



# User Guide: Montgomery County Regional Pathway Models

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## At a Glance

JFF worked with the Montgomery County Educational Service Center, Sinclair Community College, industry partners, and various stakeholders in the region to develop pathway models in health science, information technology and computer science, and advanced manufacturing. These pathway fields were selected because the industries have high-wage occupations that are expected to grow in the region. The regional pathway models are intended to support the alignment of regional stakeholders, including employers, higher education, K-12, and workforce, allowing for more seamless transitions from high school to college to career. Pathway models demonstrate the full vision of pathways, beginning with identifying high-wage, high-demand jobs, then backward mapping to educational opportunities that will prepare young people for these jobs, including potential postsecondary programs, high school coursework, and college and career preparation activities. As stakeholders implement pathways, the Montgomery County ESC can provide support.

## The pathway model user guide includes three sections:

- **Pillars of Practice**, which speaks to aspects of the models that are foundational to pathways, even if the details of the model change over time to reflect shifts in education and industry
- **Frequently Asked Questions**, which responds to questions we have commonly heard when presenting the pathway models
- **Implementation Action Items**, which outlines next steps stakeholders can take to support pathways in the region

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## About JFF

Jobs for the Future (JFF) drives transformation of the American workforce and education systems to achieve equitable economic advancement for all. [www.jff.org](http://www.jff.org)

## About JFF's Language Choices

JFF is committed to using language that promotes equity and human dignity, rooted in the strengths of the people and communities we serve. We develop our content with the awareness that language can perpetuate privilege but also can educate, empower, and drive positive change to create a more equitable society. We will continually reevaluate our efforts as language usage continues to evolve.

## Pillars of Practice: The Foundation of the Regional Pathway Models

The pathway models are based on JFF and Montgomery County ESC's best research on the courses and competencies needed today and in the near future. But as the labor market inevitably shifts, job requirements may change and education programs will need to be updated. That is why in creating the models, we drew on pillars of practice established over two decades of implementing career pathways across the United States. Below we outline the guiding pillars of practice for each section in the model, highlighting the section of the framework the pillar is most closely connected to. The first pillar is about the overall purpose of pathways and therefore is connected to the model as a whole, rather than being most closely related to a particular section.









# Pillar 5: Strategic pathways are reverse mapped from labor market needs.

- To build a skilled talent pipeline for the region, pathways must be designed with the end in mind. Strategic pathways are reverse mapped starting with researching high-wage, high-demand industries, then backward planning to postsecondary and K-12 is incorporated to ensure students develop the skills and competencies they need for success in their careers.

### Montgomery County Health Science Pathway Framework

**Academic Coursework**  
This general coursework is recommended for all students in the health science pathway.

| Grade                    | Grade 9                       | Grade 10  | Grade 11   | Grade 12   |
|--------------------------|-------------------------------|---|--|--|
| Core/Foundational Course | Health Science and Technology | Foundational Health Science or OI Course with an A or A-100 cumulative to Healthcare Industry | Strategic OI Course with an A or A-100 cumulative to Healthcare Industry | Strategic OI Course with an A or A-100 cumulative to Healthcare Industry |
| English                  | Scale 3 English               | Scale 3 English II  | Scale 3 English III  | Scale 3 English IV   |
| Math                     | Scale 3 Math or Algebra I     | Scale 3 Math or Algebra II  | Scale 3 Math or Algebra III  | Scale 3 Math or Algebra IV   |
| History                  | World History                 | US History  | US History   | US History   |
| Science                  | Physical Science              | Biology   | Chemistry  | AP Biology or AP Chemistry   |

**College and Career Preparation**  
These additional activities support students in preparing for both college and career. Work-based learning enables students to apply their academic learning to real-world settings, building necessary industry to building confidence that aligns with their strengths and future goals. Competencies describe the technical skills students need for a successful career in the health sciences.

| Grade 9   | Grade 10   | Grade 11   | Grade 12   |
|---|--|--|--|
| <ul style="list-style-type: none"> <li>Career Exploration</li> <li>Career Assessment</li> <li>College Readiness</li> <li>Work-Ready Focus</li> <li>Health Career Pathway Focus</li> </ul> | <ul style="list-style-type: none"> <li>College Readiness</li> <li>Self-Discovery</li> <li>Healthcare Industry</li> <li>Healthcare Job</li> </ul> | <ul style="list-style-type: none"> <li>College Readiness</li> <li>Industry</li> <li>Self-Discovery</li> <li>Healthcare Industry</li> </ul> | <ul style="list-style-type: none"> <li>Career Planning</li> <li>Industry</li> <li>Self-Discovery</li> <li>Healthcare Industry</li> </ul> |

**Health Science Technical Competencies**

| Competency  | Healthcare Roles and Applications  | Healthcare Confidentiality   | Customer Service and Patient Care  | Health Professional Standards  |
|---|--|--|--|--|
| <ul style="list-style-type: none"> <li>Computer Applications</li> <li>Medical, Healthcare Reporting</li> <li>Healthcare Data Analysis</li> <li>Healthcare Safety</li> <li>Healthcare Quality Improvement</li> </ul> | <ul style="list-style-type: none"> <li>Healthcare Safety and Infection Control</li> </ul> | <ul style="list-style-type: none"> <li>Healthcare Confidentiality</li> <li>Healthcare Confidentiality</li> <li>Healthcare Confidentiality</li> <li>Healthcare Confidentiality</li> </ul> | <ul style="list-style-type: none"> <li>Customer Service and Patient Care</li> </ul> | <ul style="list-style-type: none"> <li>Health Professional Standards</li> <li>Health Professional Standards</li> <li>Health Professional Standards</li> <li>Health Professional Standards</li> </ul> |

### Selected Postsecondary Options

The selected postsecondary institutions in health science-based programs agencies and health science agencies, lead to careers with healthy supporting wages. Some education pathways are available that may not be held from the previous educational, while others are not as readily available. Healthcare education may help accelerated progression through career pathway or secure a career ladder to different or higher opportunities.

| Postsecondary Institution | Healthcare Program | Healthcare Program | Healthcare Program | Healthcare Program |
|---------------------------|--------------------|--------------------|--------------------|--------------------|
| Montgomery College        | Registered Nurse   | Registered Nurse   | Registered Nurse   | Registered Nurse   |
| University of Maryland    | Registered Nurse   | Registered Nurse   | Registered Nurse   | Registered Nurse   |
| Georgetown University     | Registered Nurse   | Registered Nurse   | Registered Nurse   | Registered Nurse   |
| Howard University         | Registered Nurse   | Registered Nurse   | Registered Nurse   | Registered Nurse   |

### Selected Occupations, Wages, and Job Growth

The health science careers listed below are prepared to grow in the region. The listing wage is the MET listing wage indicator for one adult and one child in Montgomery County. Note that some jobs in the table do not pay a living wage and do not easily make it further economically, making economic advancement difficult.

| Occupation                                | Pay Range (2021-22) | Median Hourly Salary | Projected Growth | Healthcare Sector | Healthcare Sector (2021-22) |
|---|---------------------|----------------------|------------------|-------------------|-----------------------------|
| Registered Nurse                          | \$35.00 - \$55.00   | \$45.00              | 15%              | Healthcare        | 1,200,000                   |
| Medical Assistant                         | \$15.00 - \$25.00   | \$20.00              | 10%              | Healthcare        | 500,000                     |
| Medical and Health Services Manager       | \$30.00 - \$50.00   | \$40.00              | 12%              | Healthcare        | 300,000                     |
| Healthcare Quality Improvement Specialist | \$20.00 - \$30.00   | \$25.00              | 8%               | Healthcare        | 150,000                     |
| Healthcare Compliance Officer             | \$25.00 - \$35.00   | \$30.00              | 7%               | Healthcare        | 100,000                     |
| Healthcare Information Systems Analyst    | \$30.00 - \$40.00   | \$35.00              | 9%               | Healthcare        | 120,000                     |
| Healthcare Safety Officer                 | \$20.00 - \$30.00   | \$25.00              | 6%               | Healthcare        | 80,000                      |
| Healthcare Quality Improvement Specialist | \$25.00 - \$35.00   | \$30.00              | 7%               | Healthcare        | 100,000                     |
| Healthcare Compliance Officer             | \$25.00 - \$35.00   | \$30.00              | 7%               | Healthcare        | 100,000                     |
| Healthcare Information Systems Analyst    | \$30.00 - \$40.00   | \$35.00              | 9%               | Healthcare        | 120,000                     |
| Healthcare Safety Officer                 | \$20.00 - \$30.00   | \$25.00              | 6%               | Healthcare        | 80,000                      |



## Frequently Asked Questions

The FAQ below provides information about the purpose, methodology, and implementation of regional pathway models.

### What is the goal of regional pathway models?

Pathways prepare students for college and career as well as create a skilled talent pipeline for the regional economy. The models are designed as a guide to the development and implementation of regional pathways in Montgomery County, showing what an established pathway could look like, including coursework, college and career preparation activities, postsecondary program options, and potential career outcomes.

### How do I explain the model to students and their families?

The model is dense and comprehensive. It is not intended to be handed to students without explanation. It should be used to facilitate an advising conversation with students and their families to answer questions about postsecondary credential options and provide examples of occupations, salaries, and careers in a given industry. It can also be used as a reference to respond to students' questions such as "What classes should I take?" or "What should I study in college?" or "How much money do people in [job category] make?"

### How was the living wage determined?

JFF used the MIT Living Wage Calculator for the [Dayton, Ohio, Metropolitan Statistical Area](#). The calculator, which is updated annually, shows that as of 2022, **the living wage is \$12.87 per hour, or \$26,762 annually, for one adult and \$28.66 per hour, or \$59,623 annually, for one adult plus one child.** Below are the estimated individual expenses that go into the living wage estimate:

**Table 1. Living Wages Expenses for Dayton, Ohio**

|                                     | 1 adult  | 1 adult + 1 child |
|-------------------------------------|----------|-------------------|
| Food                                | \$3,246  | \$4,771           |
| Child Care                          | \$0      | \$9,921           |
| Medical/Health                      | \$2,720  | \$6,822           |
| Housing                             | \$6,276  | \$9,324           |
| Transportation                      | \$5,149  | \$9,443           |
| Civic                               | \$1,956  | \$4,200           |
| Other Necessities                   | \$2,835  | \$4,620           |
| Required Annual Income After Taxes  | \$22,181 | \$49,101          |
| Annual Taxes                        | \$4,851  | \$10,522          |
| Required Annual Income Before Taxes | \$26,762 | \$59,623          |

Categories like food and housing are straightforward, but “civic” and “other” may be confusing. The civic section includes “the cost of engaging in basic activities that enrich the lives of Americans”<sup>2</sup> as well as such items as pets, hobbies, toys, and education. While education is included, it’s important to remember that the living wage calculator is intended to cover minimum expenses and does not include enough to cover the average annual student loan payment of \$5,520 (with the monthly average payment being \$460).<sup>3</sup> The “other necessities” section includes items such as clothing, personal care items, housekeeping supplies, and broadband and cell phone service. To get more information regarding each expense, see the [Living Wage Calculator User’s Guide/Technical Notes](#).

As of April 2022, the advanced manufacturing pathway model states that the living wage is \$28.66 per hour, but the health science and IT/computer science models state that the living wage is \$23.16. This is because the living wage is updated annually to reflect the cost of

living, and as we were developing the model, the living wage was updated to \$28.66. As the models are updated, the living wage will be updated to reflect the most recent information.

### **What is the source of the labor market information?**

The “selected occupations, wages, and job growth” section of the models includes labor market information from [Emsi](#), a labor market data source that combines traditional labor market information, real-time job postings, and online resumes and profiles. The labor market information in the models is specific to the Dayton-Kettering region. The **median wage data**, also from Emsi, is sourced from government data and job postings.

### **Why are students selecting a career pathway in 8<sup>th</sup> grade?**

The intention of pathways is to make more explicit connections between education and career to meet the needs of youth, educators, and employers and build a more equitable and thriving economy. One concern we hear about pathways is that we are asking students to choose a career too early; our response is that JFF assumes that many students will try a few career pathways over the course of their early adulthood. Pathways serve as an introduction to an industry, as opposed to training for a specific job. Pathways are not meant to limit a student’s options but rather expose students to a variety of occupations within a given industry. Early career exploration and preparation has many benefits: Students learn and experience what working is all about; they find out not only what they enjoy and are good at but what they should avoid; and students learn how their classwork can be applied in the adult world of work. Career exploration helps students choose postsecondary pathways that lead to good jobs and allow for paying back student debt.

### **The models focus on health science, computer science/IT, and advanced manufacturing. What about other industries?**

We created models for these three industries first because the regional labor market information showed that these were fields that had high-paying jobs that were expected to grow over the next five to 10 years. While each pathway model has an industry focus, strong pathways combine rigorous liberal arts education with career-focused learning, allowing students to develop both technical and employability/soft skills. Employability skills are desired by employers across industries and include critical thinking, problem solving, communication, and adaptability.

### **How can I support pathways implementation?**

All stakeholders have key roles to play in implementing pathways. For employers, support may look like offering work-based learning opportunities or providing feedback about skills and competencies needed for success in the industry. For higher education partners, support

may look like collaborating with local high schools to support more opportunities for College Credit Plus and alignment between secondary and postsecondary curriculum. For K-12 partners, support may look like developing college and career advising opportunities and using the models as a template for a sequence of coursework. For more information on how to support pathways, please see the “Implementation Action Items” section.

### **Why do the postsecondary options start with initial credentials and associate’s degrees? Shouldn’t young people pursue a bachelor’s degree?**

Our goal is that students receive a credential that will enable them to enter a high-demand, high-wage industry that provides them with a living wage, with the opportunity for more education. Each industry pathway will include potential initial credentials, where applicable, to serve as a starting point for students; if students are interested in pursuing a bachelor’s degree, JFF supports that and wants to highlight that they can often earn other credentials along the way. Data regarding preferred education in the “selected occupations, wages, and job growth” table show that different occupations require different levels of education. As the models show, there are good jobs that pay a living wage and don’t require a bachelor’s degree (such as dental hygienists). However, for some occupations and industries, like computer science, many employers do prefer or require a bachelor’s degree. The models also demonstrate that some education paths have credentials that easily stack or build from the previous credential while others are not as easily stackable.

### **Will the information in the models change?**

The models were developed with labor market data, which changes as the job market shifts over time. This means that the information in the models may change, depending on how rapidly the industry is changing and if there are shifts in educational programming. For the health science model, we began our research in November 2020 and used projections 10 years out, to 2030, because healthcare is a relatively stable field. For the advanced manufacturing model, we decided to use five-year projections, because like computer science/IT, the manufacturing industry is experiencing rapid changes due to technological shifts. Additionally, manufacturing is a field that is being impacted by automation, so a shorter timeline may allow for more accurate predictions. The living wage is updated on an annual basis. Cross-sector stakeholders should work together to determine how they can be responsive to industry needs, while also recognizing that major revisions to pathways can be challenging. While the specific details of a regional pathways model may evolve over time, the pillars in the section above remain consistent over time.

## Implementation Action Items

As previously stated, the pathway models are intended to serve as a guide for how regional partners can work together to implement pathways. But what does it take to move from the vision presented in the model to pathway implementation? Below we outline action items for four pathway stakeholder groups: K-12, higher education, industry, and workforce. The action items can be customized and tailored by working with the [Montgomery County ESC](#) and the multi-county [Business Advisory Council](#).

### K-12

- Advise middle school student enrollment in a career adventures/workforce sector course that aligns with students' YouScience profiles, skills, and interests
- Strengthen middle to high school transition by ensuring middle school students understand pathway options and are taking necessary foundational math and English courses to allow them to succeed in CCP courses in high school
- Develop student recruitment and family outreach strategies in partnership with postsecondary, such as pathway information sessions and information about stackable credentials
- Demystify the college financing and application process for students and families, including FAFSA and scholarships
- Document roles and responsibilities related to pathways for core academic and CTE teachers, counselors, and school leadership
- Educate students and their families on the meaning and value of labor market information and what factors make up a living wage, allowing each to participate more fully in making college and career decisions.
- Design a transparent early alert system to intervene with students who are falling behind (see Lawrence, Massachusetts, case study on page 22)
- Develop a sequence of defined courses from grades 9 through 14-plus (high school through at least an associate's degree)
- Collect student data about pathway enrollment and completion to ensure students are entering and completing a pathway that fits their college and career aspirations

- Disaggregate student data to collect student demographic information to support equitable enrollment across pathways; to support equitable participation, consider multiple factors for enrollment, such as grades, motivation, interest, attendance, and teacher and counselor recommendations
- Develop bridge and acceleration programs in partnership with higher education to support transitions and address gaps in academic coursework
- Develop transfer or articulation agreements from secondary programs to postsecondary
- Create pathway marketing materials for students and their families
- Develop an advising continuum that includes milestones by grade level
- Partner with community-based organizations and nonprofits to support student participation in career exploration activities such as mock job internships and resume development
- Develop and implement structures and processes that encourage and support educators in integrating rigorous core academics and career-focused learning, including integrated projects and curriculum units, project-based learning, team teaching, common planning time, and CTE content embedded in academic courses
- Develop teacher externship programs that increase teachers' knowledge of industry standards
- Offer professional development opportunities for counselors, teachers, and school staff related to college and career advising and prepare them to address the academic and technical knowledge and skills (including employability skills) students need to be college and career ready
- Develop templates and tools for students to create and revise college and career plans
- Use the Montgomery County ESC's employer engagement menu to coordinate work-based learning opportunities
- Review and share employer-facing tools to support work-based learning opportunities including sample guest speaker questions, example internship descriptions and evaluation documents, and supervisor training resources

## Higher Education

- Develop a sequence of defined courses from an initial credential through a bachelor's degree or advanced credential to illustrate a clear plan for stackable credentials
- Educate students on the meaning and value of labor market information and what factors make up a living wage, allowing them to participate more fully in making decisions about their program of study and career
- Develop student recruitment and family outreach strategies, in partnership with secondary, such as [pathway information](#) sessions and information about stackable credentials
- Develop bridge and acceleration programs in partnership with secondary to support transitions and address gaps in academic coursework
- Develop a student-facing list of certifications that are offered through each program and opportunities for further education (including bachelor's and graduate degrees)
- Review embedded credentials in programs of study to ensure that they are stackable and portable
- Develop and implement a process to regularly review and revise credentials to maintain alignment with regional labor market demand
- Collect student data about enrollment, completion, and occupational outcomes to ensure students are entering and completing a program of study that supports their career goals
- Disaggregate student data to collect student demographic information to support equitable enrollment across academic programs and ensure equitable access to living wage, in-demand jobs
- Develop [transfer and/or articulation agreements](#) with secondary and bachelor's and graduate programs
- Partner with industry leaders to ensure programs of study meet labor market needs
- Partner with K-12 to ensure alignment between secondary and postsecondary curriculum

## Industry

- Use the Montgomery County ESC's employer engagement menu to coordinate work-based learning opportunities
- Participate in the co-design and development of work-based learning opportunities for students to apply skills learned in the classroom in a realistic setting, engage with industry professionals, and explore and experience potential career options
- Review and share employer-facing tools to support work-based learning opportunities including sample guest speaker questions, example internship descriptions and evaluation documents, and supervisor training resources
- Convene industry advisory councils to develop sector strategies for work-based learning, onboarding, professional development, and opportunities for advancement
- Develop formal agreements (e.g., memorandum of understanding, or MOU, agreements) and processes for working with education partners to drive coordination and alignment across institutions and organizations
- As the labor market shifts, participate in the process of reverse mapping pathways from industry to postsecondary to K-12 to ensure that students develop the skills and competencies necessary for professional success
- Provide consistent and timely feedback to ensure that all certifications and degrees embedded in pathways will have labor market value
- Ensure employee compensation and benefits packages support living wage standards

## Workforce

- Provide local labor market information and analysis to education partners to inform the development, design, and implementation of pathways
- Convene industry advisory councils to develop [sector strategies](#) for work-based learning, onboarding, professional development, and opportunities for advancement
- Determine essential industry [competencies](#), including both technical and employability skills, to inform education curriculum
- Provide consistent and timely feedback to ensure that all certifications and degrees embedded in pathways will have labor market value
- Develop [formal agreements](#) (e.g., MOUs) and processes for working with education and industry partners to drive coordination and alignment across institutions and organizations

## Endnotes

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<sup>1</sup> What Works Clearinghouse, *What Works Clearinghouse Intervention Report: Dual Enrollment Programs*, February 2017, <https://files.eric.ed.gov/fulltext/ED572842.pdf>.

<sup>2</sup> Carey Anne Nadeau, *Living Wage Calculator User's Guide/Technical Notes*, (Cambridge, MA: Massachusetts Institute of Technology, December 28, 2021), <https://livingwage.mit.edu/resources/Living-Wage-Users-Guide-Technical-Documentation-2021-12-28.pdf>.

<sup>3</sup> Melanie Hanson, "Average Student Loan Payment," Education Data Initiative, updated March 1, 2022, <https://educationdata.org/average-student-loan-payment>.