

Heritage to Hydrogen



Surrey, Metro Vancouver, BC. Canada

Peter Holt

4th International Hydrail Conference – Valencia: June 9, 2008

Surrey's Heritage Rail Demonstration Project

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Surrey is located "South of the Fraser" in a region known as the Fraser Valley, 30kms to the east of the City of Vancouver

Fraser Valley Community Rail

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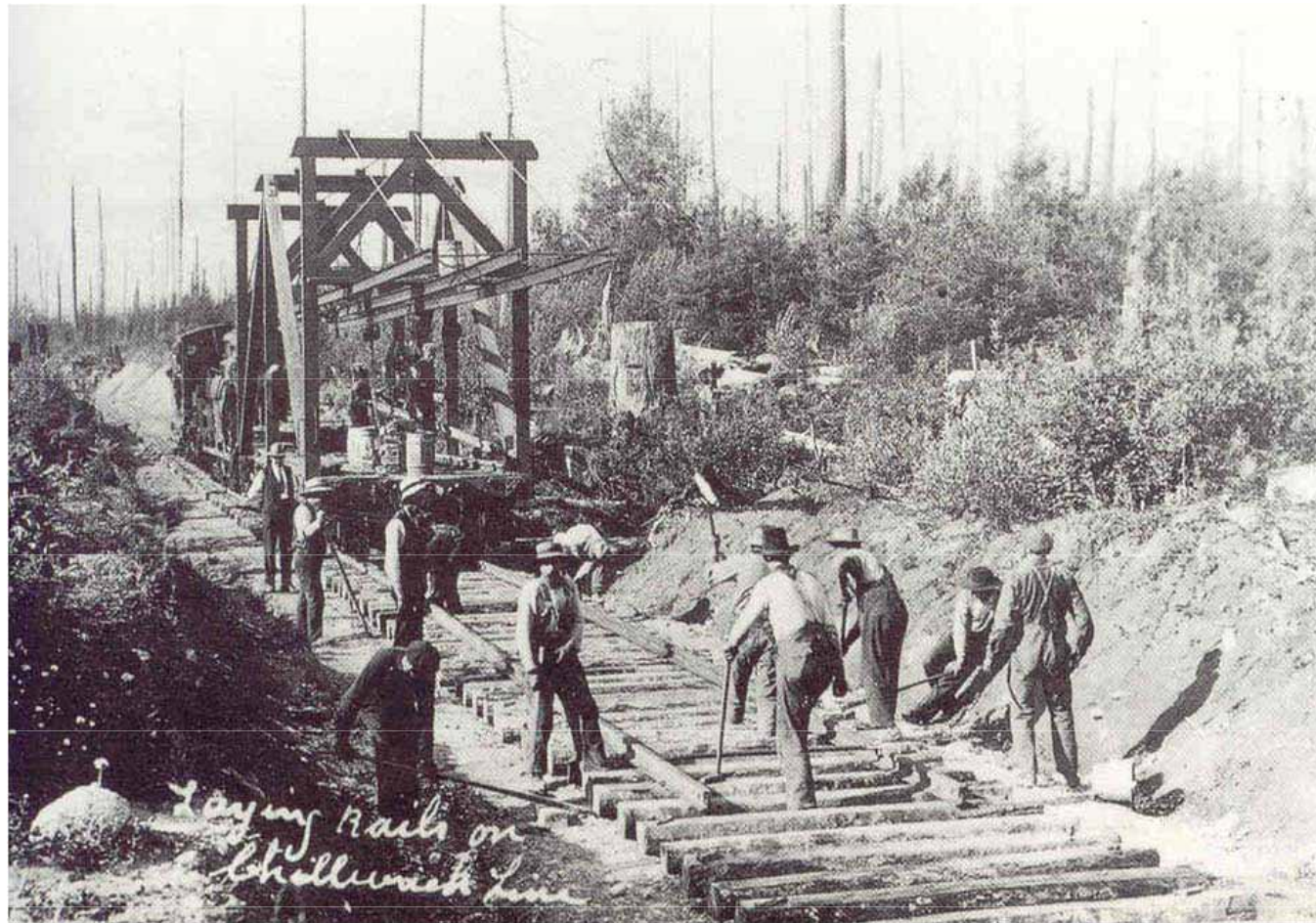
1910 to 1950



Valley Communities Were Built Around the BC Electric Railway's Electric Powered Passenger Service . It ran between 1910 and 1950. Passenger Service Ceased in 1950 – Short Haul Freight Continues

Laying Tracks On The Line -1910

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It took just three years to build over 60 miles of track

Phase 1 of the Heritage Line

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Heritage Passenger Car Progress

Rehabilitation of BCER Car1225 to Full Operational Condition

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2006

2007

2008

2009

2010

Operations

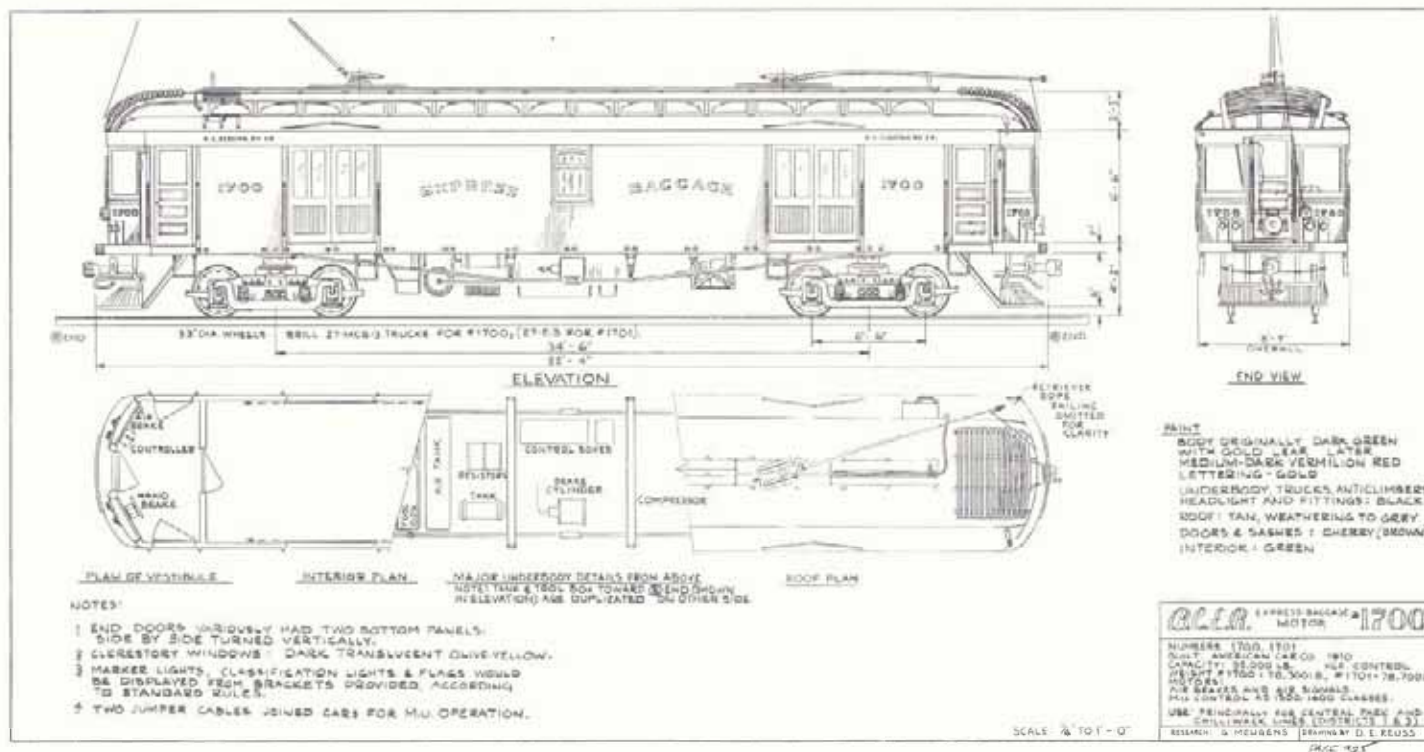
Interurban Car BCER 1225 in the 1950's

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The Baggage Car - Locomotive

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Plans are to utilize the large space inside the baggage car to house a power generator set and fuel system. This will provide the 600DC required to drive the 2 electric motors on each truck.

Goals & Objectives

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Be the first in North America to operate a hydrogen powered passenger service

Demonstrate the service prior to the 2010 Winter Olympics and be part of BC's "hydrogen highway"

Key Objectives:

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- Purchase of replica baggage/power car (to be delivered 2Q09)
- Final selection of power unit and configuration
- Choice of power source/fuel to supply 600V DC motors
- Integrate the power unit into the replica baggage car

- Length of track to be designated for operations
 - Option 1: Sullivan to Cloverdale – Most likely for January 2010
 - Option 2: Newton to Cloverdale – Phase 2 limited operation in 2012
 - Option 3: Scott Road to Cloverdale – Phase 3

Cost Comparison Between Competing Hydrogen Powered Options

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- **Option 1,**
Fuel Cell Hybrid (2 x 150KW Fuel Cell stacks + battery)
producing power to battery pack that powers motors.
- **Option 2,**
Internal combustion engine running on a hydrogen / methane
fuel powering generator that powers motors.

Both options qualify to be part of the hydrogen highway

Fuel Cells vs Hyd-Methane ICE

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Common Costs Estimates (C\$):

Replica Baggage Car	\$650,000
Track Upgrades, Level Crossings Cloverdale-Newton	\$ 1,038,000

Power Module – Fuel Cells

Power Module (Fuel Cell hybrid 300KW total)	\$700,000
Fuel package (valves, piping, tank farm)	\$100,000
Power Electronics, Engineering, Int., Test & Trials	\$750,000

Power Module – Hydrogen-Methane (20% H - 80% CNG)

ICE Power Module (using HCNG)	\$135,000
Fuel package	\$15,000
Engineering, Integration, Test & Trials	\$ 400,000

Current Status

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- The City of Surrey has announced that the project will be a major 2010 Olympic Legacy Project and allocated an additional \$1.5 million in their budget
- Matching funds are still being finalized to launch the main phase of the project in order to achieve the 2010 schedule deadlines
- Memorandum of Understanding between the City of Surrey and the rail company is in progress
- Fraser Valley Heritage Rail Society is on schedule to deliver the first working passenger car by 4Q2009

Useful Links

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Fraser Valley Heritage Rail Society

- www.fvhrs.org

City of Surrey, BC

- www.surrey.ca

British Columbia Hydrogen Highway

- www.hydrogenhighway.ca