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# Climate change and labour: The need for a “just transition”

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# The foundations for extending green jobs

*The case of the rail-based mass transit  
sector in North America*

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This paper will explore some of the conditions necessary for promoting domestic manufacturing in rail-based mass transit. Rail-based mass transit is one of the least polluting means of moving large numbers of people rapidly and is thus a key part of any green economy. I will examine the strengths and weaknesses of different regional or national production networks involving transit suppliers, trade unions, transit agencies and other governmental and non-governmental actors. I focus on five key factors that potentially contribute to or influence whether or not a region develops rail-based mass transit manufacturing. These factors help explain the actions by or institutional designs of the state, corporations, and trade unions and how these influence manufacturing outcomes.

I will examine production networks in the United States and Canada. By “production networks” I mean the capacities marshalled by elements of a corporatist coalition linking corporations, the state and trade unions. These production networks relate to: (a) smaller scale rail producers based in Milwaukee, Wisconsin, and (b) the rail-based mass transit manufacturing capacity of the Bombardier (and its predecessor firms), with a focus on Ontario. I will show how key factors illustrate why Ontario’s production network was superior to Wisconsin’s, and how the Canadian system’s capacity to support these mass transit rail producers was superior to that found in the United States. My review of development states in East Asia provides a benchmark which illustrates limits to both the American and Canadian development models.

## Theory

Contemporary theories of geography discuss two potentially competing tendencies in explaining location of firms and regional growth patterns. On the one hand, some theories emphasize *centrifugal* forces. Given the nature of the product cycle and emerging new global markets, many industries will begin within a home nation and then expand more operations overseas to access markets, R&D, and personnel. Other theories emphasize *centripetal* forces. For instance, certain products and services tied to government procurement will often have a high domestic content. The local state is similar to what geography David Harvey describes as “fixed capital”, i.e. not so footloose or likely to move operations overseas (Harvey, 2006).

The key factors that I will show contribute to successfully anchored domestic production include: (a) a system that promotes the use of state resources on a civilian development path through incentives or constraints; (b) protectionist policies and industrial policy supports; (c) a “managerial equation” linking knowledge, power, and engineering resources through development pairs utilizing user competence; (d) the existence of a diversified strategy and resource base; and (e) the relative strength and strategies of local

trade union and social movements. Some of these variables are explained by other factors beyond the scope of this paper. In addition, these five key factors can influence one another in a complicated causal chain that requires more detailed historical analysis.

### Civilian development incentives or constraints on the state to promote manufacturing

Different states will prioritize different sectors. The national state may be more or less oriented to promoting a military – as opposed to a civilian – oriented manufacturing capacity. State building projects can be tied to either the expansion of military or civilian economic power (Feldman, 1998; Melman, 2001).

The “development state” found in regions like East Asia – the Republic of Korea, Taiwan (China) and Singapore – indicates one way various constraints or incentives push the state to promote civilian industrial policy. The cases I will study either lack or possess some elements of such a state within them. I am therefore interested in specific strategies or designs common to development states known to promote industrial success but which may or may not be present in these cases. One key factor is that East Asian development states that are “corporatist states” have been based on a foundation of “institutionalized government–business cooperation”. These states are based on “close cooperation and interaction among politicians, bureaucrats, and business elites”. This tripartite cooperation is sometimes found in corporatist regimes in the West. Yet, the development states also operated under unique conditions that constrain the “transferability” or “replicability” of this model to “alternative national contexts”. For example, “the single-minded adherence to growth and competitiveness at the expense of other objectives, the unusual degree of bureaucratic autonomy and capacity, and the equally unique and unusual degree of public–private cooperation” are considered “extremely difficult to emulate” (Öniş, 1991, pp. 118–120).

Nevertheless, some key elements similar to these constraints, specific objective conditions and resulting strategies were partially replicated outside of the East Asian states in part because of corporatist coordination. I will now list some of the key strategies used to support manufacturing in development states.

First, the East Asian development states have supported *national champions*. They have achieved superior levels of growth because of “very high levels of investment, more investment in certain key industries than would have occurred in the absence of government intervention, and exposure of many industries to international competition in foreign markets, though not in domestic markets”. One way to sustain a champion is through the creation by the state of “a stable and predictable environment within which...

corporations [can] undertake long-term risks". This includes systems where "the state has managed to limit the number of firms allowed to enter an industry" through industrial licensing policies. In other words, the state "deliberately accelerated the process of industrial concentration as a basis for successful competition in international markets" (Öniş, 1991, pp. 111–112).

A second component of this strategy is the extraction of concessions by the state from assisted companies that support performance or domestic anchoring. And third, the state-brokered collaborations with foreign suppliers of technical know-how. In the Republic of Korea, for instance, "technology has been acquired through investing in foreign licensing and technical assistance" (*ibid.*, p. 113). In Japan's development, "foreign companies were required to transfer technology" (Chang, 2008, p. 59). Thus "one of the elements in the success of Japanese firms has been the capacity to absorb and refine technological developments that originated elsewhere" (Best, 1990, p. 185).

### Protectionist policies and industrial policy supports

An important comparison can be made between the "development state" on the one hand and the "entrepreneurial state" on the other. The former is characterized by policies that typically promote domestically anchored firms. The latter is characterized by policies that encourage business development that is locally based, but not necessarily involving local businesses (Eisinger, 1988). The entrepreneurial state emerged against the appeal of global trade flows, the power of transnational corporations (TNCs) and a change in ideology towards denationalized enterprises. As some nations faced contracted conditions at home or developed relatively successful export markets, academics, farmers, business leaders or workers attached to these markets began to question protectionism or lobbied to promote free trade. At the same time, foreign TNCs gained greater domestic lobbying power to place limits on free trade. Domestic-based TNCs also sought freedom from protectionist constraints in order to promote outsourcing of production (Aaronson, 2001; Faux, 2006; Greider, 1997).

The key industrial policy factors influencing the growth of the rail-based mass transit industry include: (a) the size and stability of the mass transit market; (b) the existence of local content provisions favoring domestic producers; and (c) a system that provides financial incentives for mass transit production (Feldman, 1998 and 2009).

The greater the size of the national transit market, the greater the chances that transit suppliers will be able to sustain fixed costs. Generally speaking, "a nation's firms are likely to gain competitive advantage in global segments that represent a large or highly visible share of home demand but account for a less significant share in other nations". A nation can gain a competitive advantage in those "industries or industry segments where the

home demand gives local firms a clearer or earlier picture of buyer needs than foreign rivals can have". These home advantages can occur "if home buyers *pressure* local firms to innovate faster and achieve more sophisticated competitive advantages compared to foreign rivals" (Porter, 1990, pp. 86–87). In the rail-based mass transit industry, the key purchaser is usually the local state financed in part by the national government. Yet, the competencies or role of the local state transit agency can be differentiated, as discussed below (Feldman, 1998).

Trade protection can help stabilize markets. The United States together with "many other countries" including Germany, Sweden, France, Finland, Austria, Japan, Taiwan (China) and the Republic of Korea "grew rapidly behind protective barriers" (Chang, 2008, p. 55). Countries supporting import substitution and having manufacturing experience helped generate "mid-tech exports such as steel, cement, petrochemicals, automobiles, truck parts, TVs, and tires". One pattern was that "an industry would start selling in the domestic market and then, with enough experience, would sell overseas" (Amsden, 2007, p. 13).

### The existence of a development pair and the "managerial equation"

A "development pair" can be defined as "a tightly linked long-term user–producer relation formed around several joint development projects between a manufacturing firm and a government customer" (Fridlund, 2000, p. 147). These pairs are subject to a larger set of relations influencing regions, and the firms embedded within them, which explain how growth is based on integrating knowledge (or competence), power (or resources), and the capacities of innovating engineers. The integrative element of the equation can break down at the level of the firm or region (Feldman, 1998 and 2007). One way the "managerial equation" integrates these three kinds of capacities is by linking decision-making and responsibility as well as innovation and finance, links that were broken historically by the rise of absentee owners and financial capitalists distant from the concerns of production (Veblen, 1965 and 1967).

Turning to the "power" or resource element in the managerial equation, larger firms with greater capacities often depend on follow-on contracts that sustain them as incumbent producers (Kurth, 1972). Demand for a product is a key resource and the political organization of this demand relates to power considerations. If a firm is not an incumbent in a specific industry, if follow-on contracts in mass transit are lacking, or if a firm is a follow-on producer for markets that are irrelevant to or more profitable than mass transit, the incentives for entering or remaining in mass transit markets will be limited (Feldman, 1998).



The “knowledge” element of the equation is partially based on the principle that more sophisticated purchasers can generate more competent firms. Differences in the consumption “competence” of a mass transit agency as a procurement agent have been shown to contribute to success and failure in mass transit innovation projects (Feldman, 1998; Porter, 1990).

### Diversified strategy and resource base

The contribution of the third element of the managerial equation, engineering resources, partially depends on the extent to which production is tied to research and development (R&D) and how innovative potential is organized. Companies benefiting from national or local industrial or R&D policies supporting their industrial sector can gain a comparative advantage, but not all firms will be equally equipped to profit from such policies: “government policy will fail if it remains the only source of national competitive advantage” (Porter, 1990, p. 128). A firm’s competitive advantage is based on “distinctive processes (ways of coordinating and combining), shaped by the firm’s (specific) asset positions (such as the firm’s portfolio of difficult-to-trade knowledge assets and complementary assets), and the evolution path(s) it has adopted or inherited” (Teece, Pisano and Shuen, 1997, p. 509).

One key issue is that the mass transit manufacturing sector has been affected by the microelectronics revolution which has made transportation firms platforms for software, advanced electronic controls and subject to advanced manufacturing processes. Companies that lacked certain electronic capacities and advanced systems integration capacities fell behind. In contrast, in some regions mass transit producers were simply low-technology and weak in R&D assembly operations lacking advanced innovation or production capacities (Feldman, 2009). In other words, the architecture of certain firms will shape their capacity to enter or maintain a presence in the mass transit production sector. So, for example, larger and more diversified firms have greater capacities to “devote resources to fast-growing industries” (Fligstein, 2001, p. 91). Some transit suppliers may remain profitable by capturing specialized niches, particularly if they have low overheads or can produce in batches (Feldman, 2009).

### The local strength and strategies of trade and social movements

One view is that trade union actions taken at the local scale in response to de-industrialization can be a viable strategy for addressing the problems associated with globalization. Workers can play a significant role in shaping a region’s underlying economic and industrial structure in addition to

**Table 1. Key factors promoting domestically anchored and successful rail producers**

Factor	Potential measures
Incentives or constraints promoting civilian manufacturing development state strategies	The state has a strong incentive or faces a constraint that encourages it to promote civilian manufacturing strategies
Protectionist policies and industrial policy supports	The national state limits foreign suppliers, encourages local content or provides significant financial aid to national champions
Development pair and extension of user competence	Local transit agencies support local firms through “follow on” contracts or knowledge transfer
Diversified strategy and resource base	The local firm is in multiple markets, it has an internal R&D capacity, and has complemented its local capacities with collaborations
Labour strength and power extension strategies	Labour unions are represented at a plant and use political power, electoral means and coalitions to promote national champions

corporations and the state (Herod, 2001, pp. 50–53). In contrast, some question the degree to which such local actions are sufficient: some oppositional “movements...are generally better at organizing in and dominating ‘their’ places than at commanding place” (Harvey, 1996, p. 324).

Among the factors that increase the political capacities of trade unions are their abilities to forge alliances with other groups. Unions can further extend their power by creating new coalitions to offset their weaknesses based on capital mobility in the global era. A key factor is “external solidarity, both with other unions and with the community and other social groups” (Lévesque and Murray, 2002, p. 39). Corporations are viewed as a key potential ally within coalitions to promote “green jobs” like mass transit (Jones, 2008). Yet, corporate partners can differ radically between those who are more or less mobile and more or less anchored in the local economy, e.g. in their relations to state procurement agencies.

In table 1, I have summarized the five principal factors which I argue are more likely to promote a successful and domestically anchored rail-based mass transit manufacturing industry. Companies and regions benefiting from the presence of these factors will do better than those lacking the presence or operation of these factors.

## Industrial policy regimes compared

The industrial policies of both the United States and Canada are associated with various strengths and weaknesses that have influenced their ability to manufacture trains locally. The United States used to contain a wide variety of mass transit train suppliers including firms like Pullman, St Louis Car Company, and Budd and in the post-Viet Nam drawdown attracted defence firms like Rohr and Boeing Vertol. Today, the US market

still has major locomotive producers like General Electric and EMD, but smaller to medium-sized producers are not uniformly successful as a group. These include companies like the successful Oregon Iron Works and the less successful Super Steel Company profiled below.

In Canada, Bombardier has become a very successful producer on a global scale, although its mass transit operations are headquartered in Berlin, Germany. Nevertheless, the company is not always regarded as a “German” firm within Germany, according to some industry insiders. Bombardier’s contemporary Canadian rail operations represent the consolidation of three primary railroad producers.

One part of Bombardier’s operations is the outgrowth of their recreation snowmobile operations and is centered in their La Pocatière plant in Quebec. The second part to Bombardier’s production capability was based on Hawker Siddeley Canada’s operations, which had already established itself in the rail car business with another large factory in Thunder Bay. At one point this line of companies was controlled by the Canadian Car and Foundry. Production has been ramping up to meet a Toronto subway car order. The third part was built upon the Urban Transit Development Corporation which was owned by the Ontario government and located in Kingston, Ontario.<sup>1</sup>

### The United States and industrial policy

At the national level, military (or “defence”) as opposed to civilian interests have dominated the industrial policy agenda. At the firm level, when former defence suppliers like Boeing Vertol tried to produce subways they were technically successful but the incentive system based on profits attached to making military helicopters was far superior to the mercurial mass transit market (Feldman, 1988; Melman, 2001).

Hats Kageyama, a manager at the Sojitz Corporation of America, a leading Japanese trading company in United States mass transit markets, explains some of the underlying problems of that country’s system. The home markets of the Japanese and Europeans provided advantages in supporting the price and quality of the foreign suppliers’ products. In contrast to other regions, United States suppliers of rolling stock were part of a qualitatively different market:

The U.S. market is unique, because here a railway car is treated like a consumption item, like an automobile. As opposed to a railcar in Japan, a railcar in Canada, or a railcar in Europe... [where] they’re treated not just on price. Whereas in this country, the lower the better... In America, there’s

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1. Phone interview with David L. Jeanes, President of Transport Action Canada, 5 March 2010.

no established domestic market that would protect the carbuilder's business like in Japan, or like in Europe or like in Canada. In other words, Canadian... European... or Japanese carbuilders are all protected, but not in the [US].<sup>2</sup>

The United States Government lacks policies to create national champions in mass transit and to restrict the number of suppliers, although certain policies by the Department of Transportation (DOT) provide R&D advantages for American-owned firms and require domestic content in rolling stock. The DOT also has helped the Oregon Iron Works' United Streetcar, LLC Company through R&D policies and initiatives to finance streetcar projects (Feldman, 2009).

Members of the United States Congress became concerned by the mid-1970s about "how much success foreign manufacturers were having in US heavy industries markets", particularly in supplies for transportation systems. In 1978 a Buy America provision "established a preference for products produced, mined, or manufactured in the United States" (TCRP, 2010, p. 5). Presently, a piece of rolling stock can qualify as a domestic product fundable by the United States Government if: "1) the cost of its components produced in the United States...exceed 60 percent of the cost of all its components, and 2) final assembly [takes] place in the United States" (ibid., p. 17).

### Canada and industrial policy

In the early 1980s, one author argued that "compared to Japan and Europe, Canada seems a relative novice in the area of industrial policy" (Jenkin, 1983, p. 24). Yet, in contrast to the United States, Canadian firms were on the periphery of the global military economy and Canada's defence firms "are not necessarily among the largest Canadian firms" (Pepall and Shapiro, 1989, pp. 277–278).

In the 1960s and 1970s, a debate emerged as to how Canada could move beyond an economy partially limited by small-scale branch plants serving Canadian markets and unable to achieve the "operational scale, technological sophistication, or managerial mandates to compete internationally". One approach was to promote national champions and the other approach relied upon open markets and microeconomic policies that aided greater competitiveness or economic adjustment (Hale, 2008, p. 727).

During the Administration of Prime Minister Pierre Trudeau (1968–1979 and 1980–1984), national policy in Canada supported the development of companies like Bombardier as "globally competitive 'national champions'"

2. Interview with Hats Kageyama, Vice President Sales and Marketing General Machinery Department, Sojitz Corporation of America, New York, NY, 5 September 2006.

(Clarkson, 2002, p. 205). Brian Mulroney, the Canadian Prime Minister from 1984 to 1993, “wanted to help build major Quebec-based companies and Bombardier was right at the top of the list”. As a result, he transferred ownership of the two companies to Bombardier. He also put the full resources of the Export Development Canada (EDC) behind Bombardier. His administration also started a programme, called “The Canada Fund”, which was used to provide subsidies for research and development, marketing and production. The primary beneficiary of this programme was Bombardier. In sum, there were a number of policies either developed and or promoted by the Conservatives “that helped Bombardier really move to the next level, move beyond simply being a manufacturer of snowmobiles”.<sup>3</sup>

Civilian industrial policy was central to the company’s success: “Bombardier excelled in being able to exploit every government initiative – whether it was federal or provincial – that existed”. The reason was “the nature of industries in which Bombardier competed”. In the rail and aerospace industries, success depended “on exploiting every cent of government assistance” because their competitors overseas were heavily tied to government supports. There was “not a level playing field in those two sectors”. Industrial policy became a necessary condition for success: “No matter how good your management was, unless you...had a high degree of government support in many different forms, you just could not compete.” When Bombardier was launching its rail business, European rail producers were either owned by the government or heavily subsidized by the government.<sup>4</sup> Nevertheless, Bombardier was far more committed to developing its aircraft industry, especially in light of fierce competition with Brazil, than in making trains.<sup>5</sup>

### The future of trade policy

The fact that procurement policies at the provincial and municipal level were not bound by the procurement provisions of international trade agreements has been a key factor to promote local production of rail-based transport equipment. However, this has been put into question by a recent attempt by conservatives to break local procurement of subways in Toronto and seek to bring local procurement under the disciplines of trade agreements.

The attempt to break local procurement of subways in Toronto led to an effective campaign by unions in Ontario to embarrass the province

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3. Phone interview with Fred Lazar, Associate Professor of Economics, York University, Toronto, Ontario, Canada, 25 February 2010.

4. Ibid.

5. Phone interview with Anthony Perl, Professor and Director, Urban Studies Program, Simon Fraser University, 6 May 2010.

government regarding the risks to which it had subjected the local economy (see below), after which the province supported a 25 per cent Canadian content minimum. The city of Montreal, for its part, has adopted the United States standard of 60 per cent local content.<sup>6</sup>

Recent trade fights have led conservatives to further deepen open markets. Stockwell Day, when Canada's international trade minister, tried to push "Canada's provinces – which also hold power over local governments – to formally agree to open their purchasing to foreign companies" (Austen, 2009). Later, a draft text of the proposed Canada–European Union Economic and Trade Agreement (CETA) was revealed to contain language weakening Canada's industrial policy system: "Controversial provisions... would [notably] stop municipal governments from implementing local or ethical procurement strategies" (Council of Canadians, 2010).

### The case of Milwaukee's rail manufacturers

Milwaukee used to be an important centre for facilities for the remanufacturing, rehabilitation, or new builds such as the Cold Spring Shops of the Milwaukee Electric Lines (a local railroad) and the major repair shops of The Milwaukee Road (a transcontinental railroad).<sup>7</sup> Today, Milwaukee is moving ahead to build a new light rail system, a project largely conceived of as a transit service. Yet, in 1992 a study argued that light rail transit investments could be "strategically deployed to stimulate reindustrialization and the development of a Milwaukee-based mass transit industry" and an important contributor to "the export base of the local economy" (Levine, 1992, p. 54).

The following section reviews the development of the rail-based mass transit manufacturing industry in the Milwaukee area. This case illustrates the regression of manufacturing capacities and a relatively weak system to sustain manufacturing and innovation capacities in rail.

### The Milwaukee Rail Car Corporation

Robert J. Bauman, presently an Alderman in Milwaukee, helped start the Milwaukee Rail Car Corporation in 1983 with the intention of becoming "a domestic manufacturer of railcar equipment across the spectrum from [light rail] transit to heavy rail inner city". In the early 1980s, the company had the facilities, workforce, the industrial and supplier infrastructure to do

6. Phone interview with John Cartwright, President of Toronto and York Region Labour Council, Ontario, Canada, 21 May 2010.

7. Email communications from Stephen Karlson, Associate Professor of Economics, Northern Illinois University, Dekalb, IL, 3 and 14 June 2010.

that, and yet it folded in 1987. It tried to break out from “a small job shop, custom rebuilder of rail cars into a manufacturing operation”, a conversion which required “a quantum leap in terms of scale and capital requirements”. The company found it very difficult to secure the necessary capital: “the venture capital community, the finance community, the banking community in the City of Milwaukee didn’t see a market – didn’t see an economic demand for the products we were proposing to build. Ironically, we got much more interest from financial institutions in places like New York than our own backyard”.<sup>8</sup>

### The Super Steel Products Corporation

The Super Steel Products Corporation, founded in 1923, has had more success in the railroad business (a market it began to focus on in 1966) than the Milwaukee Rail Car Corporation (Decker, 2006; Super Steel Products Corporation, 2010). In 2007, the company had about US\$100 million in annual sales and employed 800 persons, 600 in Milwaukee (Content, 2008; Journal Sentinel, 2007). By March 2010, the company employed only 250 persons and was heading for receivership (Biztimes.com, 2010). The company was more diversified than the Milwaukee Rail Car Corporation, but still vulnerable to assorted problems related to demand, supply, and the “managerial equation”.

One problem faced by Super Steel was that it was somewhat specialized and dedicated to a rail sector vulnerable to weak domestic demand: “a significant percentage of [its] business was tied up in railcar assembly”. It could go “from boom to bust over one contract cycle”. The market is dependent on political decisions often outside the control of the supplier firm. This problem has made railcar manufacturing a very risky business for many firms: “they’re capital intensive businesses, you require large facilities, you require large investment in plant and equipment and they’re relatively labor intensive operations because there’s a lot of handwork with railcar assembly”. As a form of batch production, railcar manufacturing “is more similar to building a building than building an automobile”.<sup>9</sup> An indicator of Super Steel’s rail dependency is that one facility in Milwaukee “has the interior capacity to hold up to 50 completed passenger railroad cars” (Super Steel, 2010). In 2006, about 70 per cent of the company’s work was in the rail industry, with a significant portion of that “in freight locomotives, both domestically and for export” (Decker, 2006).

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8. Phone interview with Robert J. Bauman, Alderman, City of Milwaukee, Wisconsin, United States, on 14 May and email communication on 18 May 2010.

9. Ibid.



The firm's vulnerabilities were apparent during the early part of the recession. In December 2008, the company announced that it would close a factory in Glenville, New York. Super Steel said closure was based on "the dramatic downturn in the global and national economies and a steep decline in orders". The company's diversification within the rail business provided an insufficient level of protection. The company then explained that during the last few months in 2008 it saw "dramatic and unprecedented reductions and cancellations of orders" by their "customers in freight locomotive, transit and transportation sectors" (Content, 2008).

Super Steel began as a metal fabricating company with basic welding, metal working and machining capability. As assembly contracts became available, they evolved as part of a kind of satellite to the larger railroad environment based in Chicago. For example, they later became a successful subcontractor and systems integrator for Japanese prime contractors to assemble cars for Metra in Chicago. The company then became more vertically integrated and also developed a rail system to ship the car to Chicago.<sup>10</sup>

Super Steel is involved in multiple markets including manufacturing for the industrial, construction and agricultural markets (Biztimes.com, 2010). Railcar production was not its sole business segment so Super Steel was less vulnerable than the Milwaukee Railcar Corporation to transit market size and fluctuations. Super Steel's business plan was not based on producing a highly vertically integrated product line involving new railcars for the transit market:

Their first foray into the rail industry was actually building car bodies for the Electromotive Division, diesel locomotives. So they never saw the locomotive. They just built the car body and shipped it via highway to La Grange, Illinois, which is where Electromotive historically had its main manufacturing facility.

They fit the car body onto the diesel locomotive frame, truck and prime mover to provide a finished product. Super Steel only made part of a locomotive and initially even lacked tracks "because they were just building the bodies for the locomotives". As a supplier to locomotive manufacturer EMD, they were always supplying parts of systems and never did much R&D, although they performed some field and applied engineering. However, the company never developed an extensive internal research and development capacity; instead, they used systems, parts, designs and applications provided by other firms (Decker, 2006). The company's engineering capabilities do include three dimensional modelling, virtual product development, and the

10. Phone interview with Robert J. Bauman, Alderman, City of Milwaukee, Wisconsin, United States, on 14 May and email communication on 18 May 2010.



capacity to design and build tools used in their manufacturing work (Super Steel, 2010). The company gained technical capacities by cooperating with Japanese producers, but this supply side boost was not strong enough to overcome recessionary pressures.<sup>11</sup> The company was trying to diversify into new markets in 2006 (Decker, 2006), but this planning was insufficient in helping it avoid lay-offs and contraction after the recession and problems with a specific contract.

As a general principle, neither the Milwaukee Rail Car Corporation nor Super Steel could benefit from a tripartite alliance with trade unions and a local transit provider in rail production because of the absence of both subway and light rail systems in Milwaukee. Super Steel never produced for the local Wisconsin market, but has received support from local government because they were a significant employer not because of their product line's market.<sup>12</sup> The City of Milwaukee "helped Super Steel with millions of dollars worth of financing over the last thirty years".<sup>13</sup>

The ability to involve labour was further complicated at Super Steel in 1995 when the International Brotherhood of Boilermakers Local 1993 lost a representation vote at Super Steel. The workers at the plant had "voted for the union representation by a slim margin", although after that the union was unable to negotiate for a contract. An August 1995 decertification vote was supported by both the union and the company in a test of power at that plant, but unions lost. This vote was the "sixth time in 10 years that Super Steel workers had voted on some type of union representation" (Joshi, 1995). In sum, the Boilermakers had "a couple of elections there, won them, but could not get a contract".<sup>14</sup> The lack of a partnership between management and labour in Milwaukee was largely based on business elite opposition to the interests of trade unions, African-Americans or progressives.<sup>15</sup> The former CEO argues that a paternalistic system of close labour-management cooperation helped his firm. He argues that "ultimately it's your performance that wins...but it certainly doesn't hurt to have those advocates" such as trade unions.<sup>16</sup>

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11. Phone interview with Keith Trafton, Former CEO Super Steel Corporation, Milwaukee, Wisconsin, United States, 15 June 2010.

12. Phone interview with Robert J. Bauman, Alderman, City of Milwaukee, Wisconsin, United States, on 14 May and email communication on 18 May 2010.

13. Phone interview with Jim Scherer, Vice President, Milwaukee Economic Development Corporation, Milwaukee, Wisconsin, United States.

14. Email communication with Tracy Buck, Assistant to the Director of Administrative Affairs of the International President, International Brotherhood of Boilermakers, Kansas City, Kansas, 11 June 2010.

15. Phone interview with Frank Emspak, Professor Emeritus, Wisconsin School for Workers, Madison, Wisconsin, United States, 10 June 2010.

16. Phone interview with Keith Trafton, Former CEO Super Steel Corporation, Milwaukee, Wisconsin, United States, 15 June 2010.

## Bombardier and its predecessor firms in Ontario

Bombardier has been a relatively successful producer in Canada, with two major production facilities (and supporting design capacities) based in the country. When looking at data just for Bombardier's transportation division, we learn that they had 34,200 employees in fiscal year 2009, with about 6,500 or 19 per cent of personnel located in North America. In contrast, only 10 per cent of revenues of CAN\$9.8 billion came from North America in fiscal year 2009 (Bombardier, 2009).

## Development pair and extension of user competence

One basic approach in North America has been for transit agencies to work with a supplier, build a long-standing relationship with them and negotiate with that supplier around new specifications for successive train models. There has been an historical relationship between Bombardier or its predecessor firms and the Toronto Transit Commission (TTC) in Thunder Bay and Kingston, Ontario. All of TTC's cars were built in Ontario in the two locations, creating "a long-standing relationship with those facilities". As a result, normally that relationship would not be questioned, i.e. "you would continue if you were satisfied with the product and negotiate with them for the next batch of vehicles". Under the TTC Chairmanship of Howard Moscoe, this kind of follow-on procedure was implemented and corresponded to standard practices in many other parts of the world.<sup>17</sup>

Bombardier acquired the Thunder Bay railroad production facilities from a company that at one point was owned by Hawker Siddeley. One of the keys to the latter's success was that it had "a solid client, which was the City of Toronto". Politicians in Ontario wanted to create work and business for the northern manufacturing facility of Thunder Bay which, like Toronto, was located in the Province of Ontario. The Toronto Transit Commission and GO-Transit (Government of Ontario) were two key local customers. They both did not use consultants because "people working transit agencies were good engineers", unlike the situation often found in the United States. For many such agencies "would die without consultants in a day or two".<sup>18</sup> The TTC has a great deal of in-house expertise and a substantive engineering staff. In fact, they have production lines in which they rebuilt their own buses every 15 years. Some buses have been on the road for 45 years, having

17. Phone interview with John Cartwright, President of Toronto and York Region Labour Council, Ontario, Canada, 21 May 2010.

18. Phone interview with Joe Lewalski, former engineering Manager, Hawker-Siddeley Canada, Carson City, Nevada, United States, on 6 July and email communication on 11 July 2010.

had “two rebuilds”. They do not have the capacity to manufacture, but to rebuild.<sup>19</sup> The design and engineering capacities of Hawker Siddeley were also complemented by the Toronto Transit Commission and Ontario’s Transit Development Corporation when making the four-axle CLRV-1 (Sullivan, 1981, p. 81).

The origins of the TTC’s decision to purchase local, Ontario-produced Bombardier products at the Thunder Bay facility through a sole source contract can be traced to a tripartite arrangement linking government, unions and the firm. Bombardier’s Thunder Bay facility was in serious trouble in the mid-1990s. This led to a bailout plan involving the Ontario government, Bombardier and the CAW-Canada (the Canadian Auto Workers). The Ontario government was run by Bob Rae of the New Democratic Party (NDP). The CAW convinced the Rae government to bail out the facility. The government committed themselves “to source any product that they required for TTC through that Thunder Bay operation to keep it viable”.<sup>20,21</sup> The ability of Can-Car, a predecessor to Bombardier in Thunder Bay, Ontario, to exploit “follow on” contracts can be seen in the history of TTC’s contracts with this company. From 1965 to 1999, the Can-Car company (which once owned Thunder Bay) produced 1,608 transit cars worth CAN\$1,410 million (Burkowski, 1995, p. 171).

### Diversified strategy and resource base

The Hawker-Siddeley and Can Car operations that were centred in Thunder Bay, Ontario were eventually acquired by Bombardier as it became a larger, global-scale manufacturer of rail-based mass transportation equipment. Bombardier’s capacity to do that and sustain the larger corporate entity that contained mass transportation was partially based on the way it acquired or extended its capacities through diversification.

The Quebec Pension Fund and a Quebec government business development fund both provided “low-cost capital” to Bombardier (Levine, 1992; MacDonald, 2001). While Bombardier has been successful and received government assistance, Bombardier’s historian points out that “it is not just a matter of getting aid, but of what kind of organization is in place to put it to work” (MacDonald, 2001, p. xxxiii).

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19. Phone interview with Howard Moscoe, Councillor, City of Toronto, Canada, 2 June 2010.

20. Phone interview with Robert Chernecki, Assistant to the President, Canadian Auto Workers Union, 27 October 2006.

21. Even after the NDP lost power, the CAW continued to effectively mobilize and gained leverage in decisions by various levels of government (see below).

The Bombardier Company began when Joseph-Armand Bombardier invented a motorized vehicle that could overcome the transit problems created by harsh winter conditions in rural Quebec. He used his small workshop in Valcourt, Quebec to invent the tracked snowmobile in 1936. As weather conditions fluctuated and government policies were launched to more systematically clear snow from roads, Bombardier was forced to diversify into various products related to farm, industrial and military transport devices. Other government regulations either restricted snowmobile production or the locations where these vehicles could be used (Debresson, 1989; Goritschnig et al., 2003).

Acquisitions were key to building and extending in house capacities. In 1973, Bombardier was forced to diversify because the North American snowmobile market collapsed. The company had acquired “substantial financial resources” and “leverage from prior successes” so that it decided “to become a transport equipment multinational”. This success was furthered via acquisitions including first Worthington, “one of the largest locomotive manufacturers”. This base was then used to support a licence for “French urban transit technology” which the company improved upon and re-exported (Debresson, 1989, p. 9).

When Bombardier competed to win an order for Montreal subway cars in 1974, its principal competitor was Vickers Ltd., a British firm that had supplied subway trains to the system in 1963. At the time of the competition, Bombardier had gained some capacities in mass transit based on its acquisition of the Austrian firm Lohnerwerke GmbH. These capacities were complemented by acquiring the licence of CIMT-Lorraine, a French manufacturer that had supplied Vickers with designs to make the original Montreal subway cars. Vickers let the license lapse to avoid royalty fees and used its in-house designs. Vickers’ decision gave Bombardier an advantage as Montreal could benefit from standardization because the service and repair tasks on the old and newer French-designed trains would be the same. The licence acquisition decision also explains how Bombardier could avoid some of the key bottlenecks in breaking into this new market: “A main benefit to Bombardier was not having to invest in expensive research to develop new designs, allowing it to get product out faster and keep costs down”. The team that prepared the bid included “technical specialists” from CIMT and Bombardier employees who used their knowledge from snowmobile manufacturing to cost out everything in detail to make sure that a competitive bid did not prevent the company from making a profit. Bombardier won the Montreal bid and had lower costs (about CAN\$2 million less) after making adjustments for a coupling mechanism that Vickers did not originally submit in its losing bid but needed to in order to meet Montreal specifications (MacDonald, 2001, pp. 46–48).

## Labour strength and power extension strategies

Robert Chernecki, a leading figure in the CAW, explains how the Canadian labour movement developed a strategy for resisting imports and outsourcing in the transportation sector. The CAW has fought against globalization “since we lost the auto pact in the auto sector, since the passage of WTO and NAFTA, we’ve been on the ground fighting this”. The municipal councils are comprised of local community residents and the CAW has supported an electoral campaign to gain control over the public economy through local city councils: “We have encouraged our people to run for those positions and a lot of them are. They are getting on city councils and watching these procurements and insuring that if we’re going to spend taxpayer dollars, we’re going to put people to work here”. A continuing problem is that millions of dollars in procurements have been awarded on a wide range of products and services to outside the local community.

The CAW organized rallies in front of City Hall in support of the Bombardier procurement in both Toronto and Thunder Bay. They launched a lobbying effort, called “the made in Canada solution”, that lasted several weeks. It involved radio advertisements, opinion pieces in newspapers, T-shirts, buttons and a special publication. The effort began by trying to get Thunder Bay residents “to fight for jobs in their own community”. The CAW met with the mayor, city council and chamber of commerce there. Resolutions were presented to the city council and chamber of commerce. The CAW organized community meetings of local citizens as well. After a period of inertia, the mayor and political leadership got behind the initiative. The chamber of commerce produced a study, “Made in Thunder Bay”, which supported Bombardier and local content.<sup>22</sup>

The Toronto organizing drive had the strategic advantage of preceding local city council elections. On the day of the City Council vote on the TTC contract, a union rally joined CAW with other unions including the Steelworkers, the Teachers Union and UNITE. Jane Pitfield, who was running for mayor, opposed Toronto’s sole source contract with Bombardier. She later lost to David Miller (57 per cent to 32 per cent). The CAW brought the issue up with its “parliament” which involves a meeting of 600 to 700 delegates who meet every three months. These represent the 260,000 or so members in the union (or which about 100,000 are concentrated in Ontario, especially in Toronto). The leadership wrote, emailed and lobbied Ontario and federal parliamentarians to support local procurement and job retention in Canada.

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22. Phone interview with Robert Chernecki, Assistant to the President, Canadian Auto Workers Union, 27 October 2006.

The subway contract was funded by the federal government, the provincial government and the municipality. These three levels of government had input about how the work was done and where it was done. Chernecki argues: “The issue clearly was are we going to allow taxpayer dollars – provincial, federal and municipal – to put work offshore and people stood up to that test”. A letter written by Dalton McGuinty, Ontario’s Premier, to Toronto Mayor David Miller was “critical” because it helped counter the arguments by conservatives that the sole source decision violated WTO rules and other agreements or laws. Buzz Hargrove, CAW President since 1992, “secured that letter on behalf of this fight”. The TTC and the City Council “took this pretty seriously” and it led to an agreement to continue the sole source arrangement with Bombardier.

## Conclusions

The Milwaukee-based American companies profiled in this study either dissolved or were being reorganized after a bankruptcy. They have not been as successful as their Canadian-based counterparts. Super Steel is likely to emerge as a successful mid-sized assembler, but will not ever reach the scale of a transnational in the absence of stronger industrial policies.<sup>23</sup> The Canadian firm Bombardier emerged as a national champion, although part of a transnational corporation with much activity outside Canada, and still maintains two significant plants in Thunder Bay, Ontario and in Montreal, Quebec.

In Canada, the military economy captured far less attention from national leaders than civilian industrial policy, particularly as the greatest threats to the integrity of the nation came from internal factors rather than external threats.

At the national level, industrial policy measures associated with procurement and protection have been weaker in Canada than in the United States, especially in light of recent controversies. Nevertheless, at the local state level, Bombardier and its predecessor firms found local procurement champions which Milwaukee-based firms lacked. In the late 1960s to early 1990s, various Canadian industrial policies (such as financial support) to help Bombardier or the rail sector were far more successful than their American counterparts. While Milwaukee clearly borders the large Chicago metropolitan region, the local transit agency in Milwaukee did not support the markets for these firms.

23. It is important to note that success in manufacturing often should be defined at higher production network or system level and the lower project level, rather than at the firm level. This paper explores the firm and system levels, but does not explore in detail how firms succeeded or failed in specific mass transit projects (see Feldman, 1998).

The Toronto Transit Commission provided demand and supply side supports which Milwaukee's transit agency did not provide for the firms profiled.

In Bombardier's case, a relatively diversified firm was possible based on past success in non-transit related markets. The resource base of the firm was greater than that found in the two Milwaukee firms profiled, enabling the firm to be more successful in diversification. Both of these firms rested so heavily on rail-based transit markets that they became vulnerable to the boom and bust cycle of mass transit and the effects of the global recession.

In Milwaukee, the labour union lost representation at Super Steel, so it could hardly play a role during that period as a key cooperative foundation for expanding or retaining the company's market share. A history of labour conflict and racial divisions there contrasts with the leverage unions in Ontario have gained based on a corporatist coalition linking the transit agency, provincial manufacturers, and labour unions and supported by the New Democratic Party and local politicians advocating local procurement. This explains why Ontario has been able to retain jobs created in part by the factors elaborated above.

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