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What is a Career Pathway?

A career pathway is a series of connected education and training programs, work experiences, and student support services that enable individuals to secure a job or advance in an in-demand industry.

How do Career Pathways Emerge?

Career pathways must emerge out of two ongoing conversations: one with employers in the target industry, and one with the education and training institutions ultimately responsible for their development and implementation. Sound familiar? It should. Colorado’s Sector Partnerships are the vehicle for integrating these two conversations.

Who should use this Guide?

The primary audience for this guide is education and training institutions who are jointly responsible for designing and building seamless career pathway systems that ensure individual students and jobseekers get jobs in the driving sectors of their local economies.

This guide will also be useful to other partners, including industry partners, of Colorado’s emerging and active sector partnerships. The Colorado model of career pathways assumes that they are driven out of emerging and existing sector partnerships.

If implemented, the steps in this guide should result in the following outcomes:

• An accurate, up-to-date understanding of the most critical occupations in a target industry;
• A career pathway that shows students and jobseekers jobs, their basic requirements, expectations and wages at entry-, mid- and advanced-levels;
• Deep information about the knowledge, skills and abilities of those occupations that education and training programs can use to update or create accurate programming and credentials;
• A shared action plan for education and training providers to start closing gaps, reducing duplication and building a seamless career pathway system; and
• An engaged group of industry partners willing to deepen their involvement in their sector partnership and with their education and training partners.
What's your Starting Place?

GOT A SECTOR PARTNERSHIP?
Use it. Your sector partnership is the place for authentic engagement with employers on the issues important to them. Your partnership most likely already includes a workforce or education priority, and therefore a workforce or education taskforce or committee. This is the place to begin tackling the development of a comprehensive career pathway (start with Step 5 below).

GOT A CAREER PATHWAY EMPLOYER GROUP?
The opportunity before you is to build your employer group out into a comprehensive sector partnership that facilitates focused attention on multiple priorities important to employers. Keeping employers engaged over a longer term depends on finding the multiple, but focused, priorities that matter to the health of the industry. Expand the conversation to include issues related to economic development. The partnership will still be the best place to access employers for the purposes of building a career pathway system (start with Step 2 below).

PLANNING TO LAUNCH A NEW SECTOR PARTNERSHIP?
Start thinking ahead about education and training partners that should be part of your community support partners. They will become important when the partnership moves into implementation. Rarely does a sector partnership exist without a priority related to creating a skilled, educated workforce. This will be where you and partners (employers and program) can discuss and develop a comprehensive career pathway (start with Step 1 below).

PLANNING ON BUILDING A CAREER PATHWAY?
Think bigger. Start planning now to launch a strong sector partnership, out of which you and partners can develop a comprehensive career pathway. Why bother? Don't make the mistake of asking for employers' time to just respond to their talent pipeline needs. Employers have multiple needs, but need a single table at which to work with multiple public entities, including education, workforce development and economic development. A sector partnership is an effective and sustainable vehicle to meet employers' multiple needs, including building a talent pipeline into good jobs (start with Step 1 below).
PART I

BUILD THE SECTOR PARTNERSHIP
1. Defining the Scope of Your Sector Partnership*

The key here is to work through a shared set of facts together with education, workforce development and economic development partners. Discuss and jointly assess your region's industries by wage, growth, location quotient and other factors. **Leave this discussion with agreement on which sector(s) are most ripe for a sector partnership, and discuss the most appropriate geographic scope.

2. Preparing to Launch Your Sector Partnership:

Start planning. Confirm among partners who the best person(s) and organization(s) will be to take the lead convener role, and be clear about support roles from others. Start building your invite list for employers in your target sector from around your region. Identify the "civic entrepreneurs" within these companies that you know will help lead and actively participate. Cultivate one or two lead employers who will help now with invitations, setting the agenda and showing other employers that this is worth their time. Don't forget about your community support partners. Prep them for the launch by inviting them and letting them know this meeting will be about listening to employers. Finally, set your date and location.

3. Holding your Launch Meeting***:

There is no one right process for a launch meeting with employer partners, but a few guideposts can help set the right tone and get the right outcomes. Start with opportunities, not issues or challenges. Facilitate a discussion that draws out what employers see as their biggest, most exciting growth opportunities now, and on the horizon. Follow this up with brainstorming the required action areas that will leverage those opportunities. Ask for champions around those action areas, and commitments to continue fleshing out potential next steps.

4. Organizing the Aftermath:

Guess what? You've launched! Now comes the critical follow through. Get those notes out. Pull together smaller conversations of your "champions" to flesh out short term and long-term actions. Start immediately expanding the circle of employer members, and make sure you are bringing community support partners along without sacrificing the ongoing prominence of the employer voice. Stay agile, move forward, get some early wins.

* For more resources on building a sector partnership, access the full Convener Training Toolkit

** See sample regional industry data profiles

*** Access the video to watch a simulated launch of a Sector Partnership
PART II

REVEAL THE SECTOR’S TALENT LANDSCAPE
5. Understand the Industry’s Critical Occupations:

It’s time to go back to the data, and just like in Step 1 (page 7) above, you want to use data as a conversation starter. Data is not a substitute for the kind of information you can glean through employer engagement, but just the right amount of analysis will give you “prompts” to use with actual employers in a conversation about their most critical occupations. You will want to look at past, current and projected growth of occupations in your target industry. You will want to look at wage data across occupations. You will also want to organize the occupations into rough categories of compatibility (e.g. production occupations, transportation and material moving occupations, and sales and related occupations). Present this data in a simple way (pie charts, bar graphs). For more detailed steps on how to analyze and present this data, see Appendix I.

6. Get the Real Story from Employers:

Occupational data, no matter its source and purported quality, tells only a small part of the actual talent landscape of a target industry. To truly get a handle on the real story, you need a conversation about critical occupations with employers. Use your simple data charts as prompts, but expect to spend only a few minutes hearing their reactions and reflections. Then facilitate a conversation that is instead driven purely by what employers in the room can tell you about their most critical occupations. Let them self-define “critical.” It might be in terms of hardest to fill, highest turnover, highest output or profit. It may be based on the most number of workers in a specific occupation, or it may be a “king-pin” position filled by just one or two individuals that must function well for all other occupations to also function well. Let them tell you. As they are talking, find a creative way to map or storyboard their conversation. You should end up with about 3-5 top critical occupations, but might get up to 10 depending on the industry.

This process can yield great information for public partners, and for industry members participating in the conversation. It helps them understand what they have in common with other companies, and it helps them form a collective voice around needed skills and credentials. Make sure you send them a summary and a short set of expected next steps of what you’ll do with this information, how it will be used, and when they can expect to be re-engaged. Consider also asking them to send you their official job descriptions for their critical occupations. This can be very useful information as you dig in deeper.

Data Source: Colorado Department of Labor, LMI Gateway, Manufacturing Occupation and Wage Data, 2012 and 2022 projected
Analysis: Collaborative Economics
Sample Facilitated Conversation with Employers: Critical Occupations

1. Invite employers to use index cards to write down their two most critical needs—in terms of specific positions/occupations—on index cards:
   a. Put another way, what two positions that if you can't adequately fill them will MOST hold back your ability to grow and stay competitive?
   b. Or, what two positions most concern you and keep you up at night?

2. Meanwhile, create occupational categories at the top of the blue screen, using a different color index card. For example, production, engineering, transportation, sales, office support, management.

3. Collect the yellow cards and start to group them by category, trying to discern where there might be a career pathway, or at least different levels. For example, cnc operators may fall at the bottom, with quality control technicians in the middle, and production supervisors on the top row.

4. After you have done an initial sorting of the cards, ask employers to share more about each occupation, for each major occupation on the sticky wall. Through this discussion, you may find that the same occupation looks quite different across companies.

*5. Invite employers to offer additional input, asking, “If you had had a third card, is there any other occupational need you would have identified”? Employers may identify occupations that are already on the wall or offer new additions.

*6. As you begin the discussion, continue to move cards around in response to employer feedback.
Try to create a “pathway” of entry, mid-, and advanced positions as the discussion progresses. The goal of the conversation is to paint an accurate picture of the talent landscape of these employers. Questions for discussion:

a. Why did you list these positions as your most critical needs? Was it because:
   - you need a large number of them?
   - they’re the hardest to fill
   - they have the highest turnover
   - they have the biggest impact on company costs (e.g., turnover, recruitment, hiring)
   - they have the biggest impact on company growth and profitability

b. Where are your needs shifting the most?
   - where are positions disappearing?
   - where are positions transforming?

c. Tell me about how a person advances inside your company.
   - tell me generally about wage progression for these occupations
   - where does it happen most now? Within categories? Across categories?
   - where would you like it to happen more?

d. How are local institutions/programs working to meet your most critical needs?

7. To recap, ask employers to look at the sticky wall and consider whether, taken as a whole, this is an accurate depiction of the reality facing this sector in this region. Are there any major additions or caveats to note?

8. Finally, ask employers where they currently find qualified applicants.

   a. Do they recruit from any specific local programs? Do they have favorites?
   b. Do they hire from out-of-state? At what rate?
   c. Do they advance from within?
   d. Do they rely on word of mouth, and train new hires on their own?

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Sample Facilitated Conversation with Employers (Steps 5 & 6): Critical Occupations

Materials:
- Colored markers
- 5”x8” index cards (colored cards work best)
- Blue sticky wall or tape to stick papers on wall to display
7. Develop a Rough (Not Perfect!) Inventory of Education and Training Programs:

At this stage, go back to just your education and training providers (not employers) to develop a simple inventory of the existing education and training assets that apply to the target sector in your region. List the training programs, certifications and credentials that your community colleges, job centers, and universities offer. In your inventory, consider full credit college programs, non-credit occupational training, the role of adult basic education, pre-college and incumbent worker programs, and formal on-the-job training.

The inventory can take many forms, but it’s important to at least include a few key pieces of information listed in the sample template below:

<table>
<thead>
<tr>
<th>Institution/Organization</th>
<th>Program</th>
<th>Certification/Credential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring Valley Community College</td>
<td>Manufacturing Technology</td>
<td>Associate in Applied Science, Manufacturing Technology; Machine Operations Skills Certificate; Manufacturing Essentials Certificate; Quality Technology Certificate; Tool and Die Making Certificate; Applied Welding</td>
</tr>
<tr>
<td>Springfield State University</td>
<td>School of Engineering</td>
<td>Bachelor of Engineering - Manufacturing Electrical, Plastics, Mechanical Design, Production Occupations</td>
</tr>
<tr>
<td>Spring County Adult Education School</td>
<td>Bridge to Manufacturing Careers</td>
<td>Preparation for certificate programs at Spring Valley Community College</td>
</tr>
<tr>
<td>Spring County Workforce Investment Youth Council</td>
<td>Build a Boat Summer Camp</td>
<td>Certificate of completion, Career Readiness Certificate (soft skills)</td>
</tr>
</tbody>
</table>

Where it is easy to collect, also make note of length of trainings, associated costs to students, pre-requisite credentials, and job placement rates. If not readily available, don’t worry right now. You may not be able to capture everything at this stage. The goal now is to develop a working inventory of the major education and training assets in your region that you will use later to compare against employers’ training needs.
PART III

ACT NOW AND LAY THE GROUNDWORK FOR THE LONG TERM
### 8. Start Acting Right now to Address Specific Occupational Shortages:

The remarkable outcome of this process is that you can “act as you learn”, i.e. start acting now to solve employers’ needs and get jobseekers into jobs. Almost inevitably your conversation with employers about critical occupations will reveal some non-training issues that can be resolved quickly (immediate job matching, new hire recruitment) or some short-term training responses that can fill an immediate need (incumbent worker training for example). Be opportunistic, identify these areas, and show early results. Every good sector partnership balances short-term actions with longer term strategies. Being able to show early wins to member employers and community support partners is an essential element of creating the momentum needed to sustain and expand your ongoing career pathway efforts inside of your sector partnership.

### 9. Organize Critical Occupations by Skill Sets and Levels:

Now go back to the information you’ve solicited from employers (see Step 6 on page 9). With this you will be able to begin grouping critical occupations by skill sets, first based on the direct employer input, and then based on crosswalks with databases that categorize occupations based on their required knowledge, skills and abilities. The most commonly used such database is the U.S. Department of Labor’s Occupational Information Network, or O*NET. As a first step, do a simple crosswalk of the critical occupations named by employers with Standard Occupation Codes (SOC). Then crosswalk each critical occupation with the skill profiles in O*NET, and stack them by entry, mid- and advanced levels.

### Stacked SOC Codes Crosswalk

<table>
<thead>
<tr>
<th>TITLE</th>
<th>SOC Code</th>
<th>Notes from Employer Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Entry level Production</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Vehicle Operators</td>
<td>53-7051</td>
<td>Employers emphasized high turnover in these positions; lack of soft skills.</td>
</tr>
<tr>
<td><strong>Mid-level Production</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervisors</td>
<td>51-1011</td>
<td>Our discussion highlighted a need for supervisors, particularly with diverse shop floor experience.</td>
</tr>
<tr>
<td>Welders</td>
<td>51-4121</td>
<td>Very specific aluminum welding needs highlighted here, and 2-5 years of experience.</td>
</tr>
<tr>
<td>Assemblers</td>
<td>51-2000</td>
<td>The conversation about line workers included assemblers, QC, and the need for CNC machinists. Some unexpected complexity here when we discussed actual wages as it was clear that all three occupations could be entry, mid or advanced level. Not clear cut.</td>
</tr>
<tr>
<td>Metal Workers (Machinists)</td>
<td>51-4041</td>
<td></td>
</tr>
<tr>
<td>Quality Control</td>
<td>51-9061</td>
<td></td>
</tr>
<tr>
<td>Mid-level Sales</td>
<td>41-4000</td>
<td>This conversation focused on sales people who were skilled in social media and other modern sales techniques. This is the sales code for a Manufacturing Sales Rep.</td>
</tr>
<tr>
<td><strong>Advanced level Engineers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Engineers</td>
<td>17-2112</td>
<td>Emphasis on how engineering talent improves production and innovation processes. Both mechanical and industrial engineers were mentioned by title. Also some evidence of advancing from within to these positions.</td>
</tr>
<tr>
<td>Mechanical Engineers</td>
<td>17-2141</td>
<td></td>
</tr>
</tbody>
</table>
During this process, if using O*NET, you will find detailed profiles of each occupation, by their SOC, that breaks an occupation down by needed skills, knowledge, abilities, work styles, tasks and tool use. You will also find suggested “related occupations”. This may take you outside the scope of your target industry, but that’s okay. Make note of them. You are finding jobs potentially held by individuals with compatible, or transferrable, skills for your target critical occupations. This can be important information for multiple purposes, including recruitment of workers, re-training of dislocated workers, and creating or refining curriculum and credentials that might serve multiple industries.

So what do you do with all this information? Most importantly right now, stay organized. Take stock of what you have: You’ve used industry data, employer input and existing occupational profile information to understand a list of probably about five to ten “critical occupations” in your target sector. You also have a detailed O*NET profile for each of them, in addition to what employers told you. You’ve stacked them roughly by entry-level, mid-level and advanced skill requirements. You have the bones of a career pathway.

A common pitfall at this point is to use the O*NET skill profiles as substitutes for the needed KSAs required by employers in your target industry in your region. There will be significant overlap, but they will not be precisely accurate. They may not be up-to-date, or they may over-emphasize certain elements, and under-emphasize others.

10. Deeply Understand the Underlying Knowledge, Skills and Abilities (KSAs)****:

You are now at a critical step in the process of building a career pathway that requires digging into the actual knowledge, skills and abilities of critical occupations. You explored this already by using O*NET. Now you must find a way to vet this information with actual employers in your region.

Consider the following:

- Presenting the full O*NET profiles to employers is not usually effective for two reasons: first, the profiles are very detailed, and the time needed to carefully go through each of the elements is far more than what you likely have with your employer partners; and second, presenting a profile as is lends itself to a yes/no conversation that will not yield much additional critical information on what it takes to be successful on the job. In short, the process is arduous with little impact.

- You are creating a career pathway made up, at its core, of the industry’s critical occupations. But you’ve likely surfaced a few not-so-critical occupations along the way that might represent stepping stones along the natural course of advancement. Start thinking now about how to graphically depict a pathway of advancement among the critical occupations, making note of where these stepping stone jobs might be.

- You still need more information. You are at a point where you need to bring your employer partners back into the process. They need to help you prioritize a set of critical occupations (perhaps 3 to 5) for which you will conduct either short focus groups with Subject Matter Experts (SMEs – often human resource managers or floor supervisors) or full “Skill Panels” (typically longer focus groups with hiring authorities and employees themselves).

Both processes (SME focus groups or full Skill Panels) are ways to assess the KSAs of a critical occupation, and to organize the information into a useable format for industry, education and training stakeholders. Both processes also require a close, working relationship with employers who will be willing to not only give their time to a focus group, but give their employees’ time too. This is where working within an established sector partnership proves advantageous, even essential.

See Appendix B for a description of a SME focus group. See the insert for an overview of the Skill Panel process, and Appendix C for an example Skill Panel session and handout.
The full skill panel approach (a series of input sessions) combines a focus group with both the actual hiring authorities (CEOs or HR supervisors) and the actual workers for each occupation, or closely compatible groups of occupations. There are variations on this to explore to accommodate schedules, availability and willingness of employers to commit their time and that of their workers over an approximately 3-to-6-month period. The skill panel has a set process and agenda, but the format is very interactive and discussion-based. Getting input from all participants about their work functions, activities, knowledge and skills is one key goal. Reaching agreement about the scope and content of the information is another. The process includes fast-paced and intensive discussions about work functions, activities and skills, but it is also a fun and rewarding experience for participants. Similarly, the focus group with employers or the written survey is designed to gather supplemental information about needed skills, knowledge, daily work functions, and job descriptions. The industry employers then review draft standards before final documents are produced.

The skill panel approach is about refining a general set of facts and assumptions about regional training needs for specific occupations. The process starts by looking at a general set of specifications for a given occupation and then working with local employers and employees to refine and prioritize regional training needs. The skill panel is meant to guide regional employers through a process that results in better, more actionable information for local education and training providers.

- **Stage One - fact gathering.** An analysis of job descriptions and O*NET profiles are used to put together a straw man description of what employer expectations are for a given occupation. Occupations are broken down into a series of function areas and specific tasks that the given occupation performs on the job. The focus is on what someone does at work, not the characteristics or skills that person has. This approach ensures that as knowledge and skills are discussed, they are contextualized to actual job tasks. See Appendix C for an example of this.

- **Stage Two - hiring authority skill panel.** The occupational descriptions are discussed with a group of employers who give feedback on how important certain knowledge, skills, and abilities are to job performance and give qualitative feedback on what the job looks like when performed at the entry level. Employers are asked:
  - What do workers need to know and be able to do to succeed on the job for this occupation?
  - And how do we know when workers are performing this job well?

The deliverable from the Employer Skills Panel is a 1-2 page brief on each occupation summarizing key job functions and tasks, and the knowledge, skills, and abilities (KSA's) that are most in demand. Especially in industries that rely on changing technology and constant innovation, having detailed real-time, regional-specific information from employers about what they need from employees is critical.

- **Stage Three - employee skill panel.** To develop full skill standards or an occupational profile, a focus group of employees who actually work in the occupations being studied is required. The focus groups typically are 4 hours to a full day, depending on availability and employer release times. In order to make sure that the profiles capture regional training needs, the panels typically consist of between 6 and 12 front-line employees who represent the same or similar occupations, from different companies. The group may also contain managers or other knowledgeable persons with extensive, current knowledge about those occupations. This group is asked to give feedback on how certain knowledge, skills, and abilities contribute to their job performance on a day-to-day basis. Employees are asked to review the tasks and functions brief, prioritize what tasks are most critical to job performance and/or what tasks seems hardest for new and current employees to accomplish successfully. Employees are asked to provide contextual detail for how the KSAs apply to the tasks and functions of their job in order to provide actionable information to education and training partners.

**How are skill standards and profiles used?**

- Industry: Recruiting, hiring, training and promoting employees
- Incumbent Workforce: Advancing careers and/or reentering the workforce
- Future Workforce/Students: Understanding/acquiring skills needed to attain high wage jobs
- Labor: Ensuring employees benefit from high paying career opportunities
- Government: Linking education reform initiatives, workforce training and economic development
- Educators and Trainers: Developing curriculum and teaching to the required skills sets
11. **Turn your Rough Education and Training Inventory into a Refined Asset Map:**

It's time now to re-visit your existing education and training programs. Using the inventory that you developed earlier, begin to develop a map showing the transferability and connections among the certifications, credentials, and degrees currently offered. Do not forget to include any programs that offer a work experience component, such as internships, on-the-job training or apprenticeships. Organize your map by entry-, mid- and advanced level credential attainment, and overlay what you now know about the needed skills of critical occupations. To do this, invite all of your education and training providers in your region to provide input. Similar to the storyboard or map you created during your facilitated discussion with employers in Step 6, create a visual that best represents the actual programs, their credentials and how they are connected.

Example of an Education and Training Asset Map
PART IV

BUILD THE SYSTEM FOR CONTINUOUS TALENT GENERATION AND CAREER MOBILITY
12. Apply KSAs in as Many Ways as Possible:

Once you have documented the KSAs of a critical occupation, the application potential is significant. Fundamentally, documented KSAs, in some places called Skills Standards (example: http://cleanenergyexcellence.org/skill-panel/energy-industry/), should be the guidebook for education and training providers to make changes and upgrades to existing curriculum, and to create new programming and credentials. KSAs should additionally be used to develop and refine existing jobseeker assessment protocols, as well as remedial and job readiness training. KSAs are also useful for employers to re-write their job descriptions and hiring requirements, which, if inaccurate, are often a bottleneck in recruiting skilled workers or advancing existing workers from within.

13. Create a Picture of a Career Pathway:

By now you and partners should have a clearer picture of the actual programs, curricula, and credentials that serve your target industry. More importantly you have a fresh and clear understanding of skills required to be successful on-the-job, detailed in your critical occupation KSA profiles. It is now time to put it altogether to create a picture that tells jobseekers what skills they need to attain jobs within the industry. This could also be called a Skill Attainment Map. **Congratulations! This is in fact your Career Pathway!** When you overlay the skill needs and education levels for an industry’s critical occupations with the programs and credentials that provide these skills and credentials, you get a scaffolded picture of the path a jobseeker must take to attain jobs at each level. How do you do this?

First, get creative. Consider the manufacturing example in this Guide from Kansas City. It provides just enough detail for a jobseeker to quickly understand entry-, mid- and high-level occupations in the industry, including level of required education, specific credentials and needed technology skills, as well as market demand and average wages. You may also want to add a column for any relevant physical or environmental conditions of occupations. All this in one page! This is what you present to the public. Start sketching and experimenting now with some creative graphical depictions.

Next, you will need to dig into the specific skills needed for an individual to advance from a set of entry-level occupations to mid-level occupations and onto the advanced occupations. Re-visit the KSAs, and draft short descriptions for each critical occupation that capture the essence of what's needed to be successful on-the-job. Then do a cross-analysis between the levels in order to call out more explicitly the additional or higher level skills needed to go from one occupation up to the next. For example, an entry-level Heavy Equipment Operator will need additional skills in repair, equipment maintenance, troubleshooting, reading and math, and blueprint reading if he or she is to advance to a mid-level Assembler.

Now find a way to insert actual projected demand in real numbers into your Map. The pitfall at this point is not paying attention to just how many jobs exist within a certain occupational category, and potentially training too few jobseekers or worse, over-saturating the labor market by training too many. Jobseekers and students need to know if this pathway will result in a real job. And of course, do not forget to put average wages in your career pathway. Jobseekers care about this.

Finally, take a look at what you’ve put together. See any obvious gaps in programming yet? Make note of these. You’ll want them in Step #14 below.

Example: Career Pathways and Demand in Greater Kansas City Manufacturing Career Pathway
http://www.kcworkforce.org/Assets/ManufacturingCareersinKansasCity.pdf

14. Market it – for all Audiences:

Ideally, your career pathway becomes a career advisory tool for educators, guidance counselors, workforce organizations, frontline staff in multiple programs, parents and students. It also becomes the connecting framework across the multitude of private and public education and training institutions responsible for guiding individuals onto a career path. As you implement the strategy outlined in your Career Pathway Action Plan, keep the map updated and reflective of changes in employer demand and in education and training programs. How do you distribute it broadly? Use your sector partnership. This is the natural “single-table” where education (P-20), workforce development, human service and community based organizations should be sitting. Don’t have a sector partnership? It’s time you set one up. Go back to Step 1 of this Guide.
15. Now Create a Career Pathway Action Plan*****:

This step is about identifying specific areas for action needed by multiple education and training institutions to create a truly seamless system that enables skill attainment and career mobility by individuals. This is an internal planning document, not a public document. Your Career Pathway Action Plan is what you as education and training partners can collectively use to guide how you close gaps, align curriculum and credentials, agree on which institutions will host which programs, clearly see where articulation agreements or MOUs are needed, and stay up-to-date on changing skill needs and job market saturation points. Use your Career Pathway as a template, and facilitate a process that builds it out into an actionable strategy tool (see Figure 3 for an early stage example).

As a group of education and training providers, study the career pathway and your education and training asset map together. Take at least a few hours together initially to do this, and assign a good facilitator to the task. Consider these types of questions:

- Are there whole sets of skill sets or credentials currently not offered by any of our institutions?
- Which programs or credentials do we currently all offer?
- How do our total projected graduation or completion numbers match up with current or projected demand for the occupations in this pathway?
- Do certain programs do a better job at the entry-level, and others at the mid- or advanced-levels? How do we know (placement rates, etc)?
- For the same credentials or programs teaching similar/related skill sets, are the costs and lengths of training the same? If not, by how much do they differ?
- For the same credentials or programs teaching similar/related skill sets, are the pre-requisites the same? If not, how do they differ?
- Do all of our institutions accept the same credentials on this pathway as pre-requisites? What about coursework and credits related to this pathway?
- Are any of our institutions experimenting with or accepting “prior learning” or work experience in place of credits or credentials related to this pathway?
- Are there any programs or credentials that appear to lead to a dead-end, i.e. no job or no clear next step in education or training?
- How are we including K-12 programming in this pathway? Where do we or should we offer dual enrollment?

It should now become clear where the gaps, duplications, and mismatches within the education and training system exist. All of these areas will require action. You may realize that no articulation agreements exist between important institutions along the career pathway from one credential to the next. You may realize the system offers duplicative credentials for one area, and none in another. You may find coursework that leads to dead-ends (i.e. no occupation at all!). Clearly state these areas as an action step that resolves the gap or issue. The Action Plan, in effect, becomes your strategy for building a seamless career pathway system that better serves the target industry and jobseekers in your region.

Once you have an initial sketch of the Action Plan, prioritize the actions. Find a way to agree across partners what represents “early wins” (i.e. the easy fixes), short term actions (3-6 months), or long term actions (6-12 months). To help prioritize actions, think about two criteria:

- Will the action yield high impact?
- Is it feasible to implement?
MANUFACTURING CAREER PATHWAY ACTION PLAN

Critical Occupations
- Industrial Engineer
- Electrical Engineer
- Mechanical Engineer

Certificates/Degrees Offered
- CAD/CAM system solutions
- Mechanical Engineering
- BS in Computer and Electrical Engineering
- BS in Mechanical Engineering
- Computer Aided Drafting and Design, CAD/CAM System Solutions
- MIG/TIG Welding Certificate
- Leadership Skills Certificate
- Precision Machining, CNC Operator, Fabrication
- Quality Management, Lean Enterprise Certificates
- Certified Production Technician, OSHA Safety, OSHA Forklift
- Certified Production Technician, OSHA Safety, OSHA Forklift
- OSHA Safety, Machine Tool Tech, Industrial Maintenanc
- Certifications

Diagnosing Mismatch between Supply and Demand
- Quality: Need additional hands-on training
- Quality: Need additional hands-on training
- Gap: No training options for production workers to develop engineering skills
- Capacity: Need additional completers
- Quality and Capacity: Need supply chain experience
- Quality: Need process engineering skills

Action Items
- Expand university internship offerings, working with employers
- Expand university internship offerings, working with employers
- Develop evening/weekend programs for incumbent workers
- Recruit from high school manufacturing program
- Develop supply chain certification
- Integrate process engineering curriculum

Sample Career Pathway Action Plan****
PART V

ENSURE YOUR CAREER PATHWAY HAS OWNERS AND A HOME:
YOUR SECTOR PARTNERSHIP
16. Transition to Implementation:
As you and partners begin to implement the strategy outlined in your Career Pathway Action Plan, use your sector partnership as the cross-system, employer-driven home for ongoing efforts. Establish lead employer champions to help chair the work; continue to draw on community support partners to contribute; use the discipline of action plans and timelines to stay on track. See Modules E and F of Sector Partnership Convener Workbook.

17. Sustainable Implementation:
Effective career pathways grow out of a strong and current understanding of industry’s needs, as well as a deep understanding of how individuals access and progress through the labor market. The final, and highest risk, pitfall now is to build a career pathway system that simply justifies the existing curriculum and credentials currently offered by education and training programs, verses building a career pathway system that is the true reflection of advancement through an industry. Your sector partnership is critical here. Use your sector partnership to avoid this pitfall by:

- Keeping employers in the driver’s seat;
- Regularly document and report progress and make adjustments along the way as needed;
- Establish a culture and protocol of being able respond and shift according to new information and opportunities.

Remember: your sector partnership is the vehicle to keep you career pathway going!

Final Tips:
- Remember you are building an entire infrastructure of support for industry and jobseekers
- This takes time. Be okay with that, but keep moving and benchmark progress along the way.
- Just start – this is still the best advice out there.
Appendix A: Using and Organizing Data to Understand an Industry’s Key Occupations

There are many kinds of employment data to draw from, but this toolkit references the information provided in the Bureau of Labor Statistics Occupational Employment Survey (BLS OES). This is meant to be a very simple overview of how to think about this data as a tool that doesn't require a statistician to operate!

- **Know where your data comes from and what it can tell you.**

  The Bureau of Labor Statistics collects occupational data at the industry level on an on-going basis using a mail survey that solicits information from employers about what kinds of positions exist in their companies and how much they pay. Every 2 years the BLS releases 10-year projections, projecting the growth patterns of all occupations. Sample data is used to project both the current occupational levels as well as the 10-year projections. Because the OES employs a sample method, there is an implicit margin of error. Occupational data, especially at the regional level, is not meant to be an accurate census of all workers, but rather an overview the industry composition. More information on the methodology of the OES here: [http://www.bls.gov/oes/current/methods_statement.pdf](http://www.bls.gov/oes/current/methods_statement.pdf)

- **Identify the industries involved in your sector**

  Data is sorted by two important codes. The North American Industry Classification System (NAICS) identifies a company’s industry and sub industry at an increasing level of detail; each digit of a NAICS code offers more specificity on what it is that the firm does. The first two digits are the broader industry code. To gather information on a particular industry query data using the appropriate industry code. Codes for the 19 industries OES tracks are found here: [http://www.bls.gov/oes/current/methods_statement.pdf](http://www.bls.gov/oes/current/methods_statement.pdf).

- **Identify large and growing occupations.**

  Standard Occupational Classification codes (SOC codes) are associated with occupations within a given industry. For instance, Office Manager or Engineer are two occupations that exist in many industries. Each SOC code digit adds a layer of specificity to the given occupation (See figure x below for a sample of occupations at SOC levels 1, 2, and 3). Because of the limitations of sample data, especially at the regional level, SOC data at the 4 and 5 digit level often isn't very revealing or accurate.

<table>
<thead>
<tr>
<th>NAICSCode</th>
<th>NAICSTitle</th>
<th>NAICSLlevel</th>
<th>SOCCode</th>
<th>SOCLlevel</th>
<th>SOCTitle</th>
</tr>
</thead>
<tbody>
<tr>
<td>101300</td>
<td>Manufacturing</td>
<td>3</td>
<td>00-0000</td>
<td>1</td>
<td>Total, All Occupations</td>
</tr>
<tr>
<td>101300</td>
<td>Manufacturing</td>
<td>3</td>
<td>49-0000</td>
<td>2</td>
<td>Installation, Maintenance, and Repair Occupations</td>
</tr>
<tr>
<td>101300</td>
<td>Manufacturing</td>
<td>3</td>
<td>49-2000</td>
<td>3</td>
<td>Electrical and Electronic Equipment Mechanics, Installers, and Repairers</td>
</tr>
</tbody>
</table>
Appendix A: Using and Organizing Data to Understand an Industry’s Key Occupations

- **Identify large occupations.** To identify where the majority of occupations fall in a given industry, start by looking at SOC level 2 data and sort the data from the most workers to the least. These occupational categories are fairly broad but can point to where the majority of occupations lie. In occupation categories that are either very large or you know to be critical, you can expand your view to look at level 3 data, or occupations within.

- **Identify growing occupations.** If the growth rate of a given occupation is not given, create a spreadsheet that has both current and projected numbers for occupations. Sort by highest growth. Some times occupations with less workers in the current year make projected growth look particularly dramatic. While this may temper your interest it’s an important line of inquiry to bring up with employers. Is this the result of sampling error or is something happening?

- A **note on sorting SOC code data.** When looking at SOC data it is best to make sure you are only seeing one level of data at a time. Occupations are replicated at each level of information so when you are looking at a complete data set you are seeing the same jobs represented up to 5 times with a growing level detail. For instance, when you are looking at SOC Code level 2 data all the codes should look like XX-0000. There are many ways of sorting and filtering this information in Excel – help yourself out by narrowing the amount of information you see at one time.

  o **Create visualizations of the data that communicate what you see.**

    - A bar or longitudinal chart that shows the change in level 2 occupations over the 10 year period within a given industry.
    - Pie charts or compositional charts that show the relative proportions of different occupations in the industry now and projected.
    - Projected growth information at SOC code level 3-detail on occupations that are large and/or fast growing.

  o **Confirm and explore data with employer partners.**

    As mentioned before there are limitations to occupational data so it is absolutely critical to confirm patterns you see in the data with actual employers. Let this data guide the conversation you design. Make sure that you also create room for employers to talk about occupations that did not come up in the data. This is Step 6 (page 9) in this Step-by-Step guide.
Appendix B: Sample Description of Subject Matter Expert Work Groups (CUWA)

Subject Matter Expert Work Groups
Greater Metro Denver Healthcare Industry Partnership

The Greater Metro Denver Healthcare Partnership (Partnership) is an industry led, workforce, education and economic development collaborative designed to meet the hiring, retention, and training needs identified by six of the largest hospital systems and ambulatory care facilities in the Metro Denver area. The Business Executive Committee of the Partnership, representing Denver Health, Kaiser Permanente, HealthOne, Centura, University of Colorado Hospital and Children's Hospital identified new targeted occupations in anticipation of their future hiring and training needs. The new targeted occupations include: Pharmacy Technicians, Medical Coders, LPN's and Medical Assistants and specialty training for nurses in Wound Care and ICU. They also confirmed that they still anticipate hiring Surgical Technicians, Medical Lab Technicians, Medical Laboratory Scientists (Medical Technologists), and nurses trained in OR (the original targeted occupations). One of the goals of the project is to strengthen the career pathways for all of these occupations. Collectively, these 6 healthcare industry systems have Affiliate Agreements with public and private academic institutions that provide training for these targeted occupations.

There are four new Subject Matter Expert Work Groups being formed with individuals suggested by the employers from their respective healthcare system. These Work Groups will focus on Pharmacy Tech, ICD10 Medical Coders, LPN and Medical Assistant curriculum and programs. The Work Groups are being asked to do the following:

- Review existing training program curriculum for the 4 areas and make recommendations for changes to curriculum to meet industry needs and standards;
- Establish minimum criteria/content for each training program;
- Suggest screening and assessment guidelines/criteria for selecting candidates for these training programs;
- Recruit additional Subject Matter Experts for the targeted occupations when appropriate;
- Suggest how the workforce/project training dollars could be used and allocated for the training programs and healthcare system; and,
- Hire, if appropriate, successful students.

The Work Groups will meet 3 - 4 times for approximately 1.5 hours each time. It would be ideal to meet in person for the first meeting. Teleconferencing can be made available for the following meetings to minimize travel. The information gathered by the Work Groups will be shared with the employers for their approval and buy-in.
Appendix C: Skill Panel

Hiring Authority Occupational Discussion

Each occupational discussion will follow the same process for the five critical production occupations identified during the critical occupation conversation with employers: machinists, assemblers, welders, tool and die, and quality control analysts.

1. Review key functions and tasks outlined in the handout (see below) and on the blue sticky wall. These functions and tasks were developed from initial information from employers, an analysis of O*NET, as well as an analysis of job descriptions for the critical occupations that employers sent to us and online job postings in the region. Employers will be invited to add additional functions and/or tasks that may be missing from the list to ensure that the sticky wall accurately reflects the key job functions and tasks that individuals in that occupation perform.

2. Identify which tasks are most commonly under-performed. Each employer is asked to consider the tasks on the blue screen and to answer the question:

   o If local education and training organizations were to improve training related to three of these tasks, which should they prioritize?

   Each employer will be given three sticky dots and asked to place the dot on the three tasks that they think are most critical to address more effectively.

3. Facilitate discussion to uncover underlying skills needed to perform those tasks effectively.

   For the tasks that were most commonly identified by employers, ask:

   o For those tasks, describe what someone does if he/she is meeting the minimum requirements?

   o Time permitting, what does progression look like for this particular task? What would a mid-level person be able to do that is different from entry-level?

   Each of these discussions will result in:

   • A matrix of job functions and skills that employers collectively agree accurately describes the occupation.

   • Identification of key areas where tasks are not consistently performed effectively and that should be prioritized by education partners.

   • Identification of the skills and knowledge needed to perform those tasks effectively.
## Tool and Die Maker

<table>
<thead>
<tr>
<th>Job Functions</th>
<th>Design and Development of Tools and Dies</th>
<th>Part Fabrication</th>
<th>Quality Control</th>
<th>Maintenance and Repair</th>
<th>Health and Safety</th>
<th>Shop Leadership and Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tasks</td>
<td>Reads and interprets blueprints and engineering plans</td>
<td>Sets up and operates machine tools</td>
<td>Verifies dimensions, alignments, clearances of finished parts for conformance to specs</td>
<td>Completes necessary documentation and paperwork</td>
<td>Follows safety standards and procedures</td>
<td>Provides leadership on the shop floor</td>
</tr>
<tr>
<td></td>
<td>Creates designs in CAD or other design programs</td>
<td>Cuts and shapes materials using multiple machines</td>
<td>Performs regular cleaning and maintenance on machinery and equipment</td>
<td>Detects faulty equipment operation</td>
<td></td>
<td>Manages several projects simultaneously and works with minimal supervision</td>
</tr>
<tr>
<td></td>
<td>Communicates with customers/ engineering staff about design needs</td>
<td></td>
<td>Sharpens and repairs tooling as needed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Selects materials</td>
<td></td>
<td>Repairs dies, cutting tools, fixtures, and prototypes</td>
<td></td>
<td></td>
<td>Trains and mentors apprentice tool and die makers</td>
</tr>
<tr>
<td></td>
<td>Creates assembly and layout plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Collaborates with other assembly members</td>
</tr>
</tbody>
</table>