



## LOWER MAINLAND TRANSFER CAPABILITY LIMITS

### INFORMATION RELEASE

#### TRANSMISSION SYSTEM TRANSFER CAPABILITY LIMITS Upgrade Options & Cost Estimates

##### OVERVIEW

This Information Release is intended to provide an overview of the transmission constraints as it relates to potential new generation activity in the entire province. The purpose of this information is to provide relevant information for IPPs who are locating new projects in the province. The information is provided according to the four regions of the province: Lower Mainland, Northern Interior, Southern Interior and Vancouver Island.

The transmission system is dynamic by nature. The flow of electricity constantly changes in response to shifts in generation and demand. The maximum flows on each circuit under steady-state system conditions are limited by the size of the conductor, the thermal limits for ground clearance and conductor temperature, and voltage limits. The amount of power that is transmitted along a transmission path is limited by the most restrictive of these constraints at interfaces, or “flowgates” commonly referred to as cut-planes.

It should be noted that transient stability and voltage stability constraints for secure operation through system disturbance conditions (faults) could be more restrictive. However, these stability constraints would need to be determined by specific case studies.

Based on BCTC’s current knowledge of IPP projects being planned, BCTC identified key cut-planes, where there are capacity restrictions under the most limiting time during the year: either Light Summer, Heavy Summer or Heavy Winter load periods. The power flow is usually highest under Heavy Winter conditions; whereas, the line thermal ratings are lowest during Summer conditions. This posting indicates the limitations and impacts of adding new generation in areas based on the project’s size (MW) and location in relation to the cut-plane.

The estimated available transfer capacity (ATC) at the identified cut-planes is based on the forecast 2008/09 winter peak and 2009 summer system conditions. This posting does not guarantee the available transfer capacity (ATC) across the selected cut-planes. The reported ATCs are planning level estimates.

In this information release, system reinforcement options or network upgrades have been identified, which could make additional transmission service available in these specific regions within 3 years. Estimated costs and lead times for these reinforcements are included. These are coarse preliminary estimates and hence subject to change when detailed investigations are undertaken. The process for activating one of these upgrades to the system is outlined in the BCTC Tariff Processes. It is important to note that the recovery of the cost of any reinforcements



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would be in accordance with BCUC policy. Also, the reinforcement options do not necessarily reflect all possible solutions to the constraints. These options may ultimately not be recommended by BCTC as the most efficient, long-term upgrade solutions for that area.

BCTC is committed to continuing to provide relevant, timely information about BC's transmission system. To that end, we intend to augment the information in this report with similar postings for other areas where potential generation activity is identified. BCTC will update this information as new constraints are identified.

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### INTRODUCTION

This notification provides the expected capability of the transmission system in the Lower Mainland region in 2008 based on the existing system and commitments. It indicates the limitations and impacts of adding new generation in the Lower Mainland region in terms of size (MW) and location for serving the load in the entire province. Based on BCTC's current knowledge of IPP projects being planned, BCTC identified key cut-planes, where there are capacity restrictions. The available transfer capability (ATC) of the transmission system across selected cut-planes has been identified based on thermal current ratings of the transmission system in the most limiting time during the year. Other considerations in determining the impact of new generator additions on the system, such as transient stability, changes in fault levels at adjoining stations, and protection and control requirements could be more restrictive or require system investments. These factors have not been evaluated.

### TRANSFER CAPABILITIES

The approximate annual firm transfer capabilities are given for the following cut-planes in the Lower Mainland region which is subdivided into the Metro region (M) and the Fraser Valley East region (FVE):

M-1) North of Sechelt - across line 1L44, towards Sechelt

M-2) East of Gibson - across line 1L31, towards Gibson

M-3) East of Pender Harbour tap - across line 1L35, towards Malaspina

M-4) East of Sechelt - across line 1L32, towards Sechelt



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M-5) West of Howe Sound Pulp and Paper - across line 2L47, towards Howe Sound Pulp and Paper

FVE-1) South of Spuzzum - across line 60L10, towards Wahleach

FVE-2) South of Hope - across line 60L95, towards Wahleach

The cut-planes and directions of the transfer capabilities are as illustrated in the attached figures.

The following table shows the approximate transfer capabilities for the above cut-planes.

<b>Transfer Capabilities for Planned 2008 System (based on current forecast and known commitments)</b>				
<b>Cut plane</b>	<b>TTC (MW)</b>	<b>CU (MW)</b>	<b>ATC (MW)</b>	<b>Limiting Condition</b>
M-1	60	65	-5	LS
M-2	60	-20	80	LS
M-3	60	45	15	LS
M-4	60	-10	70	LS
M-5	210	90	120	LS
FVE-1	50	30	20	LS
FVE-2	80	-25	105	LS

TTC: Total Transfer Capability  
 CU: Committed Use (maximum)  
 LS: Light Summer

ATC: Available Transfer Capability  
 ATC = TTC – CU

The given ATC for cut-planes in the above table implies the maximum aggregate amount of new generation that can be added in the region on the delivery side of the respective cut-planes without transmission reinforcements. The ATC for these cut-planes is limited by the maximum generation surplus in the area under light summer load conditions, which would have to flow across the cut-planes.

Additional transmission service can be made available through the BCTC Tariff Processes.

### Reinforcement Options:

The feasible options and the respective incremental power transfer capacity are identified for each cut-plane below. Costs are reported in 2005 dollars. Larger projects may have longer lead times because more time may be required for the regulatory approval process and construction.



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An estimate of lead time has been provided. There are no upgrade options for cut-planes M-2 to M-5 at this time.

### *Cut-plane M-1:*

M-1-A. Increase operating temperature of line 1L44 to 60°C. This will increase the line rating of 1L44 to 80 MVA.

### *Cut-plane FVE-1:*

FVE-1-A. Upgrade line 60L10 to an Orchid conductor with operating temperature of 90°C. This will increase the summer line rating to 95 MVA.

### *Cut-plane FVE-2:*

FVE-2-A. Increase operating temperature of line 60L95 to 90°C. This will increase the summer line rating to 95 MVA.

New ATC for Reinforcement Options for Cut-planes M-1, FVE-1 and FVE-2					
support Option	Total Cost (\$ million)	ATC Forecast for 2008 (MW)	Incremental ATC (MW)	New ATC (MW)	Lead Time (Months)
M-1-A	1	-5	20	15	12
FVE-1-A	16	20	45	65	36
FVE-2-A	1	105	15	120	18

If you require further information, please contact:

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### Disclaimer:

The reinforcement options set out in this Information Release do not reflect all possible solutions to the identified ATC constraints. The information set out in this Information Release is based on a number of assumptions, only some of which have been identified. The reinforcement option costs set out in this Information Release are estimates only based on those assumptions. Changes to relevant factors (including without limitation different load and generation forecasts or different construction timelines for the reinforcement options) may make those assumptions invalid, and therefore the actual reinforcement options available and their costs may differ substantially from those presented here.

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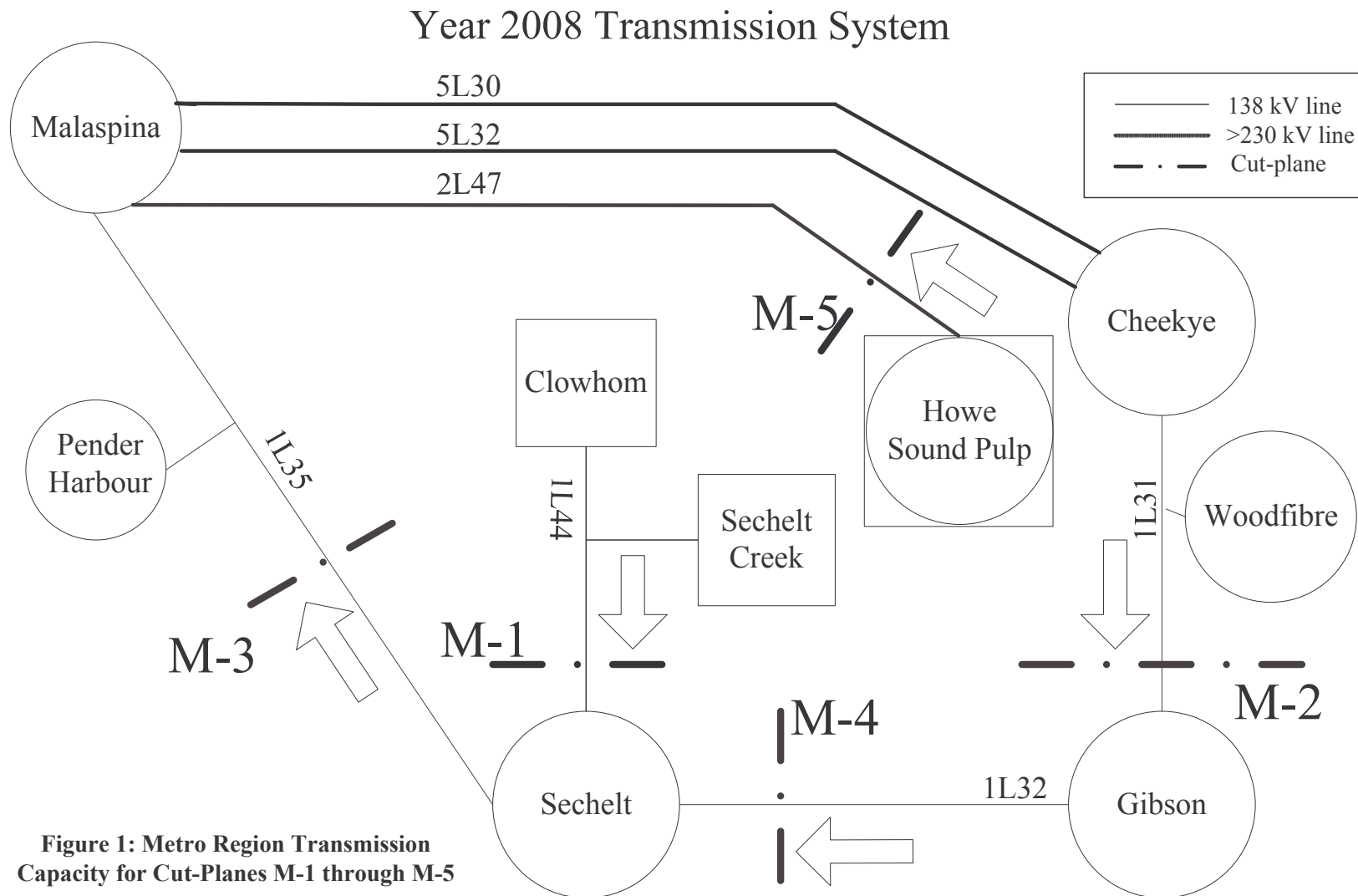


Figure 1: Metro Region Transmission Capacity for Cut-Planes M-1 through M-5



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### Year 2008 Transmission System

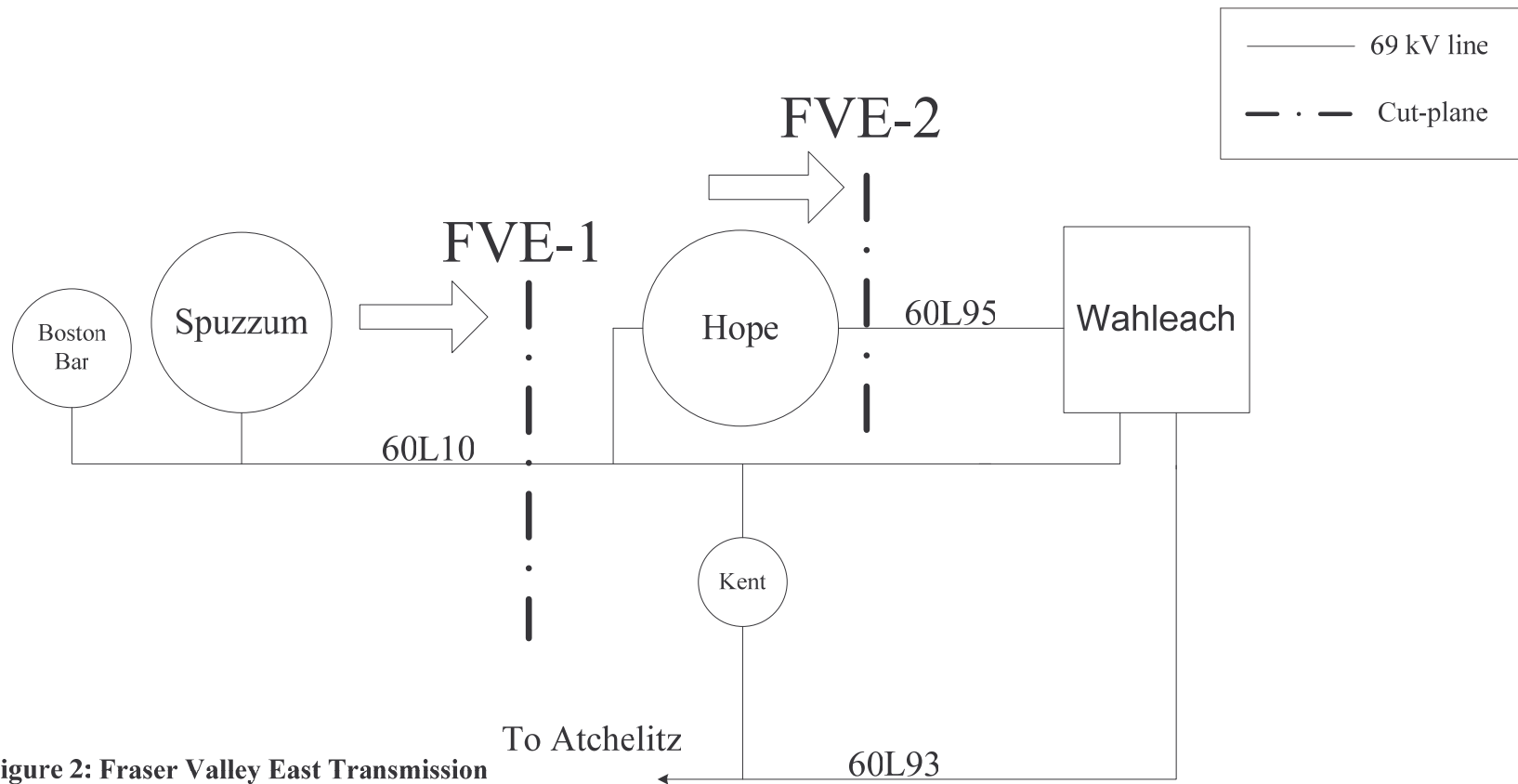
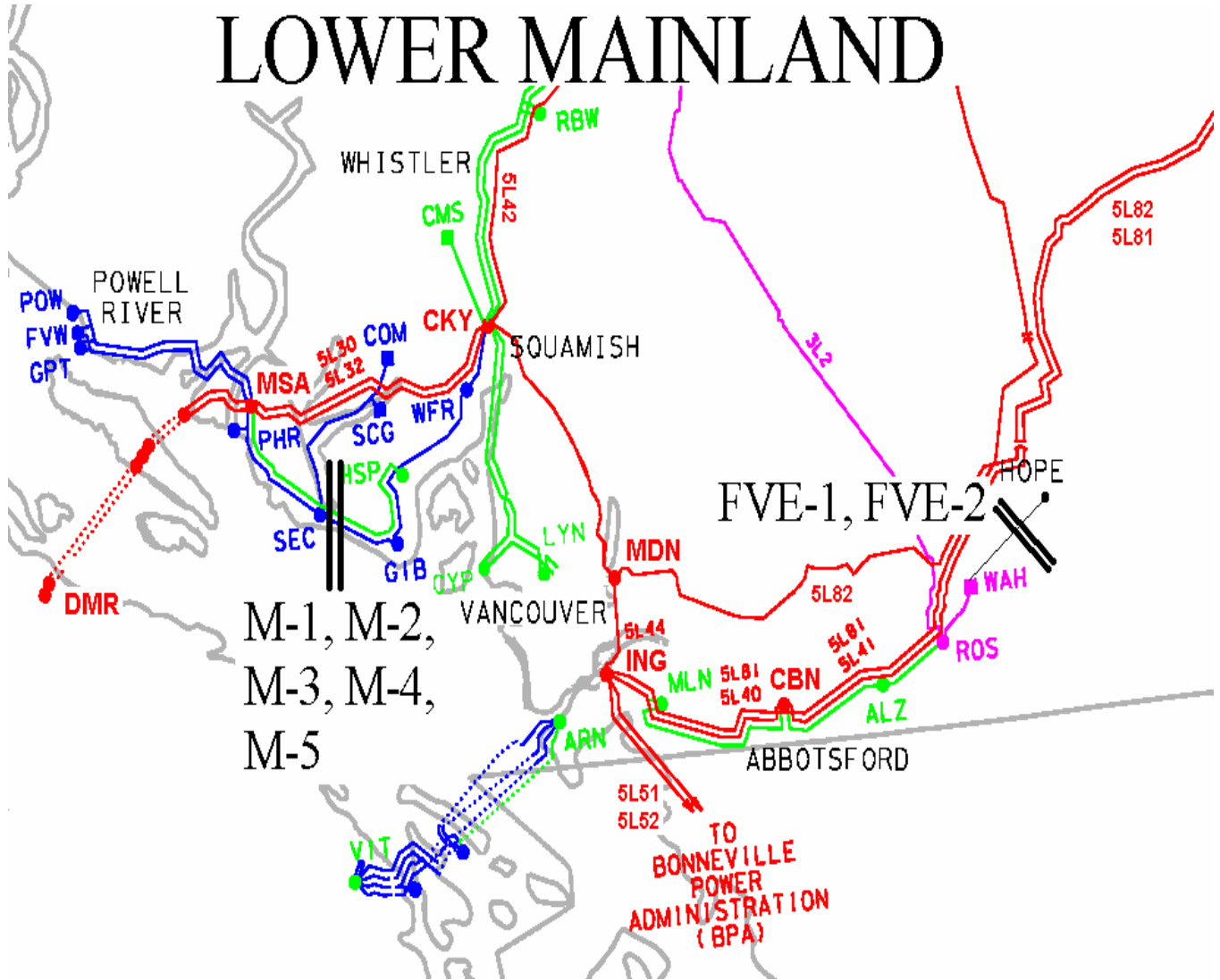


Figure 2: Fraser Valley East Transmission Capacity for Cut Planes FVE-1 and FVE-2



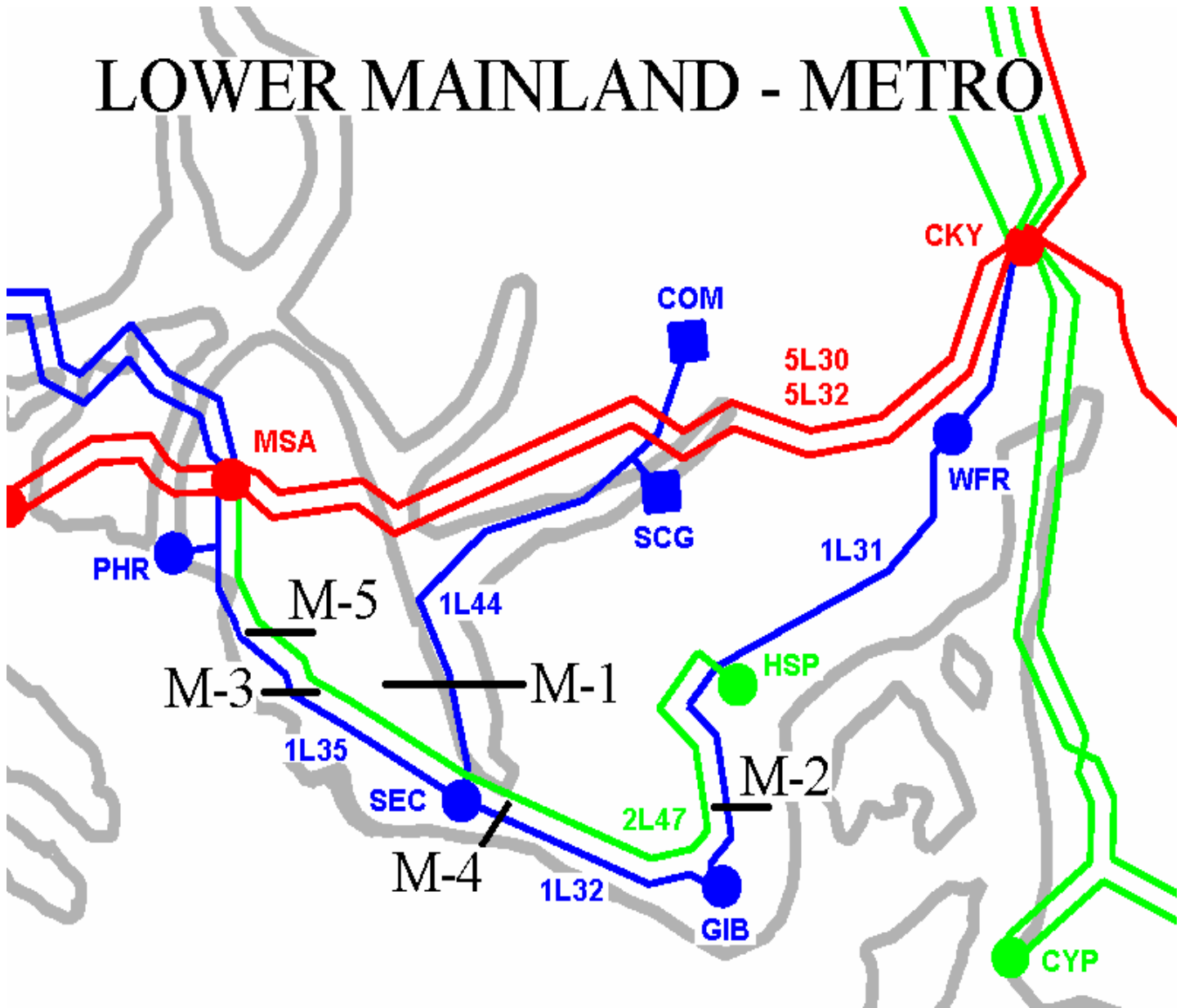
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# LOWER MAINLAND - METRO





# LOWER MAINLAND - FRASER VALLEY EAST

