

# **A Tale of Two Clusters: Innovation and Restructuring in the Windsor and Kitchener Automotive Parts Industry**

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**Fall Meeting, ONRIS/Ontario MEDT, October 21, 2004**

# *Canadian Automotive Industry: Context*

- North American automotive markets are totally integrated
- Canada accounts for 8% of the North American vehicle market but 15% of vehicle production. Ontario is eighth largest producer of motor vehicles in the world
- Canada's Auto Sector continues to perform surprisingly well, especially the automotive parts industry
- Employment in auto assembly fell from 56,000 to 48,700 between 1995 and 2003 but parts sector grew from 77,000 to 103,400. Canada's share of North American OE parts market continues to grow steadily

## *Context cont.*

- New investment in Canada continues to be relatively strong but unlikely to see the same levels of growth we saw during the mid-late 1990s
- The automotive machinery, tool, die and mould (MTDM) industry in Ontario is very important – the mould ‘cluster’ in Windsor rivaling similar clusters in Grand Rapids, MI and Marinha Grande, Portugal as a world leader. Canada supplies roughly 40% of US imports of MTDM.
- Until recently, overall low level of formal R+D located in Canada but Ontario is now emerging as a growing center for intellectual capital in the automotive industry but mainly for the Big Three OEMs:
  - Daimler Chrysler/University of Windsor Automotive R&D Centre,
  - GM Canadian Regional Engineering Centre at Oshawa,
  - GM Beacon Project,
  - Auto21 NCE

# ***Knowledge, Innovation and the Automobile Industry***

- Automobile industry is one of the most knowledge intensive
- Has undergone intense restructuring: OEM mergers, increased outsourcing and adoption of lean and modular production
- Some argue a shift towards greater supplier 'voice' and obligational supply relations

- The restructuring has increased demands for information/ knowledge through the supply chain
- But such shifts are occurring in the context of increasing overcapacity and price and profit pressure on OEMs and suppliers
- Knowledge initiatives in North America based largely on “tactical, ... cost reduction basis” (Belzowski, 2002, 19)

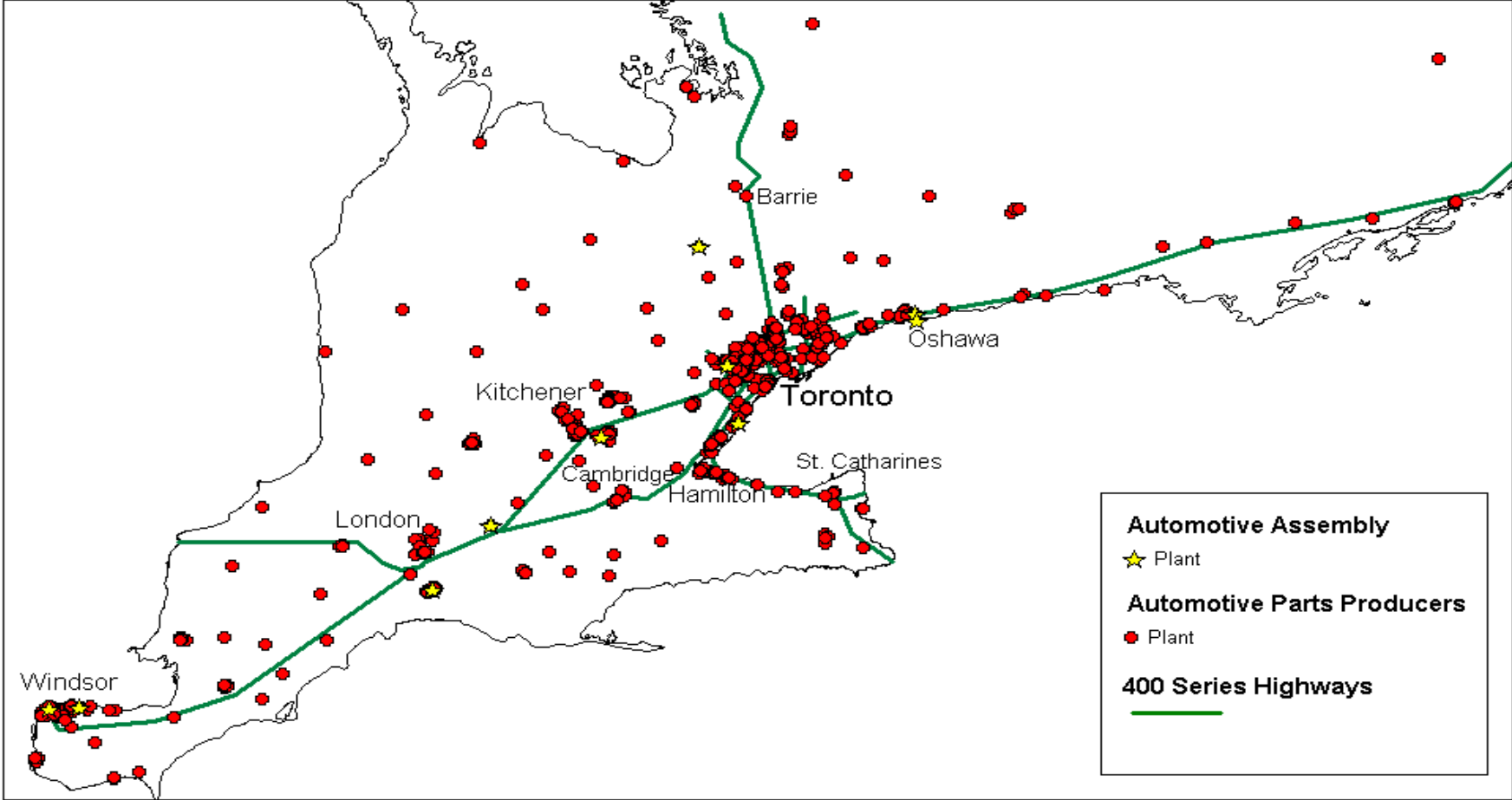
# *Innovation in the Canadian Automotive Industry*

- OEM
  - DCX and Ford links to University of Windsor. GM Engineering Centre, Oshawa
- 'Core' Auto Parts
  - variant of entrepôt model
  - R&D takes place elsewhere in TNC
  - intra-firm and OEM-firm knowledge transfers
  - incremental process innovation at plant level
- MTDM
  - a classic regionally embedded cluster
  - incremental product and process innovation
  - importance of informal/tacit knowledge over patenting

## **Innovation is largely process/productivity driven**

**“The car companies ultimately determine successful intellectual property, which is evident to the extent that it is incorporated into vehicle designs. Relatively few companies are rewarded for a strategy of original product development. In contrast a company being perceived as being a low cost, high quality “build-to-print” supplier is always valued –products at a lower price is the prime competitive requirement in the industry. Consequently most Canadian parts manufacturers are necessarily more concerned with developing process productivity improvements, rather than speculative product development or applied R+D” (National Forum on Automotive Innovation and Investment, 2002, 5).**

# All Automotive Parts Plants, 2002, Southwestern Ontario





# *Kitchener and Windsor Case Studies*

- Project thus far:
  - 63 interviews conducted:
    - 34 firms
    - 6 union
    - 6 education
    - 14 government/community
    - 3 producer services

# Size Distribution of Auto Parts Plants

Plant size grouping as share of all regional plants, 2002, Ontario									
	Number of Employees								
	15-49	(%)	50-99	(%)	100-249	(%)	250+	(%)	Total
Windsor/Chatham	32	(27.8)	18	(15.7)	38	(33.0)	27	(23.5)	115
London/St.Thomas	9	(27.3)	4	(12.1)	12	(36.4)	8	(24.2)	33
Kitchener/Waterloo /Cambridge/Guelph	14	(16.3)	15	(17.4)	30	(34.9)	27	(31.4)	86
Brantford/Hamilton/ St.Catharines/ /Niagara Falls	25	(29.8)	20	(23.8)	20	(23.8)	19	(22.6)	84
GTA/Oakville/ Oshawa	80	(29.7)	50	(18.6)	80	(29.7)	59	(21.9)	269
Other	35	(20.6)	31	(18.2)	44	(25.9)	60	(35.3)	170
<b>Total</b>	<b>195</b>	<b>(25.8)</b>	<b>138</b>	<b>(18.2)</b>	<b>224</b>	<b>(29.6)</b>	<b>200</b>	<b>(26.4)</b>	<b>757</b>

Source: Project Database

<b>Core Automotive Parts Industry</b>	<b>Tool, Die and Mould (TDM)</b>
Tier 1 Transnational Suppliers (e.g. Lear, JCI, Dana, Magna, and Budd) and Tier 2 Suppliers of Stampings and Plastic Parts	Specialized and locally owned shops. Little foreign ownership.
Medium- to large-sized plants (av. 100-400 employees)	Small- to medium-sized plants (av. 30-50 employees)
Mix of publicly-traded and privately-held companies	Privately-owned by self-made entrepreneurs and skilled tradesmen
Semi-skilled and unskilled production workforce	High levels of technical skill and tacit knowledge acquired through apprenticeships and on-the-job experience
Relatively highly unionized (40%) - union often important source of knowledge	Non-union. Strong entrepreneurial culture
Heavily reliant on OEM and Tier 1 customers in Michigan and Ontario	Less tied to local customers and exports much of its output outside of the immediate region

# The Automotive Industry in Windsor-Essex County, 2003

Category	No. of plants	Employment			Average date of establishment
		Total	Mean	Median	
<b>Total</b>	<b>504</b>	<b>48605</b>	<b>753</b>		<b>1980</b>
<b>Final assembly</b>	<b>1</b>	<b>11500</b>	<b>----</b>	<b>----</b>	<b>1925</b>
<b>'Core' Auto Parts</b>					
Subassembly of Parts	27	9240	342	100	1976
Auto parts – metal	30	10899	363	118	1971
Auto parts – plastic	25	3768	151	86	1984
Stampings	35	4072	120	57	1972
Other auto parts	22	4811	209	86	1975
<b>Machinery, Tool, Die and Industrial Moulds</b>					
Tool and die	127	4429	36	23	1981
Fixtures	67	2610	39	26	1982
Moulds	124	6129	51	30	1983
Production automation/ control systems/ Instrumentation	57	2739	49	31	1983
Engraving/polishing/ detailing	26	461	18	11	1981
Design/prototypes/testing	97	5277	56	29	1981
Other production goods	105	3539	34	16	1980
<b>Metal Processing</b>					
Other metal fabrications	99	4346	45	18	1980
Metal treatment	17	848	50	25	1980
<b>Other Production Services</b>					
Sequencing/ packaging/recycling	10	798	80	34	1965
Production consumables	14	445	33	14	1979

	<b>Windsor</b>	<b>Kitchener</b>
<b>Leading Sectors</b>	Mould making, Tool and Die, Components	Automation Systems, Tool and die, Components
<b>Support for entrepreneurship</b>	Strong in mould making	Strong at level of general economy
<b>Role of unions</b>	Strong	Weak
<b>Role of universities</b>	Links to OEMs, few to parts and MTDM	Important link to OEMs, WATCAR, some to parts
<b>Role of community colleges</b>	Important for skills development in workforce	Important for skills development in workforce
<b>Final markets</b>	Dominated by Big Three	Mix of transplants and Big Three
<b>'New economy' linkages?</b>	Not significant	Developing in IT – links to automation systems
<b>Cluster?</b>	MTDM – especially in mould making Not in components	Overall, local linkages are not strong

# Challenges Confronting Auto Parts

- Loss of intellectual property
  - “there is always an IP threat from the OEMs –they multiple source and will give your ideas to competitors” (Kitchener auto parts supply, June 2004)
- Cost/price pressures –from OEMs and offshore (China)
  - “The Big Three are demanding you move jobs to Asia – the motivation is cost” (Kitchener auto parts July 2004)
  - “Suppliers are being squeezed to the brink of extinction” (Kitchener auto parts supply June 2004)
- Possible breakdown of R+D/manufacturing synergies
  - “...do they [the Big Three] want you to dispose of all your manufacturing capacity and just provide them with the design experience which is a direct result of that manufacturing experience? ... Eventually your design logic would no longer have a manufacturing focus ... Even our original ideas would slow down-because original ideas are driven from the needs of manufacturing”. (Windsor Mould Maker, October 2003)

# Challenges ...continued...

- Shift of new assembly plants to US south
  - “Canada is a target for grabbing investment”  
(Kitchener auto parts June 2004)
    - “ ...we could build a plant in Alabama – that would be the thing. If there are no assembly plants in Canada, why would they need stamping in Canada?”  
(Windsor auto parts, August 2003)
- Lack of visibility:
  - “Nobody knows about it. To the outside world and to many politicians, many policy makers in Ottawa, the tool, die and mold is almost underground ... These people setting policy .... think this is yesterday’s industry. You ask them and they’ll say ‘Well, we’re knowledge-based’ Knowledge is simply a tool to create the product, that’s all it is (Windsor machine tool producer August 2004)

# *Challenges ...continued...*

- Over reliance on Big Three:  
Big Three's share of the North American production continues to shrink. Automotive suppliers need to focus on increasing sales to new entrant assemblers who now account for 28% of North American production and forecast to grow to 35% by 2010
- Although demand for automotive tooling remains very high due to increase in new product launches, competition from East Asia, and especially Japan, is now causing a lot of turmoil in the MTDM segment of the Ontario automotive industry.



# *Changing Supplier Strategies*

- Increasing value added activity:
  - ...if you are a commodity supplier, you are dead; there is nothing you can do. So the smarter firms have tried to provide more value-added elements. I've one plastics company that rather than just shooting and shipping parts for the entry systems, they are now assembling the entire system. (Business Services Windsor August 2003)
- Firms becoming more R+D intensive and using SRED programs:
  - “... the Big 3 right now are pushing a lot of the R&D down the line –and as a result of that –the tier 1s are pushing the tier 2s and they keep pushing as well .. especially in automotive where things get slow –we tend to see a rise in our claims-because. ...instead of laying people off they push their resources to R&D .. (Canada Customs and Revenue Kitchener, November 2003)

# *Policy advantages:*

- Government policies have been vital in industry development
- Auto Pact 1965-2001
- Education system –especially community colleges
- SR+ED/IRAP “Ontario has a very strong R&D credit arrangement – it is probably the best in the world – and it certainly is pushed forward by the local government” (Windsor respondent, August 2003)
- Auto 21
- Universities less directly linked to parts industry but...
- Auto R+D has higher profile in Canadian universities than in the US

## *Policy challenges:*

- Incentives and new assembly plants
- IP protection –especially for SME suppliers
- Bridge and border issues –Windsor especially, but a concern elsewhere
- Automotive MTDM sector has been a world leader but is now under strong competitive pressure from off-shore tooling producers, especially Japan, China, and Korea
- Facilitating cluster development?