Identifying Powerful Pathways.

Dr. Todd M. Oldham
Vice President
Economic and Workforce Development
and Career Technical Education
Session Agenda

► Overview: the Conceptual Framework Guiding Career Pathways at MCC
► Influences on MCC’s Workforce Practice
► Developing the Data Model to support the Creation of a Career Pathway System
► Application of Data Framework
► Implication and Application of Data:
  ► Instructional Design & Delivery of Curricula
  ► Student Pipeline
  ► Staffing & Operations
  ► Partnerships
► What We’ve Learned
► Q&A
Context for Career Pathway Work

The mission of the Economic Development & Innovative Workforce Services (EDIWS) division is to support the businesses and organizations within the greater Rochester area with innovative integrated credit and non-credit workforce and career technical education.

- Actively create and promote a robust applied-STEM, CTE and middle-skill career pathway system
- Support investment in curricula and equipment for academic CTE and industry targeted workforce programming
- Proactively address shortage in educational pipeline (future workforce) and skills gaps in existing (incumbent) workforce
- Aggressive and pervasive outreach to Rochester business and industry using B2B best practices
A Career Pathway is a series of connected education and training programs and student support services that enable individuals to secure a job or advance in a demand industry or occupation.

Career Pathways focus on easing and facilitating student transition from high school to community college; from pre-college courses to credit postsecondary programs; and from community college to university or employment.

**Applied Economics Perspective of Mission:** Increase the number of NY’ers with certificates, credentials, and degrees that are aligned to well paying careers identified and measured within the local economy.
Dynamic Career Pathway System

Source: National Governors Association: State Sector Strategies Coming of Age
Support for economic development and workforce development partners focused on increased need for access to qualified technical workers.

Source: National Governors Association: State Sector Strategies Coming of Age
Modularized Educational Pathway

Sequences/Modules Stack into College Credentials

Visual adapted for presentation from Batec.org
Definition: What is a Middle-Skilled Worker?

“Middle Skill” occupations refer to those job titles that require education and/or training beyond high school, but not a four-year college degree.

Most job titles in the Middle Skills category require one of the six following educational/training credentials:

- High School diploma (or equivalent) + apprenticeship
- High School diploma (or equivalent) + moderate on-the-job training
- High School diploma (or equivalent) + long-term on-the-job training
- Post-secondary non-degree award (e.g., certificate programs such as Medical Assistant and Certified Nurse Aide)
- Some college, no degree
- Associate Degree

Other terms – New Collar, Gold Collar, Middle Wage, Community College Labor Market
### Common Middle-Skilled Workforce Clusters

<table>
<thead>
<tr>
<th>Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Manufacturing (skilled production)</td>
</tr>
<tr>
<td>Health Care</td>
</tr>
<tr>
<td>Skilled Trades / Apprenticeship</td>
</tr>
<tr>
<td>Travel, Hospitality &amp; Tourism</td>
</tr>
<tr>
<td>Transportation &amp; Logistics</td>
</tr>
<tr>
<td>Construction</td>
</tr>
<tr>
<td>Energy</td>
</tr>
<tr>
<td>Information &amp; Computer Technology</td>
</tr>
<tr>
<td>Applied Technologies</td>
</tr>
</tbody>
</table>
Conceptual Framework
<table>
<thead>
<tr>
<th>Summary of Recognized Elements of a Functional Career Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>An introduction to career opportunities in a region’s high-wage, high-demand employment sectors.</td>
</tr>
<tr>
<td>Incorporation of stackable credit certificates along an associate’s degree pathway.</td>
</tr>
<tr>
<td>Continuing upgrade training.</td>
</tr>
</tbody>
</table>

(Alssid et al., 2005; Sass, 2007; Pedersen, & Truman, 2007).
Fink & Inkelas Five-Point Typology
Representative of a Learning Community Model

1. Paired or clustered courses.
2. Smaller cohorts among large enrollments, including learning communities.
3. Coordinated or team-taught series of courses.
4. Learning communities for special populations.
5. Residentially based learning communities.

(Fink and Inkelas, 2015, p. 12)
### Structured-Based Solutions Implied by Structure Hypothesis

#### Improved access to information & navigation
- More intensive and intrusive advising
- Use of technology to streamline bureaucracy

#### K-12 curriculum design
- Instructional program coherence
- Constrained curriculum
- New York State’s Pathways in Technology (P-Tech) Early College High School program
- 1 + 1 models

#### Cohort-based Learning communities
- Accelerated associate degree programs (ASAP)
- Accelerated academic certificates
- Stackable certificates/credentials

#### Integrated post-secondary and developmental curricula
- Washington State’s I-BEST program

Developing the Data Model
How to Measure a Career Pathway?

• Create an evaluation framework

• Moving from *estimated* labor outcomes to *actual* labor outcomes

• Translate the data into meaningful change

• Being prepared to organize and provide access to curricula in new ways

• Measuring results

• Working across education and industry partners to align resources and programs – regionally

• Augment Operations for Improvement and Impact
Research Questions Driving MCC’s Workforce Practice

What is the annual demand for occupations aligned to a CP?

What are graduates earning in the local labor market in the first five years, after graduation?

How well does an occupation(s) provide the graduate:
  • Year over year wage growth
  • Attainment of regional self-sufficiency thresholds
  • Employment retention/occupational stability/workforce persistence
  • Lifetime earnings compared to other CP/Opportunity costs
  • Performance relative to a direct four-year degree pathway

How do non-completers working within the career pathway perform in comparison to graduates that have obtained a credential?

Is there a viable and validated practice within CP industry(ies) for occupational progression?
Variables to consider when evaluating a career pathway

- Occupations Linked/Mapped and Aligned to College programming
- Occupational Demand and Industry Growth (Replacement & New)
- **Supply (Completions) and Demand Analysis**
- Wages & Time for Wage Progression
- Benefits as a Percent of Total Compensation*
- Index to Regional Self-Sufficiency Standards & Regional Metrics
- Occupational Churn and Attrition
- Occupational Demographics – 10 Year Age Out Rate
- **Credentials, Competencies and Skills required by employers**
- Ability of workers to ladder to next step occupations within the career pathway(s)
Talent Management and Analysis

Competitive Factors and Alternative Opportunities:
- Wage range
- Desired education
- Skillsets
- Experience

Factors to compete for scarce supply of workers:
- Identified career progression
- Mission driven organization (e.g., environmental purpose, community focus, etc.)
- Professional development/growth
- Tuition reimbursement
- Organizational culture
- Physical work environment
Compiling A Regional Dataset: MCC’s Model

Define the occupations that are Linked to Community College Program

- Publicly Sourced Decomposed Government Data
- Online Job Posting Data
- Student Labor Market Outcomes Data

Regional Member Checking and Triangulation of the Compilation

Validation
- Partner Advisors
  - Industry Associations
  - Economic Developers
  - Secondary CTE Educators
  - Industry Partners
- CTE Academic Advisory Boards
- CTE Faculty
  - Alignment to Other Studies/Literature
- Cross Referencing Other Data Sources

Process Flow

DATA DRIVEN CAREER PATHWAY MODEL
<table>
<thead>
<tr>
<th>Field of Study</th>
<th>5th Year Hourly Wage</th>
<th>% Change at 5th Year</th>
<th>$ Increase at 5th Year</th>
<th>Est. Return on Education</th>
<th>50th %ile for Peer Group</th>
<th>% of 50th %ile</th>
<th>% of Self-Sufficiency for 1 Adult &amp; 1 Child</th>
<th>% of Self-Sufficiency for 2 Adults &amp; 1 Child</th>
<th>% of 4-Year Degree Wage in the Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVAC (AAS)</td>
<td>$20.16</td>
<td>12.2%</td>
<td>$10.08</td>
<td>28.8%</td>
<td>$23.89</td>
<td>84.4%</td>
<td>109.8%</td>
<td>80.6%</td>
<td>75.3%</td>
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<tr>
<td>HVAC (CER)</td>
<td>$18.58</td>
<td>11.1%</td>
<td>$8.71</td>
<td>28.8%</td>
<td>$21.57</td>
<td>86.1%</td>
<td>101.2%</td>
<td>74.3%</td>
<td>69.4%</td>
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<tr>
<td>Computer Systems Technologies (AAS)</td>
<td>$20.55</td>
<td>8.9%</td>
<td>$8.22</td>
<td>21.1%</td>
<td>$26.75</td>
<td>76.8%</td>
<td>111.9%</td>
<td>82.2%</td>
<td>76.7%</td>
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<td>Computer Information Systems (AAS)</td>
<td>$21.84</td>
<td>9.1%</td>
<td>$8.92</td>
<td>20.4%</td>
<td>$36.85</td>
<td>59.3%</td>
<td>119.0%</td>
<td>87.4%</td>
<td>81.6%</td>
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<tr>
<td>Electrical Engineering Technologies</td>
<td>$23.47</td>
<td>7.2%</td>
<td>$8.04</td>
<td>24.4%</td>
<td>$26.32</td>
<td>89.2%</td>
<td>127.8%</td>
<td>93.9%</td>
<td>87.6%</td>
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<td>10.2%</td>
<td>$10.83</td>
<td>20.8%</td>
<td>$25.90</td>
<td>94.4%</td>
<td>133.2%</td>
<td>97.8%</td>
<td>91.3%</td>
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<tr>
<td>Optical Systems Technology (AAS)</td>
<td>$23.81</td>
<td>11.9%</td>
<td>$11.66</td>
<td>25.5%</td>
<td>$23.34</td>
<td>102.0%</td>
<td>129.7%</td>
<td>95.2%</td>
<td>88.9%</td>
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<tr>
<td>Tooling &amp; Machining (AAS)</td>
<td>$23.81</td>
<td>11.9%</td>
<td>$11.66</td>
<td>25.5%</td>
<td>$23.34</td>
<td>102.0%</td>
<td>129.7%</td>
<td>95.2%</td>
<td>88.9%</td>
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<td>Welding, Non-Credit (CER)</td>
<td>$18.65</td>
<td>8.9%</td>
<td>$7.44</td>
<td>38.5%</td>
<td>$15.93</td>
<td>117.1%</td>
<td>101.6%</td>
<td>74.6%</td>
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### Advanced Manufacturing

<table>
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<tr>
<th>Program</th>
<th>Occupational Group Size</th>
<th>Hourly Wage</th>
<th>Annual Regional Completions</th>
<th>Estimated Annual Demand</th>
<th>Estimated Gap (Δ)</th>
<th>Unique Postings</th>
<th>Posting Intensity</th>
<th>10 Year Age Out</th>
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<tbody>
<tr>
<td>Aggregate Cluster - Advanced Manufacturing</td>
<td>42</td>
<td>$22.32</td>
<td>275</td>
<td>2,107</td>
<td>-1,832</td>
<td>1,130</td>
<td>5.1</td>
<td>30.7</td>
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<td>Applied Integrated Technologies/Mechatronics</td>
<td>13</td>
<td>$23.17</td>
<td>84</td>
<td>947</td>
<td>-863</td>
<td>300</td>
<td>5.2</td>
<td>31.7</td>
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<tr>
<td>Electrical Engineering Technologies</td>
<td>10</td>
<td>$29.31</td>
<td>43</td>
<td>233</td>
<td>-190</td>
<td>348</td>
<td>5.3</td>
<td>27.2</td>
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<tr>
<td>Mechanical Engineering Technologies</td>
<td>10</td>
<td>$25.89</td>
<td>36</td>
<td>596</td>
<td>-560</td>
<td>400</td>
<td>5.6</td>
<td>30.7</td>
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<td>Optical System Technologies</td>
<td>10</td>
<td>$23.33</td>
<td>31</td>
<td>562</td>
<td>-531</td>
<td>270</td>
<td>6.3</td>
<td>32.2</td>
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<tr>
<td>Tooling &amp; Machining</td>
<td>20</td>
<td>$19.54</td>
<td>174</td>
<td>914</td>
<td>-740</td>
<td>311</td>
<td>4.3</td>
<td>30.4</td>
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</table>

### Applied Technologies

<table>
<thead>
<tr>
<th>Program</th>
<th>Occupational Group Size</th>
<th>Hourly Wage</th>
<th>Annual Regional Completions</th>
<th>Estimated Annual Demand</th>
<th>Estimated Gap (Δ)</th>
<th>Unique Postings</th>
<th>Posting Intensity</th>
<th>10 Year Age Out</th>
</tr>
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<tbody>
<tr>
<td>Aggregate Cluster - Applied Technologies</td>
<td>41</td>
<td>$22.19</td>
<td>514</td>
<td>2,762</td>
<td>-2,248</td>
<td>743</td>
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<td>22.3</td>
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<td>Automotive Technologies</td>
<td>10</td>
<td>$17.02</td>
<td>190</td>
<td>607</td>
<td>-417</td>
<td>318</td>
<td>6.2</td>
<td>19.1</td>
</tr>
<tr>
<td>Construction Technologies</td>
<td>7</td>
<td>$25.13</td>
<td>67</td>
<td>601</td>
<td>-534</td>
<td>56</td>
<td>3.8</td>
<td>19.0</td>
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<tr>
<td>Heating, Ventilation, &amp; Air Conditioning (HVAC)</td>
<td>23</td>
<td>$23.92</td>
<td>109</td>
<td>1,404</td>
<td>-1,295</td>
<td>376</td>
<td>6.7</td>
<td>25.7</td>
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<tr>
<td>HVAC: Solar Thermal Technology</td>
<td>3</td>
<td>$19.89</td>
<td>39</td>
<td>174</td>
<td>-135</td>
<td>52</td>
<td>4.4</td>
<td>16.8</td>
</tr>
<tr>
<td>HVAC: Technologists &amp; Helpers</td>
<td>4</td>
<td>$21.59</td>
<td>47</td>
<td>413</td>
<td>-366</td>
<td>84</td>
<td>6.5</td>
<td>17.4</td>
</tr>
<tr>
<td>Welding</td>
<td>3</td>
<td>$15.92</td>
<td>89</td>
<td>169</td>
<td>-80</td>
<td>52</td>
<td>3.3</td>
<td>20.9</td>
</tr>
</tbody>
</table>

All data is based on the 9 county region: Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, and Yates. Aggregate clusters represent unduplicated data for all occupations within that workforce cluster. Occupational Group Size is counted at the 6-digit SOC level. Hourly wage is at the 50th percentile. Completions data is sourced from the Integrated Postsecondary Educational Data System (IPEDS), all other data is sourced from Q4 Emri Occupational Data. July 2016-June 2017 completions data for associates degrees, awards of at least 1 but less than 2 academic years, awards of less than 1 academic year, and non-credit awards of 1 academic year or less were sourced. Unique Postings and Posting Intensity are for December 2018. The regional average for posting intensity is 4.5. 10 Year Age Out is the percentage of individuals 55 years of age or older in that occupational group. A total of 102 individual occupations are captured in this report. More information is available at www.mcc1mi.com.
Electrical Engineering Technology

87.6% of 4-Year Average Wage

82.3% of Mid-Career Wage @ 5-Year Mark

- Total Workforce Wages for Occupational Group (10th, 50th, and 90th percentile)
- 5-Year Median Wage MCC Graduates in Related Programs
- $25 Self-sufficiency standard for 2 adults + 1 preschooler (Monroe County, NY)
- $18 Self-sufficiency standard for 1 adult + 1 preschooler (Monroe County, NY)
Understanding the Impact to the Student / Future Worker

**Student Return on Investment.**

For every dollar students invest in their education in the Electrical Engineering Technologies program at MCC, they will receive an estimated $9.70 back over the course of their working lives. This investment provides a 24.4% rate of return. This is a favorable return, especially when compared to the U.S. stock market 30-year average return of 10.1%.

**Lifetime Earnings.**

![Graph showing lifetime earnings comparison between Program Completer and High School Graduate.](image-url)
What Defines a Powerful Career Pathway?

Creating a Rubric for Evaluation

Within five years:

• Attained 85% of peer occupational group median wage in 5-years
• Positive year-over-year wage growth for student cohorts
• Met or passed Monroe County self-sufficiency standards
  • 1) Single Parent - $18 hr., 2). Two working parents + 1 preschooler - $25hr.
• Achieved 60% attainment of four-year average wage (Monroe County)
• Performance metrics for students of color and females

Overall:
• Significantly greater lifetime earnings over low skill occupation
Modularizing a Career Pathway with Local Labor Market Data
Understanding Career Pathways using Labor Market Outcomes

Academic Award

0
~15 Credits

~110 Hours

Academic Certificate

~15 Credits
~30 Credits

~225 Hours

~450 Hours

Academic Degree (AAS/AS/AOS)

~60 Credits

~900 Hours

1st Semester equivalent, stackable
- Intro to Mechatronics
- Precision Machining
- HVAC Fundamentals
  $16.00
- Computer Literacy/Office Tech non-credit courses/certificate

One-year academic certificate
- Mechatronics Certificate, credit
- Precision Machining, credit
- HVAC, credit
  $18.58
- Medical Office Assistant, Academic Certificate

Two-year AAS/AOS degree
- Applied Integrated Tech, AAS
- Precision Machining, AAS
- HVAC, AAS
  $20.16
- Office Tech AAS

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Actualizing the Continuum to Scale

Functional Career Pathways

- Modular and Stackable Curricula Design
  - Micro-credentials
- Early College HS, 1+1, Dual Enrollment Sequences
- Active and Measurable Job Placement
- Emphasis on Self-Sustaining and Family-Level Wages
- Accelerated and Cohort-Based Instructional Options
- Emphasis on the non-traditional/contemporary student characteristics and background
- Leading toward Measurable Pathways to Equity
- Increased Appreciation for Risk, Innovation and Non-Traditional Models To Serve Non-Traditional Populations
- Increased demand by industry for bundled competency based education
Interventions & Models

Cohort-based Learning Models
- Peer Cohort
- Faculty Cohort
- Block Schedule for Classes
- Increased Student Support
  - Faculty & Peer to Peer
- Active Job Placement

Early College Career Exploration
- Aligned secondary and post-secondary integration
  - Early College HS/Dual enrollment Sequences
  - 1 + 1 Programs
- Public awareness for middle-skills occupations
Early College HS: Career Pathways System Project

Overview

• New 3.5 year project to launch in February 2019
• Focus on developing formal linkages between BOCES, CTE HS programs and MCC Engineering and Applied Technologies programs
• Address select Middle Skills gaps by graduating more students at the post-secondary level (MCC)
• Goal increase MCC yield on CTE oriented students among RCSD, BOCES, Greece and CTE Charter Schools
• Provide nearly $650K worth of scholarships for high school students taking CTE courses at MCC
• Create **systematic regional awareness** and promotion of Applied-STEM career pathways housed at MCC and their linked job opportunities
LMI as a Retention Tool: Email Blast to Student

Graduates from your program earn **44%** more than the typical high school graduate.

Graduates from MCC's HVAC program typically earn $20,16 by the fifth year after graduation. That is 44% more than a typical high school graduate earns at the peak of their lifetime earnings.

The registration deadline is fast approaching. So, as you consider your next steps, just remember: completing your MCC degree is WORTH IT!

Click here to register for classes. The deadline is January 15th, 2019.
Click for more information on advising and career services.
Click for more information on financial aid.

Graduates from your program earn **46%** more than the typical high school graduate.

Graduates from MCC’s Computer System Technology program typically earn $20,55 by the fifth year after graduation. That is 46% more than a typical high school graduate earns at the peak of their lifetime earnings.

The registration deadline is fast approaching. So, as you consider your next steps, just remember: completing your MCC degree is WORTH IT!

Click here to register for classes. The deadline is January 15th, 2019.
Click for more information on advising and career services.
Click for more information on financial aid.

Graduates from your program earn **70%** more than the typical high school graduate.

Graduates from MCC’s Optical Systems Technology program typically earn $23,81 by the fifth year after graduation. That is 70% more than a typical high school graduate earns at the peak of their lifetime earnings.

The registration deadline is fast approaching. So, as you consider your next steps, just remember: completing your MCC degree is WORTH IT!

Click here to register for classes. The deadline is January 15th, 2019.
Click for more information on advising and career services.
Click for more information on financial aid.
Availability of Workers by Wage Level - Upskilling

Availability by Wage

At $15.00/hr, your available workforce is 209,541. That's 37% of the entire workforce.
### Availability of Workers by Occupation - $15 hour

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Workers Making ≤ $15.00/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail Salespersons</td>
<td>15,033</td>
</tr>
<tr>
<td>Cashiers</td>
<td>14,275</td>
</tr>
<tr>
<td>Combined Food Preparation and Serving Workers, Including Fast Food</td>
<td>13,354</td>
</tr>
<tr>
<td>Janitors and Cleaners, Except Maids and Housekeeping Cleaners</td>
<td>8,242</td>
</tr>
<tr>
<td>Personal Care Aides</td>
<td>7,439</td>
</tr>
<tr>
<td>Waiters and Waitresses</td>
<td>6,409</td>
</tr>
<tr>
<td>Teacher Assistants</td>
<td>6,198</td>
</tr>
<tr>
<td>Customer Service Representatives</td>
<td>5,467</td>
</tr>
<tr>
<td>Stock Clerks and Order Fillers</td>
<td>5,357</td>
</tr>
<tr>
<td>Office Clerks, General</td>
<td>4,929</td>
</tr>
</tbody>
</table>
Transitioning the Workforce – Industry 4.0

Exhibit 4

Occupations requiring higher levels of education and experience have lower automation potential

Technical automation potential of work activities by job zone in the United States (%)

Automatable
- 55% Less than high school
- 52% High school or some experience
- 44% Some post-secondary education
- 22% Bachelor’s and graduate degrees

Non-automatable
- 45% Less than high school
- 48% High school or some experience
- 56% Some post-secondary education
- 78% Bachelor’s and graduate degrees

Example occupations
- Automatable: Logging equipment operators, Taxi drivers
- Non-automatable: Stock clerks, Travel agents, Dental lab technicians, Firefighters, Nursing assistants, Web developers, Electricians, Legal secretaries, Lawyers, Doctors, Teachers, Statisticians, Chief executives

NOTE: We define automation potential according to the work activities that can be automated by adapting currently demonstrated technology.

Implications on Operations and Staffing

- Curriculum Development and Apprenticeship
- Embedded Education to Employment Services
- Corporate Relations Management
- Business to Business (B2B) Marketing
- Customer Relationship Management
  - Business/Labor Market Intelligence
- Academic Recruiter/Program Coordinators
- Integration of Credit and Non-credit programming organized along AAS/AOS educational pathways
A partnership between MCC, Monroe County, and area businesses to recruit, train, and place workers quickly into the most in-demand careers in the region with a focus on short cycle training.

Renewed for 3 years:
$1,469,187

Program to date:
Total Training Costs: $707,910
Total LadderzUP Support: $531,093
Total Participants Served: 729
Resources
LABOR MARKET INFORMATION:
Connecting you with workforce data you can use.

The Labor Market Information (LMI) provided by the Economic and Workforce Development Center allows educators, workforce practitioners and economic developers to apply occupational-based analyses within specific regions and workforce clusters. Here, you’ll find the most recent data available from government sources in clear, easy-to-read reports.

EXPLORE WORKFORCE CLUSTERS IN NEW YORK.
LABOR MARKET RESOURCES.

Access current and past PDF publications compiled by the Economic and Workforce Development Center.

SIGN UP FOR OUR BUSINESS AND INDUSTRY DATABASE

Receive Economic and Workforce Development Center updates and new publications.
Select References


Questions and Discussion

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