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CP AGINCOURT YARD

Cover: Map of Scarborough and CP Agincourt Yard 0201-001.pcx
Map: Extra trackage to the west of Agincourt Yard 0201-002.pcx

As a special feature this month we present a Canadian Pacific official drawing indicating the master plan for the 7300-car capacity Agincourt Hump Classification Yard. This major facility, now under active construction, is located some eleven miles north-east of downtown Toronto and some fifteen miles east of the railway's present Lambton freight yard in West Toronto, a yard which the Agincourt installation will in large measure supplant. The key map accompanying this article shows the location of the yard in relation to the railway network of both of the major railways in the Metropolitan Toronto area.

The yard is generally triangular in shape, lying between the diverging main tracks of the Oshawa and Peterborough Subdivisions, the latter of which has been diverted some distance to the north in order to provide sufficient width for the yard complex. Referring to the road system, the yard lies between Sheppard and Finch Avenues and between McCowan's Road and Markham Road (Highway 48), north-east of the old community of Agincourt. A single hump is provided at the west end of the layout, with two hump leads extending westerly between the Oshawa and Peterborough Subdivisions nearly 7900 feet to Midland Avenue. The southerly lead ends at this point, while the north lead cuts into the Peterborough Subdivision main track. Provision is being made in the right-of-way widening so that these hump leads can be extended westerly to tie into the main tracks a short distance east of the overpass over the C.N.R. Uxbridge Subdivision.

The actual junction crossovers have been moved west from their former location near Agincourt station to a point just west of the aforementioned C.N.R. overpass.

In the yard, cars will move eastbound over the hump, through a master hump retarder and then through one of the seven (ultimately eight) group retarders into a 72-track classification yard which forms the central part of the total layout. The classification tracks have an average capacity of about 40 freight cars each. Extending along the north side of the Oshawa Subdivision main tracks, from the west throat of the yard at McCowan's Road to Scarborough Golf Club Road is a three-track (with provision for four more tracks) east-bound receiving yard. Immediately to the north, along the south and east flanks of the triangle of the total yard complex lies an eight-track westbound receiving and eastbound departure yard. This yard, with tracks of from 1¼ to 1½ miles in length, will have provision for eventual expansion to 13 tracks, and its east end is at the easterly throat of the entire yard, at Markham Road and Finch Avenue.

TABULATIONS of YARD TRACKS and CAPACITIES

A. MAIN CLASSIFICATION YARD

TRACK NO.	CAR CAPY.	LENGTH	TRACK NO.	CAR CAPY.	LENGTH
1	36	2030'	37	42	2320'
2	33	1925'	38	40	2218'
3	33	1925'	39	40	2217'

4	36	2045'	40	43	2337'
5	36	2045'	41	43	2336'
6	39	2166'	42	45	2458'
7	39	2166'	43	45	2458'
8	42	2287'	44	48	2577'
9	42	2287'	45	48	2576'
10	40	2200'	46	53	2794'
11	37	2098'	47	50	2694'
12	37	2097'	48	50	2693'
13	40	2220'	49	53	2815'
14	40	2218'	50	53	2813'
15	43	2338'	51	56	2935'
16	43	2337'	52	56	2933'
17	45	2460'	53	56	2955'
18	45	2458'	54	56	2953'
19 F	40	2223'	55	29	1715'
20 F	38	2121'	56	26	1610'
21 F	38	2120'	57	26	1610'
22 F	40	2244'	58	29	1734'
23 F	40	2242'	59	29	1732'
24 F	43	2363'	60	32	1854'
25 F	43	2360'	61	32	1852'
26 F	46	2483'	62	34	1960'
27 F	46	2481'	63	34	1970'
28	45	2428'	64	30	1787'
29	42	2325'	65	30	1786'
30	42	2323'	66	32	1820'
31	45	2446'	67	29	1735'
32	45	2445'	68	29	1736'
33	48	2566'	69	24	1518'
34	48	2564'	70	24	1519'
35	50	2686'	71	22	1400'
36	50	2684'	72	17	1278'

B. EAST RECEIVING YARD (SOUTH SIDE)

TRACK NO.	CAR CAPACITY	LENGTH
1 F	135 Cars, 3 Diesels & Van	6737'
2 F	139 Cars, 3 Diesels & Van	6883'
3 F	139 Cars, 3 Diesels & Van	6876'
4	142 Cars, 3 Diesels & Van	7022'
5	147 Cars, 3 Diesels & Van	7290'
6	154 Cars, 3 Diesels & Van	7583'
7	(Running Track)	

C. WEST RECEIVING AND EAST DEPARTURE YARD (SOUTH SIDE)

TRACK NO.	CAR CAPACITY	LENGTH
7A	(Running Track - branches from #7, above)	

8 F	146 Cars, 3 Diesels & Van	7333'
9 F	149 Cars, 3 Diesels & Van	7439'
10 F	148 Cars, 3 Diesels & Van	7390'
11 F	151 Cars, 3 Diesels & Van	7540'
12	149 Cars, 3 Diesels & Van	7440'
13	152 Cars, 3 Diesels & Van	7362'
14	134 Cars, 3 Diesels & Van	6776'
15 F	132 Cars, 3 Diesels & Van	6666'
16 F	118 Cars, 3 Diesels & Van	6523'
17	125 Cars, 3 Diesels & Van	6350'
18	122 Cars, 3 Diesels & Van	6210'
19	118 Cars, 3 Diesels & Van	6045'
20	112 Cars, 3 Diesels & Van	5797'
21	111 Cars, 3 Diesels & Van	5740'

The westbound departure and receiving yard extends along the north side, paralleling the single track of the Peterborough Subdivision. This yard will be comprised of six tracks at present, with an ultimate capability of 10 tracks in the future. The local departure and receiving yard, which will handle cars having an origin or destination in the Toronto area, lies between the westbound receiving and departure yard and the main classification yard. This yard will have five tracks initially, with the possible expansion to 10 tracks. A crossover track, with double slip switches, will connect the local yard directly to tracks 64 to 72 of the main classification yard, forming the east ladder track of the latter.

D. WEST DEPARTURE AND RECEIVING YARD (NORTH SIDE)

TRACK NO.	CAR CAPACITY	LENGTH
15	102 Cars, 2 Diesels & Van	4619'
16	102 Cars, 2 Diesels & Van	4622'
17	108 Cars, 2 Diesels & Van	4875'
18	109 Cars, 2 Diesels & Van	4928'
19	109 Cars, 2 Diesels & Van	4919'
20	111 Cars, 2 Diesels & Van	5002'
21 F	(Not Indicated)	7600'
22 F	(Not Indicated)	7436'
23 F	(Not Indicated)	7366'
24 F	(Not Indicated)	7435'

E. LOCAL DEPARTURE AND RECEIVING YARD (NORTH SIDE)

(a) (West of Crossover Track)

TRACK NO.	CAR CAPACITY	LENGTH
4	(Running Track)	
5	45 Cars, 2 Diesels & Van	2524'
6	39 Cars, 2 Diesels & Van	2306'
7	34 Cars, 2 Diesels & Van	2094'
8	30 Cars, 2 Diesels & Van	1886'
9	28 Cars, 2 Diesels & Van	1622'

(b) (East of Crossover Track)

TRACK NO.	CAR CAPACITY	LENGTH
4	(Running Track)	

5	34 Cars, 2 Diesels & Van	2075'
6	35 Cars, 2 Diesels & Van	2117'
7	35 Cars, 2 Diesels & Van	2136'
8	36 Cars, 2 Diesels & Van	2149
9	37 Cars, 2 Diesels & Van	2217'
10 F	(Not Indicated)	3580'
11 F	(Not Indicated)	3381'
12 F	(Not Indicated)	3200'
13 F	(Not Indicated)	3005'
14 F	(Not Indicated)	3007'

F. WEST VAN TRACKS			G. EAST VAN TRACKS		
TRACK NO.	CAR CAPY.	LENGTH	TRACK NO.	CAR CAPY.	LENGTH
1 F	13	1010'	3 tracks F	6	590'
2	12	980'	not	6	588'
3	15	1100'	numbered	10	780'

(The use of the symbol "F" in the above tabulations indicates future construction).

SERVICING YARDS: Directly south of the main classification yard will lie a 3-track car cleaning yard, narrowing to 2 tracks in its central portion, which two tracks pass through a washing platform. Proceeding south from this facility, in order, are a car repair yard, three tracks for the storage of auxiliary equipment, and inside the long curve of the eastbound departure yard, the diesel locomotive servicing shop and tracks. The car repair yard will have six tracks initially with provision for expansion to eight tracks. Of these six tracks, five will pass through the car repair building. Two of the six diesel servicing tracks will enter the locomotive shop, while an additional three tracks are provided for at some future date.

SUMMARY OF YARD CAPACITIES

		INITIAL	ULTIMATE
A. MAIN CLASSIFICATION		2506	2880
B. EAST RECEIVING*		467	880
C. WEST RECEIVING & EAST DEPARTURE*	1055	1933	
D. WEST DEPARTURE & RECEIVING*		659	959°
E. LOCAL DEPARTURE & RECEIVING		383	677°
TOTALS FOR FREIGHT YARDS		5070	7329

* - Including indicated locomotive and van capacity.

° - Capacity of future tracks estimated, as not indicated on plan.

Car cleaning yard, car repair yard, Diesel locomotive servicing tracks and van storage tracks not included in above summary.

An interesting and little publicised aspect of the Agincourt Yard is that, like the C.N.R.'s Toronto Hump Yard in Vaughan Township, it requires the construction of a new access line for its functioning. As the east throat of the yard is on the Peterborough Subdivision, requiring all eastbound departures and westbound arrivals from either subdivision to pass this point, a new cut-off is required to connect the Oshawa Subdivision with this east throat. Already constructed is a 7500 feet long access line extending in a north-west to south-east direction from the Peterborough Subdivision, near the Scarborough Golf Club Road crossing, to a junction with the Oshawa Subdivision near Finch Avenue and Staine's Road. This line involves new grade crossings of Neilson's Road and Finch Avenue.

Other significant buildings in the yard complex beyond the shop buildings already mentioned include a General Yard Office just south of the hump, a restaurant and dormitory building a short distance to the north of the same, and a Retarder Tower south of the group retarders. An extensive system of access roads will serve the various installations with connections to McCowan's Road and Markham Road. The shop area will also contain a power plant building, a 150,000 gallon water tank and a 15,000 barrel diesel oil storage tank, the latter actually situated in the crotch of the diverging east receiving and west departure yards.

MISCELLANY

A project worthy of every steam railway fan's support is that undertaken by the Bayview Railroad Museum Society in Sarnia, Ontario. This group is attempting to raise the money necessary to build a concrete base and erect a chain-link wire fence on and within which Canadian National Mountain type locomotive No. 6069 can be properly displayed in a park in Point Edward, a few miles north of Sarnia. The locomotive itself has been donated to the town if a suitable mounting base can be provided for it. You can do your part to help preserve another steam locomotive in Southern Ontario by sending a donation to the Bayview Railroad Museum Society, 108 South Christina Street, Sarnia, Ontario. An official receipt for income tax purposes will be sent to all donors.

THE FEASIBILITY OF MONORAIL IN TORONTO

<u>By Hans Blumenfeld,</u>

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Before entering into a discussion of recent developments in the field of monorail and other means of rapid transit, it seems appropriate to summarize shortly the basic problems involved. This will be done under the following headings:

(1) Elevated versus subway or other locations of rapid transit lines,
(2) Suspended versus supported monorail,
(3) Rubber versus steel wheels,
(4) Short history of "monorail".

Recent developments will be discussed under three headings:

(5) The S.A.F.E.G.E. suspended "monorail" at Chateauneuf-sur-Loire, France,
(6) The Alweg supported "monorail" at Seattle, U.S.A.,
(7) Rubber-tired subway trains at Paris, France and planned for Montreal, QC.

<u>(1) ELEVATED VERSUS SUBWAY OR OTHER LOCATIONS OF RAPID TRANSIT LINES:</u>

The main reason for the present interest in "monorail" is the desire to find a cheaper substitute for subways. Construction costs of subways are notoriously higher than that of elevated structures for rapid transit. All presently proposed "monorail" installations are on elevated structures.

Elevated railroads preceded subways on the North American continent. The old, cumbersome and rattling steel structures of the New York and Chicago "El" have discredited this type of structure. It is, however, perfectly possible with modern techniques to minimize both the unsightliness and the noise of elevated railroads. These techniques are equally applicable to "conventional" two-rail and to "monorail" installations. In the further extension of the Toronto rapid transit system serious consideration should be given to the use of elevated structures in suitable locations.

However, it should not be overlooked that subways and elevated structures are not the only alternatives for the location of rapid transit lines. It is possible to achieve lower construction costs than by either of these methods by location at grade, on fill or in cut.

This method has been successfully employed on sections of the Yonge Street line and is proposed for the entire length of the Spadina line north of Dupont Street. However, the cost estimates for this line have shown that the savings in comparison to subway construction are not as great as expected. This is due to the fact that a very substantial part of the construction cost is represented by items which are not affected by location: rails, power supply, signalling system, station equipment, storage yards and maintenance facilities.

Nevertheless, it remains highly desirable to reduce capital cost of rapid transit by finding locations other than subways. The question arises: under what conditions are elevated railroads preferable to construction either in subways or in open cut?

Even with modern construction methods, elevated structures, whether for "monorail" or conventional bi-rail, obstruct vision and light on the street and also produce some noise. They will generally not be acceptable at distances of less than 80 to 90 feet from windows of residential, office or retail premises and will therefore be acceptable only on streets with a width of about 200 feet or more between the building lines. On such wide streets, or boulevards, it is equally feasible to locate a cut in the centre of the street. A width of 80 feet would be sufficient for both tracks and stations, and would leave 60 feet for two one-way streets on either side of the cut, sufficient for up to four lanes and an ample sidewalk. Building in a cut would be considerably cheaper than any elevated structure, "monorail" or other, and would completely eliminate the sight and practically eliminate the noise of the trains.

Location on elevated structure would be acceptable on narrower streets, or on off-street rights-of-way, where these are flanked by industrial buildings or warehouses. However, as such area generate relatively few passengers, they are generally not suitable for the location of rapid transit facilities.

It must be concluded that elevated structures for rapid transit are advisable only for exceptional cases for relatively short sections of any lines. No such section has been found on any of the alignments studied to date for the Toronto rapid transit system.

(2) SUSPENDED VERSUS SUPPORTED MONORAIL:

While all presently proposed "monorail" are elevated railroads, they fall into two radically different categories, suspended and supported.

In the suspended type the rails are located above the cars which are hung from the wheels. Most present proposals employ not genuine "monorails" but "split rails", that is, two rails located close together.

The advantages of suspended over supported railroads are:

(a) sharper curves, or, conversely, higher speeds in curves of same radius,
(b) smaller vertical distance between sidewalk and train platform,
(c) greater vertical distance of rails, the main source of noise, from street level,
(d) somewhat lighter supporting beams because of lower lateral stresses.

The disadvantages are:

(a) commitment to costly elevated structures everywhere, including service yards where circumstances would permit more economical location at grade, in cut or on fill,
(b) higher and therefore costlier supporting columns,
(c) where the location is underground, higher and therefore costlier tunnels,
(d) extremely complicated, costly and time-consuming operations for switching,
(e) difficult access to trucks for inspection and maintenance.

In the supported type the rails are under the cars, as in conventional railroads. In the genuine supported monorails the wheels are arranged in tandem, as in a bicycle; therefore, the cars must be held in position by some special device, either a gyroscope or horizontal guide wheels running on vertical guide boards (actually additional “rails”).

The presently proposed types are not genuine “monorails” but employ two wheels spaced closely together. Many of them are of the “saddle” type, with the car floor lower than the top of the wheels. This somewhat increases stability by lowering the centre of gravity in relation to the rails and also slightly increases the vertical distance between the sidewalk and station platform, but leads to a very awkward and uneconomic car design, the centre being obstructed by the boxes shielding the wheels. The latest designs (Seattle) have, therefore, relinquished the “saddle” type and locate the body of the car above the wheels. The only inherent difference between this type of “monorail” and a standard gauge elevated railroad is the smaller lateral distance between the wheels, which results in a narrower, but higher and bulkier shape of the “beam” which supports the rail.

(3) RUBBER VERSUS STEEL WHEELS:

Practically all present proposals for “monorail” are designed for rubber wheels, while most standard gauge rapid transit lines employ steel wheels. There is no inherent correlation whatsoever between these two aspects. The only existing monorail rapid transit system, at Wuppertal, employs steel wheels on steel rails, while the Paris subway system uses rubber wheels on concrete “rails”. The question therefore boils down to the advantages and disadvantages of rubber versus steel wheels.

The following advantages are claimed for rubber wheels:

(a) less noise,

(b) greater adhesion making steeper grades possible,

(c) the smoother ride makes it possible to employ lighter and cheaper cars, which, in turn, makes lighter structures possible.

The disadvantages are:

(a) in wet weather, and in particular with snow and ice, traction is poor and trains may be slowed down or completely stalled,

(b) blow-out of tires may lead to interruption of service and to accidents. Because the rails are simply flat surfaces, horizontal guide wheels, guided by vertical boards or “rails” are required. Consequently:

(c) switching is slow, difficult and cumbersome,

(d) the structure becomes bigger with consequently greater obstruction of light and sight,

(e) more moving parts have to be kept in working order, increasing both costs of maintenance and risks of failure.

Concerning the question of noise, it should be noted that the movement of steel wheels on steel rails is by no means the only source of transit noise, though it may be the most noticeable one. Also, considerable reduction of noise can be achieved with steel wheels, by systematic improvement of rails and of wheels and by the installing of sound absorbers both along the right-of-way and on the cars.

Concerning the weight of the cars, other factors such as durability and safety and smoothness of ride are cited as reasons for heavier cars.

(4) SHORT HISTORY OF “MONORAIL”:

Monorail is not a new invention. A suspended monorail, horsedrawn, for freight transportation, was in operation in England as early as 1821. In the 141 years since that time, numerous monorail lines, both of the suspended and of the supported type, have been built, and, in most cases, abandoned; and many millions and vast amounts of engineering and promotional talent have been devoted to the development of monorail. However, only one mass transit line was ever built, the Nuppertal line, which has been in operation since 1901. Unique local conditions made a suspended elevated line the most appropriate solution in this area.

All other lines presently in operation are either purely experimental or adjuncts to fairs. Supported lines of the Alweg type have been built near Cologne, Germany, in Houston, Texas, and in Seattle, Washington. Suspended monorail lines exist on the fairgrounds of Dallas, Texas and at Disneyland, California. In Japan there are three short single car monorail lines for pleasure rides. No action has been taken on proposals for a monorail line from the centre of Tokyo to the airport or for a suspended monorail system of the Alweg type for Caracas, Venezuela.

(5) THE S.A.F.E.G.E. SUSPENDED MONORAIL AT CHATEAUNEUF-SUR-LOIRE, FRANCE:

This is a serious and interesting experimental installation, developed jointly by two French engineering firms and the administrations of the French state railroads and the Paris subway system.

It is not a "monorail" but a "split rail", with the supporting concrete "rails" forming the body of a hollow beam. Because the rails and wheels are protected by this beam, rubber wheel traction is independent of the weather. Nevertheless, steel rails and wheels are also provided so that the train can continue to run on steel if a tire should blow out. In addition, two horizontal rubber guide wheels, operating on the inner walls of the beam, are provided. Switching is accomplished by lowering and lifting different sections of the beam; it is claimed that this can be done in ten seconds.

Because of the smooth riding on rubber wheels, light cars are employed. Because of this reduction in weight and because of the decrease of lateral stress resulting from the low point of gravity of the suspended cars, the strength and weight of the beam are substantially reduced.

Because of the location of the wheels and motors inside a hollow beam and high up, noise both in the cars and on the street below is reduced to a minimum. It is also claimed that the high location of the beam is visually less objectionable. However, the beam is 6'-2" wide and 6'-7" high.

If, when and where conditions indicate the advisability of a suspended "monorail", this is the best system available.

(6) THE ALWEG SUPPORTED "MONORAIL" AT SEATTLE, U.S.A.:

This is a short line, slightly over one mile long, connecting the town centre with the World's Fair. There are no intermediate stations. Only two short trains, each of four sections, are in operation, shuttling back and forth on each of the two tracks. There are no storage or repair yards; consequently no switches. Because only one train runs on each track, no signalling system is required.

It is reported that the trains do not reach the speed originally scheduled; that they slow down considerably when the rails are wet; that deceleration is slow and that the ride is bumpy over the expansion joints.

As the cars are light-weight and run on rubber, there is little noise. However, despite the low capacity and consequent low weight of the trains, the supporting beams are quite heavy and unsightly, 5 feet high and over 3 feet wide.

The Seattle installation is not a mass transit system and has not demonstrated the feasibility of the Alweg type for such a system; it has developed several "bugs" not found in conventional rapid transit.

(7) RUBBER-TIRED SUBWAY TRAINS AT PARIS, FRANCE, AND PLANNED FOR MONTREAL, QUEBEC:

The Paris subway system has experimented for a number of years with rubber wheels on one of its lines. Rubber wheels have been added to the steel wheels. The rubber wheels run on concrete strips or “rails”. If the rubber wheels are fully inflated the steel wheels do not touch the rails. Additional horizontal rubber guide wheels, running along a low vertical concrete wall or “vertical guide rail” keep the cars from leaving the concrete “rails”. The steel rails serve a dual purpose. They can carry the cars in case of a blow-out of a rubber tire; and they carry the trains on switches and in the yards, where the vertical guide rails would seriously impede movement.

The system has worked satisfactorily. It is at present being extended to the main east-west line of the Paris system, and it is planned to extend it gradually to the entire system. The City of Montreal has adopted this system for its two new subway lines.

The Montreal system differs from the Toronto subway also in the size of the cars, which are only 8'-2" wide compared with 10'-5" in Toronto.

The following advantages are claimed for the Montreal system:

(a) less noise,

(b) a smoother ride with less vibration,

(c) lighter and cheaper cars, because of smaller size and smoother ride,

(d) narrower and less expensive tunnels,

(e) ability to manage steeper grades.

Against this the following disadvantages are cited:

(a) narrow cars are less convenient,

(b) fewer passengers can be seated in rush hours (in non-rush hours additional folding seats are used),

(c) lighter cars will require more maintenance and more frequent replacement,

(d) stations will have to be longer, resulting in higher construction costs and poorer distribution of the passenger loads,

(e) six rails and wheels instead of two rails and wheels will require more maintenance,

(f) where the line runs under the open sky (at grade, in cut, on fill or on elevated structure), traction will not work in wet weather.

I raised this last point with the Paris engineers who are acting as consultants on the Montreal project. They claimed that the concrete rails could be kept permanently dry by heating them electrically, at small cost. (Alweg makes this same claim, based apparently on experience in Western Europe and/or Japan. This claim cannot be accepted without extensive testing under Canadian weather conditions. No experience is available from Paris, as the line is completely underground.

Certainly the Montreal experience will warrant close study.

<u>CONCLUSIONS:</u>

1. There is no such thing as “monorail”. The systems presently advertised under that name all employ 4 or 6 rails and wheels, where “conventional” rapid transit employs two.
2. The one common element of these “monorail” systems is the employment of a beam in place of the platform used by conventional elevated railroads to carry the rails. However, it would be perfectly possible to support the rails of a “conventional” elevated railroad on two parallel beams which could be made smaller than the beams of all current “monorail” proposals.
3. The claim of lower construction costs is not borne out. Other things being equal, the cost of the monorail is equal or higher than that of a “conventional” elevated railroad. A very thorough study made by Parsons, Brinckerhoff, Hall and MacDonald in 1953 for the San Francisco Regional System found that the construction costs of a suspended monorail system would be 11.7% higher than those of a conventional elevated railroad (exclusive

of the development costs, fees and contingencies). The Alweg Company claims lower construction costs in comparison with "conventional" elevated railroads. No comparison is given for construction cost at grade, in cut, on fill or on masonry structure. In these cases the cost relation is likely to be reversed; it certainly is reversed in tunnel.

4. The most promising conditions for monorail are lines between two terminal points, without intermediate stops, such as from the city centre to an airport, or to a major recreational facility. The few existing or seriously contemplated installations of the Alweg system are all of this type.

The possibility of a monorail connection between Union Station and Malton Airport, over existing railroad tracks, has previously been investigated and rejected for the following reasons:

(a) The numerous grade separated street crossings would require extremely costly 3-level structures.

(b) Buses, after the completion of the Gardiner Expressway and of the access road from Highway 27 to the new airport Terminal, will travel at 50 to 60 miles per hour from end to end; a monorail could not provide faster service.

(c) A majority of air travellers use private cars, rented cars or taxis. The low usage and consequent infrequency of the present fairly fast and convenient bus service indicates that the probable usage and revenue of the monorail would not warrant the required very substantial capital investment.

A monorail line to the Toronto Islands also has been suggested. Such a line would require the construction of either a high bridge or a deep tunnel. As substantial volumes of traffic to the Islands are restricted to about 20 days of the year, the required investment cannot be justified. The same reason would also weigh against a monorail to the Canadian National Exhibition.

No other suitable location for monorail exists in the Metropolitan Toronto area.

In Toronto, efforts should be directed primarily to the following points:

(1) to find locations for rapid transit lines other than in subway tunnels,

(2) to reduce the cost of signalling and fare collecting systems,

(3) to reduce noise,

(4) to develop a means of transit of a capacity intermediate between the 40,000 passengers per hour of the subway and the 4,000 passengers per hour of the bus. In this respect, the experience of improved, high capacity tramways overseas, notably in Germany, should be studied.

(5) to speed up the feeder bus system, both by traffic regulations favouring buses over private vehicles and by introducing less time-consuming loading and fare-collection systems. In this respect, the "honour system" of fare collection, now in use in Moscow (similar to the system used for street sale of newspapers in Toronto) should be studied.

(6) to explore the possibility of developing a "jitney" feeder service in low-density areas.

(Editors' Note: The foregoing is a report requested by the Council of the Municipality of Metropolitan Toronto and which was recently presented. It would appear to put an effective end to the occasional demands heard at the political level in this area that all future extensions of the T.T.C. rapid transit facilities be made using monorail instead of conventional rapid transit.

Recommendation No. 4 at the end of the report is one in which electric railway enthusiasts should take great heart. This is another manifestation of a growing realization that the surface street railway is not a hopeless anachronism, and that only the location of tracks on narrow public streets, not the basic technology of this form of transportation, is in any sense out of date. If the Metropolitan authorities and the Toronto Transit Commission give recommendation No. 4 the attention that it deserves, the life expectancy of Toronto's present exemplary P.C.C.

fleet could be vastly extended, and its place ultimately taken by more advanced forms of surface electric railway equipment, such as may be found in many modern cities overseas.)

PROGRESS ON CN'S TORONTO YARD

Teams of construction and railway crews continue to sustain the on-schedule work program for the Canadian National's Toronto Terminal project, which includes a 34-mile access line as well as the 1200-acre freight classification yard. The entire project is slated for completion by early 1965.

In the east, the Henderson Avenue subway and the Woodbine Avenue bridge separating the new York Subdivision from these roads have been completed. Similarly, west of Yonge Street, bridges are complete over the west and main branches of the Humber River, the C.P.R.'s MacTier Subdivision and Woodbridge Road, while subways have been built at Bathurst and Jane Streets. Also nearing completion are bridges at the Seventh Line, Vaughan Township, east and west branches of the Don River, Bayview Avenue and Dufferin Street.

Grading of various sections of the line from Milton to Bayview Avenue ranged from 60 to 90% complete. Already track-laying crews have started their work between Georgetown and Milton and ballasting operations will be carried out concurrently. Work on a set-out yard near Malton began in mid-September. Even before the track has been laid, considerable signal installation work has been completed. Overhead signal bridges and their signals have been erected on the Oshawa Subdivision at Dunbarton, on the Brampton Subdivision at Georgetown and around the junctions with the Uxbridge, Bala and Newmarket Subdivisions. Buried cable for C.T.C. apparatus will be installed this fall on the Milton Subdivision between Milton and Georgetown.

Clearing and fencing the right-of-way between Dunbarton and Woodbine Avenue has begun and should be completed by the end of November.

In the yard itself, two bridges carrying the tracks at the main hump and a road bridge at the Sherwood Side Road have been completed. Already 14% miles of track and 188 switches have been laid, while another 60 miles of track will be in place by the end of this year. However, six more major bridges on the access line and six buildings in the yard have yet to be started.

STEAM ON THE B. C. E.

Saturday, August 25th. marked another first in West Coast railway history: a steam powered passenger train ran from New Westminster to Huntingdon, BC and return over the rails of the British Columbia Electric Railway's former interurban line. Originating at the B.C.E.'s Kitsilano Shop in Vancouver, the six-car train, composed of C.P. baggage car 4724, coaches 2211, 2236 and 2252, and mountain observation cars 597 and 598, left on time at 9:00 a.m. with GMD SW-900 No. 901 and approximately 330 passengers. Usually brief and polite crossing warnings were discarded in favour of long, mellow blasts from the Swanson air horn. Climbing up steadily, the train reached the crest of the first hill at 16th. Avenue, gathered speed down the dip at 21st. and finally ground to a halt at 33rd. where photographers alighted to enjoy a photo stop. Under way again, the sound of the horn attracted a goodly number of onlookers, especially at 41st. Avenue, where the crowd included a B. C. E. trolley coach operator who had abandoned his vehicle temporarily while he committed this precious moment to film.

After passing Marpole and the mixed farming and industrial area beyond, the special rolled on to New Westminster, and, after a brief stop for orders at the station, drew to a halt opposite the B.C.E. shop. Here engine 901 cut loose and Pacific Coast Terminals steam locomotive 4012 coupled on. This was the moment we were all waiting for! After a brief stop at the C.P. station, we were off to Huntingdon - the first passenger train to run over this line with steam power!

The 360 passengers now aboard the special had come from all areas of the Lower Mainland (of B.C.), from Seattle and Portland, from Edmonton, and even from Hamilton, Ontario.

After crossing the Fraser River bridge (the last steamer to do so was C.N. 4320 in March, 1958), engine 4012 came to life and blasted lustily, black smoke rising high in the air and the chime whistle blowing the kind of nostalgic song that our passengers had come to hear. But even this impressive effort was not enough to satisfy Scott Hill, whose sharp curves and 2.5% grade brought the train to a halt in short order. However, this was a minor problem, easily overcome by splitting the train in half and "doubling the hill". The trusty engine then made the top of the hill with ease and returned downgrade for the remaining three cars. Naturally, this afforded the passengers at the top a splendid opportunity to observe the freshly painted locomotive working hard upgrade. A run-past that was made to order!

About this time, it was discovered that a bearing in the right hand side big-end was running hot. This was to prove troublesome during the course of the day and reduced the engine's top speed to no more than 15 m.p.h.

Despite the slow pace and occasional stops to grease the hot bearing, the train made reasonably good time along the former interurban route. After ascending one short but sharp grade, the hogger decided to stop in order to build up steam pressure for the next climb, allowing the fireman to scramble back onto the tender to check his water supply. To his horror, he found the tank almost dry. Thanks to modern-day railroading, a radio call soon brought the Abbotsford Fire Department screaming to our aid.

While the tank was being replenished, the valley freight, powered by 907 and 908, caught up with us. A third unit, thoughtfully added by the B.C.E. superintendent, turned out to be No. 901, a friend from earlier in the day. In order that no further time be lost, he ordered 901 be cut into the train behind the steamer, and, this done, we were under way again, the freight train having passed us during the switching manoeuvres.

Upon approaching Clayburn, where the interlocking for a C.P. crossing at grade is located, a red signal brought us to a temporary stop. However, the C.P. trackage soon passed beneath us, with much clanking of six-wheeled trucks on the diamond crossing. To Abbotsford at last, complete with a parade of cars pacing the train, a 20-foot long banner to welcome us, and a smartly dressed band performing in their finest style. Three buses awaited the passengers from the train and offered a free 45-minute tour of the municipality. At the same time, the engines and two coaches travelled the remaining two miles to Huntingdon and were turned on the wye, returning to Abbotsford about an hour later. That rod bearing had acted up again!

Summoned by the chime whistle, the excursionists climbed aboard the train for the return journey. In retracing its steps, the train soon encountered Mt. Lehman hill, which is the ruling grade for westbound movements. But 901's presence allowed this five-mile terror to be surmounted in grand style, with tape recorders catching not only the blasting exhaust and hooting whistle of 4012 but the eighth-notch chanting of the diesel as well.

The closer to New Westminster we moved the darker it became, until finally it was pitch black, both outside the train and within. The slow speeds enforced by that hot running bearing did not allow the car generators to charge the batteries; consequently interior lights dimmed and eventually were switched off. With only the aisle lights glowing a dim brown, identification of fellow passengers was not possible at distances greater than about one foot! Oddly enough, the last two cars did not suffer from this trouble, but passengers requested that the lights be turned off so that they could enjoy the passing scenery or catch a nap. Finally only vestibule lights and a red-beamed interurban headlight on the back of the train were all that were lit. Operations in the baggage car were carried out by the light of kerosene lanterns until the head-end brakeman opened the front door of the car and turned on 901's twin sealed-beam headlights. This helped considerably. In fact it illuminated the whole interior of the train! Viewing this sight from a few cars back gave one the impression of some narrow gauge train coming right down the aisle.

The fun of riding the open cars and the periodic sounding of 4012's melodic whistle occupied most of the passengers until the stop and engine change was made at New Westminster. Because of the late hour, the temperature had dropped considerably and the die-hards in the hay-racks (observation cars) were forced to add extra clothing. A few fans, rather than be forced inside the coaches resorted to "wearing" cardboard boxes to fend off the cold!

The arrival at Kitsilano, stabling the engine and much exchanging of good wishes brought the excursion run to a close, but the photographs and recordings gathered that day will long recall the day the steam engine ran on the old interurban line to Huntingdon. While the trip had more than its fair share of incidents there were no accidents, and a word of praise should be extended to the executive of the West Coast Railfans Association for their good planning and safety first attitude. We wish them luck on their next venture.

By Peter Cox.

MEMBERS' ADVERTISEMENTS

U.C.R.S ANNOUNCEMENTS

The October meeting of the Society will again be held in the Consumers' Gas Company Auditorium, 19 Toronto Street, commencing at 8:30 p.m. This month, our guest speaker will be Mr. J. A. Beatty, Special Passenger Representative for the Canadian Pacific Railway. Mr. Beatty is a noted raconteur of railway stories and this evening he will relate some of his experiences as a motorman on the Calgary Street Railway. The date of this meeting will be the usual third Friday of the month, October 19th..

The October meeting of the Hamilton Chapter will be held on Friday October 26th. in the board room of the Canadian National station, James Street North.

The Annual Banquet of the Society will be held on Friday, November 2nd., in the Maple Room at Union Station. Entrance to this room is from the west end of the York Pioneer Restaurant, and dinner will be served at 6:15 p.m. Tickets for this event may be obtained from Box 12 , Terminal "A", or at the October meeting for $3.50 each.

MISCELLANY

- Klondike Mines Railway - White Pass and Yukon locomotive No. 4, shipped from Skagway to

Wisconsin in 1955, saw its first season of active use this year, but not by its original purchaser or at the intended location. The 3-foot gauge, Baldwin-built 2-6-2 ran daily during the summer on a two-mile loop of track at Peppermint Farm, a small amusement park with a wild-west motif, located one mile east of Waterford, Wisconsin, on Racine County road "K".

(J. D. Knowles)

Sketch: CN Passenger Car Digram 0201-003.pcx