, the pathways that CTE offers can be the beginning of a rewarding long-term career—with or without a college degree.

Maine CTE

Currently, Maine CTE schools are offering students a high-quality technical education to prepare them for existing fields that are changing quickly in response to new technologies, and new fields that require technical know-how. The schools are helping meet the needs of employers across the state. While the current system is innovative and supportive of student and employers needs, it faces known challenges. See Table Ex.-1. The idea for a new four-year school was born from an interest in providing solutions to these challenges and it was fueled by the need to produce even more CTE graduates in the state to meet growing interest and employer demand. The new school essentially adds a new option for technical education in Maine.

Table Ex. – 1. Maine CTE Challenges and Solutions in a New Four-Year Technical School

Maine CTE Current Challenges	Four-Year Technical School Solutions
Part-time in technical education classes	Four-year full-time experiences with hands-on learning
CTEs juggle their schedules with sending schools (oftentimes multiple schools)	Direct control over curriculum, scheduling, and co-curricular opportunities
Limited time for field trips and work-based learning	Time for work-based opportunities
Limited resources for transportation	Provide transportation
Do not award diplomas	Will award diplomas
More students want hands-on opportunities	Serve more students with new hands-on opportunities

The Study

Hart Consulting team worked with a 20-member Advisory Board of educators, businesspeople, professional association representatives, and economists to design and implement the study. The concept of the new four-year technical high school in the Brunswick region was formed through an iterative process. As the team conducted research, it updated the model based on the learnings.

Firstly, the study group identified the critical factors that are needed to support a new school. They then designed a research approach, both quantitative and qualitative, to gather information about each factor. The study included web scans, interviews, focus groups, online surveys, and facilitated discussions. It generated a lot of data, analyses, and information, including eight papers with detailed findings from each study, a road map that documents how another region could repeat the effort, and this report – the assessment of feasibility.

The Concept – Four-Year Technical High School

We envision a state-of-the-art, career-focused, full-time technical high school that engages students in hands-on learning and offers opportunities to participate in employer-based work experiences. The school will continue to support traditional part-time CTE programming as a component of the new high school. The new four-year technical high school will provide rigorous core academics that may be integrated with career and technical studies. It will offer deep training in high-demand jobs in the region and state. Students will receive full supports as they do in public high schools: school counseling, nurse services, special education, nutrition program, and transportation. In addition, the students will study and gain experience in 21st Century life and career ready skills.

Nuts and Bolts. Based on research and stakeholder input, the new school will have the following features:

- Be a publicly supported day school, open to all Maine students
- Increase the total number of students involved in technical studies in Maine
- Offer a four-year, full-time comprehensive high school experience in addition to a traditional part-time CTE program
- ***Offer core academics and electives integrated with technical study and experiences such as pre-apprenticeships, apprenticeships, on-site training, and exposure to multiple careers***
- Support full student services – nurse, counseling, and special education
- Host extracurricular activities or establish cooperative opportunities with other schools or non-profits
- Award high school diplomas
- Be located at Brunswick Landing (ideally)
- Attract at least 300-350 full-time students in Maine

Education and Career Pathways. As students move through their studies, they will work with advisors to develop a pathway to career or post-secondary education. Students will experience a variety of technical programs so that they can decide what interests them most. They will have opportunities to engage with employers—as instructors, and through apprenticeships and on-site projects. Students will have a clear pathway by their junior year to guide their decisions post high school graduation.

Partnerships. To support these pathways and provide meaningful connections to employers, the new school will need to establish strong partnerships with employers, the community colleges, and professional associations. These strong connections will support collaboration and open up more avenues for students to explore the careers that interest them. One of the partnerships will be with the Maine Department of Labor to offer pre-apprenticeships and apprenticeships, when possible.

Governance. The new school will follow the governance structure of Region 10, which is guided by a Cooperative Board consisting of nine members from the sending school districts, plus the program advisory boards of industry representatives. Currently, CTE at the secondary level is governed by Chapter 313 of Title 20-A of the Maine Revised Statutes. Subchapter 4 states: "It is the intent of the Legislature that each career and technical education region shall provide career and technical education in accordance with this chapter and shall function as an extension of the secondary schools and middle schools located within the region's boundaries."

Legislation Changes. To allow students to attend a new full-time career-focused high school, the legislature would need to revise the admission standards under MRSA §8305-A to allow students to attend a school outside of their home CTE region's boundaries. The laws would also need to change to allow a career-focused high school to award a high school diploma.

Estimated Cost

The new school will build on Region 10's current funding model to fund the part-time traditional CTE students in attendance and seek appropriations from the legislature to support the full-time program. See Table Ex. – 2. Presently, the Maine Department of Education regional CTE funding model provides support based on the number of students in each program and the school population overall. It does not provide funding for transportation, nutrition program, special education, non-CTE academic programming, or extracurricular activities. Region 10 receives more than $2.5 million currently through this model. The full-time school, with 300 students, is estimated to cost an additional $3.6 million for operating funds to cover all required and necessary expenses. The new school would require the two components of funding to fully support its operations.

Table Ex. – 2. Potential Governance Structure and Sources of Funds for a New School (Includes Full-time and Traditional Part-time Students in the School)

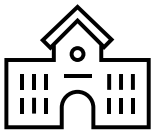
School Student Populations	Number of Students	Catchment Area	Funding Source	Governance	Curriculum
2-Year Traditional CTE students	150	Current 3 School Districts	Continue current Region 10 Funding ($2.5million)	Continue current Cooperative Board Governance – required in statute for CTE	Shared technical classes and instructors
4-Year, Full-Time Students	300	Projecting most students will come from 30-mile radius like typical commute patterns to the region (open to all students)	Funding follows students from sending schools (state average GPA) ($3.6million)	Single governance (Cooperative Board)	Shared technical classes and instructors

In addition to the operating funds, the school will need to secure construction funding to build a new, mission appropriate school. The new school would need to be at least 130,500 square feet in size and be outfitted with equipment to support the school mission. Looking at the costs of building similar schools in Maine, we estimate that a new school will cost more than $60 million and caution that costs will escalate into the future.

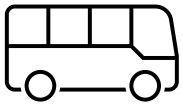
Feasibility Study Findings

This feasibility study assessed the critical factors needed to support a new technical high school in the Brunswick region. The assessment explored the facilitators and potential barriers of each factor to determine the viability of the concept. While we cannot predict the future with precision, the information and analyses shed light on the key factors and underlying assumptions to support a new school. The following table lists the critical factors needed to support the new four-year technical high school and shares topline findings from the study: supporting information as well as barriers and outstanding questions. See Table Ex-3.

Table Ex. – 3. Feasibility Study Findings for Critical Factors Supporting a New Technical High School

Critical Factor	Supporting Information (+)	Barriers (-)/Questions
The Model: Four-Year Integrated School with Part-Time CTE Option Remaining 	• Region 10 CTE part-time option currently provides a good technical education for students in the region. • Integrated four-year option will meet the needs of the students interested in a deeper technical course of study. Will combine academic rigor with more hands-on, experiential learning. • Students will not need to choose between taking AP classes and technical studies. • Generate more high school graduates with technical skills, trained to be lifelong learners. • Meet employers' need for trained workers, critical thinkers. • A new school can serve as a pilot for potential new schools in other regions. • Requires faculty with technical skills who are willing to integrate core academics into career courses.	• Needs legislative support and funding. • CTE Directors and region high schools may see a new school as reducing their enrollments and funding. For smaller schools, this could be a big impact. • New school may face its own workforce challenges in attracting staff.
Student Interest 	• 18,000 high school students within 30 miles of Brunswick, school will be open to any student in Maine. • 51% of students surveyed in sending schools indicated medium to high interest in the concept. • 68% of students surveyed highly value hands-on learning opportunities.[1]	• It is not known how many students will choose to attend the school. • It is also not known from which sending schools the students will come.

[1] Students ranking it either 4 or 5 on a 5 point scale.

Critical Factor	Supporting Information (+)	Barriers (-)/Questions
	• Region 10 students voiced interest in a new four-year technical school. • Fear over charter schools taking too many students from hometown schools did not materialize.	
Workforce and Economy 	• Greater region holds 31% of the state population and is an important economic driver. • Brunswick and greater regional economy are both growing and facing an acute shortage of workers with technical skills.	• An unforeseen change in the state economy could impact the education sector – expansion or contraction.
Employer Interest 	• Great interest in building technical workforce. • Need for workers with life skills and critical thinking skills. • Very interested in partnering with a technical high school.	• It is not known if partnership relationships with industry and the school will negatively impact businesses that may not be able to partner (small, family owned, etc.).
Parent and Caregiver Interest 	• 69% of parents/caregivers surveyed were very or extremely interested in a four-year technical high school in the region. • Parents believe it is an important option that fills a need for students in the region who want hands-on learning. • Parents support Region 10 and technical education.	• Some local parents are concerned this school could increase their property taxes.
Commuting Patterns 	• There are three regional bus lines that serve Portland and towns in-between, Lewiston region, and Bath/Brunswick. • MidCoast region has a culture of ridesharing and carpooling from outlying towns to transport workers to BIW.	• May discourage families that don't want to have students travel beyond their high school.

Critical Factor	Supporting Information (+)	Barriers (-)/Questions
Governance 	• Retaining current Region 10 governance model is possible with minor wording change to state statutes. • Additional legislative changes would allow the school to grant academic credit and diplomas.	• Board representation will be from the Region 10 sending schools only. • Legislative changes may be difficult to make.
Financial Model 	• Possible to fund the school with current Region 10 CTE funds plus per student allocation from sending districts for full-time students. • Requires 300 full time and 150 part-time students.	• A new school could impact regional CTEs and sending schools by reducing student enrollment and funding. • Legislative changes may be difficult to make.

Critical Conditions Necessary to Establish a New Four-Year Technical High School

Legislation Changes Needed to Support Student Admissions, Funding, Awarding Degrees

The feasibility of creating a new four-year technical high school in Brunswick is predicated on several key changes to existing legislation. If the school is designed as described in this paper, the following changes will be necessary.

- Revise MRSA §8305-A to include admissions standards for attending the new school from any municipality.
- Add language to MRSA §8351, State Aid for Career and Technical Education Centers and Career and Technical Education Regions, to allow CTE schools to provide regular instruction and special education.
- Revise MRSA §5205 to add exceptions to the general residency rules. Remove the subsidy count from the resident town and move it to the new school for funding purposes.
- Secure funding for the new facilities either from public or private funders.

A New Technical High School is Feasible in Brunswick

The review of the supporting information and barriers shows that a new technical high school is feasible in Brunswick, Maine, and would serve many students and businesses in the coastal and central regions of the state. In addition to the educational, technical, and workforce benefits for the region, the new school would continue to demonstrate the value of technical education and help eliminate any negative perceptions or stigma that may have been historically associated with CTE. Key points that support feasibility include:

- Area and regional businesses need skilled workers and are willing and enthusiastic partners to support technical training. The regional portfolio of businesses is diverse, offering students many career options.
- Students, parents, and community members strongly support the concept of a new four-year technical high school.
- There is a population base to draw from: 31% of the state population resides within 30 miles of Brunswick
- The legislature has shown interest in exploring the idea and has voted in support of a study commission.

Further Investigation and Policy Considerations

The Four-Year Technical High School Advisory Board discussed the feasibility study on August 15, 2023, and the Region 10 Cooperative School Board debated the feasibility study on August 21, 2023. Both groups agreed to accept the study and move on to next steps. The study group also discussed the study with business and education leaders on July 14, and presented the study findings at the annual Maine Administrators of Career and Technical Education (MACTE) Conclave on July 24. The discussions highlighted many issues that will need to be addressed:

- Reducing the impact of the loss of students (and revenues) on other high schools and CTE schools in Maine
- Attracting qualified instructors and staff
- Securing funding and legislative changes to support a new technical high school
- Continuing to find ways to meet employer and student needs for hands-on, technical learning

Background

In 2015, a group of local businesspeople, educators, and policy analysts began looking for education and training options to meet the growing demand for workers with technical skills in the MidCoast Maine region. Leaders from Region 10 Technical High School, the area's state-designated Career and Technical Education school, facilitated discussions that identified the need to explore the feasibility of operating a four-year technical high school in the region as a potential enhanced education option and a workforce solution. The Harold Alfond Foundation awarded the group a grant and Region 10 hired the team at Hart Consulting to lead the study with a multi-disciplinary team of consultants. This report shares the findings from the study and provides recommendations for moving forward.

Advisory Board

A 20-member Advisory Board comprised of educators from local schools and career and technical education schools, local businesspeople, professional associations, and state employees guided all stages of the study. See Table 1. The Advisory Board focused the study on four questions. See Figure 1.

Figure 1. Focusing Questions

- What is the current and projected demand for technical skills in Maine's labor force?
- What role could a four-year, full-time technical high school play in the region's educational landscape and economy?
    - How does this compare to four-year, full-time technical high schools in other states?
    - What role could Region 10 play?
- What are the possible operating models for a four-year, full-time technical high school in Maine?
    - What are the operating models in other states?
    - What would be feasible in Maine?

Table 1. Four-year Technical High School Feasibility Study Advisory Board

Full Name	Title	Organization
Kristine Logan	Deputy Director of Innovation and Development	MidCoast Regional Redevelopment Authority
Kelly Flagg	Executive Director	Associated General Contractors of Maine
Mike Roughton	Executive Director	Manufacturers Association of Maine
Kevin Stilphen	Director	Portland Arts and Technology High School
Julie Kenny	Director	Bath Regional Career and Technical Center
Adam Lee	Chairman of the Board	Lee Auto Malls
Jill Rivas	Human Resources Director	Crooker Construction, LLC
Craig Larrabee	President and CEO	JMG
Dan Coffey	Director, Cianbro Institute	Cianbro Corporation
Allyson Coombs	Director of Human Relations	Bath Iron Works
David Daigler	President	Maine Community College System
John Dorrer	Labor Economist	Maine Department of Labor
Marc Tucker	Founding President and CEO Emeritus	National Center on Education and the Economy
Jim Howard	President and Chief Executive Officer	Priority Real Estate Group, LLC
Eloise Vitelli	Maine State Senator	Representing District 24
Paul Perzanoski	Superintendent Emeritus	Region 10
Jason Judd	Executive Director	Educate Maine
Jim Grant	Board Chair	Region 10 Cooperative Board
Matthea Daughtry	Maine State Senator	Representing District 23
Phil Dionne	Retired	Region 10
Project Partners		
Full Name	**Title**	**Organization**
Daniel Chuhta	Deputy Commissioner	Maine Department of Education
Dwight Littlefield	Director	Maine Department of Education CTE
Kellie Gardner	Office Manager	Region 10
Dave Keaton	Executive Director	MACTE
Jean Skorapa	Superintendent	RSU 5
Phil Potenziano	Superintendent	Brunswick School Department
Steve Connolly	Superintendent of Schools	MSAD 75
Shawn Chabot	Superintendent/Director	Region 10
John Stivers	Assistant Director	Region 10

How to Read this Report

The feasibility study required primary data collection and secondary research with existing data to explore the key factors influencing the viability of a new technical high school. This report shares the findings from the collection of underlying studies conducted to understand those key factors, facilitators, and barriers. The studies included assessments of the following:

- Student populations and labor market in the catchment area
- Transportation patterns and options
- Brunswick local economy
- Student and family interest
- Staff interest
- Business leader interest
- Maine CTE Directors'/Leaders' interest
- National CTE leaders' insights
- Governance and finance

This report weaves those findings together to assess the feasibility of operating a four-year technical high school in MidCoast Maine. The first portion of the report describes the need for this new public educational opportunity, the vision for the new school, student and family interest in the school and its offerings, and the feasibility considerations. The second portion discusses the study methodology and shares summaries from the more detailed body of evidence collected for the feasibility study. The report sections are as follows:

1. The Need for Workers with Strong Technical Skills
2. Current Situation - Maine's Career and Technical Education System
3. The New Four-Year Technical High School
4. Feasibility Study Findings
5. Recommendations
6. Feasibility Study Methodology and Detailed Findings of Individual Studies

A Note on Our Experience

This feasibility study was conducted at a time when CTE, and public education generally, was under a spotlight in Maine. Schools are still recovering from the effects of the COVID-19 pandemic and may yet be recovering for some time. They are under pressure to produce skilled, educated young workers in a state experiencing serious workforce shortages across many sectors, from healthcare to construction. Some districts are also experiencing declines in enrollment, which can mean a decline in state "per student" funding.

We found that while many people—families, business and economic leaders, and students—were excited about the idea of this new school, others had reservations. This school represents a change to a system that is deeply rooted, that works as-is for many people, and that many talented and committed people work hard every day to support and improve. Even if they liked

the idea in theory, people had—and have—concerns and fears about the impact of the proposed school on the sending districts and on the CTE infrastructure in Maine.

This is a normal part of the change process, and it was important to work in consultation with the community of peers who may not ultimately support the project moving forward. It is extremely helpful to understand and respond to the concerns of people with experience and expertise.

Ultimately, whether this project moves forward or not will depend on support from the community—families, businesses, and sending districts—and political will.

1. The Need for Workers with Strong Technical Skills

The Role of Career and Technical Education in Growing the U.S. Economy

Career and technical education plays an outsized role in growing the U.S. economy, as the jobs of the 21st Century are dependent on strong technical skills and knowledge. Science, technology, engineering, and math (STEM) trained workers—including the skilled technical workforce--represented 23% of the total U.S. workforce in 2019.[1] Many of these workers are professionals with STEM degrees, such as accountants, analysts, medical professionals, and engineers. Moreover, a little over half of STEM workers have a credential of value, with most working in healthcare (19%), construction trades (20%), installation, maintenance, and repair (21%), and production occupations (14%). It is well known that technical skills improve productivity and employee earnings, helping businesses, employees, and local economies grow and thrive. A 2022 National Science Foundation study has shown that workers in science, technology, engineering, or math, and related jobs had higher median earnings, $55,000, than non-STEM workers, $33,000.[2]

Maine Needs an Innovative, Well-Prepared Workforce

The current economic climate continues to demand innovation in how goods are produced, delivered, and serviced. Workforce and materials shortages, along with increased consumer demand, have spurred many business innovations to keep up. For example, in Maine many delicate surgeries are conducted with robotic assistance, scientists have developed new composites for building and manufacturing, appliances, HVAC systems, and vehicles continue to be electrified – all driving the need to increase and improve technical training from the youngest levels. The innovations are becoming more common in our daily lives – unmanned robots deliver food to tables in busy restaurants, they wash floors in large retail outlets, and drones deliver packages to homes. These innovations developed by engineers and supported by technicians are helping our businesses improve efficiencies and address labor shortages, as well as improve environmental impacts and reduce greenhouse gases. While Maine has done well to keep up with demands in the past, we are already seeing gaps in the technical skilled workforce numbers compared to the need at all levels, with the greatest need for mid-level workers. According to the Association for Career and Technical Education, 51% of jobs in Maine require technical skills training—more education than high school but less than a four-year degree--but only 47% of Maine workers are trained at this level, creating a shortfall.[3]

[2] Source: National Science Board, National Science Foundation. 2021. The STEM Labor Force of Today: Scientists, Engineers and Skilled Technical Workers. *Science and Engineering Indicators 2022*. NSB-2021-2. Alexandria, VA. Available at https://ncses.nsf.gov/pubs/nsb20212.

[3] ACTE fact sheet, "CTE in Maine" (March 2022). https://www.acteonline.org/wp-content/uploads/2022/03/Maine-CTE-Fact-Sheet-2022.pdf. Accessed 12/20/2022.

Technical Skills are a Critical Component to Growing Maine's Economy

Maine's leaders from business, industry, education, labor, and government are all calling for a greater focus on technical training and skills to help move Maine's economy forward. Maine's most recent economic plan, Maine Economic Development Strategy 2020-2029: A Focus on Talent and Innovation, as well as the pandemic recovery plan, focus on the need for more STEM jobs in manufacturing, energy, and technology to grow the economy and increase output and employee earnings. This economic plan describes Maine's economic challenges in detail; the need is real and caused by demographic and industry changes. Maine is the oldest state in the nation, with a median age of 44.9 versus 38.2 in the U.S. This means much of our workforce is of retirement age and poised to leave positions, taking decades of knowledge and experience with them. As industry has shifted from traditional manufacturing to a more healthcare- and service-focused economy, our state has fallen behind in output and earnings. The average annual private sector earnings fell from 82% of the national average to 78% over the last 20 years. This means lower pay and a lower standard of living for many. The average job in the state produces 25% less output per worker than that of workers nationwide: $88,000 in Maine versus $120,000 in the U.S. We know the impacts and opportunities in the rural state are uneven and are more favorable in the south than in the central, western, and northern parts of the state.

To address these challenges, the state's plan identifies four areas of opportunities to grow the economy and strengthen the workforce:

- Food/Marine
- Forest Products
- Technical Services (energy systems)
- Making/Manufacturing

To accomplish this, the State Plan calls for deep investment in community college, early college, STEM training, apprenticeships, and on-the-job training to match young adults with training and mentors to help them succeed in the workplace.

Maine's Employers Need More Skilled Workers

Maine's businesses are feeling the impacts of the aging workforce and the fast pace of innovation; they are looking for action from policy makers and educators as voiced in a recent survey. In 2022, the Maine State Chamber of Commerce, Maine Development Foundation, and Educate Maine worked with the team at Hart Consulting and Market Decisions Research to survey Maine business leaders to understand the top issues impacting their businesses that a new governor should address. Close to 500 business responded to the questions that also had been fielded in 2010 and 2018. In 2018, respondents reported that workforce availability and the need for skilled workers were the top priorities. They remained at the top of concerns in 2022 (46%), but with a special emphasis on the availability of skilled entry level workers and

technically skilled workers (44%).[4] Respondents reported needing highly skilled professionals (noting shortages in engineers, doctors, and other specialties), but the sheer numbers of people needed with core technical skills made impact greater for that group. Seeing these employer needs, the business leaders guiding the report recommended more investments in CTE, more apprenticeships, and meaningful collaboration between education and industry to help increase the numbers of workers prepared for the jobs of tomorrow.

> *"Maine's labor force shortage can hurt potential job, income, and economic growth. Investing in diverse educational pathways would be one of the key factors that will support business retention and expansion in Maine."* – Anonymous Respondent, Making Maine Work Survey

Need for Trained Technical Workers in MidCoast Maine

While the need for skilled workers is apparent across the state, some of the greatest needs are in the regions that have the greatest demand for workers but are constrained by the current population, such as the MidCoast region. The region has some of the fastest growing industries in the state, and many fall into the priority sectors identified in the state economic plan:

- Food and marine – bakeries, chocolatiers, breweries, ship building, marine sciences
- Technical services – energy systems, aviation, information technology
- Making/Manufacturing – shoes, shipbuilding, composites
- Healthcare – broad range of healthcare services, services for seniors, hospitals
- Education – workforce training centers, three colleges, early childcare, high schools, CTEs, and aviation schools

The MidCoast region is part of Maine's largest population center, the Greater Portland standard metropolitan statistical area, an important economic driver in the state. Its population is growing at 8%, which is faster than the state rate of 3%, and its economy is projected to grow, shifting retail and traditional manufacturing to computer design, technology, health care, aviation, and science-based professions. As jobs shift and new skills are needed, education models will need to adapt to meet students' and employers' needs. A new four-year, integrated technical high school could meet this demand and set students up for successful, rewarding careers and post-secondary studies. Moreover, creating a new four-year technical high school in the MidCoast region could serve as essentially a learning laboratory to provide important insights on transforming Maine's high schools to prepare students for the jobs of the future.

[4] Making Maine Work 2022, Maine State Chamber of Commerce, found at https://www.mainechamber.org/making-maine-work.html

2. Current Situation - Maine's Career and Technical Education System

Established in Maine statute in 1983, Maine's Career and Technical Education (CTE) System includes 27 schools across the state, each with its own catchment area. See Figure 2. Nineteen of the schools are centers affiliated with a local school district and eight are regional independent public schools. All are funded through the Department of Education according to a formula. In 2020-2021, there were more than 9,000 students attending a Maine CTE program. Enrollment in these programs has been growing in recent years and many schools have waitlists.

Figure 2. Maine's Career and Technical Education Schools by Location

Regional CTE Schools by Location

Houlton (Region 2)
Lincoln (Region 3)
Bangor (Region 4)
Waldo (Region 7)
Rockland (Region 8)
Mexico (Region 9)
Brunswick (Region 10)
Norway (Region 11)

CTE schools provide interested students, primarily grades 9 – 12, with technical training on a variety of topics. The schools offer training on a variety of trades and skills depending on student interest and the school's ability to attract instructors. In 2021, the top four career clusters were as follows[5]:

- Transportation, Distribution & Logistics (16.2 percent)
- Architecture & Construction (14.7 percent)
- Manufacturing (14.1 percent)
- Health Science (13.2 percent)

[5] Perkins Collaborative Resource Network CTE Concentrators Enrollment Report 2020-2021. https://s3.amazonaws.com/PCRN/downloads/CTE_Concentrators_Enrollment_Report_2020-21.pdf. Accessed December 14, 2022.

CTE schools and the high schools in their catchment areas work together to schedule instruction and transportation so that students may receive technical training in addition to the standard high school requirements. The students spend part of their school week at their public high school studying core subjects and then travel to the CTE for their technical skills training. Some split a school day across the two locations, others with block schedules may split the week.

Maine CTE Strengths

The current system has many strengths and is consistently praised by students, parents, local businesses, and policy makers. The CTE schools have strong relationships with local business and industry and stay responsive to changing needs. Each program has an industry advisory board comprised of local businesspeople who provide input on changing industry needs. CTEs also adopt one or more national or state-level standards tied to the needs of business and industry. They often partner with sending schools and industry partners to provide tours and hear from experts in the technical fields.

CTE schools provide students with pathways to employment and further education, such as concurrent or dual enrollment for college credit while they are in high school. Graduates leave school well prepared for the current workplace demands. The part-time schedule allows students to participate in sports and activities with friends at sending schools.

Importantly, data show that CTE concentrators are more likely to graduate in four years; in 2021, 92.5% of CTE concentrators graduated in four years[6], compared to 86% of all Maine high schoolers.[7]

Maine CTE Challenges

The current system has challenges that are tied to its current design. The part-time nature of the schedule poses challenges in balancing students' interests in taking classes at two different schools. At Region 10, the sending schools' schedule changes interrupt Region 10's schedule on 58 out of 175 school days, or 33% of the time. Students also lose academic time as they need to travel back and forth between the two schools.

The process by which a sending high school works with students interested in CTE varies widely across the state and even from school-to-school and counselor-to counselor in each CTE catchment area. Some schools and counselors are highly supportive of CTE participation from a broad range of their students, while others are reported to have dissuaded some students--

[6] Perkins Collaborative Resource Network. Maine State Performance Data 2020-2021. https://cte.ed.gov/pcrn/profile/state/performance/2021/ME/summary/all/secondary/all. Accessed December 20, 2022.

[7] Maine Department of Education Student Outcomes Data. 2020-2021 Graduation Data. https://www.maine.gov/doe/data-reporting/reporting/warehouse/outcomes. Accessed December 20, 2022.

especially "high-achieving" students--from attending CTEs. Sending schools therefore have extraordinary influence over which of their students attend their local CTEs.

CTE schools are not permitted to offer core academic courses except in cases where scheduling conflicts would prohibit a student from attending. Sending schools also determine whether CTE credits are elective or academic. Work is underway in some CTEs to partner with their sending schools to integrate core classes such as language arts and mathematics into their technical curriculum. The success of this partnership hinges on faculty support from the sending school and the interest and cooperation of the instructors at the CTE. Many school districts cannot afford to hire extra faculty to support the integration, and for many CTEs, the limited time with students cannot accommodate the expanded instruction.

Region 10

Region 10 was established in Brunswick when Maine adopted its current CTE statewide system in 1983. It is a “region” configuration, meaning it operates out of a standalone building and campus with no physical or operational connection to a high school or school administrative unit in its region and has its own governing board comprised of three school board members from each sending district (nine total). As of Spring 2023, the school serves 333 students from three sending high schools (Mt. Ararat High School, Brunswick High School, and Freeport High School) and offers 17 programs. It has 16 teaching faculty, four full-time education technicians, two part-time educational technicians, one school nurse, two custodians, and three administrative staff. Students submit applications to attend with the coordination of their home school. Students, staff, and alumni all speak highly of the school and the technical education they receive.

Outdated Facilities. While the school provides good technical training and education, Region 10’s physical plant struggles to support today’s needs. What was once a state-of-the-art facility for the skilled trades of the 1980s and 1990s is outdated for the needs of the 2020s. Like many school buildings built in the 1980s, the open concept design does not provide sufficient separation between the programs that educators know is needed for safety, noise reduction, and student engagement. Region 10 students who participated in a focus group voiced safety concerns about the lack of interior barrier walls for protection in the event of a hostile intruder. They also pointed out that there are not enough bathrooms downstairs, too few garage doorways, and too much noise overall.

Keen Interest in Adopting a New Model to Provide Technical Training. As the leadership at Region 10 looks to the future, they see an opportunity to provide deeper technical training to students to prepare them for the future – whether that be for the technical workforce or advanced studies. In 2015, Region 10 began exploring various models of operating a full time four-year technical high school. In 2022, with generous funding from the Harold Alfond

Foundation, they were able to move forward to study the feasibility of standing up a new school with a deeper focus on workforce skills that integrate core subjects with the technical instruction. This school would address many of the current challenges faced by CTEs. It would allow students to attend a single school, all day. They would no longer have to choose to split their time between two schools. Furthermore, the new school would offer more advanced classes to students with aspirations of pursuing advanced and professional degrees. The new school would offer more options to students and graduate more students with technical skills and experience.

Maine High School Current Operating Models

CTE. Currently, there are a few different funding and operating models for high schools in Maine. Maine's CTE is a part-time model that provides qualifying high school students with exposure to career and technical programs. Schools are mostly funded by the state's general fund based on a per student formula, adjusted for enrollment. Some CTEs are supported by additional funding from sending schools. They also receive some Perkins V federal funding for career and technical education support.

Maine Public High Schools. Maine's traditional public schools have various local governance structures that are established in state statute and recognized by the Maine DOE. They are funded by local taxpayers augmented by a subsidy from the state's general fund using a special funding formula to determine appropriate costs and appropriated based on local ability to raise taxes. In other words, the school districts with limited tax base receive a higher subsidy than districts with higher tax bases. Local school boards can ask taxpayers to cover educational costs above the state subsidy level, and in the wealthier districts, local taxpayers pay most of the costs. The DOE periodically asks school districts to submit requests for funding for new construction or significant facility additions that they then rank for need. The list is long and resources scarce, so very few buildings are built each year. The waitlist languishes for decades.

Non-traditional High Schools. In addition to the traditional local schools, Maine has a magnet school in Limestone funded directly by the legislature, Maine School of Science and Mathematics (MSSM), serving 120 students in grades 9 - 12. MSSM has a governing board, a private charitable foundation, and is required to report to the legislature each year. The State of Maine has authorized up to 10 charter schools to operate; these schools receive the per student allocation of funding from their home school districts but they are not eligible for construction funding. In addition, there are a handful of private high schools – some are religious, others are boarding schools.

Opportunities: Career-Focused Schools in Other States

While Maine has a strong CTE presence as part-time options for students, currently there is no full-time option for students in the state. We reviewed the operations of 12 different four-year,

career-focused high schools in other states to understand their operating models, key features, and costs. Common threads across the schools we studied include proximity to students and employers (most are located in or near population centers); participation in a special school district or "school of choice" system, whereby parents and families apply to a public school of choice; and access to resources including funds, updated facilities, and business partnerships.

These schools see technical training as central to their missions and are dedicated to preparing students for post-secondary education and offering the kinds of cocurricular activities available to students who attend traditional high schools. This means that they have sports teams and clubs, offer AP and honors classes and dual enrollment classes, and have support services in place for students. Enrollment is competitive and graduates go on to successful careers and/or post-secondary education.

State-level governance and funding structures for technical education in other states vary and there is no common model. In states and cities where "schools of choice" are common, or in states where CTE is run at the state or county level somewhat independently of traditional public education, full-time technical high schools have different opportunities and challenges.

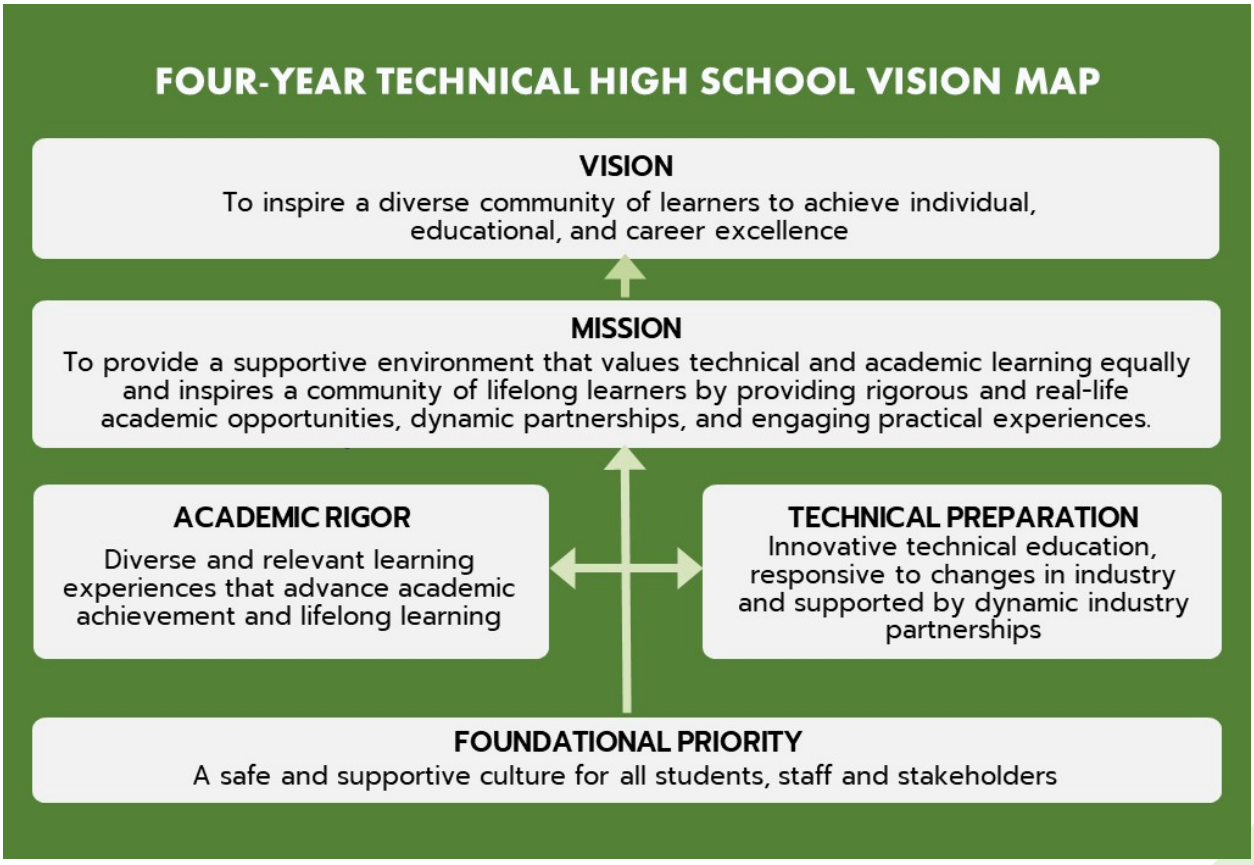
3. The New Four-Year Technical High School

The feasibility study followed an iterative discovery process to test and refine the concept. The team researched the local area demographic data, employment data, commute patterns, and state funding statutes. We interviewed students, leaders in CTE with a national perspective, local business leaders, statewide professional associations, CTE directors, and post-secondary education leaders. We surveyed students and their parents/caregivers. As we gathered information on facets and features needed in a four-year technical high school, including community interest and needs, we updated the model and focused the vision.

The Vision

The new school will prepare students to be lifelong learners, engaging them in rigorous academic classes integrated with technical and career preparation. See Figure 3. The work will be hands-on, in collaboration with businesses, and provide on-the-job and early college opportunities. Graduates will be high-performing members of the workforce and continue to further education and training. They will have many options and opportunities.

Figure 3. The Vision for the New Four-Year Technical High School



The Essential Features of a New Four-Year Technical High School

In partnership with industry and higher education partners, the new school will provide rigorous core academics integrated with career and technical studies. It will offer deep skill training for jobs in demand in the region and teach critical thinking and problem solving to prepare for the jobs of the present and future. Core academic courses will be integrated into and benefit from the career and skill focused training. For example, students studying physics and math will apply their knowledge in their welding classes as well as in classes working with composites. Students will hone their writing skills and critical thinking skills as they learn to write policy manuals and debate public policies in their health sciences classes. What sets this school apart from traditional high school studies is the deep, industry- and skill-focused hands-on learning opportunities.

Students will receive full supports as they do in the current public high schools: school counseling, nurse services, special education, nutrition program, and transportation. In addition, the students will study and gain experience in 21st Century life and career ready skills.

Nuts and Bolts. Based on research and stakeholder input, the new school should have the following features:

- Be a publicly supported day school open to all Maine students
- Offer a four-year, full-time comprehensive high school program with a traditional part-time CTE option
- ***Offer core academics and electives integrated with technical study and experiences including pre-apprenticeships, apprenticeships, on-site training, and exposure to multiple careers***
- Support full student services – nurse, counseling, and special education
- Host extracurricular activities or establish cooperative opportunities with other schools or non-profits
- Award high school diplomas
- Be located at Brunswick Landing (ideally)
- Attract at least 300-350 full-time students in Maine

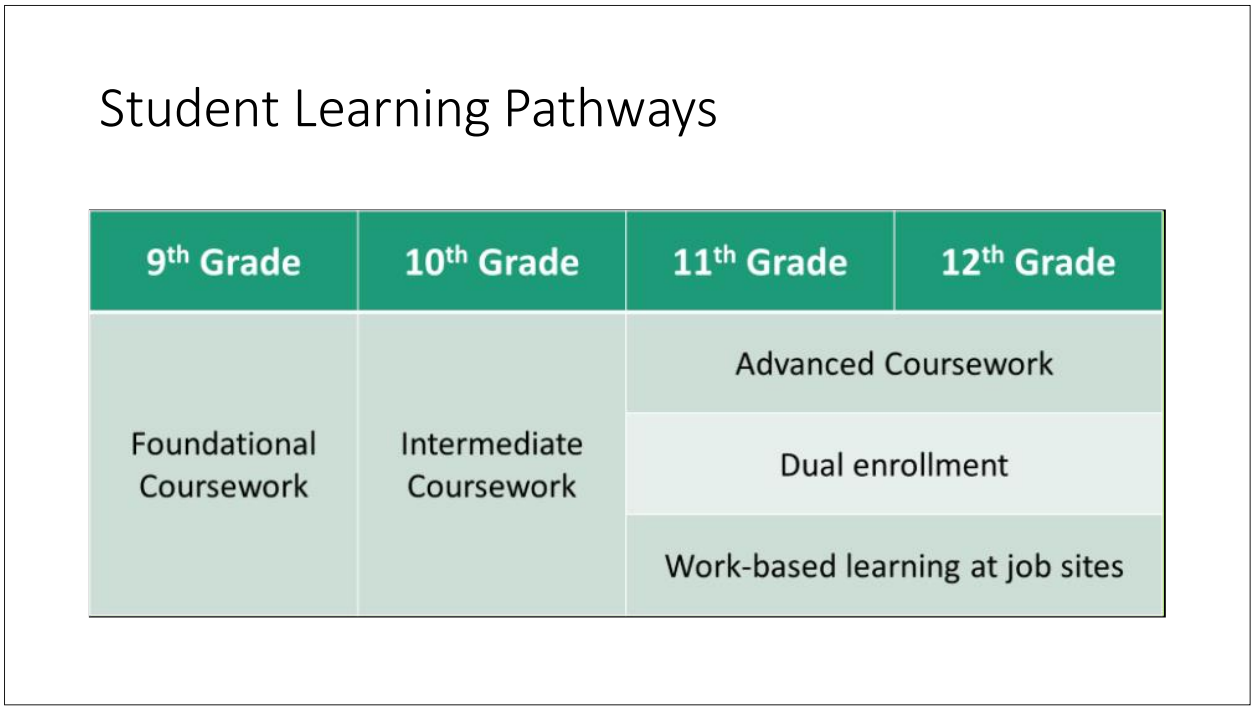
Career and Educational Pathways

The mission of the school is to help each student develop a clear and attainable pathway to career and/or education goals that prepares them to be lifelong learners. Students will graduate with skills to enter the workplace or higher education system or both. The **Maine Community Colleges Guided Pathways** program already offers opportunities for connecting education and career goals, and the new school will align its pathway and curriculum to be compatible with this program.

Core Academics. The academic sequence throughout the four years will support the student Guided Pathways model. See Figure 4. Each student will study foundational and required

standards-aligned coursework in the 9th and 10th grades, with much of the content integrated into the career and technical setting. At the end of the 10th grade, students will choose their pathway or major focus of study. In the upper grades, students will have options for more advanced classes, dual enrollment in college courses, and hands-on learning at job sites. In the 11th grade, students have increasingly specialized academic/elective offerings with significant technical integration through cross-curriculum projects. In the 12th grade, students are encouraged to do as much college-level coursework and work-based learning as possible, per their Guided Pathways work with Maine Community College System. The students will be moving into their postsecondary programs while still in high school.

Figure 4. Student Pathways to Meeting Education and Career Goals



Technical Studies. Technical studies will be integrated with core coursework wherever possible. Students will start with safety and fundamentals and move to more advanced skills and professional setting as they move through the years. The 9th grade students will take foundational courses to be introduced to industry cluster pathways. The 10th grade will progress to narrower and more specific cluster pathways. Higher-level students in 11 and 12th grades may complete their studies through dual enrollment in the community college system.

Partnerships

Industry Partnerships are Key. Industry partnerships will be key to staying relevant to employer needs, keeping current with technology, and creating opportunities for students. The school will continue to use industry program advisory boards to provide guidance and insight on current

needs and trends in their industries. Business representatives will be invited to be guest speakers, instructors, and provide demonstrations of their craft or field. The school will work closely with businesses and community college instructors to offer work-based learning experiences such as apprenticeships, internships, and on-site technical training.

Pre-apprenticeships and Apprenticeships. The Maine Department of Labor and its apprenticeship programs will be a key partner to provide students and employers with meaningful shared experiences and training opportunities. The new school will develop and offer these options for students to have rich hands-on experiences.

Post-Secondary Partnerships. Along with industry partnerships, the new school will continue to have strong partnerships with the Maine Community College System and other postsecondary institutions. The collaboration will include dual course enrollment, placement and training efforts aligned with employer needs, and coordination with high school and college guidance counseling professionals. Additional post-secondary education partnerships will be developed over time.

Governance

The new school will follow the governance structure of Region 10, which is guided by the Cooperative Board consisting of nine members from the sending districts and the program advisory boards of industry representatives. Currently, CTE at the secondary level is governed by Chapter 313 of Title 20-A of the Maine Revised Statutes. Subchapter 4 states: "It is the intent of the Legislature that each career and technical education region shall provide career and technical education in accordance with this chapter and shall function as an extension of the secondary schools and middle schools located within the region's boundaries."

Legislation Changes. To allow students to attend a new full-time career-focused high school, the legislature would need to revise the admission standards under MRSA §8305-A to allow students to attend a school outside of their home CTE region's boundaries.

Estimated Cost

The new school will build on Region 10's current funding model to fund the part-time traditional CTE school and seek appropriations from the legislature to support the full-time program. Presently the Maine DOE has a regional CTE funding model that provides funding based on the number of students in each program and the school population. It does not provide funding for transportation, nutrition program, special education, or extracurricular activities. Region 10 receives more than $2.5 million currently. The full-time school, with 300 students, is estimated to cost an additional $3.6 million for operating funds to cover all required and necessary expenses.

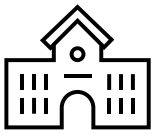
In addition to the operating funds, the school will need to secure construction funding to build a new, mission-appropriate school. The new school would need to be at least 30,500 square feet in size and would also need to be outfitted with equipment to support the school mission. Looking at the costs of building similar schools in Maine, we estimate that a new school will cost more than $60 million, depending on when it is built.

4. Feasibility Study Findings

This feasibility study assessed each critical factor needed to support a new technical high school envisioned in the Brunswick region. The assessment explored the facilitators and potential barriers of each factor to determine the viability of the concept. While we cannot predict the future with precision, the information and analyses shed light on the key factors and underlying assumptions required to support a new school. See Table 2.

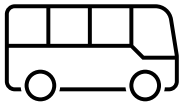
Table 2 lists the critical factors needed to support the new four-year technical high school and shares top line findings from the study – supporting information as well as barriers and outstanding questions.

Table 2. Feasibility Study Findings

Critical Factor	Supporting Information (+)	Barriers (-)/Questions
The Model: Four-Year Integrated School with Part-Time CTE Option Remaining 	• Region 10 CTE part-time option currently provides a good technical education for students in the region. • Integrated four-year option will meet the needs of the students interested in a deeper technical course of study. Will combine academic rigor with more hands-on, experiential learning. • Students will not need to choose between taking AP classes and technical studies. • Generate more high school graduates with technical skills, trained to be lifelong learners. • Meet employers' need for trained workers, critical thinkers. • A new school can serve as a pilot for potential new schools in other regions. • Requires faculty with technical skills who are willing to integrate core academics into career courses.	• Needs legislative support and funding. • CTE Directors and region high schools may see a new school as reducing their enrollments and funding. For smaller schools, this could be a big impact. • New school may face its own workforce challenges in attracting staff.

Critical Factor	Supporting Information (+)	Barriers (-)/Questions
Student Interest 	• 18,000 high school students within 30 miles of Brunswick, school will be open to any student in Maine. • 51% of students surveyed in sending schools indicated medium to high interest in the concept. • 68% of students surveyed highly value hands-on learning opportunities.[8] • Region 10 students voiced interest in a new four-year technical school. • Fear over charter schools taking too many students from hometown schools did not materialize.	• It is not known how many students will choose to attend the school. • It is also not known from which sending schools the students will come.
Workforce and Economy 	• Greater region holds 31% of the state population and is an important economic driver. • Brunswick and greater regional economy are both growing and facing an acute shortage of workers with technical skills.	• An unforeseen change in the state economy could impact the education sector – expansion or contraction.
Employer Interest 	• Great interest in building technical workforce. • Need for workers with life skills and critical thinking skills. • Very interested in partnering with a technical high school.	• It is not known if partnership relationships with industry and the school will negatively impact businesses that may not be able to partner (small, family owned, etc.).
Parent and Caregiver Interest 	• 69% of parents/caregivers surveyed were very or extremely interested in a four-year technical high school in the region. • Parents believe it is an important option that fills a need for students in the region who want hands-on learning.	• Some local parents are concerned this school could increase their property taxes.

[8] Students ranking it either 4 or 5 on a 5 point scale.

Critical Factor	Supporting Information (+)	Barriers (-)/Questions
	• Parents support Region 10 and technical education.	
Commuting Patterns 	• There are three regional bus lines that serve Portland and towns in-between, Lewiston region, and Bath/Brunswick. • MidCoast region has a culture of ridesharing and carpooling from outlying towns to transport workers to BIW.	• May discourage families that don't want to have students travel beyond their high school.
Governance 	• Retaining current Region 10 governance model is possible with minor wording change to state statutes. • Additional legislative changes would allow the school to grant academic credit and diplomas.	• Board representation will be from the Region 10 sending schools only. • Legislative changes may be difficult to make.
Financial Model 	• Possible to fund the school with current Region 10 CTE funds plus per student allocation from sending districts for full-time students. • Requires 300 full time and 150 part-time students.	• A new school could impact regional CTEs and sending schools by reducing student enrollment and funding. • Legislative changes may be difficult to make.

5. Recommendations

Critical Conditions Necessary to Establish a New four-year Technical High School

Legislation Changes Needed to Support Admissions, Funding, Awarding Degrees

The feasibility of creating a new four-year technical high school in Brunswick is predicated on several key changes to existing legislation. If the school is designed as described in this paper, the following changes will be necessary.

- Revise MRSA §8305-A to include admissions standards for attending the new school from any municipality.
- Add language to MRSA §8351. State aid for career and technical education centers and career and technical education regions to allow CTE schools to provide regular instruction and special education.
- Revise MRSA §5205 to add exceptions to the general residency rules. Remove the subsidy count from the resident town and move it to the new school for funding purposes.
- Secure funding for the new facilities either from public or private funders.

A New Technical High School is Feasible in Brunswick

The review of the supporting information and barriers shows that a new technical high school is feasible in Brunswick Maine and would serve many students and businesses in the coastal and central regions of the state. In addition to the educational, technical, and workforce benefits for the region, the new school would also demonstrate the value of technical education in the state and help eliminate any negative perceptions or stigma that was historically associated with CTE. Key points that support feasibility include:

- Brunswick is accessible by 33% of the state's population. There are several points of public transportation from coastal regions, Portland, Yarmouth, Freeport, and Lewiston region. There are many car-pools and ride share groups that travel in and out of the Bath area every day from towns north and west of the coast.
- Area and regional businesses need skilled workers and are willing partners to support technical training.
- Portfolio of regional businesses is diverse.
- Students, parents, and community members strongly support the option for students.
- The legislature has shown interest in exploring the idea and has voted in support of a study commission.

6. Feasibility Study Methodology and Detailed Findings of Individual Studies

The following section provides the methodology and summaries of each of the studies conducted for the feasibility analysis to understand the viability of a new school. Here, we share the methodology and data collection audiences and topics. The following section shares the in-depth findings from each study.

Feasibility Study Methodology

The feasibility study methodology followed a mixed methods approach to data collection and analysis working with a wide range of topics and audiences to describe the current situation and potential for a technical school in the region. The study addressed six components:

Research and Quantitative Analysis Studies

- Regional Labor Market Study
- Student Demographic Analysis and Projections

A Planning and Development Framework and Methodology

- Initial recommendation of programming and curriculum development considerations
- Benchmarking best practices and successful models across the U.S.

Assessment of Institutional Barriers and Requirements

- Assessment of federal, state and local laws, requirements, practices, and barriers including recommendations for overcoming such barriers

Determination of a Governance Model

- Recommendations for governance

Financial Modelling

- A recommended financial model that covers construction, start up and ongoing operating costs

Data Collection

The study included primary data collection from many audiences. We conducted primary data collection through in-depth interviews, focus groups, and online surveys. We reviewed secondary sources including online government survey databases, state statutes, state records, and websites for information.

Table 3. Stakeholder Input by Source

Stakeholder or Topic	Online Survey	Focus Group	In-depth Interview	Web Scan	Secondary Data Sets
Students from sending schools	♦				
Leadership from sending schools		♦			
Region 10 students	♦	♦			
Region 10 staff		♦			
CTE Directors and Professional Associations			♦		♦
Parents/Caregivers	♦				
Businesses			♦	♦	♦
Lawmakers			♦		♦
MidCoast Chamber of Commerce			♦		
MidCoast Regional Redevelopment Authority			♦	♦	
Maine Community College Leaders			♦		
National CTE Association Directors			♦	♦	
Massachusetts Technical Education Experts			♦		

In-depth Findings and Individual Studies

The findings from each of the individual studies appear in the next section. We provide an overview of the methods used in each study, the audience, and the findings. We call out the top findings and top questions from each study. The report shares findings that support and refute the viability of a new technical high school. Detailed reports for each sub-study are available by request at www.hartconsultinginc.com. The studies included assessments of the following:

- Student Populations and Labor Market in the Catchment Area
- Transportation Patterns and Options
- Brunswick Local Economy
- Student and Family Interest
- Staff Interest
- Business Leader Interest
- Maine CTE Directors/Leaders Interest
- National CTE Leaders Insights
- Governance and Finance

Study 1. Student Population and Labor Market

The MidCoast region of Maine is considered part of the Greater Portland standard metropolitan statistic area by the Bureau of Labor Statistics, the biggest population center fueling the largest regional economy in the state. It has a greater proportion of school-age children and higher population growth than northern and western regions. In 2020, Brunswick's population grew 8%, while the state grew 3%.[9] The current area unemployment rate is 2.3% compared to 2.6% in the state.[10]

Top Findings

- ✓ The MidCoast Region has sufficient student population and business base to support a new four-year Technical High School, preparing students for the jobs of the future.
- ✓ Greater Brunswick region holds more than 30% of the state's population and workforce.

Top Questions

- ✓ Student populations in two of the three sending school regions declined slightly (1%/year) from 2013 to 2022, will recent and future planned housing investments in the area attract many new families?
- ✓ How many students will come from towns outside of the sending school towns?

Area Population and Labor Market

In 2021, the population of Brunswick was 21,836 (2020 U.S. Census population estimate for 2021). There were 431,666 people living in towns within 30 miles of Brunswick, approximately 31% of Maine's population of 1,372,247. The greater MidCoast labor market area included 223,870 people in September 2022, according to the Maine CWRI. This wider region includes 81,296 children under age 18, and 18,000 high school students.

Maine High School Student Enrollment. The study group contemplates that the school will be open to all students in Maine, but it will be most convenient for students and families within 30 miles of Brunswick. There are 55,485 high school students enrolled in Maine public schools' grades 9 through 12 in 2023.[11]

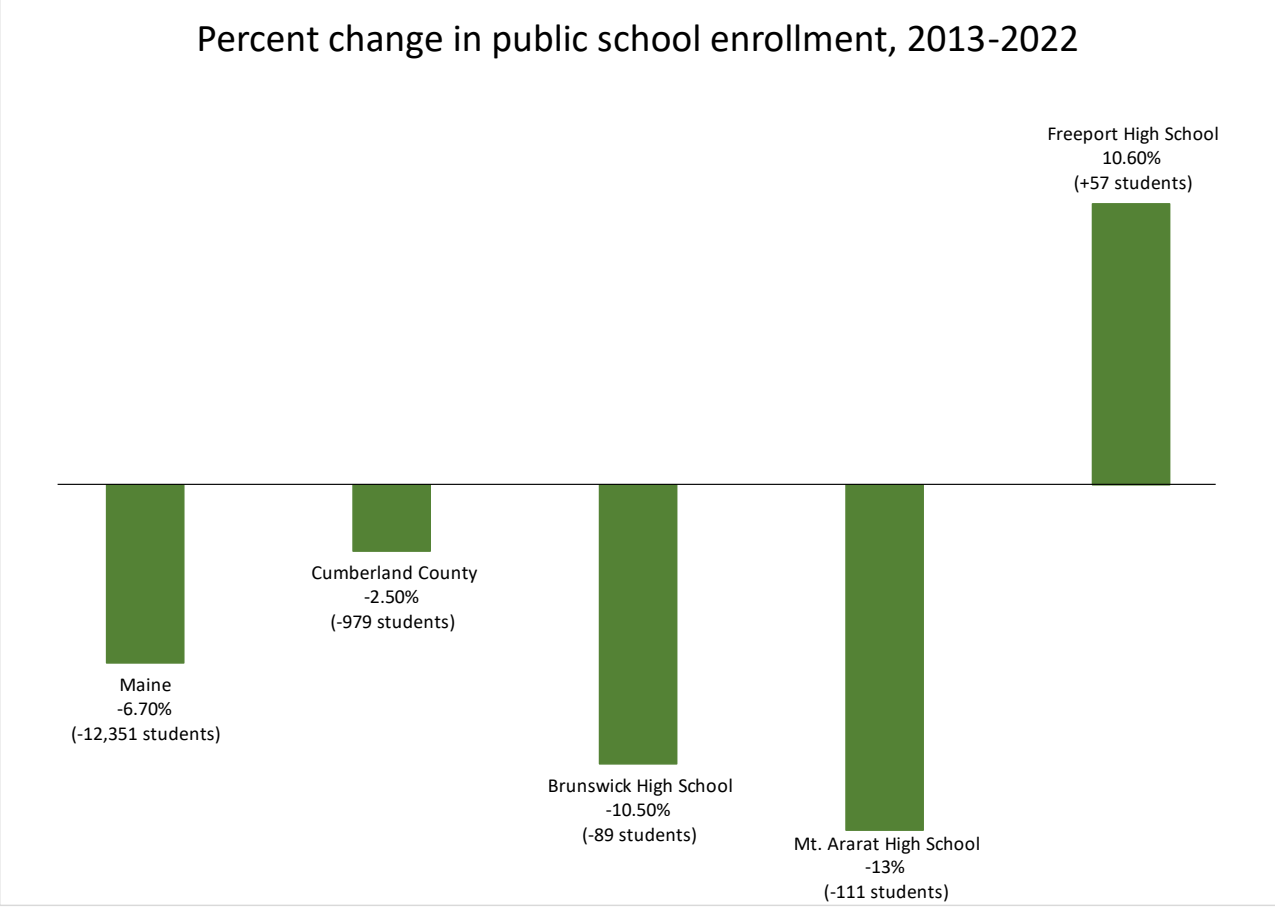
[9] U.S. Decennial Census, 2010 - 2019

[10] Maine Center for Workforce Research and Information, Maine Department of Labor, found at https://www.maine.gov/labor/cwri/laus1.html

[11] Maine Department of Education Enrollment Data, found at https://www.maine.gov/doe/data-reporting/reporting/warehouse/enrollment

Forecasting Student Population. While we know current and historic student population, it is difficult to project future populations, particularly with the economic changes experienced since 2020. Prior to 2020, the student enrollment in two of the three high schools that send their students to Region 10 showed 10% declines in student enrollment; the third posted a 10% increase. See Figure 5. However, since that time, many new housing units have been built in the area to meet the demand of new people moving to the region. Brunswick Landing, specifically, has added hundreds of housing units since 2020 and is building more than 245 new units in 2023. Nearby in Freeport, 145 new housing units were recently constructed, with plans for more apartments underway. This will lead to increased numbers of local school-aged children, including high school students. Furthermore, keeping the part-time option for sending school students and opening the school to all students in Maine may reduce the enrollment impact on local schools.

Figure 5. Ten Year Changes in Student Enrollment in Region 10 Sending Schools



Data source: Maine Department of Education Data Warehouse, Annual October 1 certified data set, 2022. Accessed 12/20/2022. https://www.maine.gov/doe/data-reporting/reporting/warehouse/enrollment

Study 2. Transportation In and Out of the Region

More than 10,000 daily commuters travel in and out of the Brunswick region to work for large employers such as Bath Iron Works (BIW), L.L. Bean, Bowdoin College, Mid Coast Hospital, and SaviLinx. While many commute in their own vehicles, over the years, commuters have created rideshare arrangements, used public transportation, and now hybrid work schedules to save money and avoid traffic congestion. There are many options for transportation to and from Brunswick from the Lewiston region, Portland region, and adjacent towns and cities.

Top Findings

- ✓ Commute patterns show established culture of travel in and out of the region.

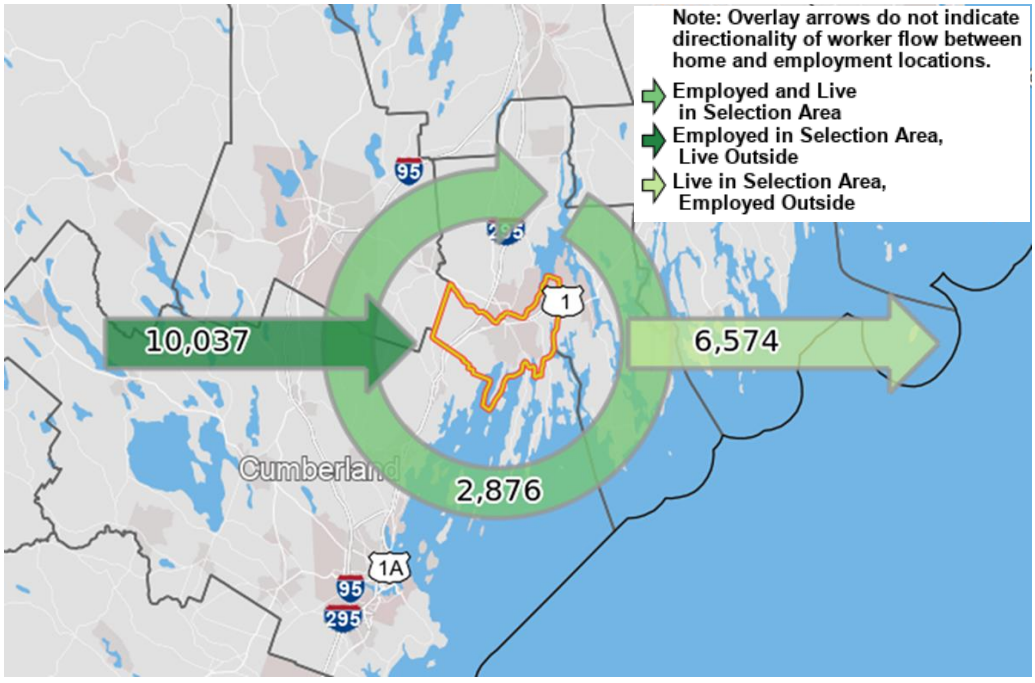
Top Questions

- ✓ How far will students/families be willing to travel to attend a technical high school?

Brunswick Daily Commute Patterns

Situated twenty-five miles north of the city of Portland and 20 miles east of the Lewiston/Auburn area, the MidCoast region is easily accessible to many workers in a wide range of professions as well as students. Workers ages 16+ in Brunswick travel an average of 22 minutes to work (mean average, 2017-2021). More than 10,000 workers commute into Brunswick and 6,500 commute out of Brunswick, making it a net importer of labor. See Figure 6.

Figure 6. Daily Commute Counts in Brunswick, Workers Over 16 Years of Age[12]



[12] Source: U.S. Census OnTheMap (data from 2019)

Public Transportation

The region is served by a network of public transportation services, providing Brunswick access to Portland, Lewiston, southern Maine, and even Boston. From the north, there are rideshare arrangements to bring workers to BIW.

- The Brunswick Link is public transportation within Brunswick serving the whole town including stops at the Brunswick Landing, Mid Coast Hospital and the Transportation Center.
- Metro BREEZ, a greater Portland public transportation service, covers Brunswick, Freeport, Yarmouth, and Portland.
- BlueLine Connection provides commuter bus service to and from Bath, Brunswick, the Topsham Fair Mall, Lisbon Falls, Lisbon, Lewiston, and Auburn. The Brunswick connection is near Cook's Corner and the entrance to Brunswick Landing.

Transportation from Other Regions

The new four-year Technical High School will be open to any student in Maine. The analysis focuses on students and people living within 30 miles, as that seems to be a manageable commute distance. Other schools in Maine that are open to students statewide, such as the Maine Arts Academy, have attracted students from across the state. Parents and students have made travel arrangements from places like Farmington to the school in Sidney (now Augusta).

Study 3. Brunswick Local Economy

Brunswick and the surrounding municipalities of Topsham, Freeport, and Bath, operate as employment and service centers for many rural coastal and inland communities. People travel into the region to work at several of the state's largest employers, including:

- Mid Coast Hospital/MaineHealth
- Bath Iron Works
- L.L. Bean
- Bowdoin College
- Tyler Technologies
- Central Maine Power
- Martin's Point Health Care

Top Findings

- ✓ Brunswick has growing need for skilled technical workers.
- ✓ The Brunswick Landing is uniquely positioned to link students to industry experiences, higher education opportunities. and training on campus.

Top Questions

- ✓ Unforeseen economic disruptions could change the need for workforce skills and demand for labor.

Growing Local Economy. According to a study prepared for the Cooks Corner Redevelopment Initiative, in the four years leading up to COVID-19 (2016-2019), the town of Brunswick experienced a period of strong job growth by 4%, with the largest gains in Professional, Scientific, and Technical Services (+232 jobs), Manufacturing (+152 jobs) and Health Care (+114 jobs).[13] The study identified job growth in Computer Systems Design (+191 jobs), Footwear Manufacturing (+93 jobs), and Business Support Services (+75 jobs) over the time period. Cumberland County added 10,000 new jobs over the same three-year period. Growth industries for the region include veterinary products and services, insurance, finance, and healthcare, construction, engineering, and technician, to name a few.

Industry and Education Opportunities at the Brunswick Landing

The Brunswick Landing is a hub of community and economic development in the town. Originally a U.S. Naval Air Station, the US government conveyed the base to the town of Brunswick in 2011 after it was decommissioned. The 3,200-acre property has since been redeveloped with residential, commercial, industrial, educational, and governmental enterprises. The Brunswick Landing, as it is now called, has brought many new businesses, jobs, and educational opportunities to the region. Currently, the Landing has 160 companies and 7 schools (4 are aviation schools).[14]

[13] Cooks Corner Revitalization Plan, March 2022, prepared for the Town of Brunswick by Camoin Associates and Gorrill Palmer, found at https://www.brunswickme.org/DocumentCenter/View/6370/2022-03-24-Cooks-Corner-Presentation---Town-of-Brunswick-AT

[14] Midcoast Regional Redevelopment Authority, found at https://mrra.us/brunswick-landing/

The Landing is focused on nurturing five sectors:

- Aviation and aerospace
- Biosciences
- Composites
- Education
- Technology based

Education Center. The Landing is home to education organizations that cover the lifespan from early care and education organizations, grade school, and trade school, to post-secondary institutions. These education organizations include:

- Bright Beginnings
- The REAL School
- Southern Maine Community College
- The University of Maine at Augusta
- University College
- Bowdoin College
- Airlink Flight School
- New England Aviation Academy
- UMA Aviation School (to open soon)

Housing Hub. There are several housing projects underway and slated for construction with some specifically for immigrant and refugee families. These newcomers are younger, have more children, and need training for their new lives in Maine.

Amenities on Campus. The Landing has cafes, banks, healthcare services, a YMCA, and a career center. In addition, it is an important stop for the Brunswick Link, the regional bus service from 6am to 6pm with stops throughout town including the interstate train and bus station. The Blue Line that services Lewiston/Auburn and Brunswick has stops at the Landing.

Study 4. Student Interest

To gauge student interest, the study team conducted several surveys and focus groups:

- Online survey with students in the towns that send their students to Region 10
- One facilitated input session with families and students at an open house night at Region 10
- Two focus groups with Region 10 students

Top Findings

- ✓ There is strong student interest in the concept of the four-year technical high school.
- ✓ Overwhelming student interest in hands-on learning and having a pathway to career or future educational opportunities.

Top Questions

- ✓ Will students want to leave their sending school districts to attend a new high school?
- ✓ Will students living in towns further away be interested in attending?

Across all stakeholders, we found support for and great interest in a new school. The highlights of the findings follow.

Student Focus Groups

In the spring of 2023, 17 Region 10 students shared their thoughts in two focus groups conducted during the school day. Interviewers asked students to share their thoughts – both pluses and minuses on the concept of a new full-time school. It is important to note that they had a hard time visualizing the new school beyond what they currently experience at Region 10.

Students in the focus groups were very interested in a new four-year technical high school. They thought that their peers would also be interested in the proposed school. They said students at their sending schools were interested in Region 10 but were hesitant to miss out on activities and classes at the sending schools, so this would be a solution. Some students said that their parents would be interested in sending their children to the proposed school, especially if the curriculum covered practical topics like personal finance, time management, and career preparation.

Benefits and Drawbacks. When asked about the benefits and downsides to attending one school full-time for academic and technical work, they believed that the experience would be more "cohesive" and that it would be logistically easier to take all their classes at the same school, but some also thought it would be hard for students to decide to leave their sending districts.

Asked specifically about drawbacks of the proposed school, some students emphasized that it would be difficult (socially and emotionally) for students to leave their home districts. They also

wondered whether there would be enough interested students for a variety of athletic teams and thought the new school might mean longer daily commutes for some students. Additionally, some students enjoy the transition time between their sending school and Region 10 and said they might miss it if they took all their classes at the same school.

Important Features. Students felt that it would be important for the proposed school to offer free transportation from all the sending towns to the school, and from the school to students' job or internship sites. They hoped that the school would offer elective classes and give students some freedom to choose their own classes. They also suggested a mentoring program to help new students acclimate to the school and agreed that a good food program would be important.

When asked what features they would like to see in a new school, students' responses focused on facilities (including more bathrooms, study spaces, and soundproofing); programming (including expanded program offerings, financial literacy courses, and flexible course requirements); student life (including clubs, events, and opportunities for students to participate in decision-making); and safety (including more secure facilities and consistent access to a school nurse).

Student Online Survey

In fall 2022, Region 10 worked with the three sending districts to send a 17-question online survey to students in grades 8-11. The survey aimed to gauge student interest in current Region 10 programming and the proposed new school. A total of 1,029 students responded:

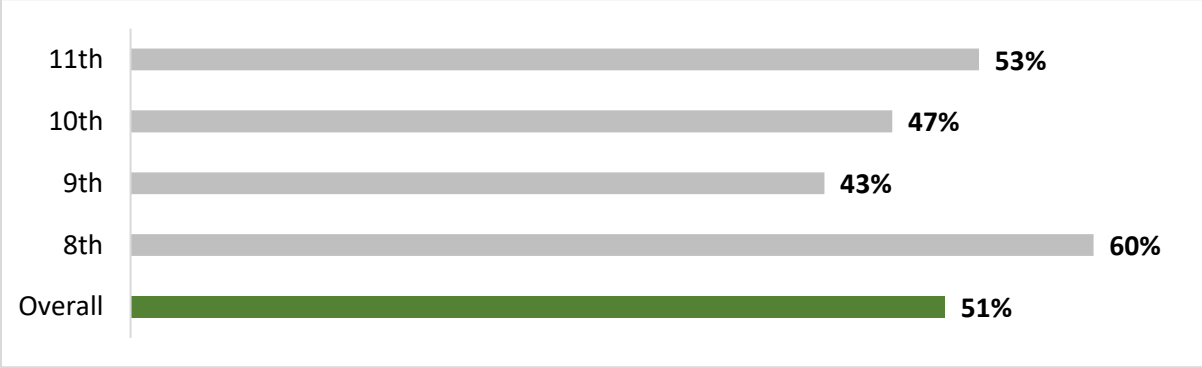
- 253 8th graders
- 757 students in grades 9-11
- 8 students who chose not to share their grade

After answering questions about their interest in specific CTE programs, students read a description of the proposed new four-year technical high school and were asked to answer questions about their interest in attending and indicate how important various school factors were to them

Many Students Showed Interest in a New School. Overall, 51% of respondents showed medium to high interest in attending the four-year, full-time technical high school. Eighth grade students expressed the most interest in attending the proposed school, with 41% indicating that they were interested/very interested in attending. Almost half (47%) of the respondents from Mt. Ararat Middle School said that they were interested/very interested, as did 35% of the respondents from Brunswick Junior High School. See Figure 7.

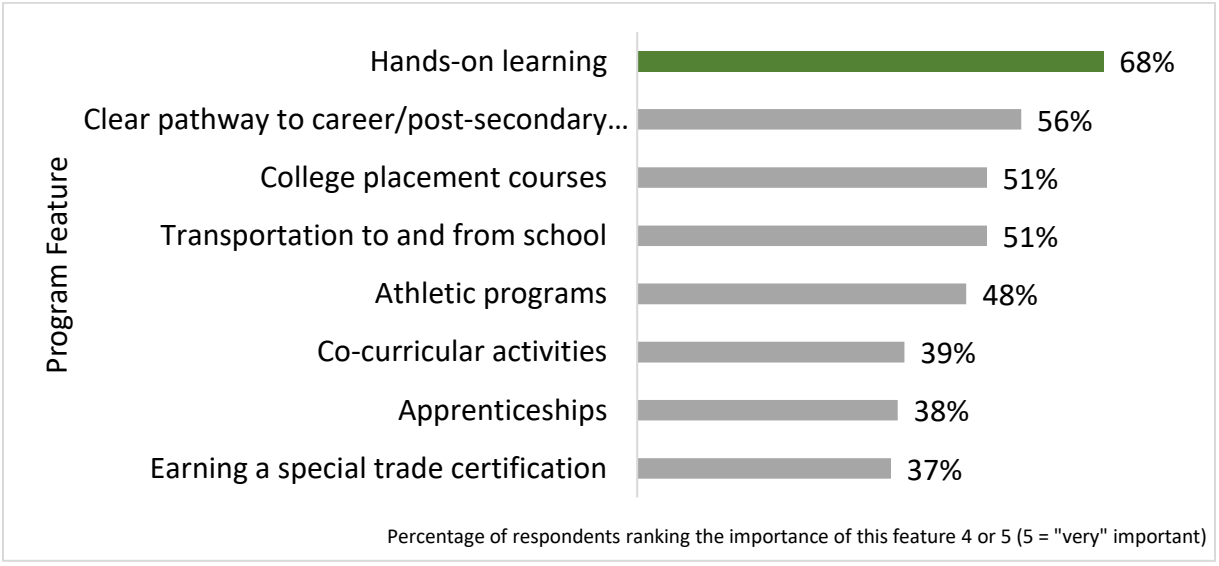
At the high school level, respondents from Brunswick High School and Mt. Ararat High School showed more interest in the proposed school than respondents from Freeport or Harpswell Coastal Academy. Interestingly, only 7% of respondents had ever taken a course at Region 10.

Figure 7. **Percentage of respondents interested in attending a four-year full-time high school.** (Rating their interest 3, 4, or 5 on a 5-point scale where 5 is "very interested") (n = 875)



Hands-on Learning was Most Important Feature. When asked about the importance of the various features of a new school, 68% of survey respondents indicated that hands-on learning would be an important school feature, followed by a clear pathway to a career or post-secondary education. Other important features for more than half of the students were college placement courses and transportation. See Figure 8.

Figure 8. **Important proposed school features.** (Percentage of respondents ranking the importance of this feature 4 or 5, where 5 is "very" important.)



Study 5. Parent/Caregiver Survey

To understand parent/caregiver support for a new four-year technical high school, the study team conducted an online survey with families in the spring of 2023. The anonymous survey had 8 questions and was available in English, French, Portuguese, and Spanish, based on language needs recommendations from sending district administrators. The sending schools sent the survey link to parents/caregivers of students in grades 6 – 12 in the Region 10 sending districts. In total, 328 people completed the survey, including one in French and one in Portuguese.

Top Findings

- ✓ There is strong parent/caregiver interest in sending their student to a four-year technical high school.
- ✓ Overwhelming parent/caregiver interest in hands-on learning and having a pathway to career or future educational opportunities.

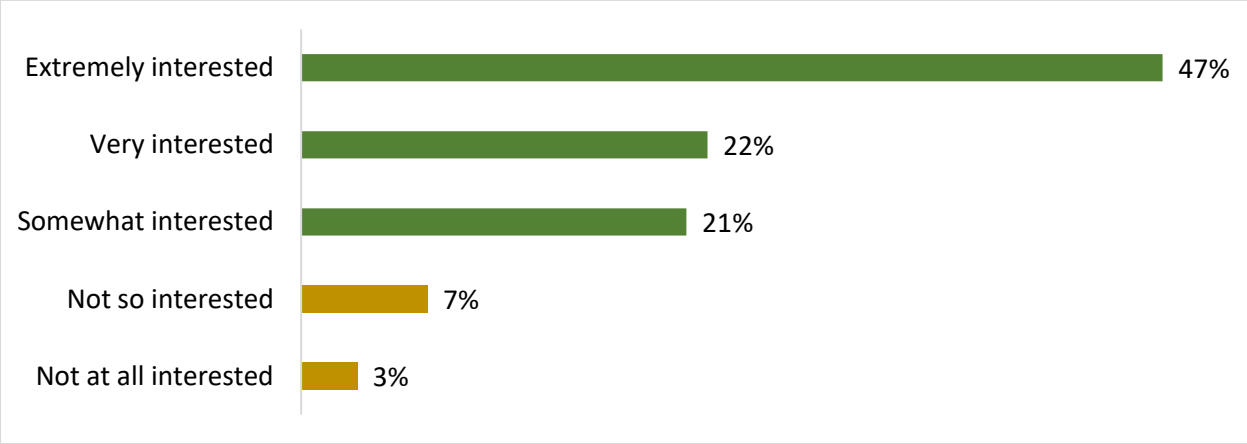
Top Questions

- ✓ Will students want to leave their sending school districts to attend a new high school?

Parents/Caregivers Interest

Parents/caregivers showed great interest in sending their student to a new high school. When asked about their interest in sending their student to a new four-year full time technical high school, 90% expressed medium to high interest. As many as 69% indicated they were “very” or “extremely” interested. See Figure 9.

Figure 9. How interested would you be in sending your student(s) to a new, comprehensive technical high school like the one described? (n = 262)



In open-ended responses to explain their level of interest, many said the students need the hands-on learning experiences and they value trade-based and skills-based education. The current schools were not meeting those needs. Some recognized the current skills mismatch

with employers and the workforce. Others said they liked the integration of academic and technical, explaining that students would no longer have to choose between two schools.

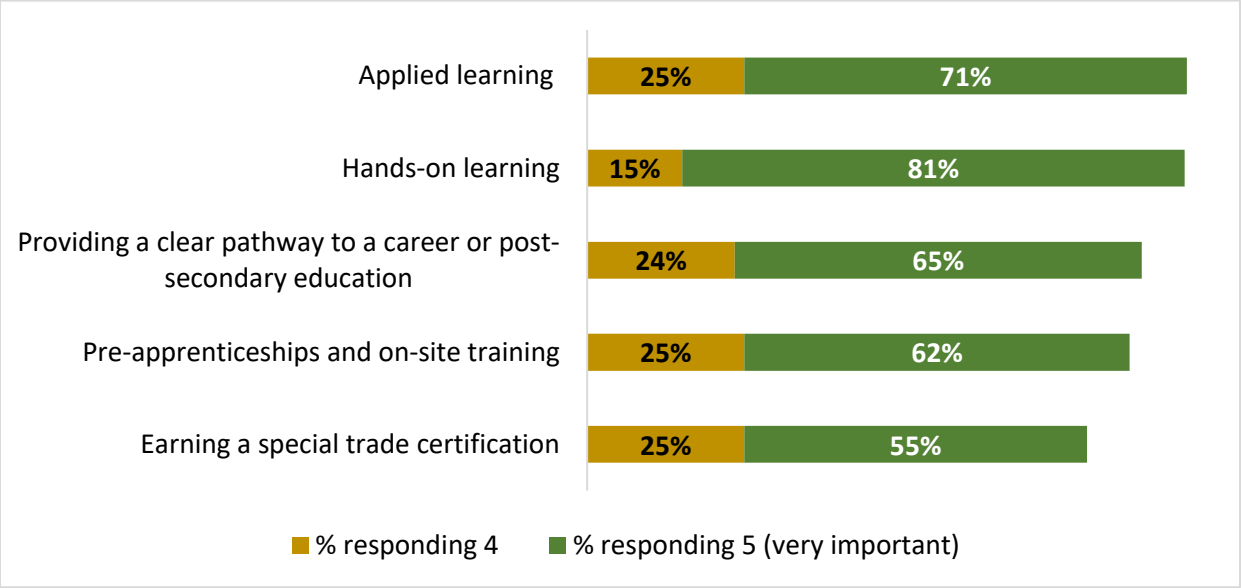
> *"Love integrating technical with high achievement academics—more applied learning. Need to remove career/tech stigma and elevate it academically."*

Parents/caregivers who were "not at all interested" (7) shared their concerns about cost and lack of student interest, and doubts about academic rigor for high achieving students. Other parents (74) who had a medium level of interest expressed a "wait and see" approach to see how the offerings matched their student's needs.

> *"How would sports works, how would connections work with friends that stay at [the sending high school], is this going to cost more for the taxpayers?"*
>
> *"I question whether the academic offerings would be rigorous enough to prepare a child for competitive colleges."*
>
> *"A technical high school would not be a good fit for my child. Their interests are focused on other fields that are not included in the curriculum in a technical high school."*

Important Features. Like the student online survey, parents were asked about the importance of the school features. Parents and caregivers ascribed great importance to applied learning, hands-on learning, pathways to career and college, and experiential learning.

Figure 10. Given the school described, how important are the following features to you? (n = 262)



Other features that more than 50% of parents/caregivers rated as important or very important included transportation (72%), college placement courses (67%), and co-curricular (50%). Athletics had the fewest parents/caregivers rate it as important/very important (47%).

Study 6. Faculty and Staff Input

The study group facilitated a session with the Region 10 staff to seek their input on the proposed new four-year technical high school. The one-hour session included all staff and administrators and gave everyone the opportunity to share their thoughts on benefits and barriers. The group was divided into four groups to support more dialogue among the peers.

Top Findings

- ✓ There is strong staff interest in the concept of the four-year technical high school.
- ✓ More flexibility, more continuity with students
- ✓ New school would be better suited to teaching technical skills

Top Questions

- ✓ Staff questioned political support from the legislature for funding a new school
- ✓ Staff wondered about support from the three sending schools

Opportunities and benefits: Region 10 faculty said they would welcome the opportunity to help design a space that would suit the needs of their programs and their students. They liked the idea of offering more in-depth instruction, new programs, and opportunities for students to participate in organizations like National Technical Honor Society. A four-year, full-time technical high school would give them more continuity with students, more flexibility, more autonomy, and more opportunities to work collaboratively—both with other CTE instructors and with academic teachers. They supported the idea that at the proposed school, students could "stay where they are happy and productive."

Challenges: Region 10 faculty were quick to identify the potential challenges posed by a new school—challenges related to finances, transportation, and the fallout from pulling students away from sending schools. They were also concerned about recruitment (of students and teachers) and marketing for the new school. Finally, they are sensitive to the nuanced challenges of CTE and academic classes coexisting in one school—they want to make sure that CTE programming remains a focus, and they don't want it to take a backseat to academic programming (or vice versa). There is a general understanding that integrated academic and technical education is both a great thing for students, and a tricky thing to achieve.

Additional concerns and questions: Autonomy is important to this group—they wanted to underscore the importance of any potential new school having its own governing body. In light of recent news about charter school closings, they wonder—what happens if this school functions for a while, and then fails?

Study 7. Business Input

The study team conducted 10 one-on-one interviews with business leaders in the region and in Maine. The business leaders shared their struggles to attract and retain skilled workers in recent years. The labor shortages and lack of skilled candidates make it difficult to fill open positions. They described situations where they turned away work because they did not have the staff to fulfill the contract. The business leaders expect demand for their services to stay strong in the coming years, especially as their industries support some of the newer industries in Maine, like renewable energy.

Top Findings

- ✓ Businesses in the region and the state need more employees with technical skills.
- ✓ The current workforce needs better foundational education in math, finance, and critical thinking.
- ✓ Graduates need stronger life skills.

Top Questions

- ✓ Will businesses support the school financially?
- ✓ If students are trained at a large business, will smaller businesses lose workers to that employer?

Support for a four-year Technical High School. The business leaders expressed enthusiasm about the proposed four-year, full-time technical high school. They see great potential in a larger, better-prepared workforce of Maine high school graduates with foundational skills, experience, and a desire to learn. But they also expressed hopes that the proposed school would give students who thrive in a hands-on, active learning environment a chance to be fully engaged at school and pursue rewarding careers and educational opportunities after graduation. They imagine the school benefiting students, communities, businesses, and the state overall.

Life Skills are Important. Employers repeatedly told us that the most important skills for graduating students are not technical skills, but life skills: how to show up to work on time and prepared, how to communicate with colleagues and clients, how to manage their finances. If students arrive at work with these skills, employers can teach them the technical skills. Businesses would jump at the chance to hire students who already have technical skills and experience, but the life skills are fundamental, and employers aren't equipped to teach them.

Opportunities to Partner. The people we spoke to were enthusiastic about the ways in which they could partner with the proposed school. Leaders of trade organizations are willing to connect students to their member organizations, while employers mentioned apprenticeships and pre-apprenticeships, financial support, field trips, guest lectures, site visits, and materials donations as possible ways to support the school.

Interviewees thought that Brunswick's central location, proximity to employers, and ongoing growth made it a good location for the proposed school, but they would also be happy to see similar schools around the state. When asked about potential challenges the proposed school might face, employers identified logistical challenges—from financing to transportation—and political challenges at the state and local levels.

In every interview, employers mentioned the "branding" problem facing both the skilled trades and CTE schools. Both schools and businesses are contending with outdated stereotypes and poor general awareness of the opportunities presented by careers in the trades. Some employers think that people's views of skilled trades and crafts are shifting, but others are less optimistic. One person summed it up by saying:

> *"I think that we need to take [CTE] seriously as an important way to teach kids skills that they can go out and make a living with. And they can do it while they're in high school, getting their normal education, and they can leave high school with no debt and go out and have a skill to start a business or go to work for a business and make a good paycheck in industries that we need right here in the state of Maine so that they don't leave the state."*

Study 8. Maine CTE Directors and National CTE Professionals

Maine's CTE schools provide high-quality career and technical education to many Maine students. This new school is intended to build on those successes and add a new option for students who want to experience an integrated curriculum in one location. As the new school is discussed, it is important to involve CTE leaders—both in Maine and at the national level—in conversations about the proposed high school to benefit from their expertise.

Interviews with CTE Professionals. At the beginning of the project, the study team invited all CTE Directors to a project kickoff meeting, interviewed three representatives from Maine CTEs at several points throughout the study, and appointed two CTE Directors to serve on the Advisory Board, along with the Director of the Maine Association of Career and Technical Educators (MACTE).

Supportive to a Point. The Maine CTE professionals were supportive of the concept to offer students more immersive and integrated technical education as is proposed, but they have concerns about the viability of a new school and the impact on the existing CTE model in the state. Specifically, they were concerned that they might lose students as well as funding to a new school.

Maine CTE Challenges. The CTE leaders acknowledged the challenges faced by Maine's part-time CTE —from scheduling issues to "branding" challenges—and that these problems are interwoven with the labor force problems currently plaguing the state, where there are critical workforce shortages in the skilled trades. CTE leaders agree that more opportunities for CTE (starting when students are younger), more technical-academic integration, and more respect for CTE study and related career paths would benefit students and their communities.

Some of the Maine-based CTE leaders we spoke with liked the general idea of the proposed school, and all of them understood the benefits of the flexibility and autonomy it would offer both teachers and students. Interviewees pointed out the ways in which they are currently working within the system to address some of the same issues the school would tackle. They wondered if Region 10—whose leadership and staff were complimented by several interviewees—could accomplish some of their stated goals within the current CTE structure.

Concerns About Impact on CTEs. Maine CTE leaders shared concerns about funding, and how funding this new school might impact the budgets of other CTE schools and local high schools. They wondered about the implications of a proposed school structure that would offer both the four-year, full-time experience and the two-year, traditional CTE experience. They raised many questions —will the school be able to attract enough students? Will it pull students (and, thus,

funding) from other CTEs' catchment areas? Will it be able to provide the services—including transportation—that all students need to access?

They also pointed out that the CTE model is defined in statute in Maine, and that if it is a CTE school, Region 10 has specific obligations and responsibilities. They expressed concerns that a four-year technical high school could create confusion about CTE in Maine, upsetting a system that they see as functioning well and making progress.

Statewide Changes to Career and Technical Education. The Maine CTE leaders we spoke to expressed that if the state is going to have a conversation about establishing a school like the proposed high school, that conversation should happen at the state level, and should not be focused on one town or area. They are interested in a "bigger look" that would consider all towns, students, and CTEs in Maine.

CTE National Perspective

At the national level, CTE leaders expect that interest in CTE will continue to expand over the next few years. The challenge at both a national and local level to is ensure that CTE both continues to train students for traditional trades and adapts to prepare students for new and fast-growing industries. They advised that the key to a successful school is to intentionally integrate academics with the technical program from the time of initial design and planning and to stay focused on the goal.

CTE leaders at the state and national levels encouraged us to explore other states' CTE models but cautioned us against if these systems could provide solutions to issues that Maine CTE schools face. While other states often offer excellent programs, interviewees point out that those programs may not be replicable in rural Maine.

Study 9. Governance and Finance Models

The core study group engaged Tyler Backus as a subject matter expert to consult on the options for governance and conduct financial modeling. Tyler served for several years as Coordinator of School Finance and Compliance for the Maine Department of Education and is currently a Technical Reviewer with RHR Smith & Company, CPAs. He has a deep knowledge of Maine statutes governing education, and of the ways different types of schools are funded in Maine. Drawing on this knowledge and input from the core group, he prepared the governance and financial modeling described herein.

Governance

The core study group assessed various standalone schools' governance structures in Maine, including magnet schools (such as the Maine School of Science and Mathematics), charter schools (like the Maine Arts Academy and Baxter Academy for Technology and Science), and CTE governance. The group determined that the current CTE governance model would be the most suitable for a new school with both the part-time CTE and four-year full-time options for students. Region 10 is currently overseen by a Cooperative Board, composed of nine members from sending towns. Each CTE program also has a program advisory board made up of professionals in the relevant trade(s). See Table 4.

Recommendations:

1. Revise MRSA §8305-A to include admissions standards for attending the new school from any municipality.
2. Add language to MRSA §8351. State aid for career and technical education centers and career and technical education regions to allow CTE schools to provide regular instruction and special education.

Recommendation:

Revise MRSA §5205 to add exceptions to the general residency rules. Remove the subsidy count from the resident town and move it to the new school for funding purposes.

Table 4. Review of Funding and Governance Models for Four Year High Schools in Maine

	Proposed Four-Year Tech School	Charter Schools	Alternative School	Magnet School	Public School
Funding	Follows student from sending school	Follows student from sending school	Local tax levy from school district plus state share	Legislative allocation, students pay room and board	Local tax levy plus state share
Governance	Elected local officials from the three Region 10 sending districts' school boards	School-appointed board of directors	Local public-school board governs (elected local officials)	Gubernatorial appointees	Elected local officials

Table 5 shows a comparison between the proposed part-time, full-time blended technical school and a full-time only school. The detailed calculations of the costs follow the table below.

Table 5. Potential Governance Structure and Sources of Funds for a New School (Includes Full-time and Traditional Part-time Students in the School)

School Student Populations	Number of Students	Catchment Area	Funding Source	Governance	Curriculum
2-Year Traditional CTE students	150	Current 3 School Districts	Continue current Region 10 Funding ($2.5million)	Continue current Cooperative Board Governance – required in statute for CTE	Shared technical classes and instructors
4-Year, Full-Time Students	300	Projecting most students will come from 30-mile radius like typical commute patterns to the region (open to all students)	Funding follows students from sending schools (state average GPA) ($3.6million)	Single governance (Cooperative Board)	Shared technical classes and instructors

Current and Potential Funding

Operating Funds. Region 10 receives funding as a regional CTE per the Maine Department of Education Essential Programs and Services (EPS) CTE funding model. Funding is based on the number of students in each program and the number attending the school. The total state FY23 allocation for Region 10 as of October 2022 was $2,547,613.75. Currently, the following expenses are not funded under this model:

- Special education. Any funding for special education comes from sending districts—it "follows" the student(s)—and is not provided directly to the regional CTE.
- Transportation, except for program expenses (e.g., travel related to field trips).

Capital Funds. CTE regions are eligible for school construction along with traditional public high schools. Maine charter schools are not eligible for construction funding.

Estimated Total Operating Funds

Enrollment numbers and funding sources. The funding model is based on several key assumptions. It assumes that the school will attract 300 full-time students plus 150 part-time

students who will study technical subjects at the new school but return to their sending schools for further instruction. A student body of 300 and its associated funding is sufficient size to support the staffing and costs needed to operate a high quality technical high school. The school will draw on general education funding for the full-time students and state CTE funding will cover the technical instruction directly for the part-time students, which will also benefit the full-time students as they share classes.

Staffing. This model assumes a 16:1 student to teacher ratio, and proposes paying Regular, Special Education, and CTE teachers on the same scale with average teacher salary of $67,000 (plus 20% benefits). When estimating the number of teachers needed, the funding model assumes that the proposed school will work with the Maine Community College System and the University of Maine System to either fund positions or teach college level courses through the Aspire Program. An arrangement like this would be separate from CTE dual enrollment programs and would allow the proposed school to draw on additional funding sources not identified in the funding model.

The new school will staff a Special Education program so that all students can attend. The funding model assumes that all special education students will be taught within the school and assumes that the school will contract with credentialed professionals for required related services.

Calculating Operating Costs

The total revenue for the proposed school would be $6,485,385.91, approximately 2.5 times the current budget of Region 10. Using the assumptions described above, we calculated the operating costs as follows:

Current CTE funding = $2,893,205.02

- FY2024 = $2,449,709.02 (Region 10's current funding) plus $443,496 (additional students) = $2,893,205.02

Estimated EPS funding for non-CTE instruction = $3,592,180.89

- Assumes 43% economically disadvantaged rate and a 15% special education rate

Federal operating funds = $120,000.00

- Individuals with Disabilities Act = $90,000
- Title IA under ESEA = $30,000

Current and Proposed Per Pupil Spending

The following two tables show the per pupil spending for Region 10 in FY23. See Table 4. We used Maine School Administrative District 46 (Dexter) as a model for the types and numbers of staff in the new school when calculating the per-pupil spending (in addition to CTE instructors). Federal grant numbers are an educated guess. See Table 5.

Table 6. Current Region 10 Per Pupil Expenditure By Category

	General Fund	State Grants	Federal Grants	Other
Regular Instruction	$0.00	$0.00	$0.00	$0.00
Special Education	$0.00	$0.00	$0.00	$0.00
Career & Technical Education (Total)	$10,728.00	$372.92	$0.00	$217.06
• Instruction	$5,058.13	$258.53	$0.00	$217.06
• Student & Staff Support	$808.12	$113.64	$0.00	$0.00
• System Administration	$62.73	$0.00	$0.00	$0.00
• School Administration	$1,765.45	$0.00	$0.00	$0.00
• Central Services	$0.00	$0.00	$0.00	$0.00
• Operation Maintenance & Plant	$2,984.59	$0.00	$0.00	$0.00
• Transportation	$48.99	$0.75	$0.00	$0.00
Other Instruction	$0.00	$0.00	$0.00	$0.00
Student & Staff Support	$0.00	$0.00	$0.00	$0.00
System Administration	$0.00	$0.00	$0.00	$0.00
School Administration	$0.00	$0.00	$0.00	$0.00
Operation Maintenance & Plant	$0.00	$0.00	$0.00	$0.00
Transportation	$0.00	$0.00	$0.00	$0.00
Debt Service	$0.00	$0.00	$0.00	$0.00
All Other	$0.00	$0.00	$0.00	$0.00
Adult Education	$0.00	$0.00	$241.01	$0.00

Table 7. Proposed Per Pupil Expenditure by Category

	General Fund	State Grants	Federal Grants	Other
Regular Instruction	$3,181.57	$0.00	$100.00	$0.00
Special Education	$1,800.00	$0.00	$300.00	$0.00
Career & Technical Education (Total)	$6,582.15	341.84	$0.00	$0.00
• Instruction	$2,827.52	$236.99	$0.00	$217.06
• Student & Staff Support	$188.24	$104.17	$0.00	$0.00
• System Administration	$62.73	$0.00	$0.00	$0.00
• School Administration	$1618.33	$0.00	$0.00	$0.00
• Central Services	$224.04	$0.00	$0.00	$0.00
• Operation Maintenance & Plant	$1,400.00	$0.00	$0.00	$0.00
• Transportation	$44.91	$0.69	$0.00	$0.00
Other Instruction	$0.00	$0.00	$0.00	$0.00
Student & Staff Support	$1,347.84	$0.00	$0.00	$0.00
System Administration	$885.35	$0.00	$0.00	$0.00
School Administration	$292.41	$0.00	$0.00	$0.00
Operation Maintenance & Plant	$1,105.60	$0.00	$0.00	$0.00
Transportation	$756.66	$0.00	$0.00	$0.00
Debt Service	$0.00	$0.00	$0.00	$0.00
All Other – Food Service	$0.00	$0.00	$555.00	$0.00
Adult Education	$0.00	$0.00	$241.01	$0.00

Staffing Assumptions

The new school will need at least one certified regular education teacher in each core subject. The proposed budget includes funding for:

- 13 regular instruction teaching positions:
  - 10 in English, Social Studies, Math, Science, non-core subjects (2 teachers each)
  - 3 in Fine Arts, Language, Physical Education (1 teacher each)
- 1 educational technician position

The new school will staff a special education program for students. This budget model accounts for the following new staffing needs:

- 1 special education director. This could be a full-time director, or a part-time director who also spends time teaching or co-teaching classes.

- 1 secretary for the special education department
- 3 special education teaching positions
- Resource room teacher and 2 case managers
- 3 special education educational technician positions

This budget model also accounts for additional administrative and student support staff, including some positions that are required in a comprehensive high school:

- 1 guidance counselor
- 1 social worker
- 1 data and technology staff member to assist the technology director (data requirements for a school of record are much higher than for CTE Regions).
- 1 additional secretary
- 1 additional assistant principal
- 1 additional business staff member

Other Staffing Considerations

To offer Advanced Placement courses, the school will need to hire or train teachers who are prepared to teach these classes. The school may need to provide funding for teachers to participate in the AP Course Audit. The funding model assumes that the proposed school will work with the Maine Community College System and the University of Maine System to either fund positions or teach college level courses through the Aspire Program. These courses would be offered at no cost to the school if the student attends the college/university (or attends virtually).

Additional staff. Additional staff may be needed to maximize the opportunities presented by this new school, including but not limited to an Instructional Strategist to work with teachers to integrate the required academic curriculum into CTE instruction, and conversely help academic teachers tie their topics into students' technical interests. A key position proposed is a Co-op Teacher/Co-op Coordinator—to manage students' work-based learning experiences and develop and maintain relationships with businesses that can offer these experiences to students. Many successful CTE high schools with strong work-based learning programs have a staff member whose time is dedicated to this work.

Teacher Pay. Teacher and staff recruitment, retention and re-specialization may add costs to the operating cost estimates. Currently, Region 10's teachers belong to a collective bargaining unit. Their pay is based on the weighted average of equivalent teacher pay in the three sending districts. The new school may need teachers with special skills, interests, and ways of thinking to offer students integrated learning. Teachers with these specialty skills and abilities may need to be paid more than average teacher salaries.

Other Costs

The funding model assumes that some of the back-office services and costs associated with operating a high school and a CTE school will be covered by Region 10's current level of CTE funding. However, the model does account for the purchase and/or maintenance of an accounting system.

Nutrition Program. The model does not include any costs for providing meals to students. Maine provides free school meals to all students who attend public schools in the state, essentially matching the federal nutrition funding amount for students who don't qualify for free lunches. This combined reimbursement level is meant to cover both food and staffing. The nutrition program also offers equipment grants for kitchen equipment.

Equipment Costs

Equipment costs are factored into the building costs for a new school building if the project is funded by the state, but there is generally insufficient state funding for ongoing CTE equipment replacement, upgrades, and repairs. New CTE programs are only funded for the additional students in the program, and not associated equipment.

Some equipment and materials may be donated in-kind by businesses, but donations cannot be relied upon to cover costs annually. This is where strong partnerships with businesses become crucial—students can train on specialty equipment during work-based learning with employers.

Construction Costs

Construction cost assumptions. We made several assumptions in our forecast of construction costs for a new school. The first was size. Maine Department of Education Space Allocation guidelines specify 185 square feet per student for high schools, and 250 square feet per student for CTE schools. By this allocation method, the total square footage for the proposed school would be 130,500 square feet. However, inflation and skyrocketing construction costs over the last few years make it difficult to predict the cost to build a school in five to ten years. So, we researched the recent costs of building new CTE schools in the state and made assumptions on future cost escalation.

Recent costs to build CTEs in Maine. Built in 2018 at a cost of $100 million, Sanford High School and Regional Technical Center has a footprint of approximately 300,000 square feet for 1,000 high school students and 600 CTE students. Taking the $100 million cost and adjusting down for the size needed for the new school in Brunswick and escalating it 40% for inflation, we estimate the cost of constructing a new school to be about $60 million. Sanford paid for 10% of the construction cost through local taxation to upgrade the design approved by the state. Raising taxes to support to pay for any new school would require voter approval from the region members, in this case Brunswick, RSU 5, and RSU 75 towns.

MidCoast School of Technology, CTE Region 8, opened a new school in Rockland in September 2019. This 90,000 square foot school, which has space for 450 CTE students, was funded entirely by a local-only bond of $25 million in 2016. Lavallee Brensinger Architects designed both the new Sanford school and the new Region 8 school.

In the fall of 2022, Biddeford Regional Center of Technology received a $7 million state grant to fund a two-story, 9,420 square foot addition to the existing building, which was constructed in 1969 and has undergone several renovations since initial construction. The new space will house a new culinary arts program, a new travel, tourism and hospitality program, and a new athletic training program. It will also allow the school to expand existing plumbing, heating, and emergency medical technician programs. School leadership hopes the expansion will be complete by the beginning of the 2024-25 school year. The grant was made as part of the Maine Jobs and Recovery Plan CTE infrastructure program.

Maine has a long waiting list to fund new school buildings. Maine CTE region schools are eligible for state construction funding, and if the state approves a school design, it will cover the costs of the construction of that design, regardless of cost increases. It could take years for a new school to rank highly in the Maine DOE's project rating cycle priority list. Region 10 was ranked #60 on the 2017-2018 list, and of that list, only projects #1-7 had been approved as of September 2022. Morse High School's new facilities, opened in February 2021, were funded because the school was ranked #11 on the 2010-2011 rating cycle priority list. According to the Department of Education's website, the next rating cycle is anticipated to be initiated in 2024.

Federal funding. Federal funding opportunities for school construction are rare. The last grant for construction planning was in 2013 to provide technical assistance and training on the planning, design, financing, procurement, construction, improvement, operation, and maintenance of safe, healthy, and high-performing education facilities.

Funding For Additional Students and CTE Programs

This section presents cost estimates for additional students and CTE programs.

Table 8. Per Pupil Funding for Additional Students

Funding Item	Amount per pupil
Teachers (based on 32 students)	$1,806
Technology	$117
Co-Curricular	$45
Professional Development	$22
Safety	$44
Assessment	$64
Supplies	$76
Per Pupil Total	***$2,174***

Table 9. CTE Funding for New Programs

Program Need (assuming at least 13 students, but fewer than 33 students)	**Cost**
Teacher (1 FTE)	$57,806 salary, plus $15,029.56 benefits
Technology	$117 per pupil
Co-Curricular	$45 per pupil
Professional Development	$22 per pupil
Safety	$44 per pupil
Assessment	$64 per pupil
Supplies	$76 per pupil

Study 10. Review of Schools in Other States

Methodology

The study team conducted a webscan of four-year, full-time high schools with a STEM and/or technical education focus to help us understand the size, resources, structures, and offerings of successful STEM and technical education schools that prepare students for both work and further training and study. This research was conducted in two stages. The first webscan focused on the seven high schools identified in the grant proposal. The second, completed after preliminary review of the first scan, focused on five additional technical high schools that aligned more closely with the vision and scope of the proposed high school in Brunswick.

Summary of Findings

Commonalities among the schools we studied include: proximity to students and employers (most are located in or near cities); participation in a special school district or "school of choice" system, in which the idea of selecting a school is normalized for parents and families (again, this is more common in cities); and access to resources including funds, updated facilities, and business partnerships.

These schools see technical training as central to their missions, but they are also dedicated to preparing students for post-secondary education and offering the kinds of cocurricular activities available to students who attend traditional comprehensive high schools. This means that they have sports teams and clubs, offer AP, honors, and dual enrollment classes, and have support services in place for students.

State-level governance and funding structures related to technical education are an important consideration when looking at schools outside of Maine. In states and cities where "schools of choice" are common, or in states where CTE is run at the state or county level somewhat independently of traditional public education, full-time technical high schools have different opportunities and challenges.

Second Review Yielded More Insights for Maine

The first set of schools reviewed were in major metropolitan areas and were not relatable to Maine. The second webscan focused on exemplary four-year, full-time high schools with an explicit focus on technical education. These schools were identified via articles about CTE in the United States, conversations with CTE leaders, and web searches for high schools often cited as forward-thinking or outstanding.

Each school we looked at serves grades 9-12, and students are generally expected to attend full-time for four years.

Table 10. Four-Year Technical High Schools Reviewed

School Name	School Location
Academy of Arts, Career, and Technology (AACT)	Reno, NV
Blackstone Valley Regional Vocational High School	Upton, MA
DeBakey High School for Health Professions	Houston, TX
Eli Whitney Technical High School	Hamden, CT
High Tech High School	Secaucus, NJ
John A. Dubiski Career High School	Grand Prairie, TX
POLYTECH High School	Woodside, DE
Worcester Technical High School	Worcester, MA
Region 10 Technical High School	Brunswick, ME

Admissions. All eight schools (and Region 10) have an application process for admission to the school. Generally, they are looking for applicants who are serious about technical education, responsible in the classroom (especially important when handling power tools and other equipment commonly found in a technical high school), and ready to learn. Since these schools are all full-time high schools serving grades 9-12, most of their applications come from eighth graders. However, most accept a limited number of older transfer students from other high school depending on program space.

In general, admissions decisions are based on factors that often include disciplinary records, attendance records, and grades.

Located Near a Population Base. All eight schools are located within one hour's drive of a city with at least 115,000 people. This proximity to metropolitan areas may offer students additional opportunities for off-campus opportunities.

Academic Study. All eight schools offer college-level courses. For most, this means offering Advanced Placement courses. Several schools partner with local colleges or universities to offer dual and/or concurrent enrollment courses (Region 10 also offers dual enrollment courses in partnership with the Maine Community College System). Honors-level offerings are also common.

In general, the core academic offerings in these schools mirrors core academics at traditional comprehensive high schools: English/Language Arts, Math, Science, Social Studies, World Languages, etc. In some high schools, the ultimate stated goal is to integrate academic and technical learning, but it is difficult to tell from a webscan to what degree schools are accomplishing this goal.

Two schools focus on specifics professions and career clusters. DeBakey High School focuses on the health professions, while High Tech High School focuses on both technology and science and the performing arts.

Technical Study. All schools offer technical study as a key component of students' education. While two schools—Eli Whitney and Region 10—enroll students directly in programs (Welding, HVAC, or Graphic Design, for instance), some schools have grouped similar programs into "academies" or "pathways," often aligned with U.S. Department of Labor Career Clusters. DeBakey High School, with its focus on health sciences, does not offer specific programs that would be recognized as CTE; students' technical instruction is completed via required courses and practicums in Health Science offered over the course of four years.

Work-Based Learning. As defined by Perkins V, "work-based learning" means "sustained interactions with industry or community professionals in real workplace settings, to the extent practicable, or simulated environments at an educational institution that foster in-depth, firsthand engagement with the tasks required in a given career field, that are aligned to curriculum and instruction." This is a key component of technical education, and all of the schools we studied attempt to offer their students work-based learning opportunities. These opportunities look different from school to school and program to program.

Seniors (and some juniors) at Worcester Tech, Blackstone Valley, and POLYTECH, and Eli Whitney are encouraged to participate in co-ops, job shadows, and internships, which the schools help to coordinate with local businesses. Several of the academies at High Tech High School mention work-based learning, but there was no more detailed information available.

Three schools operate on-site, student-run businesses that give students a chance to work in their career field, ranging from beauty salons and graphics print shops to veterinary clinics and bistros. Eli Whitney students can also be hired (via the program department head) to work on carpentry, plumbing and heating projects, or to provide drafting or electrical services. AACT's culinary arts program offers catering services to the community.

Diplomas and Certifications. All eight schools studied are diploma-granting institutions. Like most CTE schools, all of the schools studied help prepare students to obtain industry-recognized certifications and licenses. This looks different from school to school and program to program; at Blackstone Valley, for instance, all students earn an OSHA 10 safety card, while DeBakey students focus on medical certifications like CPR, first aid, and phlebotomy certifications.

Governance. All of the schools studied are free, public schools, and most are considered "schools of choice" with an application process. Six of the eight schools belong to larger districts which include other schools, while two represent the sole schools in standalone districts. State legislation enables the governance structure of each school.

Four schools are city magnet schools. AACT is a "signature academy" in the Washoe County School District of Nevada, while Worcester Technical High School is a citywide magnet school in Worcester. DeBakey is a magnet school in Houston's Independent School District (or ISD), and John A. Dubiski Career High School is a magnet school in the Grand Prairie Independent School District. In Texas, "independent" school districts are separate from any municipality, county, or state—the school district has its own taxing authority outside the direct control of other governmental entities.

Three schools belong to specialized school districts. Eli Whitney Technical High School is part of the Connecticut Technical Education and Career System (CTECS), which includes 17 full-time, four-year technical high schools across the state and is overseen by an eleven-person advisory board.

High Tech High School belongs to the Hudson County Schools of Technology School District, which consists of three schools, including two high schools and a career and technical middle school, a career development center, and a robust adult education program. In New Jersey, technical schools are run by county governments, so technical schools and districts separate from comprehensive, traditional public education are the norm. Delaware also runs full-time technical high schools at the county level. POLYTECH, serving Kent County, also offers adult education.

Operating Budgets.
It is often difficult to determine school-specific operating budgets based on information available online. Where possible, we obtained recent annual budget information for the schools studied. Where we could not find school-level information, we searched for district-level information, for a sense of the size and scope of the district spending. To the extent possible, we also analyzed the sources of the school or district funding, which can vary widely. For example, the State of Massachusetts contributes almost one third of the budget for Blackstone Valley, but in Texas, where independent school districts can levy taxes, only 4% of the Houston Independent School District's revenue comes from state aid. We found recent school-level budgets for only three schools: Blackstone Valley ($27.7 million for approximately 1,230 students), POLYTECH ($26.7 million for about 1,180 students), and Worcester Technical High School ($16.1 million for about 1,480 students). Once again, this budget information was found online and may not reflect all realities of these school's budgets.

Partnerships with Higher Education Institutions and Businesses
Like Region 10, which partners with the Maine Community College System to offer dual and concurrent enrollment opportunities for students, many of the technical high schools we studied have strong partnerships with colleges and other post-secondary institutions. Several schools offer dual or concurrent enrollment in partnership with their states' public colleges and

universities (like the Universities of Connecticut, Nevada, and Texas), while others have partnerships with private post-secondary institutions.

Tufts University Veterinary School, for example, makes possible the pre-vet program at Worcester Technical High School ("Tufts at Tech"), while DeBakey is closely tied to both Baylor College of Medicine and the University of Houston.

All successful technical high schools have relationships—formal or informal—with local businesses and other institutions. These businesses often offer training and work-based learning, volunteer to review curricula, serve on advisory boards, and recruit graduates. Some of the schools and districts we researched did an excellent job of publicly sharing their partnerships with businesses and organizations, while others invited interested businesses and community members to fill out a form on their website to be contact about involvement opportunities.

We noticed that high schools with robust business partnerships often have a staff person dedicated to working with these partners. Creating and maintaining connections with employers isn't an additional task for an instructor or administrator—it's this person's main task.