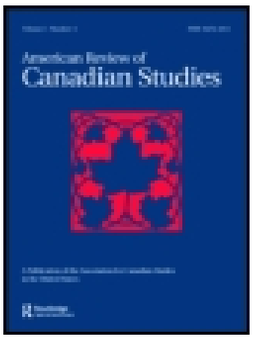

American Review of Canadian Studies

ISSN: 0272-2011 (Print) 1943-9954 (Online) Journal homepage: www.tandfonline.com/journals/rarc20

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To cite this article: Thomas F. McIlwraith (1984) TRANSPORTATION IN OLD ONTARIO, American Review of Canadian Studies, 14:2, 177-192, DOI: 10.1080/02722018409481446

To link to this article: https://doi.org/10.1080/02722018409481446

Published online: 10 Nov 2009.

TRANSPORTATION IN OLD ONTARIO

Thomas F. McIlwraith

Amphibiousness and Experimentation

There is an alligator near the eastern entrance to Algonquin Provincial Park. It is a peculiarly Ontarian beast, equally at home drawing log booms across a lake or winching itself overland to the next navigable water. This amphibious capability captures an essential element of the history of transportation in the province, and is supported by images of steamboats at Perth, railway cars crossing Lake Erie, or perhaps rain-soaked farmers knee-deep in April mud.[1] Old Ontario, what many today call Southern Ontario, was very much a transitional place, poised between the eighteenth century, when life flourished around the shores of the world's ocean sea, and the twentieth, which has been a time for facing inland. This contest between water and land provides a focus for a thematic review of transportation developments in Ontario prior to 1900.

Ontario is a peninsula thrust between the Lake Ontario-St. Lawrence Lowlands and the westerly Great Lakes. Those for whom it was a destination, or merely a way-point *en route* elsewhere, had two basic options: go coastwise around it or cross through (Figure 1). The water passage was conventional, but rather circuitous, while going overland defied established rules but offered a direct route. A Hamilton railroad promoter writing in 1854 warned that "attempts to force trade out of the natural and shortest routes always end in the ruin of those who make them, and ought to be avoided.."[2] For him railroads obviously followed natural routes.

The popularity of a direct, straight line of passage (or, to put it differently, of measuring distance solely in terms of mileage with no consideration given to time) appears in the literature with startling frequency. The Cassville-New York route is but one illustration of this opinion (Figure 1),[3] and clearly demonstrates

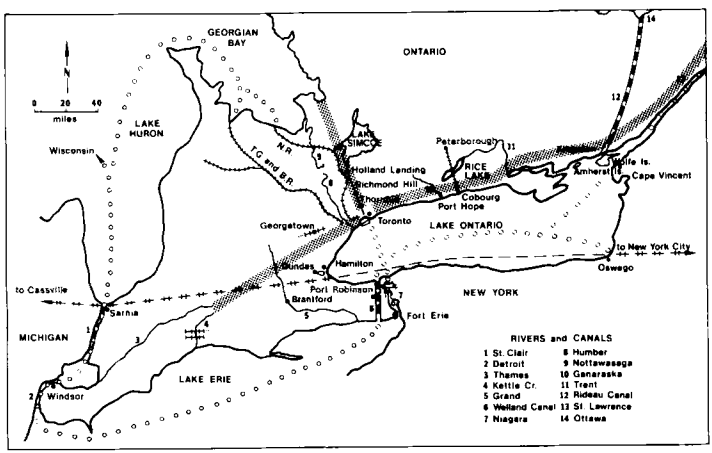

Figure 1. Transportation in Old Ontario: developments discussed in this essay.

that a mixture of modes is the price paid for linearity. And it was undoubtedly costly. The Cassville report avoided noting the St. Clair River crossing, for instance, where transfer from land to water and back to land would be necessary. Furthermore, corporate and political boundaries were crossed, with all the implications of warehousing for goods, custom inspections, jitneys between stations, new tickets and more. Still cutting across the Ontario Peninsula is a predominant factor underlying the pattern of transport routes in the province, and helps explain the persistence of amphibiousness.

Whenever water transportation tried to cross land, or land methods tried bridging water, spectacular—even monumental—results were possible. The Welland Canal, dug in the 1820s, was the province's first big corporate enterprise.[4] It permitted schooners to be towed past Niagara Falls and created Port Robinson, a lake port some fifteen miles from the nearest open lake. The Rideau Canal employed cleverly engineered dams which flooded obstructions in the Cataraqui, Rideau and Ottawa rivers, making a slack-water surface along which barges could be towed. Canals of course had the appearance of water transportation, but in their operating procedures anticipated that most terrestrial of forms, the railroad. The timber slides and log flumes of the Trent and upper Ottawa rivers were still further removed from true navigation. They were to all intents and purposes the pipelines of the 1850s, one-way conduits for which there is no container to send back.

Bridges are the obvious extension of land transport over water. To railroad men, the Niagara River interceded between New York state and the Niagara peninsula, much as the Falls interrupted the passage of watercraft. A succession of distinguished bridges resulted, including Roebling's 1855 suspension bridge which carried the Great Western Railway and road traffic on separate decks[5] (Figure 2). At Sarnia and Windsor, tunnels were driven underground to link Michigan and

Figure 2. The Roebling suspension bridge across the Niagara River gorge at Clifton, looking southward towards the Falls, 1850s. Oil painting, artist unknown. *Museum of Fine Arts, Boston. Karolik Collection.*

Ontario railways before 1910. They too bridged open water, but were better suited to soft, low river banks and the condition that navigation not be interrupted.[6]

Ships poking inland eventually lost headway. Dundas was the *ultima thule* for Lake Ontario schooners, as was Holland Landing for Lake Simcoe craft. Conversely, where resources could not be stretched to provide a bridge, ferries extended land transport over water. Railroad cars were carried across the St. Lawrence, Lake Ontario, Lake Erie and the Detroit River before the end of the century.[7] Locally, the Trent ferry (Figure 3) typifies the scores of such little platforms scattered throughout pre-Confederation Ontario to assist travellers and goods across streams. One may imagine that an interview with the patient traveller shown in the painting, whose forward progress appears stymied by a dilatory ferryman, would yield some uncomplimentary remarks on the subject of amphibiousness.

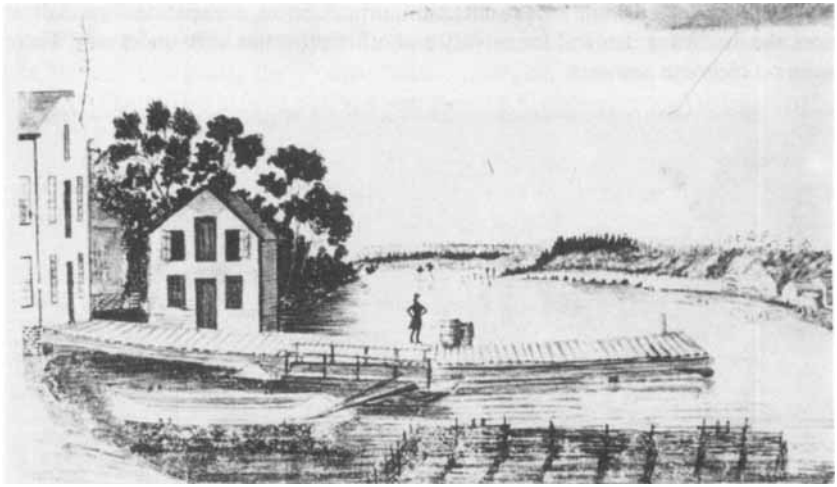

Figure 3. Wharf and ferry where the Lake Ontario shore road crossed the Trent River, Trenton, about 1830. *Ferry at the Mouth of the River Trent*, Watercolor by Thomas Burrowes. *Ontario Archives, Burrowes Collection* No. 114.

The 1850s were euphoric years in Ontario, and produced two structures which took the "direct-route-without-change-of-mode" concept beyond sensible limits. Wolfe Island stands in the St. Lawrence River astride the direct line between Kingston, Ontario and Cape Vincent, New York. Entrepreneurs in both centers foresaw vast quantities of traffic flowing across the border at this point and one group, determined to corner the traffic, surmised that a canal across Wolfe Island would achieve that end. The canal opened in 1857 and served until the 1870s. But without maintenance the cut gradually filled in and a curious linear marsh, sufficient to bemuse the best of geomorphologists to this day, is all that remains.[8]

Transpose land and water for the case of the Cobourg and Peterborough Railway. Rice Lake lies directly between the two towns, but was not a sufficient deterrent to prevent construction of a two-mile causeway straight across in 1855. Trains passed for two years before the relentless power of ice floes destroyed the structure and relegated the entire project to the ash can of misplaced adventures.

The long earthwork projecting into Rice Lake from the south shore poses another puzzle for landform students today.[9] Promoters of the Toronto and Georgian Bay Ship Canal and (far from home, but nonetheless instructive) the Prince Edward Island Causeway may have noted the consequences of such folly, or simply have had the good fortune to present their schemes at moments when the economy could not stand them. Neither has materialized.[10]

The nineteenth century was a distinctive experimental period for transportation in Ontario. The vast range of options is implied in Figure 4. Should vehicles be on wheels or runners? Should they travel over water, rails or bare ground? Should the motive power be mechanical or animate or perhaps the atmospheric principle allowed for in the charter of the Northern Railway in 1849?[11] Should fuel be fed through a wire or through the mouth? Should the means of stopping be manual or vocal? All options were feasible, and each had advantages and drawbacks which had to be discovered while industrialization, urbanization, occupational specialization, the increasing demand for privacy and other processes were under way. There were no clear-cut answers.

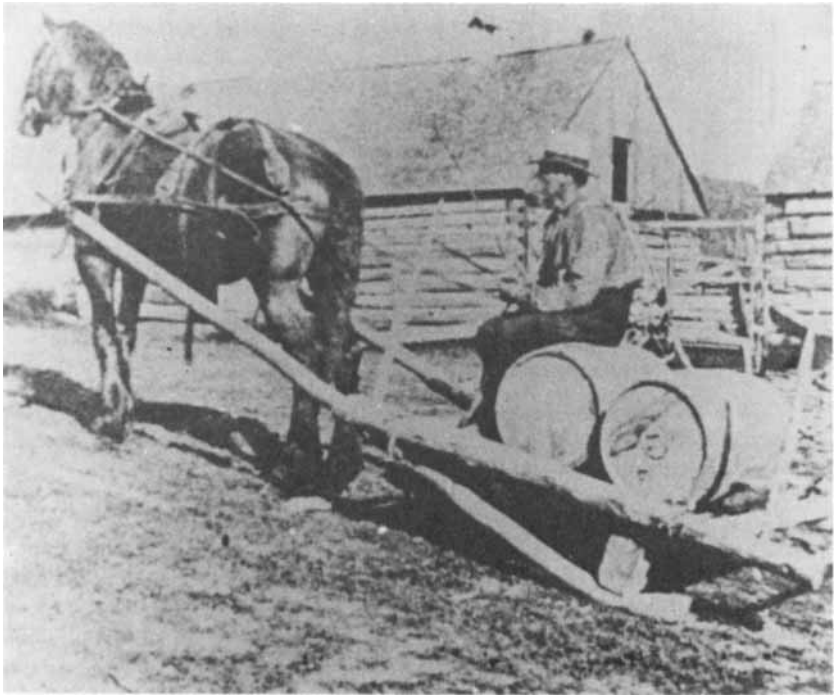

Figure 4. A "jumper," about 1875. *Ontario Archives, Ralph Greenhill Collection.*

Transport and Access

The transport requirements of pre-Confederation Ontario were very modest, and have often been overrated by commentators.[12] Canals and railways preoccupied a handful of politicians caught up in a trade rivalry with the United States and entrepreneurs who thought in terms of railroad-car-sized shipments. But for the settler on his forty acres of cleared land, a horse (or ox) and wagon, a cleared

track, and his own time as teamster were the essential ingredients that tied his small farm into the wider export economy.[13] For weeks each winter the whole land was a free road for sleighs, and even ponds and streams assisted, rather than deterred, movement.[14] All but the largest rivers, such as the Grand, were found to be more useful as power sources than as arteries in this world of land-based, unobtrusive transportation.[15] It was an order scaled to the individual settler, capable of indefinite extension with the inland spread of settlement, and almost totally devoid of corporate transport enterprise. It served well during the pre-Confederation era of the wheat economy, and only broke into a less personalized hierarchy of major and minor facilities with the rise of industry and cities later in the century.

The neighborhood access described above might have evolved by the unpremeditated response of settlers to fundamental needs. But a paternalistic Colonial Office saw matters differently, and introduced provisions for roads prior to settlement, as a basic part of the plan for the colony. In the 1790s, Lieutenant-Governor Simcoe laid out a system of military roads linking York (Toronto) with the Niagara peninsula, the Thames Valley, Georgian Bay, and the St. Lawrence Valley[16] (Figure 1). This was a strong statement of British intentions to be assertive over the entire Ontario peninsula, and it was complemented by a cadastral survey with allowances for roads included. These rights-of-way constituted a Crown reserve of long straight strips upon which settlers were instructed to build their own system of local and regional arteries.[17] Throughout much of human history roads had been important ends in themselves, as local marketplaces, common pasture, or sites for political or religious dialogue. But Ontario in the nineteenth century was a vastly different place, a subdivision for exploitative commercial activity on an international, oceanic scale. Roads were perceived as routes elsewhere far more than as local places to be.[18]

Public services plied selective routes from the earliest days, and by 1830 regularly scheduled coaches and steamboats called at the principal towns throughout old Ontario.[19] Major and minor routes were beginning to be differentiated, and new facilities sprang up to serve the traveller and his goods. For those individual trips which ended *en route* there was the way stop: a lakeside landing, a trackside freight shed, later a trolley stop or a letter box (Figure 5). Conversely, traffic destined beyond

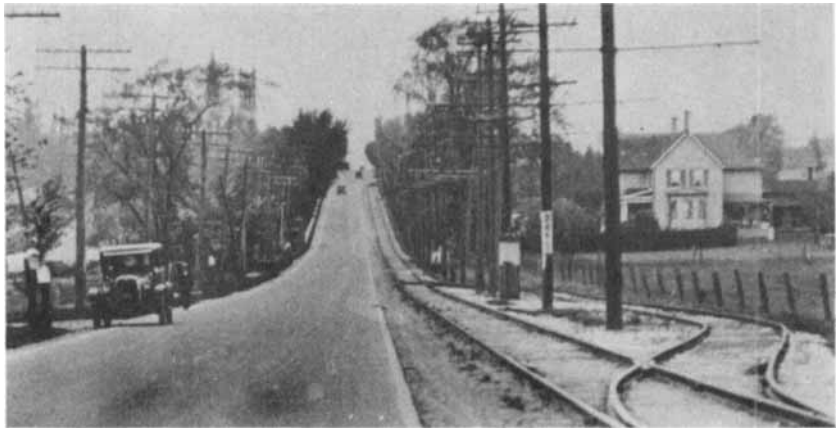

Figure 5. Yonge Street, York County, looking north towards Richmond Hill, about 1930. *City of Toronto Archives, James Collection*, No. 1195.

the end of the line encountered a terminus, often a distinguished edifice announcing to the traveller that he was embarking on a new phase of his journey. The steamship office at the foot of Yonge Street, in Toronto (Figure 6) was an example, and many a central post office of Romanesque design from the 1890s held center stage in medium-sized Ontario towns.[20]

Movement occupies time as well as space. As night fell, people on long journeys stopped at inns to bridge the time until daybreak (Figure 7). Darkness obstructed speed and directness, and the introduction of saloons and staterooms on boats, and the palace dining and sleeping cars later on railroads, were modifications which assisted the restless traveller.[21] The annual freezeup opened the countryside and allowed farmers to clear their barns of export grain, pent up since harvest, and draw it to the lake front. But winter also closed shipping for months, locking wheat in elevators and icebound schooners (Figure 8). The Ontario climate forced a seasonal rhythm upon a commodity for which demand was uniform the year round,[22] and emphasizes the essential, unremarked role of barns and warehouses in the transportation geography of old Ontario.

Figure 6. The Foot of Yonge Street, Toronto, 1907. *City of Toronto Archives, James Collection* No. 483.

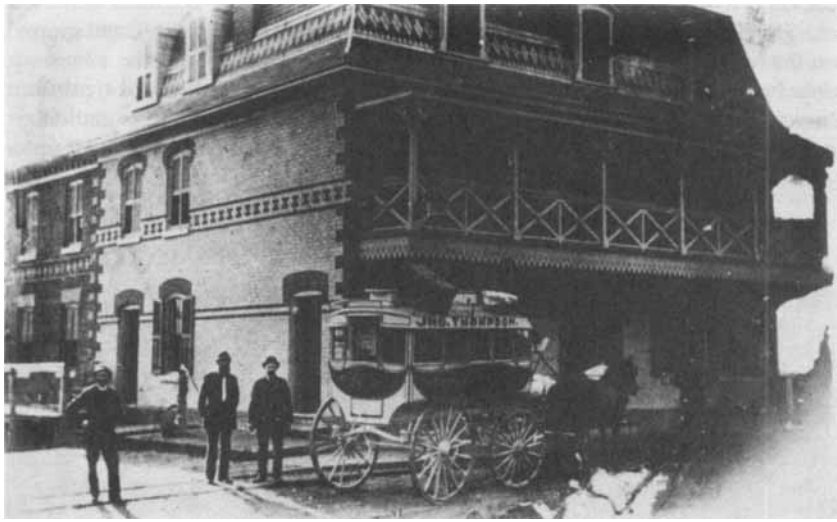

Figure 7. Stagecoach at inn, Richmond Hill, about 1896. *Ontario Archives*, No. 51297.

Figure 8. Picton harbor, 1905. *Ontario Archives* No. 6899-562.

All-weather transportation was an elusive goal for the builders of the province. It was beset by the intrusion of water upon land which was supposed to be dry and of land into watery places intended only for boats. The technology of cambered surfaces, road stone through which water could percolate, and lateral ditches was understood long before the first applications in Canada in the 1830s.[23] Large quantities of land fill, however, were necessary to withstand freezing and

thawing. It was railroad construction in the 1850s that first exhumed Ontario's rich gravel deposits, making them accessible for road working (Figure 9), and spurred on the work on all-weather roads. Properly engineered gravel roads became common by the 1870s, as significant a development as the initial cutting of trees from surveyed road allowances. They permitted the rise of the mixed farm and dairy-products agricultural economy of the Victorian era, a way of life dependent upon year-round access to the industrializing cities.[24]

Figure 9. Loading ballast, Grand Trunk Railway, Paris, Ontario, 1870. *Ontario Archives* No. 516147.

Cutting the forests in southern Ontario washed soil into the streams, carried it downstream, and deposited it in the river estuaries where the current slowed. As early as the 1830s the province bought a steam-powered dredge to keep the lake ports deep enough for schooners and steamboats.[25] The dredge was a maintenance machine, and it was a lesson only slowly learned that a one-time investment in constructing a transport facility carried with it a continuing commitment to upkeep. Decaying plank roads were a particular menace, causing horses to stumble and wagons to overturn, and yet no adequate provisions were made by companies for repairs. The statute road labor performed annually by rural residents was a form of maintenance, but too often was applied quite ineffectively to fixing a road which had never been "built" in the first place. Scraping, ditching and grading machines were the dredges of the land, not to mention the rotary snowplow, an Ontario invention designed to throw drifted snow out of the deep railway cuttings found everywhere in the rolling Ontario countryside.[26] These machines constitute a mundane but necessary component of a mobile society.[27]

The routes of Lieutenant-Governor Simcoe's system have caught the fancy of transportation investors throughout Ontario's history. These corridors, as they have

been called,[28] form the skeleton of the transport system and have been traversed by a succession of competing modes. Names such as Thornhill Station and Richmond Hill Station, two stops along the Northern Railway (Figure 1), are reminders that the railroad was simply a new manifestation of Yonge Street.[29] Already this route had witnessed fur traders canoeing the Humber-Nottawasaga portage, and would see the construction of super-highway 400 in the 1950s.

Individual transport facilities were underused in Ontario throughout the nineteenth century, and the proliferation of modes, especially in the corridors, only exacerbated the situation. By the most pessimistic of estimates, the Welland Canal was utilized to about half of its capacity in 1840; eight years later, after being enlarged, use had diminished to only one-seventh of capacity.[30] The double-track design of the Grand Trunk Railway was utilized only thirty years after construction in the section east of Toronto, and has never been implemented west of Georgetown.[31] Locally, the sixty-six-foot road allowances were far larger than needed (Figure 10). Plank roads of the 1840s had only a twelve-foot-wide surface.[32]

Figure 10. Looking north across Spencer Creek along Brock Road, west of Bullock's Corners, West Flamborough Township, Wentworth County, about 1885. *Ontario Archives* No. 511947.

Over-capacity signified a gamble that business would eventually swell to fill the space provided as settlement and commerce intensified. But many firms could not weather the lean early years and the competition in the corridors drove them under. The routes themselves have survived, more durable than the technologies and administrative structures tried out along them. Streetcar tracks paved over with asphalt marked for automobiles, and unused roadbeds are evidence of this evolutionary process. Which firm would endure was not clear, but the survival of transport in the corridor was never questioned.

Transport and Organization

The construction of arteries and vehicles was paralleled by the establishment of new administrative procedures. Sale of the public lands not only spawned an early civil service comprising land agents, surveyors and registrars, but created years of work for the local Courts of Quarter Session. The cadastre was wholly insensitive to physiography, and many road allowances crossed a lake or precipice, not to mention less obvious obstructions such as marshes and ravines. Roads actually in use deviated along the path of least resistance, and many a jog or "given road" bears witness to this common-sense solution. The Courts, however, were responsible for the title settlements involved in warping the plan onto the existing topography.[33]

The earliest neighborhood roads and wagons were built by private individuals and largely for personal use. It was not a question of going into the transportation business, but by the 1830s partnerships operating schooners or roads, and charging for the service, heralded a new era. Steamboats, harbors, elevators, canals, plank roads and railroads all were regional or provincial in scope, requiring organizational and promotional talents beyond individual means, not to mention capital. The Northern Railway proposed a lottery to raise money in 1849, but the legislature ruled the procedure unethical.[34] The Grand Trunk raised money in England, while smaller companies hired promoters to raise funds, or bonuses, among residents and municipalities in the areas to be served. One of the best in this competitive business was George Laidlaw of the Credit Valley Railway, who won the accolade "The Prince of Bonus Hunters" for his work in the 1870s.[35]

There never was enough money, however, and as construction costs outran immediate prospects for revenue, promoters faced the dilemma of how to allocate those scarce resources for the greatest return. For the railroad entrepreneur, for example, the basic question was whether to build a portion of the line fully equipped, or the full line partially equipped. The tendency was in fact to scrimp on both counts. The Toronto, Grey and Bruce Railway cut costs by being built to a narrow gauge, which permitted steep grades and sharp curves, and by falling short of intended destinations in downtown Toronto by a mile and Lake Huron by thirty miles.[36] In 1881, after less than ten years of running, it was rebuilt to a wider gauge under new management. Economy on the Great Western Railway was at the high cost of life and limb, a well-known condition echoed in the grisly 'Song of the Locomotive':

> Avant! avant! for I heed you not!
> Nor pause for the cry of pain;
> I rejoice o'er the slaughter my wheels have wrought,
> And I laugh at the mangled slain![37]

Only the Grand Trunk combined substantial works and a full-length line, but the bankruptcy of its investors, largely English, is well documented.[38]

With so many small corporations, each having its own plan for conducting business and none using what would be called a systems approach to its affairs, a disharmonious transport scene was inevitable. As often as the Welland Canal was enlarged, lake boats too big for it were built. Railroad cars could not be exchanged among companies until the three different gauges were standardized in

the 1880s, and brake and coupling procedures likewise made uniform.[39] A wave of railroad mergers in the 1880s considerably simplified matters, as did mass production of everything from freight cars to hotel cutlery and spare parts.[40]

The vast mileage of roads was rationalized into a hierarchy of provincial, county, township and municipal roads all interlaced to offer appropriate levels of access to cities, towns, villages and hamlets. Just as the countless indistinguishable hamlets of pioneer Ontario grew by varying amounts through the later nineteenth century, so did the roads serving them become sorted as to highways and byways. Some were rebuilt and filled the sixty-six-foot allowance that had so long appeared largely unused. Others vanished completely, along with the hamlets they served.[41]

Rules of the road became mandatory as population and traffic increased. On plank roads, normally only one vehicle wide, the emtpy wagon deferred to the laden one.[42] Railroads prohibited private vehicles from using their lines, and introduced side tracks, signalling systems and schedules to pass trains in safety. Transportation was becoming more and more specialized. Sidewalks, cartracks, overhead wires, underground sewers and cobbled pavement each handled separately particular components which once had commingled in the linear quagmire that was many an early Ontario road. Even keeping to the right may be seen as directional specialization applied to portions of the road surface. Services became specialized too: express trains and accommodation trains, or first class and steerage. The dormitory style of early inns gave way to private rooms.[43]

Transport and Living

The roads, piers and stations of Old Ontario were also places to be, or destinations in themselves. The predictable daily arrival of the steamboat or express train was a signal event in the lives of many residents. They congregated at the stopping place to exchange news or just to watch in the timeless tradition of the market square.[44] Roads are diffuse sites, and the parade of funeral cortege are two of many displays with configurations derived from the linear stage upon which the performance takes place. Strolling in fancy clothes or driving fast buggies were other visible activities (Figure 11). It was fashionable to live on main street in town, to see and be seen. Front porches and ostentatious façades facing the street were essen-

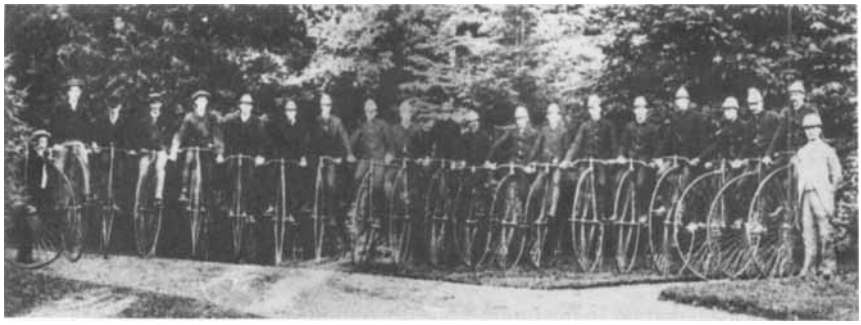

Figure 11. The Woodstock Bicycle Club, about 1900. Streets have long been ideal places for showing off. *Ontario Archives* No. 12826-11.

tial to the image. In the countryside, neighborhoods lined up along the concession line roads while tending to shun the cross-roads running perpendicular to them.

Transportation was newsworthy. It was such a visible aspect of progress that ground-breaking ceremonies and accidents – the anticipation and the setbacks – generated columns of saleable copy. In just one random newspaper example there are four different transportation-related stories, concerning overnight train travel, construction contracts, cruelty to dray horses and a jilted horse-car driver, filling more than 25 per cent of the news area.[45] People in transport got the glory, even to the grave. The tombstone of one Robert Burleigh, who was drowned "by a fall from the topmast of the schooner STAR OF HOPE" in 1865, stands on Amherst Island; another in Douro for a youth of 19, "killed while in discharge of his duty as brakesman," was erected by his fellow railroad employees.

Transport is the most visible of all corporate enterprises, a countryside showroom for technological and decorative achievements (Figure 2). Form competed with function with particular energy through the later decades of the nineteenth century. Bridges, locomotives, steamships, tunnel abutments and buggies all received decorative attention, before Edwardian severity and Henry Ford's basic black put an end to such frivolity by the 1910s.[46] As transportation took its place in the landscape, more and more it became identified with the natural state:

> Over the broad and serpentine valley [of Kettle Creek] the eye stretches across the tops of the opposite hills covered with green forests extending beyond improved farms where the sky is literally fringed by the woods, behind which the setting sun emblazons all the horizon. Here, too, we have in full view the Canada Southern Railway bridge which is a fine specimen of art and mechanical skill. To the north we have in full view another range of heights and the Great Western Air Line Bridge . . . . The country . . . is delightful to behold.[47]

People began travelling for pleasure. The lake cruise to Niagara in the 1890s and the trolley ride through the Niagara Gorge were indeed trips, if one had to go to the Falls. But they were events, first and foremost, in which the ride itself was memorable. Those fortunate enough to have an early Kodak took their own photographs, and some fanatics ("fans") never stopped recording on film the blurred motion, reciprocating machinery and monumental structures that made the transportation world of 1900.

Conclusion

The turn of the twentieth century is a good place to pause, for signs that an age of innocence was passing were everywhere about. The consolidation of corporations, increased isolation of consumers from producers, freight-rate lobbies and the cancellation of unremunerative services all placed unfamiliar constraints upon transportation users.[48] In due course an elaborate civil service would emerge to monitor every move. If one believes that transportation is the servant and not the master of society, this is a disturbing trend.

But in 1900 that lay in the future. Four generations of steady growth had taken place with few surprises. After all, railroads, private hotel rooms and all the other ideas were being tried world-wide. What is distinctive in Ontario is the timing. Settlement by subdivision and a suddenly wide variety of options for establishing ac-

cess to, through, and around the peninsula combined to produce a supply of transportation well in excess of immediate needs. Generally this buyer's market appears to have been hard on investors but a boon to users. Yet this expansive era left to investors and users alike a legacy of incalculable value – the framework for the industrial-agricultural base upon which Ontario would flourish for generations to come.

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NOTES

An oral version of this paper was the keynote address to the January, 1981 conference of the Ontario Museum Association in Toronto. In appears in processed form in *By River, Road and Rail: Transportation in Nineteenth Century Ontario* (Toronto: Ontario Museum Association, 1984), pp. 1-16, and is published here by permission of the OMA.

[1]The amphibious theme underlies much of Canadian historical scholarship of the 1920s and 1930s; see, for example, the text in Harold A. Innis and Arthur R. M. Lower, eds., *Select Documents in Canadian Economic History, 1783*-1850 (Toronto: The University of Toronto Press, 1933).

[2]Hugh B. Willson, *The Proposed Hamilton and South West Railway* (Hamilton, 1854), p. 9.

[3]James Buchanan, Letter to [Sir Francis] Bond Head . . . on constructing railroads in Upper Canada without foreign assistance (Toronto, ca. 1836). See also Thomas C. Keefer, "Travel and Transportation," in *Eighty Years Progress of British North America* ed. H.Y. Hind, (Toronto: L. Stebbins, 1863), reprinted in *Philosophy of Railroads, and other Essays by T.C. Keefer,* ed. H. Vivian Nelles, (Toronto: University of Toronto Press, 1972), pp. 165-167.

[4]Hugh, G.J. Aitken, *The Welland Canal Company: A Study in Canadian Enterprise* (Cambridge, Mass.: Harvard University Press, 1954).

[5]David B. Steinman and Sara Ruth Watson, *Bridges and Their Builders* (New York: Dover, 1957), pp. 217-221.

[6]See Act of Incorporation of the Fort Erie and Buffalo Suspension Bridge and Tunnel Company, Province of Canada Act, 14-15 Victoria, cap. 72, sec. 10 (1851-52), for a clause regarding navigational requirements. Notice that a high bridge was not required at Fort Erie, as the Niagara River did not carry cargo vessels. Regarding the St. Clair tunnel at Sarnia, see Archibald W. Currie, *The Grand Trunk Railway of Canada* (Toronto: University of Toronto Press, 1957), pp. 349-353; on the Windsor tunnel, see Neil F. Morrison, *Garden Gateway to Canada: One Hundred Years of Windsor and Essex County, 1854-1954* (Toronto: Ryerson Press, 1954), pp. 104-105, 236-238.

[7]George W. Hilton, *The Greak Lakes Car Ferries* (Berkeley: Howell-North, 1962); George Musk, *Canadian Pacific Afloat, 1883-1968, A Short History and Fleet List* (London: World Ship Society, 1956), pp. 53-54.

[8]Winston M. Cosgrove, *Wolfe Island Past and Present* (Author, 1973).

[9]Currie, *Grand Trunk*, pp. 284-285. See also Frederick J. Rowan, "Rice Lake from the Church at Gore's landing," watercolor over pencil, ca. 1856, in Mary Allodi, *Canadian Water-*

colours and Drawings in the Royal Ontario Museum (Toronto: University of Toronto Press, 1974), no. 1479.

[10]George P. Glazebrook, *A History of Transportation in Canada* (New York: Carnegie Endowment for International Peace, 1938; reissued in two volumes, Toronto: McClelland and Stewart, 1964), vol. 1, p. 85. On the ship canal see William Kingsford, *The Canadian Canals . . .* (Toronto, 1865), pp. 94-104, and Ingersoll *Chronicle*, September 10, 1868. On the causeway, see Mary K. Cullen, "The Transportation Issue, 1873-1973," in *Canada's Smallest Province,* ed. Francis W. Bolger (Charlottetown: Prince Edward Island, Centennial Commission, 1973), pp. 242-243, 260-263.

[11]12 Victoria, cap. 196, sec. 1 (1849). The atmospheric principle (propulsion by compressed air) was tried in Devon, England, between 1846 and 1848, without success; see Lionel T. C. Rolt, *Isambard Kingdom Brunel: A Biography* (London: New York, Longmans and Green, 1957), pp. 178-191.

[12]Glazebrook, *History*, Vol. 1, pp. 128-132; Thomas F. McIlwraith, "The Adequacy of Rural Roads in the Era before Railways: An Illustration from Upper Canada," *The Canadian Geographer* 14 (1970), 344-360, questions the alleged seriousness of muddy roads.

[13]Thomas F. McIlwraith, "Transportation in the Landscape of Early Upper Canada," in *Perspectives on Landscape and Settlement in Nineteenth Century Ontario,* ed. John David Wood (Toronto: McClelland and Stewart, 1975), pp. 51-63.

[14]McIlwraith, "Adequacy of Rural Roads," pp. 356-357.

[15]Whether rivers were to be used for navigation or power is the concern of a petition of some 300 inhabitants of Glengarry County to Lieutenant Governor Maitland, December 29, 1824, seeking legal protection for their mills; Public Archives of Canada (hereafter PAC), Upper Canada Sundries, pp. 36875-76. See also Arthur R.M. Lower, *The North American Assault on the Canadian Forest* (New Haven: Yale University Press, 1938), p. 40.

[16]Donald W. Kirk, "Southwestern Ontario: The Areal Pattern of Urban Settlements in 1850" (unpublished Ph.D. dissertation, Northwestern University, Evanston, Illinois, 1949), pp. 51ff.; Glazabrook, *History*, vol. 1, p. 129.

[17]The definitive work on the complicated and constantly changing system of land subdivision, titles, road opening and statute road labor is Lillian F. Gates, *Land Policies of Upper Canada* (Toronto: University of Toronto Press, 1968). A mapping of the various types of surveys, township by township, is found in *Economic Atlas of Ontario*, ed. William G. Dean (Toronto: University of Toronto Press, 1969), plate 99.

[18]John B. Jackson, "The Discovery of the Street," in idem., *The Necessity for Ruins and Other Topics* (Amherst, Mass.: University of Massachusetts, 1980), pp. 55-66.

[19]Edwin C. Guillet, *The Story of Canadian Roads* (Toronto: University of Toronto Press, 1966), pp. 85-86; Montreal *Gazette*, June 18, 1833, reprinted in Innis and Lower, *Select Documents*, pp. 145-146.

[20]Ralph Greenhill, Ken Macpherson, and Douglas Richardson, *Ontario Towns* (Toronto: Oberon, 1974), plate 99; George W. Hilton, *The Night Boat* (Berkeley, Calif.: Howell-North Books, 1968).

[21]Russell Lynes, *The Tastemakers* (New York: Grosset Universal Library, 1949), pp. 225-234.

[22]McIlwraith, "Adequacy of Rural Roads," p. 357.

[23]The first macadam road (crushed rock roadbed) in Canada was a portion of Yonge Street put into use in 1836; Guillet, *Roads*, pp. 65-66.

[24]Evidence of the role of gravel in the old Ontario economy is scattered and circumstantial, and has yet to be pulled together to verify the statements made here.

[25]"Report of the Commissioners for Purchasing a Steam Dredge," Appendices to the Journals of the Legislative Assembly of the Province of Upper Canada, 12th Parliament, 2nd Session (1836), vol. 3, pp. 146-149, and 13th Parliament, 3rd Session (1837-38), pp. 347-353.

[26]See description of Orange Jull's snowplow in Alfred Price, "George Laidlaw – Pioneer Railway Builder," *The Canadian Magazine* 67-68 (December, 1927), 36.

[27]Jeffrey L. Brown, "Earthworks and Industrial Archeology," *Industrial Archeology* 6 (1980), 1-8.

[28]Charles F. J. Whebell, "Corridors: A Theory of Urban Systems," *Annals of the Association of American Geographers* 59 (1969), 1-26, esp. p. 12.

[29]The names Thornhill (now Concord) and Richmond Hill (now Maple) appear in *Travelers Official Railway Guide for June 1868* (New York, 1868; facsim., Ann Arbor: University Microfilm, 1968), Table 11.

[30]Thomas F. McIlwraith, "Freight Capacity and Utilization of the Erie and Great Lakes Canals before 1850," *Journal of Economic History* 36 (1976), 866-874.

[31]Currie, *Grand Trunk*, p. 350.

[32]Guillet, *Roads*, p. 68.

[33]Irma E. Pattison, comp., *Historical Chronology of Highway Legislation in Ontario, 1774-1961* (Toronto: Ontario Department of Highways, 1964), pp. 7-8, 12-13, 45-47.

[34]12 Victoria, cap. 196 (1849); Currie, *Grand Trunk*, p. 261.

[35]*The Toronto World*, June 14, 1889; Thomas F. McIlwraith, "George Laidlaw," *Dictionary of Canadian Biography, Volume II* (Toronto: University of Toronto Press, 1982), pp. 483-485.

[36]Thomas F. McIlwraith, *The Toronto, Grey and Bruce Railway* (Toronto: Upper Canada Railway Society, 1963), pp. 20-22.

[37]Brantford *Expositor*, January 25, 1856. Five accidents, resulting in 67 deaths, were the subject of a special investigation: "Report of Commission of Enquiry into Several Accidents on the Great Western Railway in 1854," PAC, Isaac Buchanan papers, vol. 94, unpaged.

[38]Currie, *Grand Trunk*, passim.

[39]George R. Taylor and Irene D. Neu, *The American Railroad Network 1861-1890* (Cambridge, Mass.: Harvard University Press, 1956).

[40]Currie, *Grand Trunk*, pp. 229-245, 315-317.

[41]Pattison, *Highway Legislation*, pp. 47, 162. On the sorting process for urban places see Edward K. Muller, "Selective Urban Growth in the Middle Ohio Valley, 1800-1860," *Geographical Review* 66 (1976), 178-199.

[42]52 George III, cap 4 (1812) specified that users had to yield half the road and keep to the right in doing so. A broadside posted throughout Huron District in 1846, to this effect, suggests that the subject was only then becoming a problem; Ontario Archives, Daniel Lizars papers, January 19, 1846.

[43]Lynes, *Tastemakers*, pp. 81-89.

[44]Elizabeth A. Willmot, *Meet Me at the Station* (Toronto: Gage, 1976).

[45]Toronto *Weekly Globe*, February 19, 1869, p. 5.

[46]This theme is evident in Norman R. Ball, "The History of Technology and New Meaning for Local Studies: the Bertrams of Dundas," in *By River, Road and Rail: Transportation in Nineteenth Century Ontario*, ed. Thomas F. McIlwraith (Toronto: Ontario Museum Association, 1984), pp. 84–96.

[47]St. Thomas *Weekly Dispatch,* July 7, 1873.

[48]Archibald W. Currie, *Economics of Canadian Transportation* (Toronto: University of Toronto Press, 1954).