Center for Business and Economic Research

**BALL STATE UNIVERSITY**

# Manufacturing Scorecard 2019

The Manufacturing Scorecard shows how each state ranks among its peers in several categories that are of particular interest to site selection experts for the manufacturing and logistics industries.

## ABOUT THE AUTHORS

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## ABOUT BALL STATE CBER

The Center for Business and Economic Research (CBER) at Ball State University conducts timely economic policy research, analysis, and forecasting for a public audience.

Our main product, the CBER Data Center, offers primary data sets, data resources for grant writers and economic developers, and a projects and publications library at **cberdata.org**.

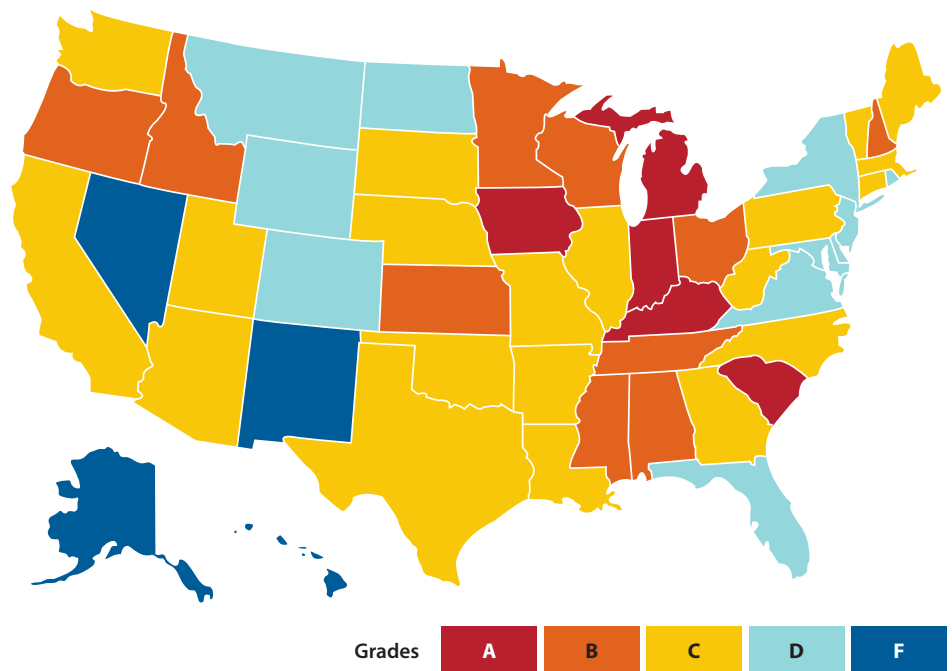**Center for Business and Economic Research, Ball State University**
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**https://mfgscorecard.cberdata.org**



Grades | A | B | C | D | F

## Manufacturing Industry Health

The production of goods holds particular interest in the US economy. Manufacturing firms are not necessarily reliant on local demand for goods and are therefore footloose. Their location depends more on local factors such as the quality and availability of the labor force, transportation infrastructure, non-wage labor costs, access to innovative technologies, and the cost of doing business. Manufacturing is the production of both consumer durable goods (e.g. automobiles, electronics, and home appliances that last for years) and consumer non-durable goods (e.g. clothing, processed foods, and other goods that are consumed after use).

To measure manufacturing industry health, we include three variables: the share of total income earned by manufacturing employees in each state, the wage premium paid to manufacturing workers relative to the other states' employees, and the share of manufacturing employment per capita.

Sources: US Census Bureau and Bureau of Economic Analysis.

# About the Grades

The categories in this report were chosen as those most likely to be considered by site selection experts for manufacturing and logistics firms, and by the prevailing research on economic growth.

Each category included multiple variables for each state that were aggregated and then ranked 1st through 50th, with 1st being the most desirable. Within each category, the lowest aggregate score assigned provided the overall rank. Grades were assigned A through F using a normal distribution of grades commonly known as a bell curve. Plus and minus scores were not assigned to A or F grades.

| Grades | A | B | C | D | F |
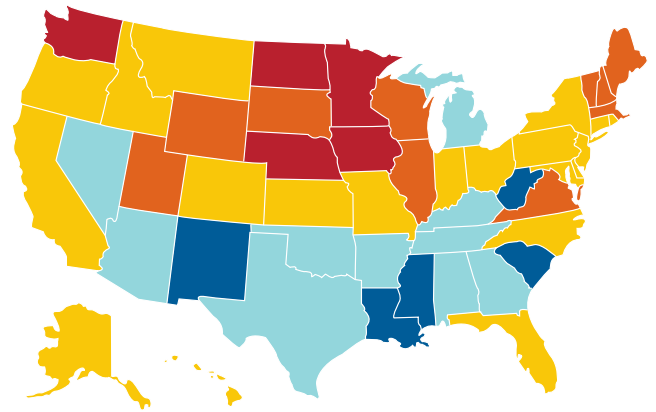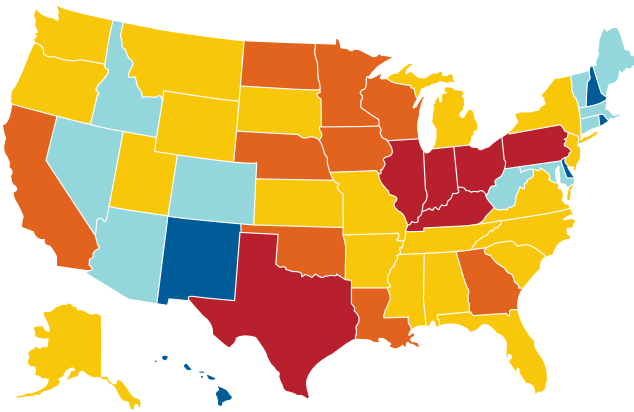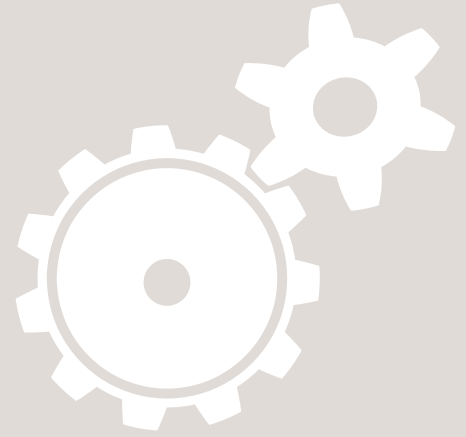


## Logistics Industry Health

The movement of goods is of central importance to the production of goods. Without a robust logistics industry, manufacturing and commodity production will not occur. Logistics comprises not merely the capacity to move goods, but to store inventory and manage the distribution and processing of manufactured goods. Logistics firms depend upon many of the same factors as manufacturing firms in their location decision, but there is a more complex interplay between local conditions and the existing or planned transportation networks of roads, railroads, waterways, and airports.

To measure the health of the logistics industry, we include the share of total logistics industry income as a share of total state income, and the employment per capita. We also include commodity flows data by both rail and road. To this we measure infrastructure spending as the per capita expenditure on highway construction.

Sources: US Census Bureau, Bureau of Economic Analysis, and US Department of Transportation Center for Transportation Statistics.

## Human Capital

No factor matters more to businesses than the quality and availability of labor. Workers represent the largest single cost of doing business, but, more importantly, they are the source of most innovation and process improvements that distinguish successful firms from those that are not successful. Because produced goods have a high degree of value dependent on each individual worker in a production line or transportation leg or hub, a uniformly high quality of workers is required. These workers must possess the ability to understand increasingly complex production processes that today are mostly managed by computers with specialized software. The factories, rail yards, distribution facilities, and machine shops of today are highly technical and complex, and they are dependent on workers who can work successfully in this environment. Human capital (especially education) is the most important factor in firm location decisions.

Our human capital measurements include rankings of educational attainment at the high school and collegiate level, the first-year retention rate of adults in community and technical colleges, the number of associates degrees awarded annually on a per capita basis, and the share of adults enrolled in adult basic education.

Sources: National Center for Educational Statistics and US Census Bureau.
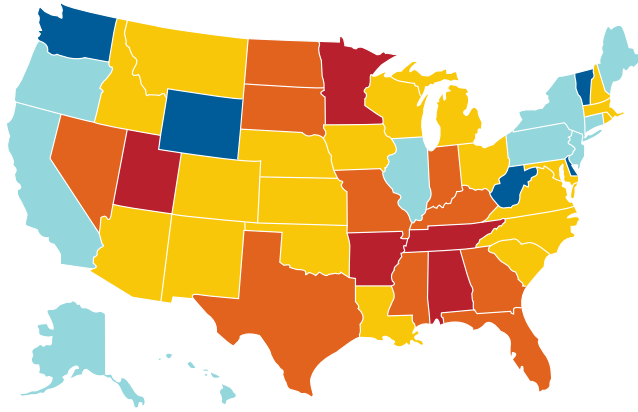
## Worker Benefit Costs

Non-wage labor costs represent an increasingly important part of total business costs. These are affected by local and state public policy (laws), as well as worker demographics and condition of health, and the performance of firms and industry. Benefits range from a variety of health care issues to liability and casualty insurance, workers' compensation, and other costs including retirement and other fringe benefits.

To measure benefit costs, we include data on health care premiums and long-term health care costs, workers' compensation costs per worker, and fringe benefits of all kinds as a share of worker costs.

Sources: American Association of Retired Persons (AARP), Bureau of Economic Analysis, IMPLAN, and authors' calculations.
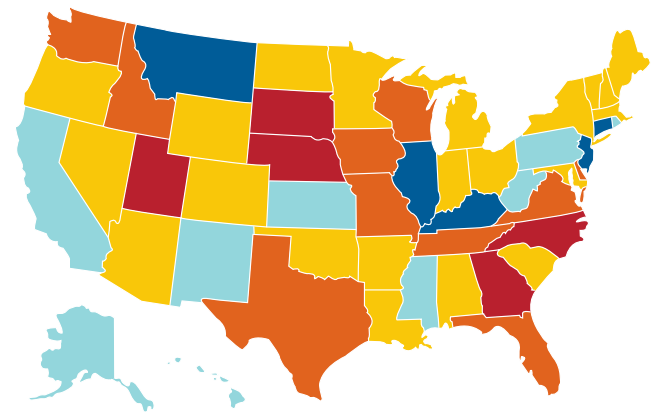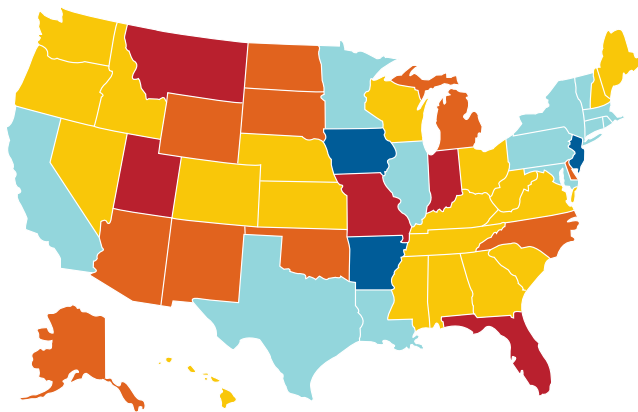




## Tax Climate

Few factors garner as much policy interest as do state and local taxes. For firms that may operate virtually anywhere, tax rates (along with the quality of local public goods) matter a great deal in location decisions. Business taxes, individual income taxes (both on workers and small business), sales, unemployment, insurance and property taxes all play a role in assessing regions for a potential employer location.

To measure the tax climate, we use data on corporate taxes, income and sales and use taxes, property and unemployment insurance tax data collected by the Tax Foundation.

Sources: Tax Foundation and US Internal Revenue Service.

## Expected Fiscal Liability Gap

State and local governments throughout the US purchase bonds for infrastructure improvement and provide pensions and health care for workers. Typically these bonds are paid for by a dedicated revenue stream from local or state finances. Pension obligations are typically funded in an actuarially evaluated fund. However, many states have failed to provide a direct funding stream to bond obligations or fully fund pension plans. This leads to unfunded bond and pension liabilities. These unfunded liabilities represent an expected state fiscal liability gap, which is a good indicator of the direction of future taxes and public services.

To measure the expected fiscal liability gap, we include data on unfunded liability per capita and percentage of GDP, average benefits, and bond rankings.

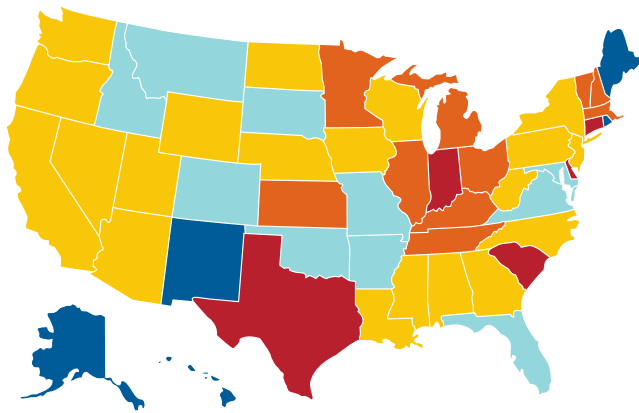Sources: Boston College Center for Retirement Research, US Census Bureau Statistical Abstract, and Bureau of Economic Analysis.

| Grades | A | B | C | D | F |
|--------|---|---|---|---|---|
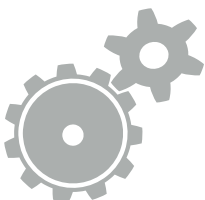
## More Online

Visit the Manufacturing Scorecard project website to view the performance history for each state and an archive of past reports with insight into the manufacturing industry: **mfgscorecard.cberdata.org**

## Global Reach

The level of international trade (in both imports and exports) is a robust measure of the region's competitiveness in the production, movement and distribution of consumer durable and non-durable goods. Both firms and regional governments focus considerable effort at improving ties with foreign firms, but for different reasons. Governments seek foreign investment in plant and equipment, while firms care about supplier relationships on both commodities and finished goods. Of course, manufacturers want to make goods with a global market appeal. How well this is done is an important predictor of the health of state-level manufacturing and logistics sectors into the future.

To measure global reach, we include the export-related measures of per capita exported manufacturing goods and the growth of manufacturing exports. We also include the foreign-direct investment measures of the amount of manufacturing income received annually from foreign-owned firms in a state, the level of adaptability of the state's exporters to changing demand, as well as the reach of foreign direct investment.

Sources: US Department of Commerce International Trade Administration and Bureau of Economic Analysis.

**Grades** | A | B | C | D | F
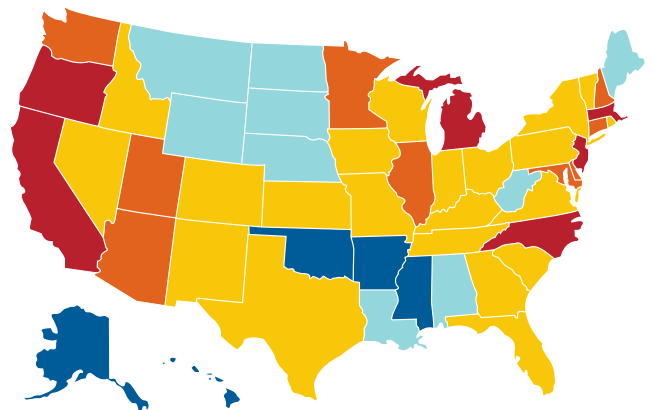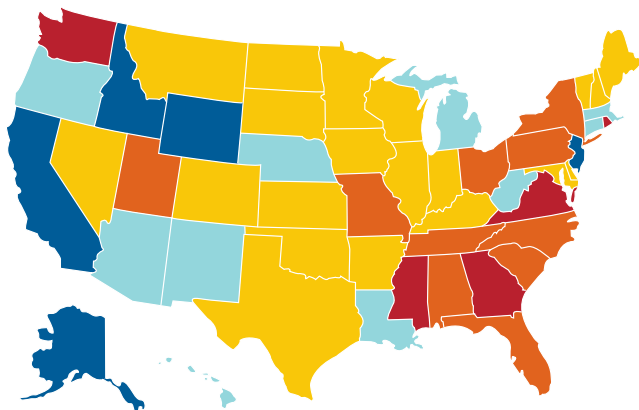


## Sector Diversification

There are both risks and rewards to economic diversification. States that concentrate their manufacturing activity in a single sector typically suffer higher volatility in employment and incomes over a business cycle and are also more likely to experience greater effects of structural changes to the economy involving a single sector. One potential benefit of low levels of economic diversification is that the resulting agglomeration economies often emerge in highly specialized regions. As a consequence, policies that seek to diversify the economy are typically pursued in concert with efforts to strengthen the supply chain of existing industries.

We calculate each state's diversification of manufacturing activity using the Herfindahl-Hirschman Index. We then rank each state from the most diverse (1st) to the least diverse (50th).

Sources: Bureau of Economic Analysis, North American Industrial Classification System (NAICS), and authors' calculations.



## Productivity and Innovation

The value of manufactured goods per worker—productivity—as well as firm access to inventions and innovations is critical to the long-term performance of a firm and the industry as a whole. Though innovations and inventions are aggressively sought from across the globe, the presence of local talent in these areas through access to university laboratories and non-profit research activities plays an important role in location decisions by manufacturers.

To measure productivity and innovation, we use manufacturing productivity growth, industry R&D expenditures on a per capita basis, and the per capita number of patents issued annually.

Sources: Census of Manufacturers, National Science Foundation, and US Patent Office.

# 2019 Manufacturing Scorecard

Visit **mfgscorecard.cberdata.org** to view past scorecards for each state.

↗ Score improved from last year → Score same as last year ↘ Score declined from last year

| State | Manufacturing Industry Health 2018 to 2019 | Logistics Industry Health 2018 to 2019 | Human Capital 2018 to 2019 | Worker Benefit Costs 2018 to 2019 | Tax Climate 2018 to 2019 | Expected Fiscal Liability 2018 to 2019 | Global Reach 2018 to 2019 | Sector Diversification 2018 to 2019 | Productivity and Innovation 2018 to 2019 |
|---|---|---|---|---|---|---|---|---|---|
| Alabama | B → B | C → C | F ↗ D- | A → A | C → C | C → C | B ↘ C | B → B | D → D |
| Alaska | F → F | C- → C- | C → C | D → D | B → B | D → D | F → F | F → F | F → F |
| Arizona | C → C | D → D | D ↘ D- | C+ ↘ C | B → B | C ↘ C- | C- → C- | D- → D- | C+ ↗ B- |
| Arkansas | C+ ↘ C | C → C | D → D | A → A | D- ↘ F | C → C | D+ → D+ | C → C | F → F |
| California | C ↗ C+ | B- → B- | C ↘ C- | C- ↘ D | C- ↘ D+ | C ↘ D- | C ↘ C- | D ↘ F | A → A |
| Colorado | D → D | D+ → D+ | B- ↘ C+ | B ↘ C | C → C | D+ ↗ C | D → D | C → C | C+ → C+ |
| Conn. | C ↗ C+ | D → D | B- ↘ C+ | C- ↘ D | D ↘ D- | D- ↘ F | B+ ↗ A | D → D | B → B |
| Delaware | D → D | D- ↘ F | C+ ↘ C | F → F | B- → B- | A ↘ B | A → A | C- → C- | A ↘ B |
| Florida | D → D | C → C | C ↗ C+ | C ↗ B | A → A | B → B | D → D | B → B | C → C |
| Georgia | D+ ↗ C- | B → B | D → D | C ↗ B | C → C | A → A | C → C | A → A | C → C |
| Hawaii | F → F | F → F | C → C | D ↘ D- | C+ → C | D → D | F → F | D → D | F → F |
| Idaho | B → B | D → D | D+ ↗ C- | C ↗ C+ | C → C | C+ ↗ B | D ↘ D- | F → F | C → C |
| Illinois | C+ → C+ | A → A | C ↗ B- | C- ↘ D+ | F ↗ D- | F → F | B ↗ B+ | C+ → C+ | B- → B- |
| Indiana | A → A | A → A | C → C | B- ↗ B | A → A | B- ↘ C+ | A → A | C → C | C → C |
| Iowa | A → A | B+ ↘ B | A → A | C- → C- | F → F | B ↘ B- | C ↘ C- | C ↘ C- | C- → C- |
| Kansas | B+ → B+ | B- ↘ C+ | C → C | C ↘ C- | C → C | D- ↗ D | C ↗ B- | C- → C- | C → C |
| Kentucky | A → A | A → A | D → D | B- → B- | D+ ↗ C- | F → F | A ↘ B+ | C → C | D+ ↗ C- |
| Louisiana | C → C | B → B | F → F | B ↘ C+ | D+ → D+ | C → C | C → C | D → D | D ↗ D+ |
| Maine | C- → C- | F ↗ D- | B → B | D- ↗ D | D ↗ C | C → C | D- ↘ F | C → C | D- → D- |
| Maryland | D → D | D → D | C → C | C → C | C- ↘ D | C ↗ C+ | F ↗ D | C- → C- | B → B |
| Mass. | C → C | D → D | B → B | C → C | D → D | C → C | B+ ↘ B | D ↗ D+ | A → A |
| Michigan | A → A | C → C | D → D | C → C | B ↘ B- | D → D | B+ ↘ B | D → D | A → A |
| Minnesota | B- → B- | B ↗ B+ | A → A | A → A | F ↗ D- | C ↗ C+ | C ↗ B- | C → C | B → B |
| Mississippi | B+ → B+ | C → C | F → F | B → B | C+ → C+ | F ↗ D | C → C | A → A | F → F |
| Missouri | C → C | C+ ↘ C | C ↘ C- | A ↘ B | A → A | B+ ↘ B | C ↘ D+ | B → B | C ↘ C- |
| Montana | D- → D- | C ↘ C- | C+ ↘ C | D ↗ C- | A → A | D- ↘ F | D → D | C → C | C- ↘ D |
| Nebraska | C- → C- | B → B | A → A | C+ ↘ C | C+ → C+ | A → A | C- ↗ C | C- ↘ D | D- ↗ D |
| Nevada | F → F | D → D | D+ → D+ | B+ → B+ | C → C | C- → C- | B ↘ C | C → C | D+ ↗ C- |
| New Hamp. | B- ↗ B | F → F | B+ → B+ | D+ ↗ C | C ↘ C- | D+ ↗ C- | B → B | D+ ↗ C- | B ↗ B+ |
| New Jersey | C- ↘ D+ | C ↗ C+ | C → C | D- → D- | F → F | F → F | C+ ↘ C | D- ↘ F | B+ ↗ A |
| New Mex. | F → F | F → F | F → F | C+ → C+ | C ↗ B | C- ↘ D+ | F → F | F ↗ D- | C → C |
| New York | F ↗ D- | C → C | C- ↗ C | D → D | F ↗ D- | C → C | D+ ↗ C- | B → B | C+ → C+ |
| N. Carolina | C+ → C+ | C → C | C → C | C → C | B+ → B+ | A → A | B- ↘ C+ | B+ → B+ | A → A |
| N. Dakota | D- ↗ D | B → B | A → A | B → B | B → B | C- → C- | C- → C- | C → C | D → D |
| Ohio | B → B | A → A | C- ↗ C | D ↗ C- | C → C | C → C | B- ↗ B | B ↘ B- | C → C |
| Oklahoma | C- ↗ C | C+ ↗ B- | D- ↗ D | C → C | B → B | C+ → C+ | F ↗ D | C → C | F → F |
| Oregon | B ↘ B- | C- → C- | C- → C- | D+ → D+ | C → C | B- ↘ C | C+ ↘ C | F ↗ D | A → A |
| Penn. | C- ↗ C | B+ ↗ A | C → C | C- ↘ D+ | D- ↗ D | D ↘ D- | C- ↗ C | A ↘ B+ | C → C |
| Rhode Is. | D → D | F → F | C- → C- | D ↗ C- | D → D | C- ↘ D | D ↘ F | B ↗ A | D+ ↗ C- |
| S. Carolina | A → A | C- → C- | D- ↘ F | C → C | C ↘ C- | C- ↗ C | A → A | B+ ↘ B | C- ↗ C |
| S. Dakota | C → C | C → C | B ↗ B+ | B+ → B+ | B → B | B ↗ A | D → D | C- ↗ C | D → D |
| Tenn. | B → B | C+ → C+ | B- → D | A → A | C → C | B+ → B | B → B | B- → B- | C → C |
| Texas | C → C | A → A | C- ↘ D+ | B ↘ B- | D ↗ D+ | B+ → B+ | A → A | C+ → C+ | B- ↘ C+ |
| Utah | C → C | C- → C- | B → B | B ↗ A | A → A | A → A | C- ↗ C+ | B- ↗ B | B → B |
| Vermont | C → C | D- → D- | B → B | F → F | D → D | C- → C- | C ↗ B | C → C | C → C |
| Virginia | D ↘ D- | C- ↗ C | C+ ↗ B- | C → C | C → C | C+ ↗ B- | D- → D- | A → A | C → C |
| Wash. | C ↘ C- | C → C | A → A | F → F | C- → C- | B → B | C ↗ C+ | A → A | B → B |
| W. Virginia | C → C | D+ → D+ | F → F | F → F | B ↘ C+ | D → D | C → C | D+ → D+ | D → D |
| Wisconsin | B → B | B → B | B+ → B+ | C → C | C- → C- | A ↘ B+ | C+ ↘ C | C+ → C+ | C- → C- |
| Wyoming | D+ → D+ | C → C | B → B | F → F | B+ → B+ | C → C | C → C | F → F | C- ↘ D- |