

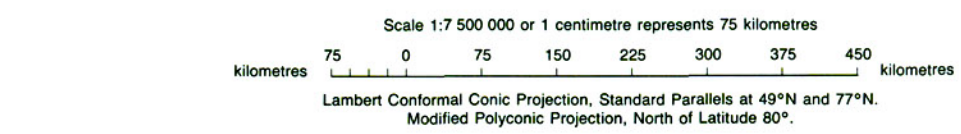
# CANADA MANUFACTURING PRODUCTIVITY

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## MANUFACTURING PRODUCTIVITY

This map represents the level of manufacturing productivity in 1986 and the change in productivity between 1981 and 1986. To provide a measure of the magnitude of manufacturing activity at each centre, the total value added by manufacturing in 1986 is also shown.

Manufacturing productivity can be considered as an indicator of Canada's wealth-creation capacity. In general terms, productivity is a measure of efficiency in combining resources to produce outputs. A comprehensive multifactor productivity index would take into account all resources that are used as inputs to the production process and the effectiveness with which they are combined and organized for production. However, the information needed for the precise measure of all these inputs is not generally available and in some cases not quantifiable. It is not possible to derive a completely satisfying measure of productivity. The measure used here, labour productivity, has the advantage of being widely used in many countries. It should be borne in mind, however, that measured changes in output per unit of labour input are not necessarily attributable to labour alone but to factors such as capital investment, technological change, economies of scale, capacity utilization, work force, management skills and labour-management relations.

For the purposes of this map, manufacturing productivity was defined as the amount of value added in the manufacturing activity per person-hour for production and related workers. In order to make comparisons possible across a wide range of centres and between time periods, productivity values were standardized to obtain standard scores. The standard score (i.e. the observation value subtracted from the mean of the distribution and divided by the standard deviation) reduces all observations to values that vary around a zero mean. For 1986, the mean represents a value added by manufacturing of \$34.51 per person-hour, and one standard deviation from the mean represents a difference of \$15.61. A standard score of 1.00 is one standard deviation above the mean, and thus represents a production value of \$50.12 above the Canadian average (i.e. \$49.12).

The change in manufacturing productivity was derived as the change in standard scores from 1981 to 1986; an increase in the score indicates that the productivity of the manufacturing base for a place improved relative to the norm for the set of places shown here; a decrease denotes a decline. The selection of time period was based on data availability and on business cycle considerations: 1986 was the last year for which sub-provincial data will be issued; it was also well into the recovery period following the 1981-82 recession. It was expected that some of the effects of this recession would be reflected by the 1981 data.

Manufacturing productivity data were derived from the Census of Manufactures (1981 and 1986). Because of Census data disclosure limitations designed to ensure that data for individual establishments are neither released nor readily estimated, it was not feasible to map and compare productivity in particular industries across Canada. As a consequence, aggregate productivity for all manufacturing establishments in each municipality is shown. The geostatistical units used to represent manufacturing centres are Census Subdivisions which were aggregated, where applicable, and where a complete data set existed, to Census Metropolitan Areas and Census Agglomerations. These units reflect the designations in place for the 1986 Census of Population. The size threshold for inclusion of a centre was a total value added by manufacturing of \$15 000 000 in 1986.

Census of Manufactures disclosure restrictions also preclude the availability of any productivity data for a large number of manufacturing centres (data are suppressed if a municipality has less than three manufacturing establishments or if it is dominated by a single industrial firm). In order to represent these places, lists of individual establishments by employment size range were used to obtain estimates of manufacturing labour force. The location of those places for which productivity data were not available, and with an estimated 1986 manufacturing labour force of 200 or more, are shown on the map as uncoloured symbols. Many of the larger places are single-industry towns dominated by pulp and paper mills.

Some spatial patterns of manufacturing productivity are evident on the map. Productivity and productivity change values for most large urban centres approximate the national average as the variety of manufacturing types and the number of establishments in these centres tend to dampen the dominance of single types or establishments with extreme values. In contrast, a number of small centres have high productivity values that reflect the dominance of highly capitalized manufacturing establishments. These centres are commonly resource-processing communities, in peripheral parts of Canada, that compete internationally. Many of these centres also reflect the highest positive changes in productivity, a fact that suggests some restructuring during the 1981-1986 period in order to remain globally competitive.

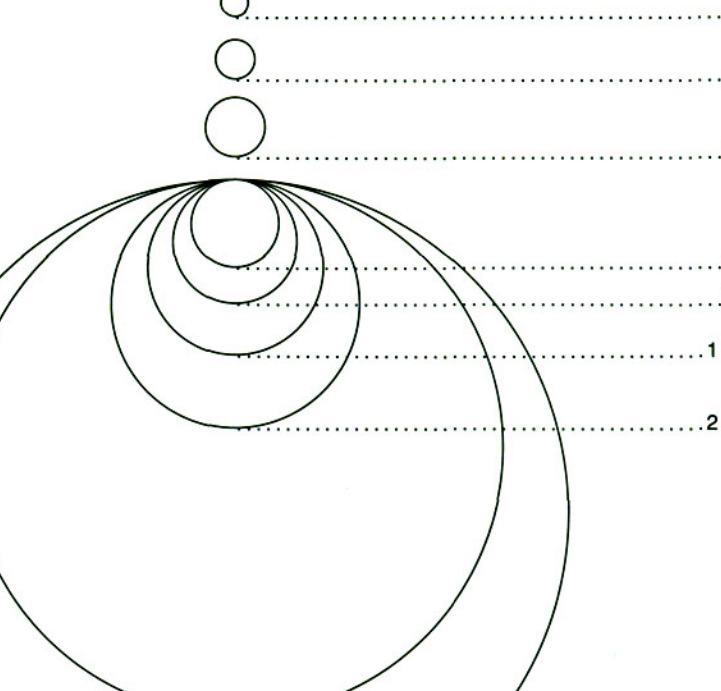
Research by R. A. Roberge, Department of Geography, University of Ottawa, and T. Harbeck, National Atlas Information Service, Research Assistance by Shen Xiaoping, University of Ottawa. Edited by D. M. Chapman, National Atlas Information Service, Cartography by the National Atlas Information Service, Canada Centre for Mapping, Energy, Mines and Resources Canada.

Digital technologies were used in part for the production and publication of this map.

SOURCES  
 Canada, Statistics Canada, 1979, Concepts and Definitions of the Census of Manufactures (Concepts and Definitions in French), Cat. 33-208, Ottawa.  
 1987, Industries manufacturières du Canada - Sub-Provincial Areas, Cat. 33-209, Ottawa.  
 1990, Manufacturing Industries of Canada - Sub-Provincial Areas, 1986, Industries manufacturières du Canada - zones interprovinciales, 1986, Cat. 33-209, Ottawa.

## MANUFACTURING PRODUCTIVITY, 1981-1986

TOTAL VALUE ADDED BY MANUFACTURING, 1986  
 (millions of dollars)



## MANUFACTURING CENTRES

Canada, Statistics Canada, 1979, Concepts and Definitions of the Census of Manufactures (Concepts and Definitions in French), Cat. 33-208, Ottawa.  
 1987, Industries manufacturières du Canada - Sub-Provincial Areas, Cat. 33-209, Ottawa.  
 1990, Manufacturing Industries of Canada - Sub-Provincial Areas, 1986, Industries manufacturières du Canada - zones interprovinciales, 1986, Cat. 33-209, Ottawa.

Centres for which productivity data were not available  
 Manufacturing labour force

300 - 899    900 - 2 999    ≥ 3 000

## MANUFACTURING PRODUCTIVITY, 1986

Value added per person-hour  
 (standard score units)

CHANGE IN MANUFACTURING PRODUCTIVITY, 1981-1986  
 Change in value added per person-hour  
 (standard score units)

≥ 2.00  
 1.00 - 1.99  
 0.50 - 0.99  
 0.00 - 0.49  
 -0.01 - -0.49  
 -0.50 - -0.99  
 ≤ -1.00

≥ 0.50  
 0.00 - 0.49  
 -0.01 - -0.49  
 ≤ -0.50  
 Change data unavailable

