



**Metro Denver Regional Partnership
Quarterly Narrative Progress Report
Submitted July 31, 2007**

SECTION I: GENERAL GRANT INFORMATION

A. Grant Identification

Grantee: Colorado Department of Labor and Employment on behalf of the Metro Denver Region

Name of Project: *Growing our Own: A Model for Reducing Dependence on Imported Skills*

Grant Agreement Number: WR-15401-06-60; CFDA #: 17.261

Reporting Period: April 1 to June 30, 2007

Submitted by:

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B. Summary of General Grant Activities

As the attached panel reports will illustrate, there was a lot of panel-related activity this quarter.

- The Workforce Survey of businesses (attached) in our target clusters was completed, posted on our website and released to the press. It was covered by all of the major newspapers in the region.
- Metro Denver WIRED hosted other WIRED regions interested in renewable energy at an ETA meeting at NREL.
- WIRED Executive Director facilitated conference calls and meeting with an ETA-sponsored NSF mentor to help our local community colleges apply for NSF grants to train more technicians for jobs in the WIRED industries.
- EVP of the Metro Denver Economic Development Corporation and WIRED Executive Director made a presentation to the Governor's Jobs Cabinet.
- EVP of the Metro Denver Economic Development Corporation and WIRED Executive Director met with the new State Treasurer to discuss WIRED.

- EVP of the Metro Denver Economic Development Corporation and WIRED Executive Director met with the director of the Commission on Higher Ed to discuss WIRED.
- Hosted the Puerto Rico WIRED group and organized a tour of the Denver School of Science and Technology.
- Convened three meetings of the High Skills Leadership Council
- Continued to meet with local foundations to discuss partnerships around STEM education
- Conducted training around financial and performance issues for JumpStart subgrantees
- Finished panel asset maps and jobs matrices.

The report’s appendix contains panel reports describing the quarter’s activities for following panels: Workforce, Higher Ed, K-12, Energy, IT/Software, Aerospace and Energy.

C. Status Update on Strategic Partnership Activities

The newest partner to join our initiative is the Governor’s Office through a \$500,000 STEM grant that it has received through the National Governor’s Association (NGA). The proposal to NGA was written by staff at the Center for Education Policy Analysis of the Graduate School of Public Affairs, CU Denver (CEPA) – the same individuals who serve as the conveners of the WIRED Higher Ed Panel – and it incorporates the WIRED findings and thinking. The Executive Committee of the grant includes: WIRED, CEPA, the Colorado Children’s Campaign (conveners of our K-12 Panel), College in Colorado, CU Denver and the Governor’s Office. Each one of the participants of the Executive Committee serves on a WIRED panel.

This list was included in the last quarterly report, and it represents our JumpStart partners who are bringing in \$11 million in leveraged funds to the initiative:

Colorado Minority Engineering Association/ Colorado Mathematics Engineering Science Achievement (MESA).....	\$350,000
Community College of Aurora (CCA)	\$430,000
Community College of Denver (CCD).....	\$360,000
Council for Adult and Experiential Learning (CAEL)	\$350,000
Denver School of Science and Technology (DSST).....	\$160,000
Jobs for America’s Graduates (JAG) – Colorado.....	\$350,000
Red Rocks Community College (RRCC)	\$400,000
Regis University.....	\$450,000
Thompson School District	\$400,000
University of Denver (DU)	\$450,000
Total	\$3,700,000

Other partnership activities:

- 1) ***Partner engagement:*** Partners continued to be engaged through meetings, presentations, site visits and one-on-one contacts. WIRED staff members continue to meet with business leaders, state policy-makers, and foundation program officers to discuss potential partnerships.
- 2) ***Specific roles and contributions of partners:*** Partners are bringing ideas to address the shortage of workers as well as funds to leverage WIRED grant funds. We had anticipated that the \$3.7 million of funds released through the JumpStart RFP would be leveraged at 100%, but actual leveraging amounts far exceed our expectations. We are leveraging these funds at almost 300%. The new partnership with the Governor's Office STEM grant will add over \$1 million in leveraged funds.
- 3) ***Challenges encountered/resolved in the development and management of the partnership:*** We continue to have administrative challenges related to contracts – this time with some of the contracts provisions that we must pass on to our subgrantees. We are working hard to resolve these issues.
- 4) ***New partners:*** We continue to add partners to our Initiative. Each of our JumpStart grantees was in itself a partnership of organizations from industry, education and or workforce and economic development. As stated above, our newest partner is the Governor's Office through the NGA STEM grant.

D. Status Update on Leveraged Resources

There has been no change in leveraged resources since the last quarterly report. We will report the \$1 million from the partnership with the Governor's Office's STEM grant in the next quarter, as the project begins.

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SECTION II: REGIONAL METRICS

A. WIRED Performance Measures and Results

Following are the performance measures, as stated in the Implementation Plan. We are working with the Department of Labor to receive technical assistance for updating these measures.

Panel	Measures
Four Targeted Industry Panels: Aerospace, Bioscience, Energy and Information Technology/Software	<ul style="list-style-type: none"> ➤ Employer satisfaction with workforce skills of the applicant labor pool in each sector ➤ Training capacity and remaining needs (skills gaps) of each sector ➤ Employer investment in human development in each sector ➤ Three year outcome: Increase number of employees in each sector by 10%
Metro WIB Association	<ul style="list-style-type: none"> ➤ Capacity of incumbent worker and dislocated worker training ➤ WIA performance measures ➤ Three year outcome: Increase the number of incumbent workers enrolled in training in the region by 20%
K-12 Education	<ul style="list-style-type: none"> ➤ Number of students exposed to career opportunities in science, technology, engineering and math (STEM) ➤ Three year outcome: Increase the number of students taking advanced STEM courses by 10%
Higher Education	<ul style="list-style-type: none"> ➤ Number of students from Metro Denver area entering technical post-secondary training ➤ Number of Metro Denver high school students who enter post-secondary school, with a special emphasis on students who qualify for college but choose not to go ➤ Three year outcome: Increase the number of low-income students in participating districts who go directly from high school to college by 20%
Entrepreneurship/Small Business Development	<ul style="list-style-type: none"> ➤ Number of students in technical fields who start businesses ➤ Number of business start-ups ➤ Number of small companies that win contracts from government or large private-sector companies ➤ Three year outcome: Increase the number of business start-ups in targeted sectors by 10%

Performance measures will be reported quarterly using the *Suggested Metrics: Proposed Report Addendum* format below:

Grantee Identifying Information				
1. Grantee Name:			2. Grant Number:	
3. Program/Project Name:				
4. Grantee Address: Quarter End Date: Street: _____ _____			5. Report	
City/State: _____ Date: _____			6. Report Due	
Grantee Results				
Progress Report Performance Categories and Measures	Year 3 Target	Baseline Data (Jan-Mar 06)	Current Quarter: Q2 2007	Cumulative Grant-to-Date
Category 1: Education/Training	Suggested metrics for Quarterly Reporting			
1. Number Began Workforce Education/Training Using WIRED Funds by Industry				
a. Aerospace				
b. Bioscience				
c. Energy				
d. IT/Software				
2. Number Completed Workforce Education/Training Using WIRED Funds by Industry				
a. Aerospace				
b. Bioscience				
c. Energy				
d. IT/Software				
3. Number Attained Degree, Certificate or Industry Certified Credential as a result of Workforce Education/Training Using WIRED Funds by Industry				
a. Aerospace				
b. Bioscience				
c. Energy				
d. IT/Software				
4. Number of Individuals Participating and/or Completing Workforce Education/Training Using WIRED Funds Placed in Target Industry Employment				
5. Total Investment in Incumbent Worker Training				
Others as Identified by Region (insert cells as needed)				
Category 2: Capacity Building	Suggested metrics for Quarterly Reporting			
6. Number of Educators Prepared for Instruction in Identified Industries and Projected Number of Additional Students That Will Be Trained Annually as a				

Result				
7. New Curriculum Developed and Projected Number of Additional Students That Will Be Trained Annually as a Result				
8. Work-Based Strategies Developed /Implemented (clinical experiences, internships, etc.) and Projected Number of Additional Students That Will Be Trained Annually as a Result				
9. Career Guidance Strategies Developed/Implemented				
10. Instructional Equipment Purchased with WIRED Funds and Projected Number of Additional Students That Will Be Trained Annually as a Result				
Other Capacity Building Activities as Identified by Region and Projected Number of Additional Students That Will Be Trained Annually as a result (insert as needed)				
Category 2: Economic Indicators	Suggested Metrics to be tracked annually			
11. Number of New Jobs Created By Occupation/Industry				
a. Occupation/Aerospace				
b. Occupation/Bioscience				
c. Occupation/Energy				
d. Occupation/IT Software				
12. Average Wage				
13. Unemployment Rate				
14. Performance Improvement on Common Measures by Workforce Investment System Region Wide				
a. Entered Employment Rate (common measure)				
b. Employment Retention Rate (common measure)				
c. Average Earnings (common measure)				
15. High School Dropout Rate				
16. Retention Rates in All Public Education Institutions				
17. Number of Completers (Receive degree or certificate) in All Public Education Institutions by Industry				
a. Aerospace				
b. Bioscience				
c. Energy				
d. IT/Software				
18. Academic Achievement in K-12 Based On No Child Left Behind Test Scores				
19. Number of New Business Startups or Expansions				
20. New seed and Venture Capital Investments				
21. Government investments				
22. Patents				
Others As Identified by Region (insert cells as needed)				

B. Discussion of Results

We expect to see reportable results from subgrantee quarterly reports during the third quarter of 2007.

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SECTION III: CHALLENGES TO PROJECT PROGRESS

During the quarter, WIRED Executive Director and staff continued to work through contract issues in order to execute contracts with our conveners and JumpStart grantees. This has been challenging, in part, because four of these contracts are with State of Colorado agencies, which are restricted by state statute from agreeing to indemnify others. We will be convening a meeting of all stakeholders in July to resolve indemnification language and other outstanding issues so contracts can be executed.

At the end of the last quarter, we were dealing with serious time constraints which have been alleviated to a great extent by the one-year no-cost extension to our WIRED grant. This additional time allows us to better synthesize and analyze the huge amount of data collected in the last six months (e.g. gap and issues analysis), develop an implementable action plan, and make strategic decisions on funding promising practices to address the gaps identified in the Metro Denver WIRED Region. We are anticipating that the next WIRED request for proposals will be released sometime in the fall.

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SECTION IV: PROMISING INNOVATION PROCESSES AND SUCCESS STORIES

A. Promising Approaches, Processes and Lessons Learned:

Asset Map:

The asset mapping exercise conducted by each of the panels has created a valuable tool for identifying regional resources for developing, recruiting and retaining workers.

Key lessons learned from the asset mapping exercise include the importance of coordination with all partners from the outset. Definitions, language and terminology all need confirming in advance of data collection, and should be consistent and understood by all contributing partners. The data collection process itself requires a consistent approach, in addition to a framework, or data repository, that meets the needs of all contributing partners. The risk of subjectivity can be minimized by requiring the identifier of an asset to justify its inclusion according to agreed definitions and parameters.

In the planning stages, and throughout the data collection process, it is important to keep in mind what the end product will be used for, who the audience will be, and how it will be presented. Other key points to consider are whether the asset map will be a one-off research exercise, or an ongoing process. If ongoing, where will it be housed and who will be responsible for updates, or will it be a self-sustaining “wiki-style” resource?

Workforce Study:

The WIRED Workforce Study research benefited from extra qualitative input and feedback from the four industry panels. Industry panel members were given the opportunity to review study findings from the on-line survey results of 200 companies and four industry focus groups. The benefit was two-fold: the accuracy of Workforce Study findings was further reinforced, and having the approval of industry experts added to Study’s value and credibility.

B. Sharing “Success Stories”

[The Metro Denver WIRED brochure](#) continues to prove a useful resource for WIRED and its partners. A second print run (1,000 copies) was issued in April, and due to further demand, a third print run (1,000 copies) is planned for Q3.

In partnership with the Colorado Space Coalition, we developed [Metro Denver WIRED’s contribution to the Colorado in Space: Our Heritage, Our Future exhibit and brochure](#) at Denver International Airport for inclusion in the exhibit’s “Training The Next Generation” section. An estimated four million passengers are expected to view the exhibit by the end of September.

WIRED’s partnership with the Governor’s Office for the NGA STEM grant enabled WIRED principles and strategies to be woven into this \$500,000 grant. The proposal was written by the conveners of the WIRED Higher Ed panel, and each member of the grant’s Executive Committee is represented on a WIRED panel. WIRED is both a regional and statewide partner, supporting the regional STEM compacts in the WIRED region and providing a STEM and workforce resource for Colorado’s P-20 Council on a statewide level. WIRED is also a member of the grant’s advisory board.

C. Research

During the quarter, we completed the business survey and published the results. The survey and its findings are reported in the [Metro Denver WIRED Initiative Workforce Study](#)

In addition, the industry coordinators completed jobs matrices ([Energy industry example](#)) of the high demand jobs for their respective industries. They compared their matrices to identify common issues and differences between the targeted industry clusters. This information was used to develop a [PowerPoint presentation](#) which was delivered to the Leadership Council (formerly known as the High Skills Leadership Council) in May, and updated for [a broader presentation](#) to the economic development professionals who belong to the Metro Denver EDC (included an overview of WIRED and accomplishments to date).

All eight panels have completed asset mapping activities ([Aerospace industry example](#)). These asset maps have been delivered to the Graduate School of Public Affairs to synthesize the information and spot trends/gaps.

All panels discussed preliminary recommendations for WIRED grant funding and activity, and final recommendations are expected from each panel in August.

In the next quarter, we will be polling students, teachers, parents, career counselors, and job seekers to understand the perceptions these stakeholders and influencers have of the four targeted industry clusters.

We are in negotiations with Development Research Partners (DRP) to analyze all the research data collected to date, and identify what workforce gaps and issues are relevant to the WIRED Initiative. These findings will form the basis of the Action Plan to be developed by the WIRED Leadership Council that will inform future grant funding and activity.

Update on Technical Assistance:

1. New Economy Strategies (NES) began work on Workforce Competency Analysis and Best Practice Analysis reports for the WIRED industry clusters. The final reports are scheduled for completion by the beginning of August.
2. The Council on Adult and Experiential Learning (CAEL) conducted research to identify examples of career pathway models that currently exist for Metro Denver's WIRED industries. CAEL will deliver this research in a report (Career Pathway Models for Key Denver Industries) scheduled for completion in early August.
3. The WIRED team plans to meet with Randall Kempner from the Council on Competitiveness (COC) early next quarter to discuss remaining COC assistance with WIRED research initiatives.

APPENDIX:

Attachments:

- A Workforce Panel Quarterly Report
- B Higher Ed Panel Quarterly Report
- C K-12 Panel Quarterly report
- D Bioscience Industry Panel Quarterly Report
- E IT/Software Industry Panel Quarterly Report
- F Aerospace Industry Panel Quarterly Report
- G Energy Industry Panel Quarterly Report
- H Metro Denver WIRED Workforce Study Press Release
- I Metro Denver Workforce Study Press Articles (*Rocky Mountain News, Denver Post, Denver Business Journal*)
- J [Metro Denver WIRED feature on National Public Radio](#) (*subject to copyright law, reproduction prohibited*)

Attachment A

Workforce Panel Quarterly Report

Linda Murphy

Director, Workforce Board of Metro Denver Metro Chamber of Commerce

July 6, 2007

The members of the Workforce Board of Metro Denver serve as the core of the Denver WIRED workforce panel. In addition, representatives from higher education, departments and/or divisions of the state workforce system, local economic development offices, business development divisions at local workforce centers, and Metro Denver WIRED attend and freely participate in the meetings. At these monthly meetings, the focus is devoted to topics and discussions that advance the WIRED vision.

The Workforce Panel met 3 times during the quarter to discuss:

Asset Mapping

- The workforce development system completed the mapping project in May. The Board submitted the map to Metro Denver WIRED and the information will be used as part of the WIRED gaps analysis to be completed this summer. In June, the Board established a review committee, which will analyze the data and use the information in their work to create a cohesive regional workforce development system that supports the intent of the WIRED initiative.
- The Board documented that the initial project was worked on by an average of four staff in each of the seven participating regions and that each region spent an average of four hours total to complete their section. In addition, Board staff and local region volunteers spent an estimated fifty (50) hours designing and piloting the instrument, formatting the data submitted by local regions and proofing the document. In total, thirty-two people contributed over one hundred and sixty (160) hours completing the workforce asset map. We anticipate that a similar amount of time was needed to complete the asset maps of each of the other WIRED panels.
- The Board felt the mapping activity was extremely valuable; however, they were not prepared for how labor intensive it would be. They felt that it was important that this information be shared with other regions planning to undertake asset-mapping activities.

Business Survey Report and Other Reports Prepared by Technical Assistance Providers

- The Board reviewed several drafts and provided Metro Denver WIRED with feedback on the Business Survey Report, as well as, draft reports prepared by New Economy Strategies and the Council for Adult and Experiential Learning. The Board continues to use information provided in all three reports, especially information relating to the energy industry, to advance a sector approach to regional workforce development.

Energy Sector

- The Board decided to focus their initial work on the energy sector. Board discussions this quarter have focused on: aligning training resources (targeting ITAs on WIRED industries), working with employer and educational partners to expand internship opportunities for both youth and adults, linking services to meet the needs of small businesses, leveraging resources to bring disconnected youth into the WIRED framework and, developing innovative ways to connect unemployed and underemployed populations with learning and employment.
- The Board collected and reviewed research from national, state, and local sources, and information gathered from the workforce and the energy panel asset maps. This information has been used in meetings with industry leaders involved in local workforce regions, and leaders representing our community college partnerships to develop regional sector strategies.
- The Board hosted a panel discussion with leaders from Suncor USA, Shell Exploration and Production, Coors Brewing Company and Xcel Energy. The discussion allowed the regional workforce development system and our education partners to share information on services and training in place to address current short-term workforce needs. Local regional directors, community college representatives and the companies shared information on specific innovative workforce training programs that are currently in place or being developed. Equally importantly, incumbent worker needs were identified and a commitment was made by the Board, industry representatives, and educational partners to work together on regional workforce development strategies that address the energy industry's intermediate and long-term educational training needs.
- Local Directors Mary Russell (Jeffco) and Linda Perez (Weld) and Linda Murphy continue to participate in the Rockies Energy Workforce Collaborative led by the American Petroleum Institute. This participation has led to expanded partnerships with energy sector employers and workforce system representatives from other states.
- Board staff and local directors are members of the pre-conference planning committee for a session focused on renewable energy that is part of the National Network of Sector Partnerships Conference scheduled for November in Denver.

Workforce Gaps Analysis

- In 2004, OED conducted a comprehensive workforce gaps analysis that looked at both workforce demand and supply in their region. They have contracted with Development Research Partners (DRP) to update their original study, which will focus on 2006-2011.

In the spirit of regional collaboration, the City and County of Denver's Office of Economic Development (OED) has agreed to extend the scope of their updated study to include the entire nine-county Metro Denver region (Arapahoe, Adams, Boulder, Broomfield, Denver, Douglas, Jeffco, Larimer, and Weld). They will cover the cost of the expanded scope and information will be shared with the Board and local regions.

This gaps analysis is different from the planned Metro Denver WIRED Gaps Analysis in that it will:

- Examine the fundamental characteristics of the population (both those currently employed as well as those seeking employment) to understand the size and skill level of the existing workforce;
- Identify occupational workforce gaps;
- Provide available data and information on educational level and skill sets of current workforce;
- Compare enrollment numbers with degrees awarded for accredited post-secondary public education institutions in the nine-county region;
- Discuss potential and viability of skills certification process (including Work Keys) as a way to address some workforce deficits;
- Focus on Business Services, Financial, Insurance, and Real Estate (FIRE), Healthcare and Construction and Extraction industries and,
- Map jobs versus workforce using GIS.

In addition to the panel activities, Board staff and members and or local staff have actively participated in a variety of meetings and activities including

- Three meetings of the WIRED Leadership Council
- More than thirty-five other WIRED-related meetings, conference calls, focus groups, panel meetings, national WIRED and WITS Webinars
- Six local Workforce Investment Board meetings to continue to discuss ways that local action can be expanded to support regional success.

Attachment B

Higher Education Panel Quarterly Report

Beverly Buck

**Director, Communications and Development, Center for Education Policy Analysis (CEPA), School of Public Affairs, University of Colorado at Denver/Health Sciences Center
June 30, 2007**

The Higher Ed Panel held two meetings this quarter.

Meeting 4, April 10, 2007

The panel held its fourth meeting in April 2007. This was a joint meeting with the K-12 Panel

The large group split into 5 smaller groups to discuss, within the topic below how to make connections between the K-12 and Higher Education Panels and brainstorm ways to strengthen and institutionalize connections between K-12 and higher education and improve transitions.

1. Strengthening **Student** transitions between K-12 and higher education and the workforce
2. Strengthening Student **Employee** transitions between education and the workforce
3. Strengthening **Teachers** education, pre-service, development, training and support
4. Institutionalizing and building sustainable and viable **links** between K-12, higher education, and other stakeholders
5. Revising the **DRAFT K-12 recommendations**

While there were more K-12 representatives than higher Ed panel members in each small group, there was higher Ed representation in all subgroups. The “report out” was done by categorizing issues into “Buckets to Support Transition,” which were remarkably consistent throughout, allowing for some dissimilarity in semantics. Even when a new bucket was proposed, no one disagreed with its relevance to the discussion or its need to be fit into the puzzle. The discussions also made it clear that these buckets could apply to students as well as to institutions. The industry panels were represented in the discussion and these buckets resonated with them.

Buckets

Relevance

- Content had to be wrapped in context and the ability to engage and excite students, *e.g.*, if you teach calculus, explain in terms of real life/day-to-day skills, why it is important.
- Internships, experiential learning, survival and performance skills, capstone projects all foster this content/context duality
- Involves cultural awareness and role modeling
- This type of teaching requires refitting of current teachers and new pedagogy, as well as financial support,

Counseling about transition

- Needed at all transition points
- Counseling targets students, parents, teachers, regardless of whether a student is college bound
- Would probably require changes to FERPA and other privacy laws
- Has a direct link to relevance, alignment, career paths

Bridging Experiences

- Students, parents, and to some extent educators should visit campuses (used broadly—not just college) their students go to
- This starts with ECE
- Bridging experiences includes concurrent enrollment programs for students
- Includes a common language of expectation for students, parents, teachers, and institutions, *e/g/*
- Includes translators between the education sectors;
- Making the individual pipelines fit each other

Content

- Demystify STWM content (direct link to relevance)
- Agreed upon alignment, guaranteed transfer pathways, articulation agreements (see bridging and relevance)
- Cultural awareness
- The group discussing the K-12 panel's recommendations proposed that someone develop a turn key STEM curriculum that smaller districts could adopt as they saw fit

Financial

- Accessibility
- Sustainability
- Often swayed by Perceptions of legislature, electorate, parents, and students

Professional development

- Includes new educators, current educators, relocating educators, adjunct educators, second careers
- Goal is to stabilize and increase current knowledge base
- Teacher prep linkages need strengthening esp. with relevance to industry participation
- Role of technology in professional development as well as in initial teaching and remediation

Assessment

Need to assess learning and teaching

Advocacy

Needed for all buckets

Regional voices necessary—rural districts are different

Many interesting bills have been introduced this session, not all of them passed; the opportunities presented by a new Governor and new Education Commissioner are real; and the STEM education community has to be ready for the next legislative sessions.

Panel convener, The Center for Education Policy Analysis, made presentations about the Higher Ed assessment mapping project and the network analysis.

Meeting 5, May 29, 2007

The Lessons learned from Higher Ed Asset Mapping Process:

- The existing data is insufficient or non-existent to answer many of Higher Ed panel's questions, including inability to measure all activities at the community college level; lack of links (between K-12 system and higher ed, education and employment sectors); and, lack of clarity in the grain size and skill level.
- The system has weak capacity to analyze current data because data sets are not analogous.
- There seem to be few incentives in the system for STEM graduates.
- Once out of the K-12 system, where principals talk to superintendents, teachers, and parents, there are fewer and decreasing opportunities for higher education communication with workforce boards, business, etc.
- The transition programs that bridge HS and postsecondary work better when in postsecondary setting (staff can help kids navigate system, more resources, can present a better view of what postsecondary ed looks like to younger kids).

In a discussion about metrics, there was consensus that:

- The old metrics are not useable as they are beyond the control of higher ed.
- The JumpStart grants are learning what works, we can amass that inventory to develop metrics.
- There is some value to identifying metrics that are not currently measured, if they would capture important measurable data.
- The earlier buckets discussion (repeated below) offers a framework for metrics.
- Learner readiness and re-readiness (transferability of skills, life-long learning, and education as a means rather than an end) is crucial. Teaching skills that might survive the next boom and bust cycle is preferable to teaching skills or applications that are currently flavor of the day for industry (or education gurus).
- Building capacity for institutional ability to adapt (*e.g.*, changing job markets, boom or bust cycles, availability of new technologies, creation of new forms of jobs) “have 4 critical industries now, but may change. But no matter what will need prepared workforce that can move around.”
- We need data to move public and private policy.

APPLICATION	BUCKET	AVENUES FOR CHANGE					
		Controllable Data					
		Data & Assessment	Public Policy & Advocacy	Sustainability	Other? comment	Other? comment	
LEARNER READINESS	Relevance	Curriculum development		X indicators of where we might fill in a box Comments welcome			
		Grad rates					
		Drop out rates					
		Certificates earned					
		Job placement					
	Content (STEM)	Curriculum development		X			
		New partners					
		Job placement					
	TEACHER READINESS	Professional Development/Capacity	Teacher training				
			Enrollment				
Curriculum development			X	X			
INSTITUTIONAL CAPACITY	Bridge/Transition Programs	Career counseling		X	X		
		Job placement					
	Financing	Graduation rates		X	X		
		Enrollment					
		Certificates earned					
OTHER							

A meeting is planned for the end of August to revise and hopefully finalize a set of higher Ed recommendations. By then many of the policy tables (*e.g.*, P20, NGA grant, House Bill 1118, etc) will be set up and we can limit duplication of effort. The panel could then review the Gap analysis, draft recommendations from other panels, and the new RFP. During the interim, CEPA will forward via email questions for review and comment by the group, and we urge all of you to respond to requests for comment or to ask questions. CEPA will disseminate all comments received during the summer. In July or early August, CEPA will draft and circulate a set of recommendations based on higher ED's previous conversations. If necessary, we will convene a 7th meeting to finalize and approve the final recommendations. However, the Ed Panel was very interested in WIRED continuing to provide a venue and forum where the cross panel discussions would continue. The panel's co-chairs (Karen Newman and Linda Bowman) agreed to continue representing the panel on the Leadership Council.

CEPA Efforts

During the past quarter, CEPA staff has:

- attended Metro Denver WIRED Group meetings, site visits from visiting teams, and WIRED “webinars” as requested by the Contractor;
- continued to identify and recruit Higher Education panelists, including academics and other experts from community and four-year colleges and universities;
- provided staff support for Panel meetings including arranging meetings, taking meeting minutes, and providing minutes to Panel members and WIRED staff;
- completed work on Higher Ed asset map
- developed template for network analysis of WIRED panels;
- field tested questions for the network analysis;
- revised network analysis based on field-testing;
- worked with the K-12 panel to assure seamless education system input;
- worked with the Industry and Workforce panels to revise individual asset maps to answer WIRED issues more concretely
- presented at Leadership Council meeting
- provided technical assistance to Contractor as requested;
- included WIRED as partner in successful grant proposal from Governor Ritter’s office to the National Governor’s Association.
- provided all administrative documents as requested by Contractor.

Outcomes Reporting

CEPA efforts have helped increase WIRED’s geographic influence in Colorado.

Attachment C

K-12 Panel Quarterly Report Alex Medler Colorado Children's Campaign June 2007

K-12 Panel

- Panel discussed and provided input on the administration of WIRED Funds and the project timeline to strengthen viability and feasibility of effective partnerships with K-12 stakeholders; and
- Panel discussed and provided input for future strategies for involving the K-12 stakeholders in the work of the WIRED Initiative.

Asset Map and Panel Recommendations

- Prepared the K-12 Asset Map for inclusion in the project Asset Map; and
- Revised the recommendations for the K-12 Panel regarding the allocation of WIRED funding, changes in policy and practice, how to build and sustain viable networking; and how to structure subsequent participation in the WIRED Initiative by K-12 stakeholders.

Cross-Sector Networking

- Distributed information on upcoming opportunities for WIRED stakeholder involvement in various interim committees and work groups deliberating issues in K-12 and higher education to be appointed by the Governor and other state bodies. Forwarded nominees from among WIRED stakeholders for consideration;
- Convened the K-12 Panel in a joint meeting with the WIRED Higher Education Panel; and
- Staff of the Children's Campaign worked with the Governor's office on the support of a statewide P-20 Council and on a STEM grant received from the National Governor's Association. Both the Council and the related NGA grant will create opportunities for WIRED K-12 stakeholders, and their analysis and asset map for example, to influence deliberations of related issues.

Challenges to the K-12 Panel

The primary challenge to the K-12 Panel is also a potential opportunity for the WIRED Initiative to leverage enormous resources and political support for its broadest goals. There is a considerable amount of interest and activity in the state now around opportunities to improve outcomes from across the P-20 spectrum of education. As a challenge, these multiple forums and groups create a potential diffusion of interest, and also potential competition among the various groups and projects. However, the WIRED Initiative should be well placed to promote coordination and maximize the effectiveness of these various efforts in ways that leverage all these resources to change policy and practice. The result should be more investment of resources and political support, for changes that help young people succeed in the workforce after being adequately prepared in their P-20 education.

Another challenge has been the increasing interest of stakeholders in having more cross-sector dialogue. The coming years of the WIRED project should facilitate work that includes the

members of the K-12, Higher Education, Workforce Development, and industry sectors in shared work.

Best Practices

The modification of the timeline for implementation of the grant should be looked at by other regions as an effective tool for making the partnerships and engagement of the K-12 community more viable and sustainable. The K-12 schools' calendar and work flow throughout the year will necessitate grant-funded activities that cross the fiscal, calendar, and school years of various systems. The flexibility of the WIRED Administration and the U. S. Department of Labor in this regard is a welcome support.

Attachment D

Bioscience Industry Panel Quarterly Report
Jerry McCarthy
Bioscience Industry Coordinator
July 3, 2007

The Bioscience Industry Panel has met three times during the quarter, the fourth, fifth and sixth meetings of the six meeting commitment of its members. The fourth meeting was held on April 27 with a topic of gap identification and how WIRED subgrants could address these identified gaps. This meeting also included presentations and discussion with two representatives of K-12 initiatives, John Sepich of COMSTEC, a STEM education advocacy organization, and Dr. Yashka Hallein, Instructor for the new Biotechnology education program at Warren Tech (the vocational/technical education campus of Jeffco Schools). The fifth meeting was held on May 30 with a topic of generating preliminary recommendations in the areas of 1) distribution of WIRED funding; 2) policy and practice; 3) networking; 4) next steps for stakeholder involvement; and 5) industry needs and priorities. The sixth meeting was held on June 27 and included an initial presentation by Beverly Buck of the Higher Education panel and a discussion around the topic of identifying themes in the previously reported recommendations and issue discussions of the panel.

The Bioscience panel is interested in continuing to meet in its present form, occasionally for updates on WIRED activity and to continue their discussions of issues in the cluster, primarily around whether and how to get involved in K-12/STEM education reform and how to improve industry interaction with higher education resources. Several members of the panel are also interested in serving on task groups (perhaps with representatives of other WIRED panels) to pursue action items which result from the WIRED planning process.

Meeting discussions included:

- **Jobs** – A late addition to panel membership, Clay Anselmo, CEO of Reglera, Inc. (<http://reglera.com/biomed/about/>), a brought the panel representation from his well-respected local company that provides contract services to companies in the cluster, in the wider region, and nationally. Mr. Anselmo was able to provide input on hard-to-fill jobs from the experience both of his own company and what he has learned from providing contract services to his customers.
- **Asset Mapping** – Based on the results of the asset mapping discussion of the bioscience panel's March meeting and subsequent additional submissions by several panel members and other representatives of the cluster, a preliminary asset map document was generated and reviewed by the panel at its May meeting. All material from external contributors is reflected in the current document. However, the coordinator has a backlog of additional material to add from ongoing researches and discoveries.
- **Business Survey** – The WIRED business survey was completed, reviewed, edited and published. The results are summarized further on in this document.

- **Gap Analysis** – Gap analysis was the topic of the April panel meeting and generated the following suggestions of perceived ‘gaps’ for further review:
 - Curriculum Change
 - Lack of Lab Education Programs
 - Inability of some companies to provide internship opportunities
 - Coordinator (person/entity) needed to ‘make things come together’
 - Need for a ‘med prep’-like bioscience education program in HS (connects with curriculum change above)
 - Need to define the ‘employer’s perspective’ for internships and similar activities that connect education and industry
 - Lack of awareness and connection between business world and academia
 - Challenge of professional development and growing staff competencies

- **Recommendations** – The May bioscience panel meeting generated an extensive list of preliminary recommendations in five discussion areas of: 1) distribution of WIRED funding; 2) policy and practice; 3) networking; 4) next steps for stakeholder involvement; and 5) industry needs and priorities. The report of this meeting, detailing these recommendations, is attached.

- **Jobs Matrix** - Data has been collected and is still being entered into the WIRED Bioscience jobs matrix. Additional efforts are being made with industry contacts regarding the variety of engineering job titles in the industry (QA, Process, design, validation, software, etc.) and the coordinator has searched without success for a career ladder document specific to bioscience industry engineering occupations.

Related activity:

Motivated in part by panel discussions, results of the WIRED survey, and member expressions of interest, the Colorado Bioscience Association has initiated its own survey of interest in K-12, STEM and higher education involvement by its members. Preliminary results were discussed at the June panel meeting. Early results show interest by companies in involvement in higher education undergraduate and graduate programs, with an undergraduate and high school focus for CBSA.

The Pharma HR group is participating with Mountain States Employers Council (MSEC) in an annual salary survey for the pharmaceutical industry in the region.

Kathy Kregel of Bioscience Larimer County (an affiliate of the Colorado Bioscience Association) has completed a *Larimer Bioscience Industry Survey* that will be released and discussed at the group’s July 10th meeting.

Additional Coordinator Activity

The industry coordinator has attended a variety of industry-sponsored professional and educational meetings and has participated in the following WIRED, industry and education activities (a selection):

- Attended STEM –EC (STEM education advocacy group) gathering April 2;
- Attended Colorado Health Care Summit, April 3
- the Community College of Aurora WIRED Summit, “Opening Minds to Bioscience,” May 22;
- the Colorado Science Educators Network meeting on May 17;
- regular CBSA meetings, and individual meetings with company representatives;
- and a meeting with CBSA to plan K-12 and possible Workforce System involvement in the annual BioWest Conference in December, and the two day CBSA Biobootcamp program for Bioentrepreneurs on June 27 and 28.

The coordinator also drafted several WIRED documents, including RFP/RFQ drafts and created and updated WIRED Procedures for Release of Funds. He also shared Metro Denver WIRED’s RFP documents and had telephone consultations on RFP processes with next generation WIRED communities in Pennsylvania, Tennessee, and New York.

What We Have Learned

High-Demand Jobs

Early discussion in the Bioscience Panel's second (February) meeting centered on trying to identify what were the hard-to-fill positions for bioscience companies in our region.

The discussion opened with a general comment on the difficulty of hiring IT positions; then moved to anecdotal mention of a few specific positions (Network/systems administrator, Software Developer for medical devices, MD Research Clinical Oncologist, Instrument Calibration Technician), then to certain task categories of employment (regulatory affairs, documentation control, quality control, toxicology); then on to desired skill sets (communication skills most prominently).

It was noted that although specialized research MDs are difficult to find and hire, MDs in part-time or contractual advisory roles are relatively easy to get on a retainer basis because they can live anywhere and be flown in for occasional meetings.

(Clinical) Nurses can be hired into drug safety and medical science liaison positions in pharmaceutical companies.

There are also bioscience jobs that do not require a bachelor's degree, primarily production and administrative support jobs that may be open to high school graduates and holders of AS degrees or other occupational certifications.

A need for a basic certification program for clinical research associates was noted also.

The February panel meeting closed with a long discussion of internships and student involvement/exposure to companies and the need for a communications resource for such connections. The cluster needs a resource to find faculty, students seeking jobs/internships, displaced workers (layoffs), downsizing placements, and special project involvement. The online community Craig's list was discussed as a model.

Asset Mapping

The March panel meeting focused on asset mapping, i.e., identifying programs and resources in the region and elsewhere that are valued and useful as assets to the businesses and educators in the bioscience industry cluster.

The discussion opened around the value of 'word of mouth' (an asset) as a means of filling many positions and moved to the topic of internships and relationships with higher education programs as assets.

Discussion of the successful use of internships for engineering recruitment led to mention of the potential for outsourcing some future engineering needs to contract service providers (another form of asset). CBSA does advise on available contract service providers.

Two company situations: small and growing R&D and a larger, established company recently purchased by another company. In each case, recruitment is difficult because of issues of uncertainty in each company's future. What are assets that can overcome this?

A discussion of the lack of apparent work ethic in young applicants ('it isn't just our industry; it's everywhere' led to recommendations to 'listen to the new generation' and its need for flexibility, individuality and challenge).

It was suggested that the need for self-directed, project-oriented workers should make the industry look back at the 'systems which feed us' (schools/universities) to make sure that the curriculum includes project-oriented work.

Crossover industries such as beverage production and temp agencies are an asset for filling some positions.

Employee referral programs are an asset.

There is a need for more interaction with the workforce development system.

Identifying Gaps for WIRED Investment

Gap: Curriculum Change

Goal: Better industry awareness and understanding at HS level. Teachers need more 'real world' experience. Students, teachers, guidance counselors spend time at companies. Summer program for teachers.

Gap: Lack of Lab Education Programs

Goal: Expand programs that are already in existence.

Gap: Inability of some companies to provide internship opportunities

Goal: Invest \$ to facilitate internships with education partner.

Gap: Coordinator (person/entity) needed to 'make things come together'

Gap: **Need for a 'med prep'-like bioscience education program in HS (connects with curriculum change above)** – on a regional basis via school district networking and through BOCES groups.

Gap: Need to define the ‘employer’s perspective’ for internships and similar activities that connect education and industry, better structure it for ‘win-win’ and come up with a different term to describe internship-like activities. Develop employer-side buy-in from managers on internship support and value.

Gap: Lack of awareness and connection between business world and academia

Goal: Fund an FTE at CBSA to support a connection service.

Gap: Challenge of professional development and growing staff competencies

Goal: Partnership with community colleges, specific to departments such as QA and RA (training currently not available in Colorado).

WIRED Workforce Survey results

The survey is perhaps most valuable in comparing the Bioscience workforce with the three other targeted industry clusters: Aerospace, Energy, and IT. Of the four clusters, Aerospace seems to devote the most attention, traditionally, to supporting K-12 and higher education programs, most likely due to the additional presence of significant grant availability from NASA for this purpose.

All four surveyed industries report a sense of disconnection between industry and educational institutions in the region. In Bioscience, 27% of companies employ 93% of the region’s bioscience workforce. Sixty-seven percent (67%) of bioscience companies have fewer than 10 employees.

High Demand Occupations in Bioscience (as reported in the survey)

Analytical Chemist (PhD)	Mechanical Repair Technician (HS/GED)
Bioanalytical Chemist (BS)	Microbiologist (PhD)
Cancer Biology Associate (BS)	Molecular Modeler (PhD)
Clinical Development Director (PhD)	Production Supervisor (BS)
Clinical Research Associate (BS)	Regulatory Affairs Professional (BS)
Computational Chemist (PhD)	Research Associate (molecular biology, BS)
Field Service Engineer (BS)	Research Associate (microbiology, BS)
Histotechnician (AS)	Senior Project Manager (BS)
Business Development (MBA)	Service Sales Representative (inside sales, HS/GED)
Information Technology (Masters)	
Licensing Associate (Ph.D)	
MD (MD/PhD)	
Tox/pharmacology Scientist (PhD)	
Toxicologist (PhD)	

WIRED Bioscience Panel Recommendation Discussion, 5/30

WIRED Funding:

A number of advisory comments and recommendations for the use of WIRED funding and the WIRED funding process were generated in the Bioscience Panel discussion:

1. Make access and response to the RFP be as broad as possible (both organizationally and geographically) to bridge the gap between those that usually respond to such opportunities (due to experience and staffing) and other entities less experienced in grant writing and with no staff dedicated to development.
2. Provide funding to existing programs (like CCA) for increased outreach to K-12, with a goal of making programs achieve critical mass for continuity after WIRED grant funding is completely expended.
3. Use WIRED funds or WIRED staff time to research promising practices and institutional policies in industry-academia interaction in other states.
4. Create a centralized resource access and networking service that unites academia with industry, increasing resource awareness, knowledge, and contact on both sides.
5. Research how rules, traditions and systematic incentives (such as requirements for tenure) may lead post-docs and other academics to connect with industry or (in the case of post docs) be aware of and motivated to explore opportunities in the local industry cluster.
6. (Perhaps as an example of activities under item 4 above) Provide an industry leadership training course for a mixed class of individuals from academic, industry, and post-doc categories, with part of the goal being the creation of a network connections between attendees. Foster networking, connectivity, and awareness with other mixed learning opportunities on this model.
7. Expand and improve the effectiveness of internship and other work experience programs by making funding support available for smaller companies which could not otherwise afford to offer internship experiences and developing a communications capability for tracking and remaining in contact with successful internship participants for whom on-graduation job opportunities were not available. The communication system would effectively allow communicating job opportunities and information about already vetted candidates among companies in the Colorado Bioscience Cluster, as well as allowing companies in the cluster a means of communicating job opportunities to Colorado educated candidates who may have taken positions elsewhere in the industry.
8. Discover ways to get the ‘energy and input’ of the young into our efforts to address the education/workforce development problems of the industry. A panel member called this process ‘reaching down to the next level.’ This might be accomplished by sponsoring a one- or two-day symposium for students at all levels to lay out this

problem: *We need to continue to grow as an industry, and we need to tap into you [the young] as the future of the industry. How do we get to you? How do we reach you? How do you get your information? What can we do to help you get excited about whatever it is that we do, about science?* The panelist making this comment noted that ‘We may have to step outside our comfort zone to do this.’

9. The WIRED process must take into account that the Colorado Bioscience Industry is not monolithic. Large and small companies have different needs and can contribute in different ways back into development. WIRED activity needs to tap into both sides. Different segments of the industry (medical device, Pharma, R&D) also have very different workforce/education issues/needs and sustainability issues.
10. Target WIRED funding toward actions with measurable outcomes.

Policy & Practice

The Bioscience Panel discussion on policy and practice focused on two issue areas: 1) promoting or incentivizing interaction between academics and industry scientists and executives; and 2) defining at what level (and how) industry should get involved in the education system, as well as how that involvement may differ by educational level (K-12, Community College, University). The following comments and recommendations were recorded.

1. Colorado should develop a broad higher education policy to provide incentives for contact and interaction between academics and industry. Mention was made of Georgia Tech’s policy of requiring faculty to spend 10% of their time on industry contact. One panel-generated concept for Colorado: offer an annual award (\$25,000) to recognize outstanding effort by an individual academic interacting with industry.
2. Incentivize individuals in the industry to go into academia. There is a perceived need to get more industry experience into the teaching community. The current system is upside down (educators lack the industry information they need).
3. Recognize that what business people do is solve problems. There is a tendency to attempt to bring that problem solving approach into education. One panel member commented, “Educators do not need business people to solve their problems.” What is needed is collaboration. It cannot be a business environment or ‘business as usual’ when business and educators enter a room. That is what creates tension between the two sides.
4. Address the policy problem of inadequate funding in education by working to improve funding at all levels of the system;
5. Advertise the excellence that is already present in the educational system (in K-12, graduate school programs, medical school programs, biotechnology) as a state policy.
6. By advertising excellence, start changing the perception of what the university organization looks like and what it does give back to the industry.

Networking:

The Bioscience Panel discussion on Networking generated recommendations and comment for a wide variety of ideas for improvement of both networking opportunities and understanding how networking 1) takes place; and 2) can become more effective. The following recommendations and comments were presented.

1. Create a centralized resource access and networking service that unites academia with industry, increasing resource awareness, knowledge, and contact on both sides. (duplicates recommendation 4 under WIRED Funding).
2. Establish a 'Professor in Residence' (retired or semi-retired) for the industry side. This experienced academic would be afforded an office for a day a week to work with some of the larger companies in the state and bring some of his/her knowledge, higher education contacts, and students into contact with the industry.
3. Provide research lab access to faculty who otherwise are distracted by grant writing to support their research labs (although IP would be an issue in any industry-university partnerships).
4. Provide a forum or a series of forums for academia and students to encounter industry. 'Listening is important.' The forums would require each side to listen to the interests of the other side (similar to 8 under WIRED funding).
5. Better networking of where industry can go to hire people. A directory of contact names at high schools for entry level jobs, for example, a single point of contact by county of education suppliers to approach with job openings.
6. Get the Colorado Bioscience Association involved with the existing informal Pharma HR group (approximately 25 members), and have HR group make connection with education staff.
7. CBSA existing programs and committee activity represent a huge promising practice in networking for the industry. It has educators on its board, but needs to get more classroom educators involved in CBSA programs and meetings. It is difficult for CBSA to develop special interest programs that will bring industry and education together.
8. Every post-secondary academic institution should have an industry advisory board (on the model of the University of Denver Engineering Department) which allows the Dean of that school to meet with industry representatives regularly to discuss concerns. This will build a bridge between academia and industry.
9. Examine what the incentives are for networking. People tend to use networks when they want something from them. It is difficult for participants in a network to always be giving. We need to create an information flow, so that participants will understand what they will get out of participation. It may not be something right away.
10. One possible way to network with educators is to sponsor a separate track at BioWest for educators. They could pay a registration fee and attend a separate track. They could

then take something away from that, such as a point of contact they otherwise wouldn't have.

Next Steps:

The Bioscience Panel Discussion of Next Steps included a focus on measuring and evaluating outcomes of WIRED activity and how the panel members/industry can continue to be involved in the follow-up action toward identified priorities.

1. Identify action steps linked to WIRED metrics and form subgroups from industry panels to address and follow-up on activities, priorities and outcomes.
2. Bring academic and industry resources together.
3. Learn from other sites. Rather than re-invent the wheel, take a look at what others have done. Identify notable programs and promising practices in other states. Form a task group to address implementation of promising practices. Define what may work in Colorado.
4. Identify additional funding sources for continuing efforts. This has to come out of the State budget somehow (as in NC), although additional funding is not there. State funding for industry development is part of its commitment to economic development.
5. Determine what role WIRED can play to influence top-down policy, for example on the interaction of industry and higher education. Incentivizing boundary-spanning between industry and academia should be a top-down activity.

Industry Needs/Priorities:

The Bioscience Panel culminated with a discussion of Industry Needs and Priorities.

1. Create a centralized resource/connectivity service to maximize awareness and use of resources in the industry cluster and to facilitate networked interaction of academia and industry. (As mentioned twice before above).
2. Improve understanding and academic preparation for industry worklife and skill set requirements. This would include 1) generating a realistic expectation of salary and other features of the work environment; 2) instilling a strong work ethic and sense of competitiveness; 3) learning how to learn (being prepared and willing to learn in the work environment); 4) educational and practical experience in communication skills (interpersonal, presentational, writing, teamwork); and 5) ideally, preparation and experience with multiple and interdisciplinary skill sets, mixing science, engineering, business, and legal/regulatory skills.
3. Improve communication with and 'listening to' youth who are the potential future workforce, perhaps through an initial symposium/meeting that would address this issue.
4. Industry must 'draw the line' on how it will drive education. For example, K-12 education may not need to be industry specific, but rather more focussed on basic skill development and activities to motivate and develop industry awareness and scientific

interest in students.

5. Communicate the value of multiple skill sets to students who may be interested in working in the industry. Combinations of scientific, engineering, business, and legal skill sets and experience. Support interdisciplinary programs that provide these broader skill sets.
6. Regarding the education system, the Bioscience Industry should decide where it wants to see the biggest change.
7. Industry needs to identify how to ‘fire up’ kids. Examples: exposure to a motivating teacher, the Sputnik Program, etc.
8. Examine how to improve ‘hands on’ student/industry interaction. Students get work ethic from mentorship, internship, hands on experiences. We need internship programs that are more of a process (not fragmented).
9. Panel members should meet with other cluster representatives to discuss core curriculum issues in K-12 to identify common interests and feed back any industry specific interests as well.
10. Closing comment: “K-12 education: we can do better.”

Attachment E

WIRED IT Industry Panel Quarterly Report
Laura Hahn
IT Industry Coordinator
July 11, 2007

Brief Summary:

The WIRED IT Industry Panel has met three times during the second quarter of 2007. Discussing the following issues:

Workforce

- Some of the IT worker shortages are for highly technical positions that require years of work experience.
- The panelists agreed that a greater emphasis is needed on strategic IT skills; such as leadership, personnel and project management. At this time these skills are more important to focus on in our region versus the traditional technology skills.

Higher Education

- There is a need for research on international best practices of education models.
 - It was suggested that we look at other countries that have made successful transformations by focusing on economics and education.
 - It was also suggested that we look at Canada or an area in Eastern Europe that have strengthened their education systems yet haven't improved their economy. Looking into a country's economic freedom index was also suggested.
- IT Internship programs were discussed:
 - The Internship interface is too complicated and inconsistent.
 - A sustainable one-stop-shop is needed.

K-12 Education

- Enhancing communication programs in Colorado was discussed. Better communication between industries is needed as well as better communication with education.
 - The IT Panel examined: "Are we creating the demand at the student level for participation in our industry?" "Why aren't kids that excited about our industry?"
 - Some responses included: Counselors and teachers aren't promoting our industry.
 - Laid-off IT people are telling their kids not to go in to IT.
 - Parents should be our biggest target.
 - Find out where kids are getting these messages?
 - It was suggested that polling be conducted to try and figure out what the current messages are; and, where they are coming from.

- **A Promising Practice:** Open World Learning (OWL)

“OWL is a voluntary after-school and summer educational program offered tuition-free to third through fifth graders in nine (9) Denver-area public schools. Each OWL program meets four (4) days a week for three (3) hours a day, and includes a snack, 30 minutes of vigorous physical exercise, 90 minutes of computer project time in which children design their own software, and 30 minutes of homework support. OWL “turns the lights on” in children’s minds and in school facilities, including school computer labs, which would otherwise sit locked and empty during non-school hours.

At the core of the OWL program is MicroWorlds Logo, a computer programming language for children developed at MIT. Students who reach the intermediate level in OWL curriculum earn donated computers for their homes – becoming technology leaders within their families.

By virtue of the neighborhoods OWL serves, the majority of students are Latino, and 80% come from low-income families. Of the 1,700 students who have participated in an OWL program since its inception in 2000, more than 90% have made dramatic gains in computer skills and have mastered introductory-level computer programming.

Schools provide their facilities to OWL at no cost and contribute \$10,000 per year; OWL raises the additional \$30,000 needed per school. In Colorado the after-tax cost to an individual or corporation contributing \$30,000 to sponsor a site for one year is \$9,000 as a result of a state education tax credit.”

(Taken from a WIRED IT Industry Panel presentation on April 12, 2007)

See www.openworldlearning.org

- **A Promising Practice:** Denver School of Science and Technology (DSST)

For the April 12, 2007 IT Panel Meeting the group visited the Denver School of Science and Technology, a public charter high school that has a “unique focus on merging academic learning and character development for its diverse student body, and provide a strong liberal arts education with an innovative science and technology focus.” (Taken from a DSST 3rd Annual Gala brochure)

See www.scienceandtech.org/

DSST was one of the ten Metro Denver WIRED JumpStart grant recipients awarded monies in early 2007. The WIRED funding supports DSST’s 11th Grade Internship Program.

- **A Promising Practice:** Colorado State University’s (CSU) Science, Technology and Engineering Internship program.

Several WIRED IT Panel members had recommended the CSU Career Services Center as a promising practice in university internships. A site visit and meeting with several respective CSU representatives provided more detail on their successful internship program.

WIRED IT Panel Recommendations:

The WIRED IT Panel is finishing up their recommendation document and will have it completed in July. Following are some of the major topics that the document will address:

Economic Vision:

The group agreed that state leadership and public officials need to have a better understanding of the significance of the IT Industry; and, how important IT is to the regional economy. IT is the “bedrock” to overall industry growth.

An Industry and an Enabling Technology

IT is both a significant key industry, as well as an enabling technology. We need to tell both stories. According to Su Hawk of Colorado Software and Internet Association (CSIA), Colorado employs 175,000 people that work in technology; and, a third of those work within Technology /Software companies.

Workforce Skills:

The panelists agreed that a greater emphasis on strategic IT skills, such as leadership, managing personnel and project management are at this time more important to focus on in our region than on the traditional technology skills.

The Perception of the IT Industry

Changing the perception of the IT Industry has consistently been mentioned in previous panel meetings. Helping educators articulate the many IT job and career opportunities, as well as making education relevant for students are two important marketing components.

Education Vision

- K-12 Policy
 - Graduation criteria
 - Technology education standards
 - Technology availability
 - Funding (nationwide, Colorado is ranked near the bottom)
- Higher Education
 - Funding
 - Technology Transfer
 - Leadership and Coordinating

Internships

The need for a portal or centralized place to obtain internship information for regional companies and interns was discussed. Posting the information on different web sites, as well as who should own and manage it was discussed.

Ongoing Research/Data

The need for consistent and competitive data on global and national Best Practices research is very important yet is not being done.

WIRED Funding

It was suggested that the panel recommend putting a very large portion of WIRED money toward STEM education since one of the WIRED goals is to be “the best STEM region in the country.”

Employer Incentives

If a Colorado company hires 10 new employees in a month there is an incentive program for the employer and the IT industry needs to get the word out about these incentives. See <http://www.metrodenver.org/NewsCenter/EDbill.icm>

Recommendation Priorities (by vote)

The WIRED IT Panel voted on their top recommendations. Following is the outcome of that voting process:

1. Strategic IT Skills Development (not pick & shovel)
2. Internships – (Communications/consider self populating portal model)
3. Perception Gap / Not enough interest; how to shift; and, create demand with students by demonstrating relevance.
4. Core Education / Skills for changing needs in the marketplace

Second Quarter Highlights:

- The WIRED Puerto Rico visit and tour of DSST
- Barbara Bauer’s (IT Panelist) presentation of “Curriki” (a web based, free curriculum program) to Gay Gilbert, U.S. Dept. of Labor
- A tour of Arapahoe/Douglas County Workforce center (AD Works) and subsequent meetings with Dawn Gardner
- Meeting with CSIA to collaboration with the Energy industry (focusing on IT in Energy)
- Meeting with CSIA’s Education Committee and non-profits working on IT and STEM education issues, (i.e., MESA, OWL and COMSTEC)

- Meeting with representatives from the University of Colorado at Denver and Health Sciences Center regarding a new IT/Business operations degree proposal.

Also, WIRED is starting to receive many IT resumes that we’re distributing to a list of industry associations and recruiting firms.

Attachment F

Aerospace Industry Panel Quarterly Report
Vicky Lea
Aerospace Industry Coordinator
June 30, 2007

1. The Aerospace Industry Panel met three times during the quarter and accomplished the following:

- **Focus Group:** 3 panel members participated in the WIRED Workforce Survey's Aerospace focus group.
- **Workforce Study review:** the panel reviewed and commented on the aerospace section of the WIRED Workforce report.
- **Industry needs and issues:** the panel developed a list of key industry needs and issues (policy, organization and student-focused) for aerospace companies in the region (list attached).
- **Job Matrix:** the panel finalized its contribution to the Aerospace Job Matrix, i.e. identification of in-demand occupations within panel companies. The Aerospace Job Matrix also includes other occupations identified as in-demand by the US DOL.
- **Difficult to fill and high criticality positions:** a list of difficult to fill positions, and positions with high criticality was developed from the panel's contribution to the Aerospace jobs matrix (attached).
- **Experience & education requirements:** data provided by the panel was collated to develop a breakdown of employee requirements in 7 job categories according to level of experience, projected numbers of new hires, minimum education requirements, employee supply source and institution supply source (breakdown attached).
- **Special skills/certification/knowledge required:** the panel developed a list of special skills, certifications and specialist knowledge required for in-demand jobs with panel companies (list attached).
- **Required and projected skill sets:** the panel developed a list of skills sets that are currently required, and are likely to be required in the next 10 years (list attached).
- **Aerospace workers estimate:** using panel company data as a reference, the panel developed a regional estimate of the number of workers required for the region's aerospace workforce pipeline (including the number of engineers), based upon experience level (results attached).
- **Asset Mapping:** the panel's asset map was completed in May. The panel's asset map data was supplemented by the Aerospace coordinator's additional research with non-panel companies.
- **Workforce System:** the panel identified training incumbent workers, retraining displaced workers, youth programs and outreach, and industry promotion as areas the workforce system should target when working with the aerospace industry.
- **Preliminary recommendations:** the panel developed a series of preliminary recommendations for WIRED funding and activity, and a suggested "HIRE Colorado" implementation framework. Both will be finalized mid-July.

Future Activity:

- June's panel meeting was the aerospace panel's final meeting under the current panel structure. Some panel members have expressed an interest in continuing their involvement with WIRED, and will be invited to join the new structure when finalized.
- The panel's 3 co-chairs have been invited to continue their role on the WIRED Leadership Council. Their participation will be confirmed (or, if necessary, replacement sought) by the next Leadership Council meeting in August.
- The Aerospace coordinator will compile a "WIRED Aerospace Panel Report" that will serve as a work product for the Aerospace Panel, and include summaries of the panel's discussions during the 6 monthly meetings, research findings, and recommendations.

2. In addition to panel activities, the aerospace industry coordinator has participated in the following WIRED, industry and education activities:

- Participated in two South Metro Denver STEM-EC meetings: briefed group on WIRED Initiative, and shared WIRED research findings with STEM-EC Resources and Market Demand working groups in preparation for July group meeting with CO Governor on STEM issues and industry participation on the Governor's P-20 Initiative.
- Attended National Space Symposium (3 days): promoted WIRED while staffing the CO Space Coalition exhibition stand, attended industry sessions, and made several excellent contacts for future WIRED research and participation.
- Met with U.S. Commercial Service Dept of Commerce to provide WIRED briefing and discuss impact of ITAR regulations on local aerospace workforce.
- Attended two Colorado School of Mines' "Introduction to Space Exploration" classes, and viewed student reports on interviews with local aerospace companies.
- Developed Metro Denver WIRED's contribution to the *Colorado in Space: Our Heritage, Our Future* exhibit and brochure at Denver International Airport (4 million passengers are expected to view the exhibit by the end of September).
- Attended two Colorado Space Coalition meetings and delivered update on WIRED activity.
- Attended Colorado Nanotechnology Alliance "Nano in Space" event.
- Attended Metro Denver EDC Annual Report to Investors and Awards Luncheon.
- Attended WIRED Energy Industry reception and Dinner at NREL.
- Attended Lunar Ventures Student Business Plan Competition final (national competition for graduate and undergraduates in business, engineering, and science to collaborate in creating business ventures related to space and associated technologies).
- Met with Arapahoe/Douglas Works! staff, and toured workforce center.
- Individual meetings with Northrop Grumman, Lockheed Martin, Intergraph, Stellar Solutions and SpaceDev to discuss WIRED research and activity.
- Delivered WIRED presentation to Metro Denver Public Affairs and Transportation Committee.
- Briefed British Consul on WIRED to establish connection with workforce development and best practice within the UK space and satellite industry.
- Meeting with University of Denver to discuss the 2008 Colorado Multicultural Career and Internship Fair.

- Participated in Grant Station webinar.
- Met with Ken Barber to discuss his volunteer, online job placement network for Veterans.
- Attended Workforce Board of Metro Denver June meeting.
- Attended Wings over the Rockies Air and Space Museum “Space Adventures” exhibit opening.

Aerospace Industry Panel Research Findings and Data

1) Needs and Issues for the Aerospace Industry in the Metro Denver WIRED region:

Policy-focused:

- More promotion needed for CO as an aerospace hub
- Future growth/development in region will be more successful if deliberate
- ITAR regulations significantly limit the ability to hire non-U.S. citizens
- Lack of connectivity between industry, education and the workforce system
- Industry fluctuations

Organization-focused:

- Larger talent pool needed (negative impact of poaching from within the industry)
- Competition for employees from other industries
- Shortage of staff with security clearances, and time/cost issues of obtaining new ones
- Lack of women and minorities within the industry, particularly locally
- Lack of knowledge retention and transfer capabilities within organizations
- Employee retention issues
- Baby boomer retirement (biggest impact is expected in 10 years)
- Lack of sufficient local experience for some positions and niche areas (principle reason for recruiting from outside region)
- Communication, leadership, team-working and business skills difficult to find

Student-focused:

- Developing and retaining student interest in STEM
- Providing positive influences on student career choice
- Internships and mentoring programs help address experience requirement, but are sometimes challenging for smaller companies
- More rigorous STEM skills education required for K-12 population
- Misleading/unbalanced information from career counselors/teachers/parents

2) **Difficult to fill positions**

- Engineering by far the largest category (58%) with Aerospace, Electronics, System, Software and Mechanical engineers the most in-demand.
(The Workforce Survey also identified Network, Electrical and Antenna Design engineers as in-demand occupations, and Technicians, Logistics Support and Assemblers as high demand trade/craft positions);
- Photogrammetry and Optics niche skills are in-demand;
- Occupations in Business Functions, Manufacturing & Production, and Analysis categories each accounted for approximately 9% of difficult to fill positions;
- Operations and Scientific occupations account for the remaining difficult-to-fill positions (15%);
- None of the occupations in the IT & Non-Engineering Software category were identified as difficult to fill (although demand in this category is historically cyclical).

3) **High criticality positions (those which are crucial to maintaining operations)**

- The majority of engineering occupations identified as difficult to fill were also defined as having high criticality.
- Difficult to fill Business Functions occupations with high criticality:
 - Contracts Specialist
 - Proposal Specialist
 - Strategic Product Manager
- Difficult to fill Manufacturing and Production occupations with high criticality:
 - Technician
 - Assembly Tech
 - Planner
 - Spacecraft Assembly and Test Technician
- Difficult to fill Analysis occupations with high criticality:
 - Business Analyst
 - Mission Analyst
 - Spacecraft Dynamic and Static Structural Analyst
 - Spacecraft Thermal Analyst
- Difficult to fill Management occupations with high criticality:
 - Mission Assurance Manager
 - Engineering Manager
 - Program Manager
 - Government Contract Administrator

4) Experience required of predicted new hires:

0-5 years experience: 42 occupations

(all in 1-10 new hire per year category)

- Engineering: 59.5%
- Business Functions: 9.5%
- IT & Software: 9.5%
- Manufacturing & Production: 9.5%
- Analysis: 7%
- Management: 2.5%
- Operations: 2.5%

6-14 years experience: 62 occupations

(48 in 1-10 new hire per year category, 14 in 11-30)

- Engineering: 55%
- Business Functions: 11.3%
- Management: 9.7%
- Analysis: 9.7%
- Manufacturing & production: 6.5%
- IT & Software: 4.6%
- Operations: 1.6%
- Science: 1.6%

15+ years experience: 31 occupations

(28 in 1-10 new hire per year category, 3 in 11-30)

- Engineering: 75%
- Management: 10%
- Analysis: 3%
- Business Functions: 3%
- Manufacturing & Production: 3%
- Operations: 3%
- Science: 3%

5) Breakdown of projected new hires

In the 1-10 new hires per year range:

- Engineering: 58%
- Business Functions: 10%
- Analysis: 9%
- Management: 7%
- IT & Software: 6%
- Manufacturing & Production: 6%
- Operations: 3%
- Scientists: 1%

In the 11-30 new hires per year range:

- Engineering: 76%
- IT & Software: 12%
- Manufacturing & Production: 12%

- The largest category of anticipated new hires is engineers with 6-14 years experience.
- Positions which fall within the 11-30 new-hires-per-year category:
 - Engineers (Aerospace, Electronics, Optics, RF, Systems, Electrical, Mechanical, Production, Software, Digital Signal Processing Design)
 - Managers: (Business, Engineering)
 - Technicians (Manufacturing and Assembly)

6) Minimum Education Requirements:

All occupation categories:

- Undergraduate degree: 73%
- HS/GED: 10%
- Graduate degree: 8%
- Associate degree: 4%
- Vocational certification: 2.5%
- Professional certification: 2.5%

Category breakdown:

Analysis:

- Undergraduate: 58%
- Graduate: 28%
- Associate: 14%

Management:

- Undergraduate: 100%

Manufacturing & Production:

- HS/GED: 100%

Business Functions:

- Undergraduate: 73%
- HS/GED: 18%
- Professional Certification: 9%

Operations:

- Undergraduate: 86%
- Graduate: 14%

Engineering:

- Undergraduate: 85.5%
- Graduate: 6.5%
- Associate: 5%
- Vocational Cert: 3%

Scientists:

- Graduate: 100%

IT & Software:

- Undergraduate: 67%
- HS/GED: 17%
- Associate: 8%
- Vocational Cert: 8%

7) **Employee Supply Source:**

All occupation categories:

- Online Advertising: 39%
- Employee Referral: 26%
- Word of Mouth: 14%
- Trade Shows/Industry Events: 6%
- Print Advertising: 6%
- Internal Promotion: 5%
- Private Agency: 4%

Category breakdown:

Analysis:

- Online Advertising: 100%

Management:

- Word of mouth: 67%
- Online advertising: 33%

Business Functions:

- Employee Referral: 45%
- Online advertising: 22%
- Internal promotion: 11%
- Word of mouth: 11%
- Print advertising: 11%

Manufacturing & Production:

- Print advertising: 50%
- Online advertising: 50%

Engineering:

- Online advertising: 33%
- Employee referral: 25%
- Word of mouth: 17%
- Trade shows/Industry events: 11%
- Private agency: 6%
- Internal promotion: 6%
- Print advertising: 2%

Operations:

- Online advertising: 44%
- Employee referral: 44%
- Word of mouth: 12%

Scientists:

- Online advertising: 100%

IT & Software:

- Online advertising: 43%
- Print advertising: 28.5%
- Employee referral: 28.5%

8) **Institution employee source:**

- From within the Metro Denver Region: 43%
- University of Colorado: 53%
- Colorado State University: 16%
- Metro State College of Denver: 16%
- University of Northern Colorado: 5%
- Red Rocks Community College: 5%
- Colorado School of Mines: 5%

- From outside Metro Denver Region: 57%
- Wisconsin, Ohio, California, Illinois, Louisiana, Kansas, Indiana, New York, Arizona, Virginia, Montana, Washington DC, Oklahoma, Minnesota, Wyoming.

9) Outsourcing:

- **No occupations were identified as being outsourced**

10) Special Skills/Certification/Knowledge Required:

- | | |
|-----------------------------------|-------------------------------------|
| - Earned Value Analysis | - IDL, C/C++, Java, Visual Studio, |
| - Remote sensing | UNIX, LINUX, Windows, |
| - Satellite operations | HTML, Adobe Photoshop, Adobe |
| - Image processing | Illustrator, QuarkXpress, |
| - Security clearance | FrameMaker, Adobe Acrobat, |
| - Digital signal processing | ENVI |
| - Board design | - Math/scientific programming |
| - High reliability | languages (Matlab, Mathematica, |
| manufacturing/soldering | ArcGIS, ERDAS) |
| - Aerospace electronics enclosure | - Object oriented and software |
| packaging design | design skills |
| - Geospatial software | - Multispectral/hypersectral theory |
| - Optical engineering | - MSI/HSI-specific algorithm |
| - Soldering | development/validation |
| - Image science | |

11) Required and Projected Skill-Sets:

- | | |
|------------------------------------|----------------------------|
| - Active listening | - Persuasion |
| - Complex problem solving | - Programming |
| - Critical thinking | - Quality control analysis |
| - Instructing | - Team-building |
| - Judgment and decision-making | - Technology design |
| - Leadership | - Time management |
| - Learning strategies | - Troubleshooting |
| - Management of financial | - Reading Comprehension |
| resources | - Science |
| - Management of material resources | - Service orientation |
| - Management of personnel | - Social perceptiveness |
| resources | - Speaking |
| - Mathematics | - Systems analysis |
| - Monitoring | - Systems evaluation |
| - Negotiation | |

12) Estimate of Worker Experience Levels and Number of Engineers within the WIRED Aerospace sector

Based on the data provided by mainly panel members (which accounted for 11,252 of the region's 18,000 estimated workers, or 62.5%), the following regional estimate was calculated:

Panel Sample		
<u>Years of Experience</u>	<u>All Aerospace Workers</u>	<u>Engineers</u>
0-5 Years	2,074	1,625
6-14 Years	2,590	2,029
15-24 Years	3,448	2,702
25+ Years	3,140	2,460
Total	11,252	8,816

WIRED Regional Estimate		
<u>Years of Experience</u>	<u>All Aerospace Workers</u>	<u>Engineers</u>
0-5 Years	3,221	2,198
6-14 Years	4,344	2,906
15-24 Years	5,722	3,839
25+ Years	4,713	3,247
Total	18,000	12,190

- Number of Engineers identified by panel averaged 78.4% of aerospace workforce.
- Because the number of engineers from the region's 4 Prime companies is accounted for in the panel sample, the estimated percentage of region's remaining engineers is calculated based on the average percentage of the panel sample's smaller companies (50%), as smaller companies account for the remainder of the region's uncounted aerospace companies. Percentage of engineers in the combined regional estimate is therefore 67.7%.
- Using this data, we estimate the front end of the workforce pipeline requires approx. 500 new workers each year.

Attachment G

Energy Industry Panel Quarterly Report

Mary Jeffreys

Energy Industry Coordinator

June 30, 2007

The Energy Industry Panel met twice during the quarter to discuss:

- **Jobs:** The energy jobs matrix was completed on May 30, 2007. It provides an inventory of the high-demand jobs across the energy industry (please see attached jobs matrix). High-demand jobs are defined as those that are difficult/critical to fill and those that are filled frequently due to expansion and/or turnover.
- **Asset Mapping:** The energy asset map was completed on June 12, 2007, and submitted to the Graduate School of Public Affairs for inclusion in the overall asset map. (please see attached energy asset map). Sources of information for the asset map included panel meetings and one-on-one visits with industry businesses, as well as extensive Internet research..
- **Business Survey:** The business survey was conducted and the energy panel was given a draft copy of the report (aka Workforce Study) to review. Their questions and recommendations were shared with the consultant conducting the survey work, and were incorporated in the final report as appropriate. The final results of the business survey were published and released to the public on June 25, 2007, and can be found on the WIRED website at <http://www.metrodenver.org/documents/newsCenter/WIREDWorkforceStudy.pdf>.
- **Gap Analysis:** The gaps and issue analysis work will be completed over the summer.
- **Polling.** Research remains to be done on the perceptions of potential workers about the energy and other WIRED industries. There are two polling efforts to be conducted – K-12 students, parents, teachers and counselors; and job seeker customers of the workforce system. WIRED is currently drafting the RFP to engage a polling firm. The work should be done in late summer or early fall.
- **Recommendations:** The energy panel's recommendations are still preliminary. They fall into two general categories – outreach to attract potential workers to the industry and sustainability through funding promising practices. The energy industry coordinator will convene the panel one more time, in July or August, to streamline and finalize the panel's recommendations.

In addition to panel activities, the energy industry coordinator has been active in the energy industry in the nine-county metro region to learn as much as possible about industry issues and make connections with industry leaders:

- The energy coordinator continues to participate in the combined quarterly meetings for the Center for the Advancement of Process Technology (CAPT); Rockies Alliance for Process Technology (RAPT); and Rockies Energy Workforce Collaboration (REWC).

She continues to serve on the steering committee for REWC, and has recently been asked to head up REWC's outreach committee. Please see attached draft communications plan for REWC written by the industry coordinator.

- The energy coordinator was accepted into the Energy Execs program at NREL, a six-month immersion program on renewable energy that runs from May through October. One Friday a month is dedicated to a specific topic. May's session covered big picture energy issues and opportunities. The June session covered utilities, and included a site visit to the Ponnequin Wind Farm in Weld County.
- Hosted the WIRED Generation I team from Puerto Rico.
- The US Department of Labor's WIRED Institute on Alternative Energies was held at NREL in mid-April. The Metro Denver WIRED Initiative hosted a reception and dinner for participants.
- Participated in planning with the National Network of Sector Partners for a pre-conference session on renewable energy in advance of the NNSP November 2007 conference.
- Made a presentation to the Denver Workforce Investment Board on energy jobs. Recruited a business to talk about the urgent need for installation and repair techs in heating, cooling, ventilating and air conditioning. Distributed copies of the draft jobs matrix and the Rocky Mountain Oil and Gas Career Toolkit.
- Toured Western Area Power Authority facility in Larimer County to better understand utilities and "the grid." Invited energy business services representatives from workforce centers throughout the region, and was joined by Denver and Adams County.
- Met with unsuccessful JumpStart grant applicants to discuss ways to improve proposals for the next round of funding.
- Attended meetings of the WIRED Leadership Council (fka The High Skills Leadership Council).
- Attended a one-day Department of Defense conference in Washington D.C. on energy conservation on federal sites.
- Extensive tour of Coors Brewing company to understand process technology needs of this and similar companies (e.g. pipeline, refinery, etc.)
- Attended presentation at Alameda High School in Jefferson County on Red Rocks Process Technology program. The program was piloted last year with five students, and received Jumpstart funding to expand the program to 200 students over 18 months. There were three graduates of the program in attendance, each of whom had an internship (e.g. on an offshore rig with Shell, a summer internship at Xcel Energy, etc.).
- Attended presentation by Lakewood High School seniors on renewable energy technologies.
- Member of the planning committee for NREL's 20th Annual Industry Growth Forum scheduled for November 2007.

Attachment H

June 25, 2007

WIRED Initiative Workforce Study Reveals Gaps in Metro Denver's Workforce

Aging workforce, employee training and educational needs hinder Metro Denver's fast-growing industries

The [Workforce Innovation in Regional Economic Development \(WIRED\) Initiative](#) – a partnership among workforce development, economic development, education, and industry – today revealed its first Workforce Study, designed to understand the human resource needs of Metro Denver's fastest-growing industries.



The study not only found that regional employers face a growing need for skilled workers, but also a shrinking pool of qualified candidates. Further, the research discovered a need for technical workers with a broader-than-expected range of skills and a growing number of skilled employees planning to retire. Combined, the information points to an increased urgency for expanding training and educational programs to meet Metro Denver's workforce needs and equip the region's companies for competition in the global economy.

"We expected to hear loud and clear that Metro Denver employers in growing industries absolutely need highly skilled engineers, technicians, and scientists," said Patty Silverstein, president of Development Research Partners and author of the study commissioned by the Metro Denver WIRED Initiative. "What we didn't expect was the call for these technical workers to also have solid writing, marketing, leadership, or sales skills. Metro Denver's growing economy now demands well-rounded specialists."

More than 200 companies were surveyed in industries under the WIRED focus – aerospace, bioscience, energy, and information technology. These WIRED industries represent 6,500 businesses and employ 106,000 workers in the region – including Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld Counties. In addition, the team conducted four focus groups with 25 industry leaders.

Launched in May 2006 with a \$15 million, four-year grant from the U.S. Department of Labor, the Metro Denver WIRED Initiative seeks to develop an educated, skilled workforce to fill high-paying jobs in the region's growing industries. Metro Denver is one of 13 initial recipients of the WIRED funds to develop and implement a "transformational" approach to regional economic development.

Attachment I

Rocky Mountain News

URL: http://www.rockymountainnews.com/drmn/other_business/article/0,2777,DRMN_23916_5602785,00.html

Survey: Technical firms are short of qualified workers

Necessary skills have been eluding students raised in state's schools

By James Paton, Rocky Mountain News
June 26, 2007

SpaceDev, a maker of micro satellites, rocket motors and other sophisticated products, hopes to hire 20 additional employees in the next year, but finding qualified candidates won't be easy.

Companies in the aerospace sector, like those in bioscience, energy and technology, report an increasing need for skilled workers.

The challenge, according to a study released Monday, is coping with a decreasing pool of people with math, science, engineering and technical backgrounds.

The survey is part of a program aimed at keeping the Denver region economically competitive by identifying the needs of employers in key sectors and training Coloradans to fill the jobs.

The Workforce Innovation in Regional Economic Development initiative is being financed with a \$15 million grant from the U.S. Department of Labor.

State officials also worry about what has been known as the "Colorado paradox." While the state attracts a lot of people from out of state with college degrees, it fares poorly in enrolling its own high school grads at universities.

Businesses in Colorado's fast-growing industries must often look beyond the state's borders to find workers who fit the bill, according to the WIRED research, which is being carried out under the roof of the Metro Denver Economic Development Corp.

"Attracting the best and brightest from out of state is always a good strategy," WIRED Executive Director Ledy Garcia-Eckstein said in a telephone interview. "But it shouldn't be the only strategy. How fair is that to people who live here and have grown up here? We want our people to have a chance at these good jobs."

Companies seeking to relocate or to expand also want to know that the state has a steady supply of available workers with the right skills, she said. Employers in some cases must ramp up quickly. If they fail to find those conditions, they might go elsewhere.

At the moment, "the pipeline from the school systems to the work force is not turning out the number and quality of students to meet industry demand now and in the future," according to the report, which was prepared by Development Research Partners.

Scott Tibbitts, managing director of SpaceDev, noted that Colorado is one of the hottest aerospace hubs in the nation.

"If we had the ability to draw more talent in the area, I would expect we'd see an even greater growth rate," said Tibbitts, whose company employs 150 in Louisville but has its headquarters in California. "We could be substantially more successful if we had a large supply of employees."

Many of the aerospace workers in Colorado come from Southern California and the East Coast, he said.

SpaceDev has 50 people in North Carolina and San Diego.

The other problem is the work force is aging. That makes training Colorado's youth even more important, the report states.

A number of companies, including Lockheed Martin and Xcel Energy, are taking steps to address the issue.

Xcel has a program allowing students to shadow workers, said spokesman Mark Stutz.

The more than 200 companies polled in those four industries said they also want technical workers who have strong writing, marketing or sales skills, an unexpected finding, the authors said.

Earlier this year, the WIRED effort awarded grants of \$3.7 million to finance existing programs. In late 2007, the group hopes to grant \$4 million to seed new and innovative solutions, Garcia-Eckstein said. Ideally, those funds would be matched by foundations and companies, she said.

"This isn't just about future jobs, in 10 or 15 years," she said. "Some of these jobs are open now, and we need to begin to get workers out into these industries."

WIRED for the future

A few of the findings from the WIRED survey of aerospace, energy, technology and bioscience companies in the Denver region:

- **More than two-thirds** (67.6 percent) of the companies' current jobs require a bachelor's degree or higher.
- **Nearly 71 percent** surveyed expect they'll need more employees in the next three years.
- **High demand:** Scientists, sales and marketing, operations and information technology.
- **The Denver area's aerospace** industry employs nearly 18,000 in 100-plus companies.
- **The region's bioscience** sector has more than 14,000 people and almost 500 companies.
- **The energy industry** in the Denver area employs about 26,600 people and has about 2,200 companies.

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Versatile techies in demand

A Metro Denver Wired Initiative study finds more high-tech industries are hard-pressed to find employees with a diverse set of skills.

By Kimberly S. Johnson
Denver Post Staff Writer

Article Last Updated: 06/25/2007 11:43:33 PM MDT

Employees with a combination of technical, business and marketing skills are in high demand in high-tech industries, according to a workforce study released Monday.

Results from the Metro Denver Wired Initiative study found that companies in the aerospace, bioscience, energy and software industry have difficulty finding employees that have a well-rounded set of skills.

"Traditionally, there's more of a separation of skills, but now we're seeing a convergence of the two," said Greg McBoat, research economist for Development Research Partners, authors of the study. "We were expecting a higher level of demand for a higher set of skills."

Those candidates, labeled "techno-functional" are getting harder and harder to find, said Andrew Albarelle, president of Remy Corp., a Denver-based high-tech staffing and executive recruitment firm.

"Employers are looking for more versatility in a candidate, and they can hire one person instead of two," he said. "Companies have always wanted these employees, but the demand for that need has grown."

Albarelle said he must often look outside Colorado to find these "techno-functional" candidates. The Wired study found that although entry-level workers are almost always hired locally, higher-level workers are most commonly sought from California, Texas, Wyoming and New York.

"There's hardly anyone in Colorado right now; it's a tight market," Albarelle said, adding Boston to the list. "We're going to be running out of people very quickly. We have to cross-train."

Retiring baby boomers also will put a pinch on the highly skilled workforce. The study - which surveyed 203 businesses - found that "the majority of wired businesses expect the biggest impact to occur after 2017."

But nearly 19 percent of companies surveyed said they're going to feel the effects of retiring baby boomers over the next three years, McBoat said.

The goal of Metro Denver Wired Initiative is to expand the local pool of skilled workers in the region, which also includes Larimer and Weld counties, under a three-year, \$15 million U.S. Wired grant.

According to Ledy Garcia-Eckstein, executive director of the Wired Initiative, the results of the study will be used to come up with ways to address workforce shortages. The initiative is expected to accept proposals from schools and businesses for a piece of a \$4 million grant designed to help bridge the workforce gaps, she said.

EDC study says tech workers' base is shrinking

The Denver Business Journal - 2:57 PM MDT Monday, June 25, 2007

A work force study issued by the **Metro Denver Economic Development Corp.** has found the region's pool of technically skilled workers is shrinking at a time when the needs of the fastest-growing companies is increasing demand.

The overall conclusion of the 200-company survey wasn't a surprise. But companies intending to hire engineers, technicians and researchers report also seeking job candidates with good communications and sales skills, revealing that industry wants workers with broader abilities than expected.

"Metro Denver's growing economy now demands well-rounded specialists," Patty Silverstein said in a news release. She's president of **Development Research Partners**, which conducted the study for the local EDC.

The study found 71 percent of respondent companies expected to add employees in the next three years. According to the study, most respondents said they worried about the impact of retiring workers, a trend that was most pronounced in aerospace, where 20 percent of companies projected replacing significant numbers of retirees in the next two years.

A \$15 million federal Workforce Innovation in Regional Economic Development initiative grant from the U.S. Department of Labor paid for the study.

Local economic developers won the grant 13 months ago under a program intended to help invent new approaches in work force development, specifically in aerospace, bioscience, energy and information systems. The Metro Denver Wired Initiative -- covering nine counties around the metro region -- was one of 13 nationally to receive funding.

The study findings will be used in grant applications to fund partnership development between industry, government and education institutions.