The Task Force on Competitiveness, Productivity, and Economic Progress

Presentation to
Niagara BiNational Region Economic Roundtable

by
James Milway, Executive Director

Niagara-on-the-Lake
September 27, 2002
This is a copy of the presentation given by James Milway in Niagara-on-the-Lake on September 27, 2002. It was one of the afternoon presentations from the day long roundtable - Growing Knowledge Clusters in Niagara BiNational: Higher Ed and Industry in Partnership.

This document provides an outline of the presentation and is incomplete without the accompanying oral commentary and discussion. It represents work in progress based on research conducted by the Institute for Competitiveness and Prosperity.

Much of the material is from the Institute’s first and second Working Papers which can be viewed at our Web site, www.competeprosper.ca

The Web site also provides more information on the Institute and the Task Force on Competitiveness, Productivity, & Economic Progress.

We ask that you acknowledge the Institute as the source if you use the material from this presentation.
Task Force Mandate

To measure and monitor Ontario’s competitiveness, productivity and economic progress compared to other provinces and the US states and to report to the public on a regular basis.

Long Term Aspiration

We aspire to have a significant influence in increasing Ontario’s competitiveness, productivity and capacity for innovation. This will help ensure continued success in the creation of good jobs, increased prosperity and a high quality of life for all Ontarians.

We will accomplish this by undertaking research, publishing breakthrough reports and proposing significant innovations in public policy which stimulate businesses, governments and educational institutions to take action.
# Mix of Clusters: Results from US Cluster Mapping

## Identifying 41 Clusters of Traded Industries

### Upstream Materials and Products
- Metals and Materials
  - Construction Materials
  - Metal Manufacturing
- Forest Products
  - Forest Products
- Petroleum/Chemicals
  - Oil and Gas
  - Chemical Products
  - Plastics
- Semiconductors/Computer
  - Information Technology

### Industrial and Supporting Functions
- Multiple Business
  - Education and Knowledge Creation
  - Business Services
  - Heavy Machinery
  - Financial Services
  - Motor Driven Products
  - Prefabricated Enclosures
  - Production Technology
  - Analytical Instruments
  - Heavy Construction Services
- Transportation and Logistics
  - Automotive
  - Distribution Services
  - Transportation and Logistics
- Power
  - Power Generation
  - Power Transmission and Distribution
- Office
  - Publishing and Printing
- Telecommunications
  - Communications Equipment
- Defense
  - Aerospace Engines
  - Aerospace Vehicles and Defense

### Final Consumption Goods and Services
- Food/Beverages
  - Agricultural Products
  - Processed Foods
  - Fishing and Fishing Products
- Housing/Household
  - Building Fixtures, Equipment & Services
  - Lighting and Electrical Equipment
  - Furniture
- Textiles/Apparel
  - Textiles
  - Apparel
  - Footwear
- Health Care
  - Medical Devices
  - Pharmaceuticals and Biotechnology
- Personal
  - Leather and Sporting Goods
  - Jewelry and Precious Metals
  - Tobacco
- Entertainment/Leisure
  - Entertainment
  - Hospitality and Tourism

Cluster Overlap in the US Economy

Note: Clusters with borders or identical colors/shading except gray have at least 20% overlap of industries by number in both directions

Results from the US Cluster Mapping Project

The Economics of Traded Clusters, Local Industries, and Natural Resources

Share of Employment
- Traded Clusters: 32%
- Local Industries: 67%
- Natural Resources: 1%

Share of Income
- Traded Clusters: 43%
- Local Industries: 56%
- Natural Resources: 1%

Average Wage ($US thousands)
- Traded Clusters: $42
- Local Industries: $26
- Natural Resources: $31

Patents per 10,000 employees
- Traded Clusters: 20.48
- Local Industries: 1.38
- Natural Resources: 6.40

Distribution of Traded Cluster Employment

Share of Employment in Traded Clusters

US
- Traded Clusters: 32%
- Local Industries: 67%
- Natural Resources: 1%

Canada
- Traded Clusters: 37%
- Local Industries: 61%
- Natural Resources: 2%

Ontario
- Traded Clusters: 40%
- Local Industries: 59%
- Natural Resources: 1%

New York
- Traded Clusters: 32%
- Local Industries: 68%
- Natural Resources: 0%

Note: US Statistics are for 1999; Canadian Statistics are for 2000.
Distribution of Traded Cluster Employment

Share of Employment in Traded Clusters

- **Rochester**
  - Traded Clusters: 36%
  - Local Industries: 64%
  - Natural Resources: 0%

- **Buffalo**
  - Traded Clusters: 30%
  - Local Industries: 69%
  - Natural Resources: 1%

- **St. Catharines**
  - Traded Clusters: 37%
  - Local Industries: 62%
  - Natural Resources: 1%

- **Hamilton**
  - Traded Clusters: 36%
  - Local Industries: 62%
  - Natural Resources: 2%

Note: US Statistics are for 1999; Canadian Statistics are for 2000.
Dynamics of a Cluster: Pressure and Support

- The underlying inputs firms draw on in competing
  - natural (physical) resources
  - human resources
  - capital resources
  - physical infrastructure
  - administrative infrastructure
  - information infrastructure
  - scientific and technological infrastructure

- The availability and quality of local suppliers and related industries

- The context shaping the types of strategies employed and the nature of local rivalry

- The nature of home demand for products and services

Competitive vs. Uncompetitive Clusters

Competitive Clusters:
May rely on any part of the full diamond

Uncompetitive Clusters:
Usually only rely on factor conditions

Clusters evolve – they’re not created

Japan and consumer electronics

- Transistor radios
- Televisions
- Colour Televisions
- VCRs

Source: Porter, Institute for Strategy & Competitiveness, Harvard Business School and Institute for Competitiveness & Prosperity
Clusters and Government

- Create sound economic policies
- Support upgrading to all clusters, not choose among them
  - Productivity depends on how firms compete, not what industries they compete in
- Reinforce established and emerging ones, instead of trying to create entirely new ones
- Remove obstacles, relax constraints, eliminate inefficiencies

Source: Porter, Institute for Strategy & Competitiveness, Harvard Business School
Some lessons learned from cluster work in the U.S.

- Focus should be on sustaining prosperity not just growth for its own sake
- Success defined by innovation, not efficiency
- Diffusion of knowledge more important than level of R&D
- Success in traded clusters pulls along non-traded clusters
- “Low tech” successful clusters are more numerous than “high tech”
- Successful regions don’t pick winners but build on advantages to create specialized economies

Source: U.S. Council of Competitiveness
Niagara BiNational’s Leading Clusters

Employment in Leading Clusters

- **Education and Knowledge Creation**
- **Business Services**
- **Metal Manufacturing**
- **Publishing and Printing**
- **Automotive**
- **Hospitality and Tourism**
- **Financial Services**
- **Processed Foods**
- **Distribution Services**
- **Heavy Construction Services**

Source: Statistics Canada, Canadian Business Patterns (June 2000); Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Institute for Competitiveness & Prosperity
## Niagara BiNational’s Leading Clusters

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Rochester</th>
<th>Buffalo</th>
<th>St. Catharines</th>
<th>Hamilton</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Education and Knowledge Creation</td>
<td>22,375</td>
<td>10,640</td>
<td>3,642</td>
<td>10,914</td>
<td>47,571</td>
</tr>
<tr>
<td>2. Business Services</td>
<td>17,195</td>
<td>11,718</td>
<td>3,528</td>
<td>10,804</td>
<td>43,245</td>
</tr>
<tr>
<td>3. Metal Manufacturing</td>
<td>5,723</td>
<td>6,418</td>
<td>7,004</td>
<td>23,848</td>
<td>42,993</td>
</tr>
<tr>
<td>4. Publishing and Printing</td>
<td>30,434</td>
<td>6,009</td>
<td>1,695</td>
<td>3,617</td>
<td>41,755</td>
</tr>
<tr>
<td>5. Automotive</td>
<td>11,368</td>
<td>12,439</td>
<td>7,568</td>
<td>4,041</td>
<td>35,416</td>
</tr>
<tr>
<td>6. Hospitality and Tourism</td>
<td>6,275</td>
<td>6,325</td>
<td>10,930</td>
<td>4,658</td>
<td>28,188</td>
</tr>
<tr>
<td>7. Financial Services</td>
<td>5,625</td>
<td>6,295</td>
<td>3,294</td>
<td>9,865</td>
<td>25,079</td>
</tr>
<tr>
<td>8. Processed Foods</td>
<td>5,979</td>
<td>7,873</td>
<td>1,958</td>
<td>6,095</td>
<td>21,905</td>
</tr>
<tr>
<td>9. Distribution Services</td>
<td>6,981</td>
<td>6,929</td>
<td>1,409</td>
<td>5,779</td>
<td>21,098</td>
</tr>
<tr>
<td>10. Heavy Construction Services</td>
<td>3,995</td>
<td>5,570</td>
<td>3,251</td>
<td>5,695</td>
<td>18,511</td>
</tr>
</tbody>
</table>

Source: Statistics Canada, Canadian Business Patterns (June 2000); Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Institute for Competitiveness & Prosperity
## Niagara BiNational’s Leading Clusters

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Total</th>
<th>Regional Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Education and Knowledge Creation</td>
<td>47,571</td>
<td>1.60</td>
</tr>
<tr>
<td>2. Business Services</td>
<td>43,245</td>
<td>0.74</td>
</tr>
<tr>
<td>3. Metal Manufacturing</td>
<td>42,993</td>
<td>2.30</td>
</tr>
<tr>
<td>5. Automotive</td>
<td>35,416</td>
<td>1.98</td>
</tr>
<tr>
<td>6. Hospitality and Tourism</td>
<td>28,188</td>
<td>0.84</td>
</tr>
<tr>
<td>7. Financial Services</td>
<td>25,079</td>
<td>0.62</td>
</tr>
<tr>
<td>8. Processed Foods</td>
<td>21,905</td>
<td>1.17</td>
</tr>
<tr>
<td>9. Distribution Services</td>
<td>21,098</td>
<td>0.85</td>
</tr>
<tr>
<td>10. Heavy Construction Services</td>
<td>18,511</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Note: The location quotient is North American quotients
Source: Statistics Canada, Canadian Business Patterns (June 2000); Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Institute for Competitiveness & Prosperity
# Rochester’s Leading Clusters

## Leading Clusters by Share of Traded Cluster Employment (2000)

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Employment</th>
<th>Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Publishing and Printing</td>
<td>30,434</td>
<td>7.13</td>
</tr>
<tr>
<td>2. Education and Knowledge Creation</td>
<td>22,375</td>
<td>2.36</td>
</tr>
<tr>
<td>3. Business Services</td>
<td>17,195</td>
<td>0.93</td>
</tr>
<tr>
<td>4. Automotive</td>
<td>11,368</td>
<td>2.00</td>
</tr>
<tr>
<td>5. Distribution Services</td>
<td>6,981</td>
<td>0.88</td>
</tr>
<tr>
<td>6. <strong>Plastics</strong></td>
<td><strong>6,828</strong></td>
<td><strong>1.96</strong></td>
</tr>
<tr>
<td>7. Hospitality and Tourism</td>
<td>6,275</td>
<td>0.58</td>
</tr>
<tr>
<td>8. Processed Foods</td>
<td>5,979</td>
<td>1.00</td>
</tr>
<tr>
<td>9. <strong>Medical Devices</strong></td>
<td><strong>5,888</strong></td>
<td><strong>2.19</strong></td>
</tr>
<tr>
<td>10. Metal Manufacturing</td>
<td>5,723</td>
<td>0.96</td>
</tr>
</tbody>
</table>

Note: The location quotients are North American quotients.
Source: Statistics Canada, Canadian Business Patterns (June 2000); Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Institute for Competitiveness & Prosperity
### Buffalo’s Leading Clusters


<table>
<thead>
<tr>
<th>Cluster</th>
<th>Employment</th>
<th>Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Automotive</td>
<td>12,439</td>
<td>2.15</td>
</tr>
<tr>
<td>2. Business Services</td>
<td>11,718</td>
<td>0.62</td>
</tr>
<tr>
<td>3. Education and Knowledge Creation</td>
<td>10,640</td>
<td>1.11</td>
</tr>
<tr>
<td>4. Motor Driven Products</td>
<td>10,518</td>
<td>5.84</td>
</tr>
<tr>
<td>5. Processed Foods</td>
<td>7,873</td>
<td>1.30</td>
</tr>
<tr>
<td>6. Distribution Services</td>
<td>6,929</td>
<td>0.86</td>
</tr>
<tr>
<td>7. Metal Manufacturing</td>
<td>6,418</td>
<td>1.06</td>
</tr>
<tr>
<td>8. Hospitality and Tourism</td>
<td>6,325</td>
<td>0.58</td>
</tr>
<tr>
<td>9. Financial Services</td>
<td>6,295</td>
<td>0.48</td>
</tr>
<tr>
<td>10. Publishing and Printing</td>
<td>6,009</td>
<td>1.39</td>
</tr>
</tbody>
</table>

Note: The location quotients are North American quotients.
Source: Statistics Canada, Canadian Business Patterns (June 2000); Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Institute for Competitiveness & Prosperity
### St. Catharines’ Leading Clusters


<table>
<thead>
<tr>
<th>Cluster</th>
<th>Employment</th>
<th>Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hospitality and Tourism</td>
<td>10,930</td>
<td>2.56</td>
</tr>
<tr>
<td>2. Automotive</td>
<td>7,568</td>
<td>3.34</td>
</tr>
<tr>
<td>3. Metal Manufacturing</td>
<td>7,004</td>
<td>2.96</td>
</tr>
<tr>
<td>4. Education and Knowledge Creation</td>
<td>3,642</td>
<td>0.97</td>
</tr>
<tr>
<td>5. Business Services</td>
<td>3,528</td>
<td>0.48</td>
</tr>
<tr>
<td>6. Transportation and Logistics</td>
<td>3,301</td>
<td>1.19</td>
</tr>
<tr>
<td>7. Financial Services</td>
<td>3,294</td>
<td>0.64</td>
</tr>
<tr>
<td>8. Heavy Construction Services</td>
<td>3,251</td>
<td>1.04</td>
</tr>
<tr>
<td>9. Heavy Machinery</td>
<td>2,420</td>
<td>3.31</td>
</tr>
<tr>
<td>10. Entertainment</td>
<td>2,211</td>
<td>1.26</td>
</tr>
</tbody>
</table>

Note: The location quotients are North American quotients.
Source: Statistics Canada, Canadian Business Patterns (June 2000); Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Institute for Competitiveness & Prosperity
Hamilton’s Leading Clusters

### Leading Clusters by Share of Traded Cluster Employment (2000)

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Employment</th>
<th>Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Metal Manufacturing</td>
<td>23,848</td>
<td>5.52</td>
</tr>
<tr>
<td>2. Education and Knowledge Creation</td>
<td>10,914</td>
<td>2.53</td>
</tr>
<tr>
<td>3. Business Services</td>
<td>10,804</td>
<td>0.80</td>
</tr>
<tr>
<td>4. Financial Services</td>
<td>9,865</td>
<td>1.06</td>
</tr>
<tr>
<td>5. Processed Food</td>
<td>6,095</td>
<td>1.40</td>
</tr>
<tr>
<td>6. Distribution Services</td>
<td>5,779</td>
<td>1.01</td>
</tr>
<tr>
<td>7. Heavy Construction Services</td>
<td>5,695</td>
<td>1.00</td>
</tr>
<tr>
<td>8. Hospitality and Tourism</td>
<td>4,658</td>
<td>0.60</td>
</tr>
<tr>
<td>9. Automotive</td>
<td>4,041</td>
<td>0.98</td>
</tr>
<tr>
<td><strong>10. Entertainment</strong></td>
<td><strong>3,761</strong></td>
<td><strong>1.17</strong></td>
</tr>
</tbody>
</table>

Note: The location quotients are North American quotients.
Source: Statistics Canada, Canadian Business Patterns (June 2000); Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Institute for Competitiveness & Prosperity
The Location Quotient (LQ) Defined

- The location quotient is a ratio measure of the concentration for a cluster in a particular location relative to the North American average.
- An LQ > 1 indicates a higher than average concentration in the particular location.
- Hamilton’s cluster LQs are calculated as follows:

\[
LQ = \left( \frac{\text{Employment in the Cluster in Hamilton}}{\text{Total Hamilton Employment}} \right) \times \left( \frac{\text{Total Employment in the Cluster in North America}}{\text{Total North American Employment}} \right)
\]
The Six Technology Clusters

- Pharmaceuticals and Biotechnology
- Information Technology
- Medical Devices
- Communications Equipment
- Aerospace Engines
- Aerospace Vehicles and Defense

## The Technology Clusters

### Ontario and New York’s Cities by Traded Cluster Employment
(US: 1999, Canada: 2000)

<table>
<thead>
<tr>
<th>Ontario CMA</th>
<th>Employment</th>
<th>Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Toronto</td>
<td>63,690</td>
<td>1.03</td>
</tr>
<tr>
<td>2  Ottawa</td>
<td>20,439</td>
<td>1.68</td>
</tr>
<tr>
<td>3  Kitchener</td>
<td>4,661</td>
<td>0.85</td>
</tr>
<tr>
<td>4  Hamilton</td>
<td>2,835</td>
<td>0.35</td>
</tr>
<tr>
<td>5  St. Catharines</td>
<td>1,828</td>
<td>0.41</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>US MSA</th>
<th>Employment</th>
<th>Location Quotient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Nassau-Suffolk</td>
<td>36,697</td>
<td>1.44</td>
</tr>
<tr>
<td>2  New York</td>
<td>34,458</td>
<td>0.39</td>
</tr>
<tr>
<td>3  Rochester</td>
<td>12,493</td>
<td>1.11</td>
</tr>
<tr>
<td>4  Binghamton</td>
<td>9,414</td>
<td>3.90</td>
</tr>
<tr>
<td>5  Buffalo</td>
<td>6,865</td>
<td>0.60</td>
</tr>
</tbody>
</table>

Note: The location quotients are North American quotients
Source: Statistics Canada, Canadian Business Patterns (June 2000); Porter, Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School; Institute Competitiveness & Prosperity