WASHINGTON STATE
WORKFORCE TRAINING AND EDUCATION COORDINATING BOARD
MEETING NO. 132
JANUARY 22, 2009

IDENTIFYING STRATEGIC INDUSTRY CLUSTERS FOR WORKFORCE DEVELOPMENT

Purpose

This item requests the Board's action on identifying *strategic* industry clusters[1] for workforce development. Identifying strategic clusters helps assure that workforce investments are prioritized for clusters that have the best outlook for employment and wages.

Background

In 2007, the Legislature passed Substitute House Bill 1091, directing the Economic Development Commission and the Workforce Board to jointly convene a working group to:

1. Specify the process and criteria for identification of industry clusters.

2. Establish criteria for identifying strategic clusters which are important to economic prosperity in the state, considering cluster size, growth rate, and wage levels among other factors. (SHB 1091 Sec.2(2) and RCW 43.330.280(2))

The Workforce Training and Education Coordinating Board and the Economic Development Commission initially convened the Cluster Workgroup in August 2007 and work was completed in April 2008. Members included representatives from:

- Office of Financial Management
- Employment Security Department
- State Board for Community and Technical Colleges
- Department of Community, Trade and Economic Development
- Higher Education Coordinating Board
- Washington Technology Center

Most of the representatives were researchers or other technical staff. The group recommended a process beginning with a quantitative analysis to identify clusters in each Workforce Development Area of the state. The analysis would also include data for each cluster on a series of characteristics that might be considered to be of strategic significance. Through a competitive process the Workforce Board contracted with research economists from Seattle University and University of Washington to conduct this quantitative analysis.

The next step is for policy leaders to identify which clusters are strategic given their particular policy goals. The workgroup decided that different policy bodies may have different goals and that therefore, the strategic clusters may vary somewhat from one body to another.

[1] **Industry Cluster**: A geographic concentration of interdependent competitive firms that do business with each other, including firms that sell inside and outside of the geographic region as well as support firms that supply new materials, components, business services, and other institutions including government and education.

Table 8
Workforce Development Area 12 - Spokane

	Indicies and Rankings				Variables ("**Workforce**" variables in **bold**)											
Cluster or Industry	**Workforce Index Score**	**Workforce Rank**	All Variables Index Score	All Variables Rank	Location Coeff.	**2007 Empl.**	Output ($ millions)	Earnings/ Worker	**Percent of Occs. in Middle Wage Range**	**Percent of Occs. in High Wage Range**	Change in Establishments 2001-07	Ehange in Empl. 2001-07	Change in Wages 2001-07	Projected Empl. Increase 2006-16	R & D Occ'n. as % Empl.	Exports as % Output
Other Ambulatory Health Services	6.46	1	6.28	4	2.86	3,783	587	58,542	69%	30%	31.8%	32.3%	70.5%	25.4%	1%	49%
High Tech Manufacturing	6.40	2	6.29	3	5.42	2,631	2,366	88,033	45%	42%	16.7%	-42.7%	-17.2%	-18.6%	30%	54%
Health Care except Other Ambulatory Health Services	6.30	3	6.52	1	1.40	24,368	2,085	55,104	42%	33%	-4.7%	46.7%	119.2%	22.4%	1%	25%
Construction	6.24	4	6.06	5	1.17	16,539	2,056	48,790	70%	24%	14.5%	30.4%	55.4%	8.1%	2%	14%
Misc. Prof. & Technical Services	6.14	5	6.47	2	1.74	1,106	350	12,772	25%	13%	202.4%	255.0%	318.7%	42.1%	2%	70%
Sheet Metal & Metal Bldgs	6.04	6	5.75	6	5.04	935	195	52,593	77%	14%	0.0%	25.3%	73.9%	20.5%	0%	99%
Federal Electric Power Services	6.02	7	5.59	7	10.86	233	149	123,670	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	29%
Wood Kitchen Cabinet mfg.	5.28	8	4.72	10	4.41	1,042	139	46,382	92%	5%	-25.2%	91.6%	175.8%	-7.5%	0%	0%
Metal & Machinery Manufacturing	5.19	9	5.21	8	30.32	1,667	1,018	70,446	63%	9%	-45.5%	-25.9%	-18.2%	*n/a*	*n/a*	97%
Other Concrete Products Mfg.	4.95	10	4.45	13	3.76	355	58	44,107	88%	10%	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*
Colleges & Universities	4.94	11	4.52	12	1.68	4,188	240	30,360	*n/a*	*n/a*	-6.7%	17.1%	43.6%	*n/a*	*n/a*	41%
Business Support Services	4.89	12	5.09	9	2.60	4,418	227	21,499	49%	9%	35.7%	149.3%	184.4%	17.8%	1%	10%
Travel Trailer & Camper Mfg.	4.37	13	4.59	11	4.18	263	52	43,015	47%	11%	-25.0%	32.7%	73.0%	*n/a*	*n/a*	*74%*

Source: Workforce Board analysis of Sommers et al's Industry Cluster Analysis for Washington State Workforce Development Areas, November 2008.
Missing values were assigned the median Z score for the given variable. Z scores convert a measurement into a standardized unit of measure. They enable us to compare variables with different units of measure. (Not shown on this sheet)
Location quotient measures the relative concentration of employment in this cluster in this region compared to the US as a whole. The higher the number, the more specialized the given area's employment is for this cluster.

Explanation: Coloring indicates three tiers of clusters, as ranked by the Workforce Index. Dark green is the top tier, light green middle, and white lowest tier.

Table 5
Workforce Development Area 5 - Seattle-King County

	Indices and Rankings				Variables ("**Workforce**" variables in **bold**)											
Cluster or Industry	**Workforce Index Score**	**Workforce Rank**	All Variables Index Score	All Variables Rank	Location Quotient	**2007 Empl.**	Output ($ millions)	Earnings/ Worker	**Percent of Occs. in Middle Wage Range**	**Percent of Occs. in High Wage Range**	Change in Establishments 2001-07	Change in Empl. 2001-07	Change in Wages 2001-07	Projected Empl. Increase 2006-16	R & D Occs. as % Empl.	Exports as % Output
Software/Computer Services	11.17	1	9.6	1	15.4	58,938	29,353	140,922	17%	82%	2.9%	21.5%	-5.0%	46.8%	70%	74%
Aerospace	9.66	2	8.4	2	14.5	42,877	22,651	126,261	41%	51%	1.4%	-17.1%	15.1%	10.6%	39%	81%
Custom Computer Programming	7.83	3	6.8	3	1.5	13,870	1,380	92,870	23%	77%	-1.7%	2.5%	37.4%	30.2%	71%	40%
Other Ambulatory Health Care	7.42	4	6.7	4	1.5	14,940	2,542	53,067	75%	20%	22.1%	25.7%	69.1%	13.6%	4%	50%
Scientific Research & Development	7.36	5	6.5	6	1.5	18,247	2,119	67,030	57%	40%	*n/a*	*n/a*	*n/a*	22.5%	50%	50%
Water Transportation	7.07	6	6.6	5	4.3	3,118	1,698	83,372	50%	45%	-2.8%	19.4%	41.8%	7.5%	2%	88%
Telecommunications	6.88	7	5.9	8	1.7	16,936	8,613	113,709	46%	52%	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	32%
Nonstore retailers	6.74	8	6.3	7	3.4	19,858	4,657	49,228	64%	9%	5.1%	-13.4%	42.9%	22.7%	4%	78%
Travel Arrangement	6.33	9	5.8	9	2.7	5,708	1,108	74,917	79%	16%	-29.5%	8.5%	77.6%	9.4%	4%	67%
Depository Credit	6.24	10	5.7	10	1.5	18,817	8,028	103,827	48%	30%	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	38%
Overhead Cranes & Hoist Mfg.	6.13	11	5.6	11	18.9	3,029	960	70,358	80%	14%	-28.2%	-1.8%	39.9%	16.9%	12%	42%
Other Construction	5.92	12	5.5	12	1.1	2,463	19,261	49,699	78%	16%	-16.8%	12.1%	46.3%	1.0%	4%	49%
Spectator Sports	5.09	13	5.0	13	2.5	11,152	905	48,511	42%	5%	-13.9%	13.0%	56.8%	11.7%	1%	62%
Electromedical Apparatus	5.08	14	4.7	14	2.7	1,681	710	105,183	66%	29%	-9.3%	-23.5%	0.0%	-14.4%	21%	55%
Fisheries	4.43	15	4.4	16	10.6	9,119	1,729	64,062	36%	5%	-32.4%	-11.8%	26.3%	5.3%	0%	72%
Heavy Truck Mfg.	4.33	16	4.4	15	3.3	1,278	1,253	89,424	71%	2%	0.0%	-16.1%	19.8%	-4.4%	2%	41%
Air Transportation	4.31	17	4.3	17	2.0	10,142	2,468	79,844	44%	10%	-11.2%	-27.9%	-9.7%	8.4%	4%	80%
Performing Arts	3.92	18	3.8	18	1.7	10,789	242	10,113	32%	4%	-13.1%	-6.0%	28.2%	6.9%	1%	62%
Sporting Goods and Toy Mfg.	3.89	19	3.7	19	4.7	3,436	13	83,197	64%	19%	-12.2%	-24.4%	-5.4%	0.5%	1%	20%

Source: Workforce Board analysis of Sommers et al's Industry Cluster Analysis for Washington State Workforce Development Areas, November 2008.
Missing values were assigned the median Z score for the given variable. Z scores convert a measurement into a standardized unit of measure. They enable us to compare variables with different units of measure. (Not shown on this sheet)
WDA 5 Seattle-King County's top tier was extended to a total of 7 clusters in recognition that Software/Computer Services and Custom Computer Programming are component parts of larger clusters.
Location quotient measures the relative concentration of employment in this cluster in this region compared to the US as a whole. The higher the number, the more specialized the given area's employment is for this cluster.

Explanation: Coloring indicates three tiers of clusters, as ranked by the Workforce Index. Dark green is the top tier, light green middle, and white lowest tier.

Table 6
Workforce Development Area 7 - Southwest

	Indicies and Rankings				Variables ("**Workforce**" variables in **bold**)											
Cluster or Industry	**Workforce Index Score**	**Workforce Rank**	All Variables Index Score	All Variables Rank	Location Quotient	**2007 Empl.**	Output ($ millions)	Earnings/ Worker	**Percent of Occs. in Middle Wage Range**	**Percent of Occs. in High Wage Range**	Change in Establishments 2001-07	Change in Empl. 2001-07	Change in Wages 2001-07	Projected Empl. Increase 2006-16	R&D Occs.. as % Empl.	Exports as % Output
Forest Products	8.23	1	8.43	2	15.86	7,293	3,611	83,777	78%	14%	-13.9%	-20.7%	19.1%	-15.9%	2%	88%
Construction	8.08	2	8.50	1	1.75	11,176	1,339	52,452	77%	20%	-5.6%	26.9%	73.0%	6.5%	1%	19%
Other Ambulatory Health Care	7.96	3	8.40	3	2.13	2,399	437	73,528	56%	32%	38.2%	38.2%	80.2%	16.8%	0%	47%
Federal Electrical Utilities	7.84	4	7.49	5	71.65	1,574	982	120,783	*n/a*	*n/a*	*n/a*	*n/a*	*14.1%*	*n/a*	*n/a*	71%
Industrial Machinery	7.58	5	8.16	4	17.17	1,077	296	69,808	64%	31%	12.8%	27.6%	57.7%	1.5%	14%	23%
Semiconductors	7.12	6	7.40	6	5.55	1,727	1,339	66,315	*n/a*	*n/a*	-6.3%	-26.1%	-14.2%	2.1%	19%	80%
Auto Rental	6.59	7	6.72	8	2.52	1,111	135	16,418	15%	23%	59.3%	74.1%	89.7%	17.1%	7%	40%
Pump & Pumping Eq Mfg.	6.44	8	6.90	7	4.02	141	83	81,021	*n/a*	*n/a*	-33.3%	-27.8%	-10.1%	21.8%	9%	97%
Air & Gas Compression Equip. Mfg.	6.08	9	6.67	9	6.53	219	78	44,502	72%	26%	-33.3%	-27.8%	-10.1%	21.8%	9%	95%
Personal Care	6.03	10	5.67	15	1.61	2,346	102	14,552	10%	4%	23.5%	46.1%	69.5%	33.6%	0%	33%
Gambling	5.93	11	5.77	13	1.85	2,430	180	24,736	54%	2%	-1.0%	-2.6%	36.2%	31.2%	0%	46%
Other Commercial Industry Machinery	5.83	12	6.47	10	5.29	363	51	63,129	68%	31%	-40.0%	-6.2%	15.7%	*n/a*	*n/a*	64%
Lighting Fixture Mfg.	5.75	13	6.20	11	4.73	284	71	60,947	*n/a*	*n/a*	-34.6%	-20.5%	-3.5%	*n/a*	*n/a*	100%
Food Products	5.68	14	5.99	12	5.59	1,493	518	43,352	*n/a*	*n/a*	-25.4%	-16.4%	-1.3%	5.1%	2%	76%
Poultry Processing	5.40	15	5.76	14	3.46	1,039	236	34,688	*n/a*	*n/a*	-42.2%	-12.6%	14.1%	*n/a*	*n/a*	59%

Source: Workforce Board analysis of Sommers et al's Industry Cluster Analysis for Washington State Workforce Development Areas, November 2008.
Missing values were assigned the median Z score for the given variable. Z scores convert a measurement into a standardized unit of measure. They enable us to compare variables with different units of measure. (Not shown on this sheet)
Location quotient measures the relative concentration of employment in this cluster in this region compared to the US as a whole. The higher the number, the more specialized the given area's employment is for this cluster.

Explanation: Coloring indicates three tiers of clusters, as ranked by the Workforce Index. Dark green is the top tier, light green middle, and white lowest tier.

Table 10
Workforce Development Area 10 - Eastern

	Indicies and Rankings				Variables ("**Workforce**" variables in **bold**)											
Cluster or Industry	**Workforce Index Score**	**Workforce Rank**	All Variables Index Score	All Variables Rank	Location Coeff.	**2007 Empl.**	Output ($ millions)	Earnings/ Worker	**Percent of Occs. in Middle Wage Range**	**Percent of Occs. in High Wage Range**	Change in Establishments 2001-07	Ehange in Empl. 2001-07	Change in Wages 2001-07	Projected Empl. Increase 2006-16	R & D Occ'n. as % Empl.	Exports as % Output
Mining	8.51	1	8.71	1	22.04	266	89	92,917	9%	70%	-28.6%	162.4%	221.6%	6.3%	10%	89%
Forest Products	7.33	2	7.13	2	16.46	3,366	1,243	61,577	77%	12%	-19.7%	-12.0%	4.3%	-6.9%	1%	83%
Heating Equipment Except Warm Air Furnac	6.68	3	6.58	3	41.06	317	79	51,196	*n/a*	*n/a*	0.0%	5.3%	29.2%	-7.1%	3%	100%
Agriculture & Food Products	6.16	4	5.49	6	9.58	8,907	1,008	17,471	8%	1%	-17.0%	-11.8%	9.4%	2.0%	0%	84%
Agricultural & Forestry Support Services	5.80	5	5.91	4	3.7	812	29	30,379	39%	3%	53.3%	50.4%	93.4%	12.8%	0%	13%
Colleges & Universities	5.62	6	5.36	7	2.25	1,611	94	31,422	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	54%
Depository Credit Organizations	5.48	7	5.65	5	1.54	1,063	280	21,181	75.0%	22.0%	7.5%	-2.0%	22.3%	1.5%	0%	0%
Cattle Ranching	4.64	8	4.50	8	3.32	678	92	7,911	*n/a*	*n/a*	-0.4%	-51.6%	-38.1%	2.0%	0%	48%

Source: Workforce Board analysis of Sommers et al's Industry Cluster Analysis for Washington State Workforce Development Areas, November 2008.
Missing values were assigned the median Z score for the given variable. Z scores convert a measurement into a standardized unit of measure. They enable us to compare variables with different units of measure. (Not shown on this sheet)
Location quotient measures the relative concentration of employment in this cluster in this region compared to the US as a whole. The higher the number, the more specialized the given area's employment is for this cluster.

Explanation: Coloring indicates three tiers of clusters, as ranked by the Workforce Index. Dark green is the top tier, light green middle, and white lowest tier.

After this step, local workforce and economic development leaders, business and labor will review the clusters and strategic clusters identified by the state for their region. Local partners may identify clusters that are missing from the state analysis and will contribute their own view of which clusters are strategic for their area. Thus, when the state directs grants to strategic clusters, the clusters on the state list will not be the only ones considered. Locally identified clusters as evidenced by hard data will also be targeted.

Once strategic clusters are identified by the Board, the list will be posted to the Board's website, as indicated by *High Skills, High Wages*.

The purpose of the Board's meeting on January 22 is to discuss the criteria that the Board finds best to identify strategic clusters for workforce development. A detailed analysis follows this face sheet.

At the March 2009 meeting the Board may take action on approving criteria. In between the January and March meetings Board staff will have additional discussions with the Department of Community, Trade and Economic Development and the Economic Development Commission about identifying strategic clusters.

No Board Action Requested: For Discussion Only

Strategic Clusters for Workforce - Recommended Methodology

Overall, the cluster analysis looked at 12 characteristics (variables) of clusters. They are listed in the box on the right.

Strategic Clusters for Workforce: Staff suggests workforce clusters be identified by creating an index of all 12 of the variables and weighing three workforce variables to count twice, as shown in the second column of the box.

Cluster Analysis Variables	Workforce Index
Location Quotient	✓
Employment	**Count twice**
Output	✓
Earnings/ Worker	✓
Percent of Occs. in Middle Wage Range	**Count twice**
Percent of Occs. in High Wage Range	**Count twice**
Change in Establishments 2001-07	✓
Change in Employment 2001-07	✓
Change in Wages 2001-07	✓
Projected Empl. Increase 2006-16	✓
R & D Occupations as a Percent of Total Employment	✓
Exports as a Percent of Output	✓

Of all the characteristics examined in the cluster study, **employment** and the **percent of middle- and high-wage occupations (jobs)** are the variables that offer the most direct indicators of a cluster's potential to offer good and plentiful employment opportunities to the state's workforce. We tested this by creating a composite index for each of four Workforce Development Areas (WDAs) – King, Spokane, Eastern and Southwest***. Tables 1-4 summarize the results, tables 5-8 show details.***

Alternatives: For comparison, the ***tables 1-4 and 5-8*** show how each cluster ranks overall when all variables are included equally.

There are a number of alternative combinations of workforce-related variables that could be used to identify strategic workforce clusters. The Board may wish to deliberate on other options.

Issues for Discussion

Discussion questions might include:

- Should output, research and development, or exports factor into prioritizing clusters for workforce-related initiatives?
- Should there be a minimum employment threshold for a cluster to be prioritized for workforce-related initiatives?
- Should workforce and economic development have exactly the same prioritization of strategic clusters?

Tables 1-4, Comparison of Rankings – All Variables and Workforce Industry Cluster Analysis for Washington State Workforce Development Areas, 2008

TABLE 1 Workforce Development Area 5 - Seattle-King Cluster/Core Industry	All Variables Rankings	**Workforce Rankings**
Software/Computer Services	1	**1**
Aerospace	2	**2**
Custom Computer Programming	3	**3**
Other Ambulatory Health Care	4	**4**
Scientific Research & Development	6	**5**
Water Transportation	5	**6**
Telecommunications	8	**7**
Nonstore retailers	7	**8**
Travel Arrangement	9	**9**
Depository Credit	10	**10**
Overhead Cranes & Hoist Mfg.	11	**11**
Other Construction	12	**12**
Spectator Sports	13	**13**
Electromedical Apparatus	14	**14**
Fisheries	16	**15**
Heavy Truck Mfg.	15	**16**
Air Transportation	17	**17**
Performing Arts	18	**18**
Sporting Goods and Toy Mfg.	19	**19**

TABLE 2 Workforce Development Area 7 - Southwest Cluster/Core Industry	All Variables Rankings	**Workforce Rankings**
Forest Products	2	**1**
Construction	1	**2**
Other Ambulatory Health Care	3	**3**
Federal Electrical Utilities	5	**4**
Industrial Machinery	4	**5**
Semiconductors	6	**6**
Auto Rental	8	**7**
Pump & Pumping Eq Mfg.	7	**8**
Air & Gas Compression Equip. Mfg.	9	**9**
Personal Care	15	**10**
Gambling	13	**11**
Other Commercial Industry Machine Mfg.	10	**12**
Lighting Fixture Mfg.	11	**13**
Food Products	12	**14**
Poultry Processing	14	**15**

TABLE 3 Workforce Development Area 10 Eastern Cluster/Core Industry	All Variables Rankings	**Workforce Rankings**
Mining	1	**1**
Forest Products	2	**2**
Heating Equipment Mfg.	3	**3**
Agriculture & Food Products	6	**4**
Agricultural & Forestry Support Services	4	**5**
Colleges & Universities	7	**6**
Depository Credit Organizations	5	**7**
Cattle Ranching	8	**8**

TABLE 4 Workforce Development Area 12 Spokane Cluster/Core Industry	All Variables Rankings	**Workforce Rankings**
Other Ambulatory Health Services	4	**1**
High Tech Manufacturing	3	**2**
Health Care except Other Ambulatory	1	**3**
Construction	5	**4**
Misc. Prof. & Technical Services	2	**5**
Sheet Metal & Metal Bldgs	6	**6**
Federal Electric Power Services	7	**7**
Wood Kitchen Cabinet Mfg.	10	**8**
Metal & Machinery Manufacturing	8	**9**
Other Concrete Products Mfg.	13	**10**
Colleges & Universities	12	**11**
Business Support Services	9	**12**
Travel Trailer & Camper Mfg.	11	**13**

Source: Workforce Board analysis of Sommers et al's *Industry Cluster Analysis for Washington State Workforce Development Areas*, November 2008.

Explanation: Coloring indicates three tiers of clusters, as ranked by the Workforce Index. Dark green is the top tier, light green middle, and white lowest tier. The four Workforce Development Areas displayed were selected as test areas for this methodology based on their diversity of cluster employment, urban and rural nature, and geographic distribution.