



City of Richmond

Report to Committee

To PWT - Apr. 18 2012

To: Public Works and Transportation Committee

Date: April 3, 2012

From: John Irving, P.Eng. MPA
Director, Engineering

File: 10-6060-01/2012-Vol
01

Re: BC Hydro 20 Year Work Program in the City of Richmond

Staff Recommendation

That Staff report back on BC Hydro activity and progress toward a common voltage for Lulu Island on an annual basis.

John Irving, P.Eng. MPA
Director, Engineering
(604-276-4140)

Att.

FOR ORIGINATING DEPARTMENT USE ONLY		
CONCURRENCE OF GENERAL MANAGER		
REVIEWED BY TAG	YES	NO
	☒	☐
REVIEWED BY CAO	YES	NO
	☒	☐

Staff Report

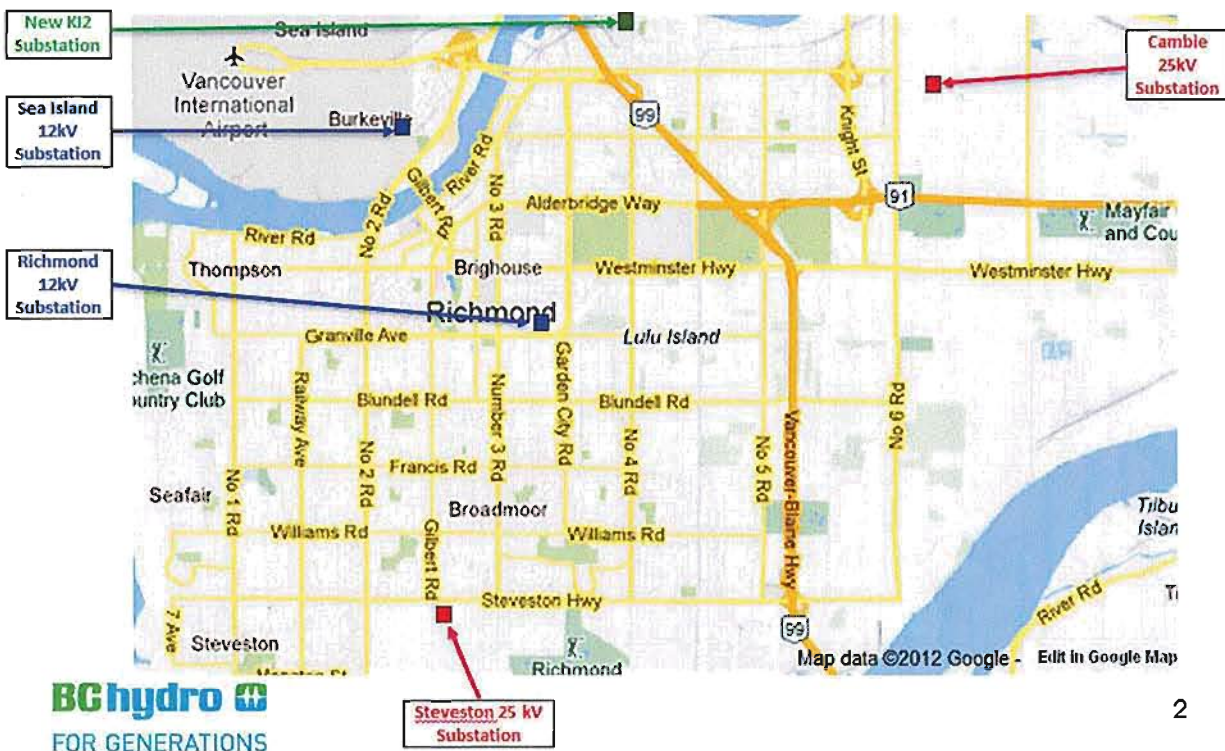
Origin

Even with the success of the BC Hydro Power Smart program and City District Energy initiatives, Richmond's rapid growth is creating a demand for electricity that is approaching the limits of the existing electrical network in the City. For planning purposes, BC Hydro estimates an annual 3% increase in power usage within Richmond for the next 20 years and is taking steps to meet the existing and future demands for electricity. This staff report updates Council on BC Hydro network upgrade activity over the next 20 years and to highlight the level of cooperation between BC Hydro and City staff.

Findings of Fact

Richmond is currently served by two 25 kV substations (Cambie Substation and Steveston Substation) and two 12 kV substations (Richmond Substation and Sea Island Substation) as identified in Figure 1.

Figure 1: BC Hydro Substations in Richmond



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Richmond's rapid growth is creating a demand for electricity that is approaching full utilization of the capacity of existing substations. To meet growing demand for electricity, BC Hydro has significant network upgrades planned over the next 20 years that will increase capacity and establish a common operating voltage, 25 kV, on Lulu Island. A common operating voltage will provide operational flexibility by allowing load to be switched between substations, thereby enabling reduced outage durations and improving reliability. The higher 25 kV operating voltage

will reduce the number of feeders required to serve Richmond's electrical load and will reduce overall electrical losses.

Work is under way on a new 25 kV substation at BC Hydro's existing Kidd-2 (KI2) transmission switch station at the intersection of River Drive and No. 4 Road (see Figure 1) that will be completed in the spring of 2016. Feeder upgrades are planned that will facilitate decommissioning of the 12 kV Richmond Substation by the spring of 2018, which will be a significant milestone toward a common voltage on Lulu Island. The estimated cost for the upgrades planned for the next two years is between \$18 million and \$27 million. Figures for subsequent years are not yet available to City staff.

The 12 kV Sea Island Substation will also be converted to 25 kV, however, the timing of this upgrade will be largely dependent on the scope and timing of industrial and commercial development on Sea Island as this substation predominantly serves Sea Island.

Attachment 1 is a copy of a presentation BC Hydro made to City staff regarding the scope of work in 2013/2014 and beyond. The information in this presentation is preliminary and the work program may change significantly as the program proceeds. Having said that, the presentation does give the reader a sense of the breadth of the program and the number of neighbourhoods that will be impacted.

BC Hydro staff is working with City staff to identify future population distribution and coordinate their significant body of proposed construction work with other City infrastructure projects and traffic issues. For example, there is an overlap between BC Hydro feeder upgrades and the Metro Vancouver Gilbert Trunk Sewer replacement along the CN rail corridor that will ultimately become the new River Road between Capstan Way and Gilbert Road.

Impacts to Roads and BC Hydro Service

The extensive upgrading of BC Hydro infrastructure will impact a large number of neighbourhoods in the City. Specific projects and information on impacted areas are being determined by BC Hydro staff and will be made available to the public as the program proceeds. The improvements will include significant construction effort that has potential public impacts including traffic disruption and electrical service impacts. City staff will work with BC Hydro staff to minimize public impacts.

Financial Impact

None at this time.

Conclusion

Richmond's rapid growth is creating demands for electricity that are approaching the capacity of the existing electric power network. While the BC Hydro Power Smart program and City District Energy initiatives have significant impacts on reducing per capita electricity demand, city wide demand is projected to increase by 3% per year due to municipal growth.

April 3, 2012

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BC Hydro is proactively planning and implementing electrical infrastructure upgrades that will stay ahead of the growing demand and improve system reliability in the future. Hydro's 2013/2014 work plan includes \$18 million to \$27 million in system improvements over the next two years and this work is actively being coordinated with other City infrastructure projects to minimize cost and public disruption.

A handwritten signature in black ink, appearing to read 'L. Bie', with a small dot at the end.

Lloyd Bie, P.Eng.
Manager, Engineering Planning
(604-276-4075)

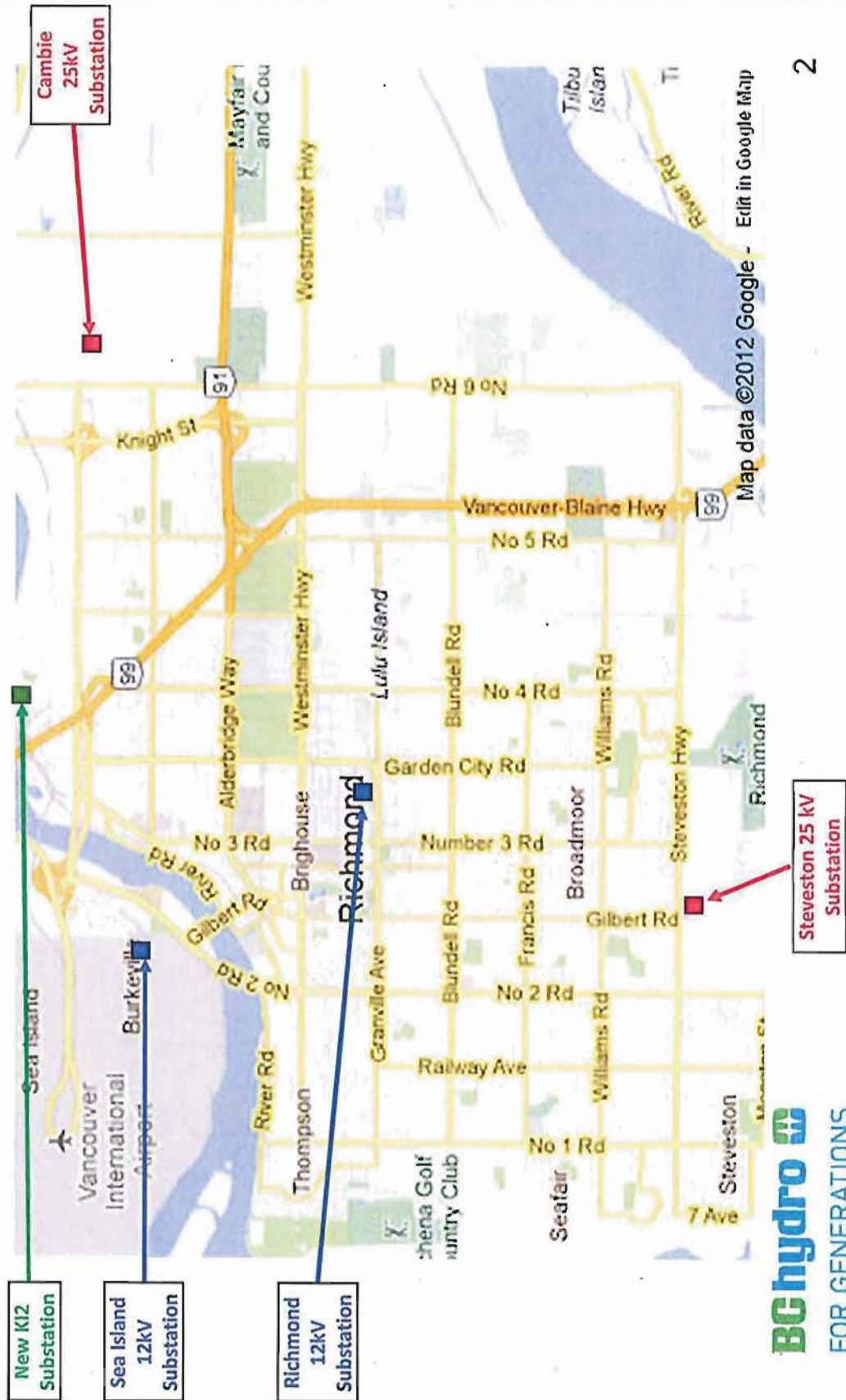
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Major Distribution Capital Projects in Richmond *F2013 – F2022*



Distribution Planning
March 2012

City of Richmond Power Supply System



Major Distribution Projects in F2013/14 - Overview

Project Description	Fiscal Years	Page
New underground duct bank along No 4 Rd from KI-2 Substation to Bridgeport Road (800m)	F2013/14	4
New underground duct bank along Bridgeport Rd from Garden City to No 3 Rd (600m)	F2013/14	4
4 new KI-2 feeders and 1 standby feeder to offload Richmond and Steveston substations	F2014	5
Voltage Conversion of 6 Richmond Substation feeders (ongoing)	F2013/14	6-8
Voltage Conversion of 3 Richmond Substation feeders	F2013/14/15	9-11

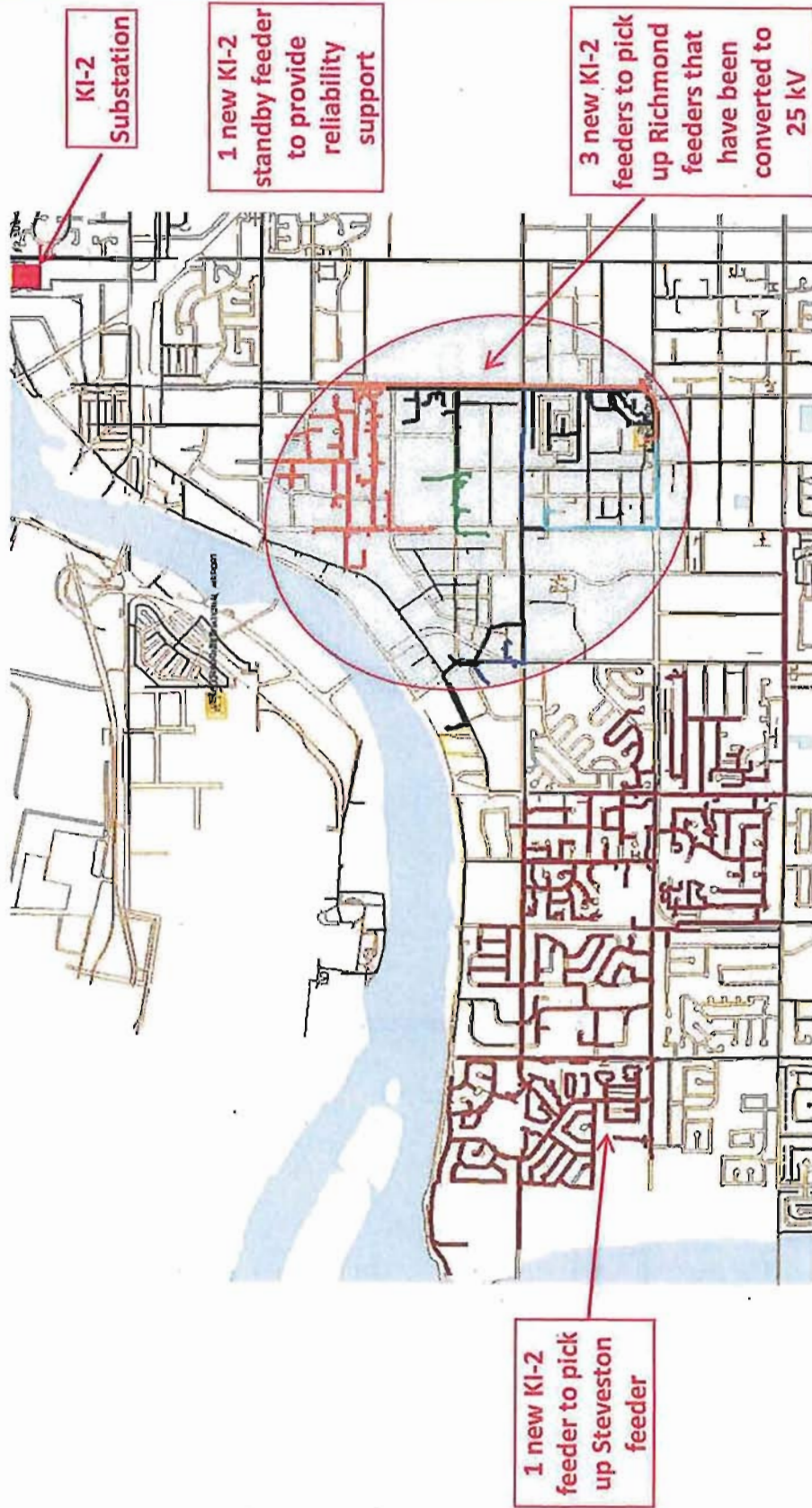
Note: The majority of these projects are currently under design phase. Projects will be submitted for approval when design is complete.

Major Distribution Projects in F2013/14



F2013/14

Major Distribution Projects in F2013/14

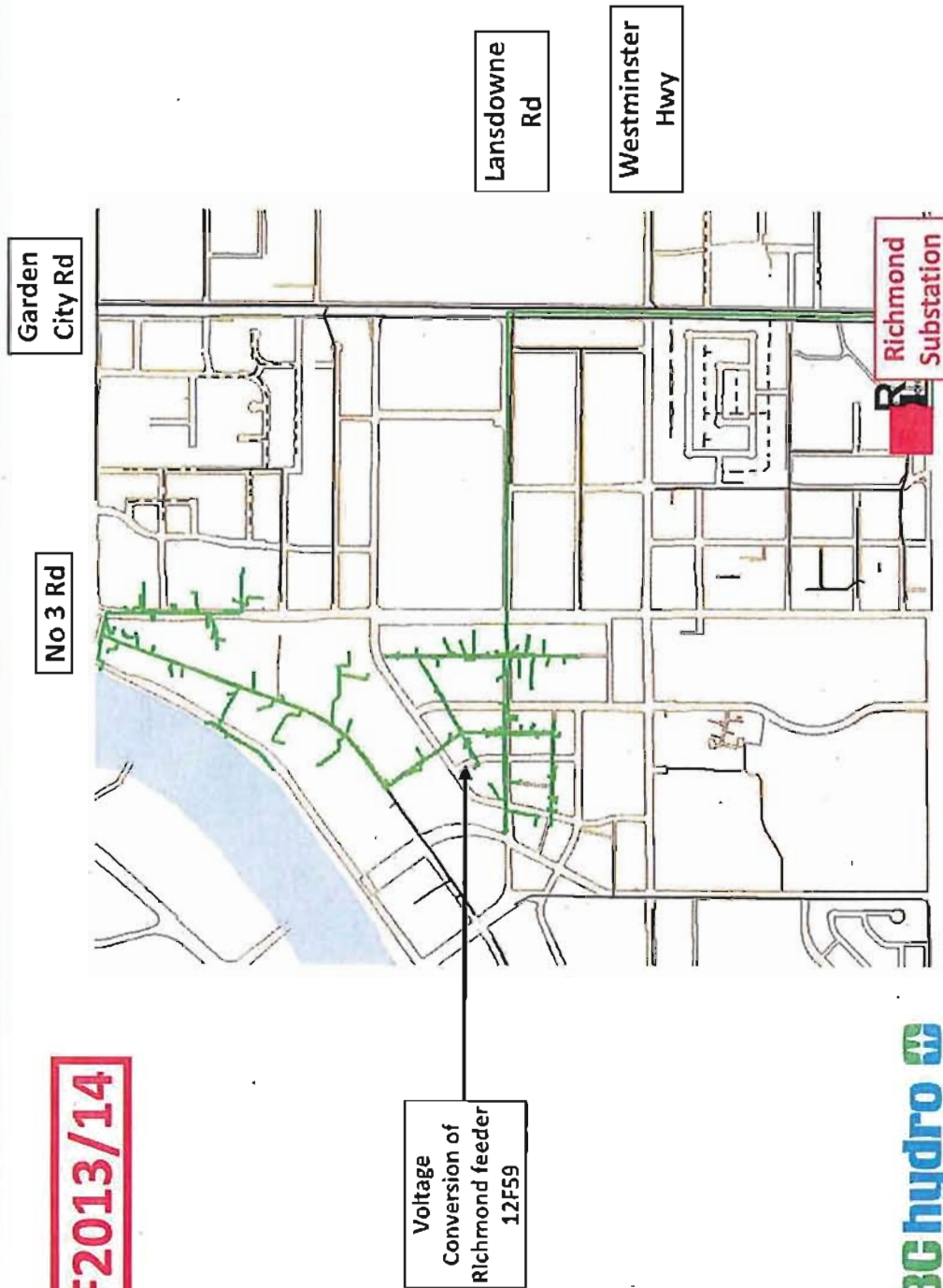


BC hydro 
FOR GENERATIONS

F2014

Major Distribution Projects in F2013/14

F2013/14



BC hydro 
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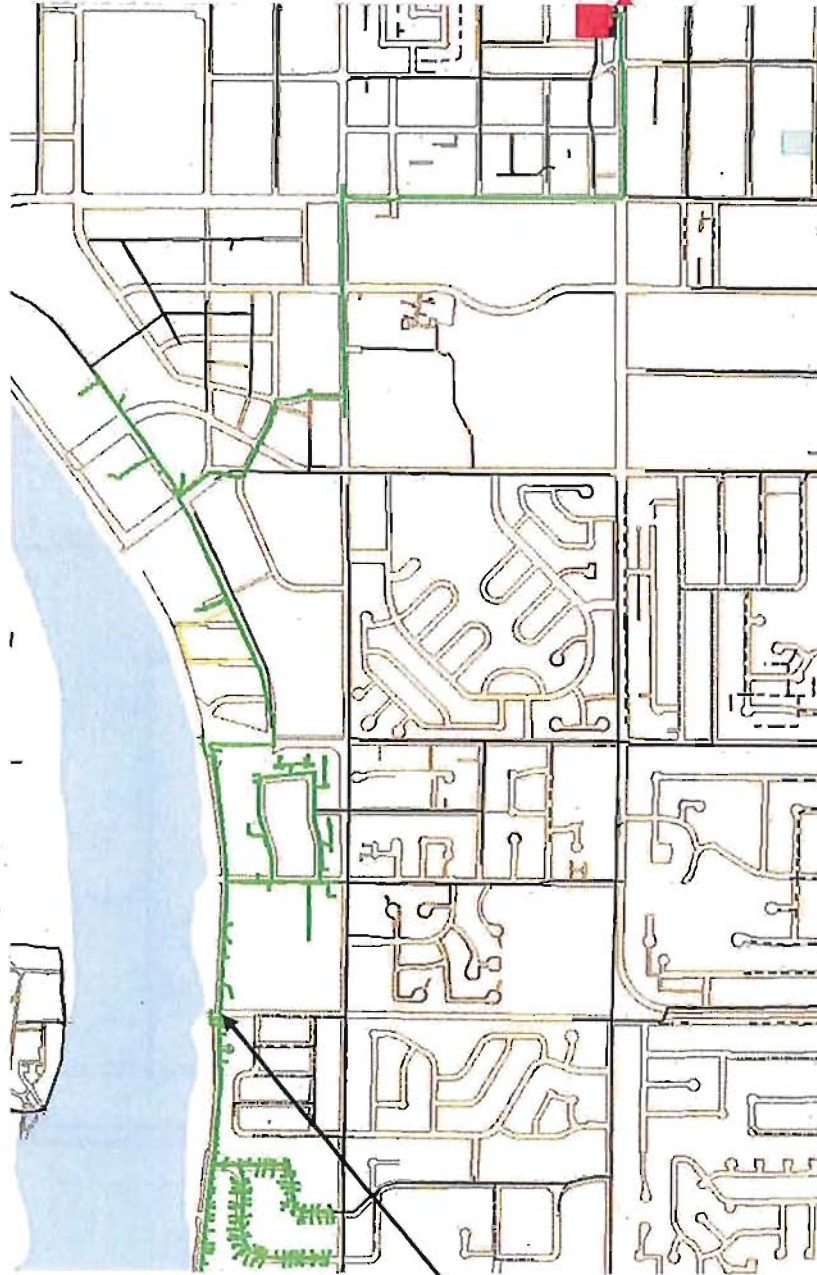
Major Distribution Projects in F2013/14

F2013/14

No 2 Rd

Gilbert Rd

No 3 Rd



BC hydro 
FOR GENERATIONS

Major Distribution Projects in F2013/14

F2013/14

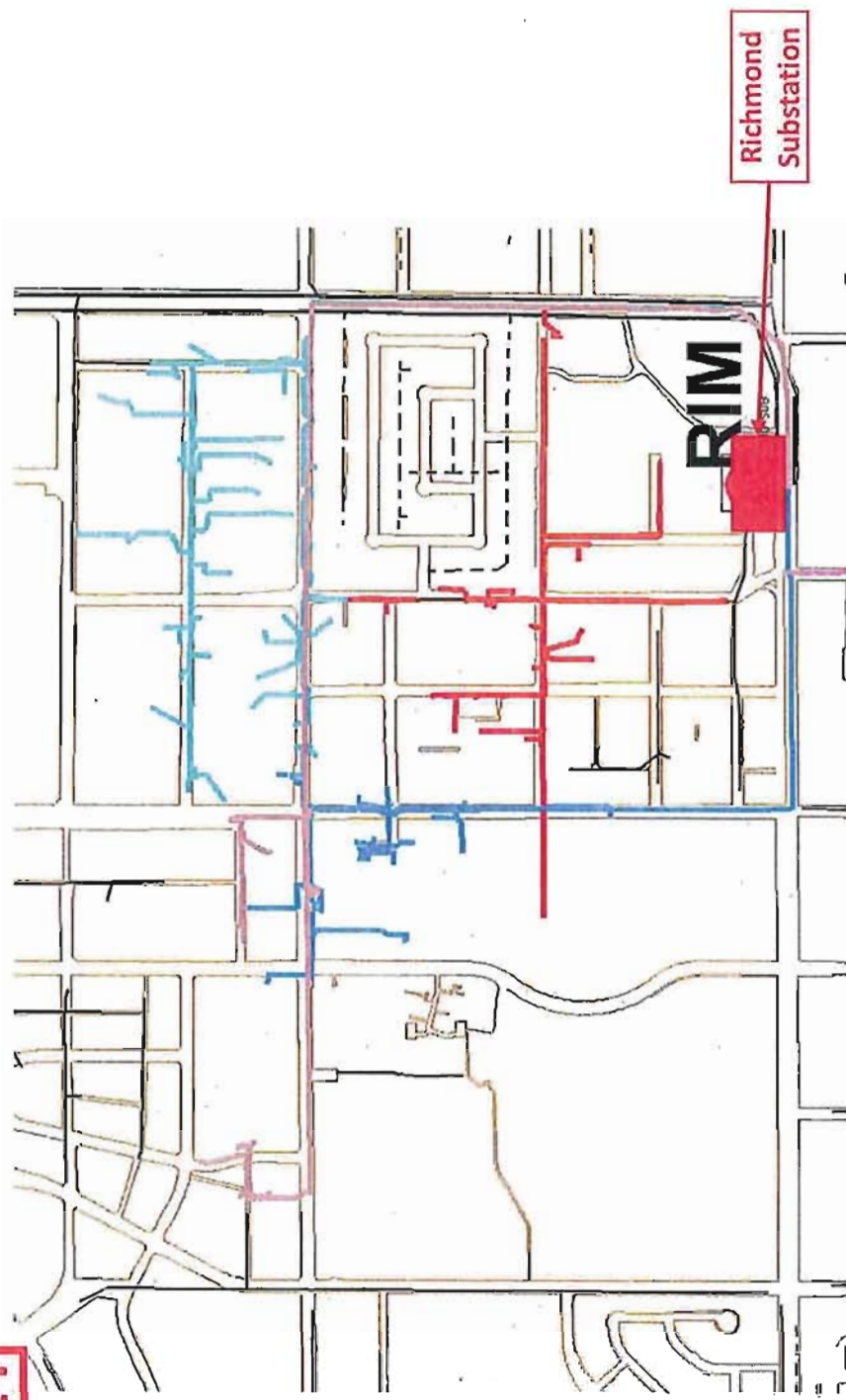
Gilbert Rd

No 3 Rd

Garden City Rd

Westminster Hwy

Granville Ave



BC hydro
FOR GENERATIONS

Voltage Conversion of Richmond feeders
12F52, 12F56, 12F57, 12F70

Major Distribution Projects in F2013/14/15

F2013/14/15

Gilbert Rd

No 3 Rd

Garden City Rd

Westminster Hwy

Granville Ave



Voltage Conversion of
Richmond feeder 12F53

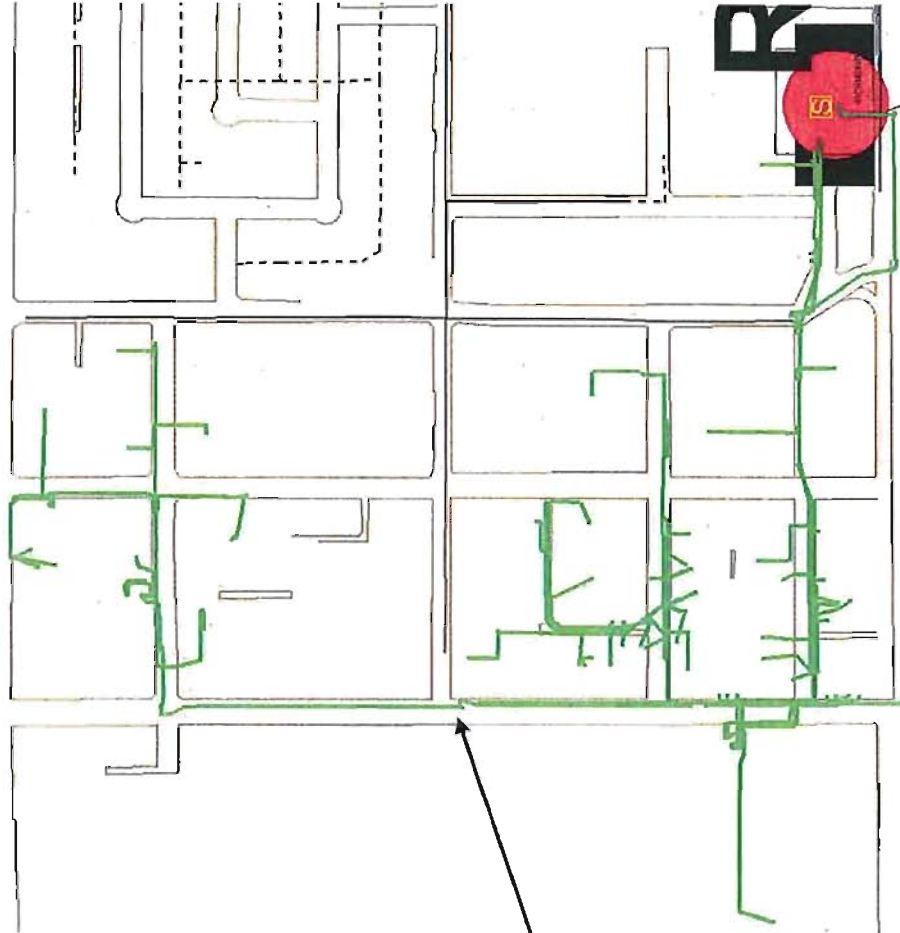
BC hydro 
FOR GENERATIONS

Major Distribution Projects in F2013/14/15

F2013/14/15

No 3 Rd

Westminster
Hwy



Granville
Ave

10

Voltage
Conversion of
Richmond feeder
12F61

BC hydro 
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Major Distribution Projects in F2013/14/15

F2013/14/15

Gilbert Rd

No 3 Rd

Westminster Hwy

Granville Ave



BC hydro 
FOR GENERATIONS

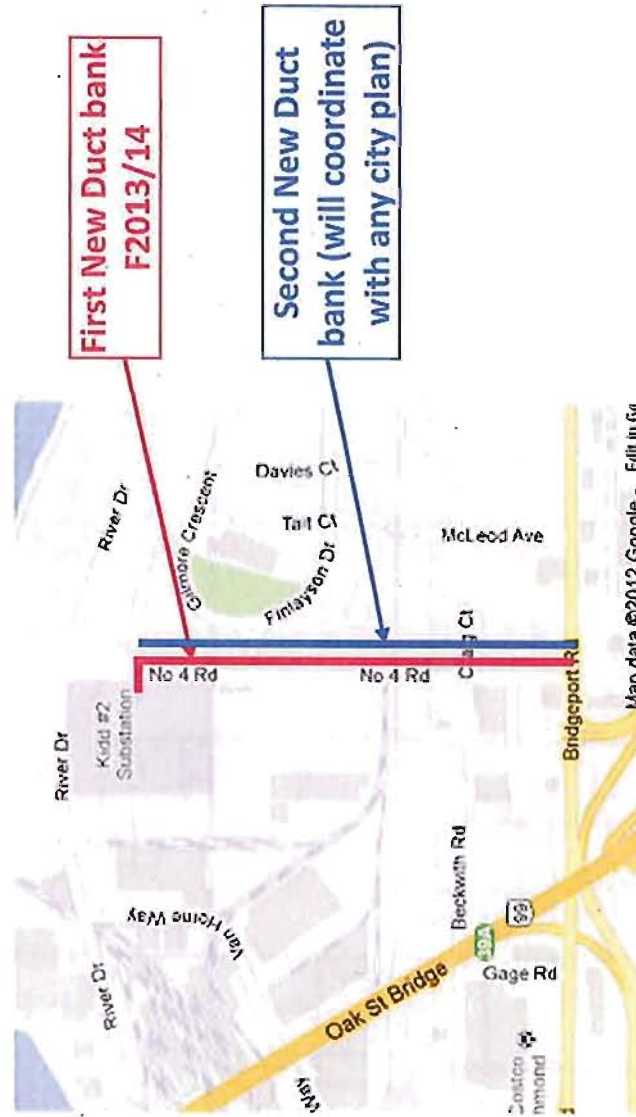
Major Distribution Projects (F2014-F2022) - Overview

Project Description	Fiscal Year	Page
Second new underground duct bank along No 4 Rd from KI-2 Substation to Bridgeport Road (800m)	Will coordinate with city work	13
Voltage Conversion of 5 Richmond Substation feeders	F2014/15/16	14
Richmond Substation Decommissioning	F2016-18	-
KI-2 to pick up 3 Steveston substation feeders	F2014/18/22	-
KI-2 to pick up 3 Cambie substation feeders	F2014/18/22	-
Voltage Conversion of 7 Sea Island Substation feeders	Timing depend on new load	15

Note: These projects from F2014 to F2022 are in the planning stage. Routing and timing of feeder projects may still change based on future growth, detailed planning/design and approvals.

Major Distribution Projects (F2014-F2022)

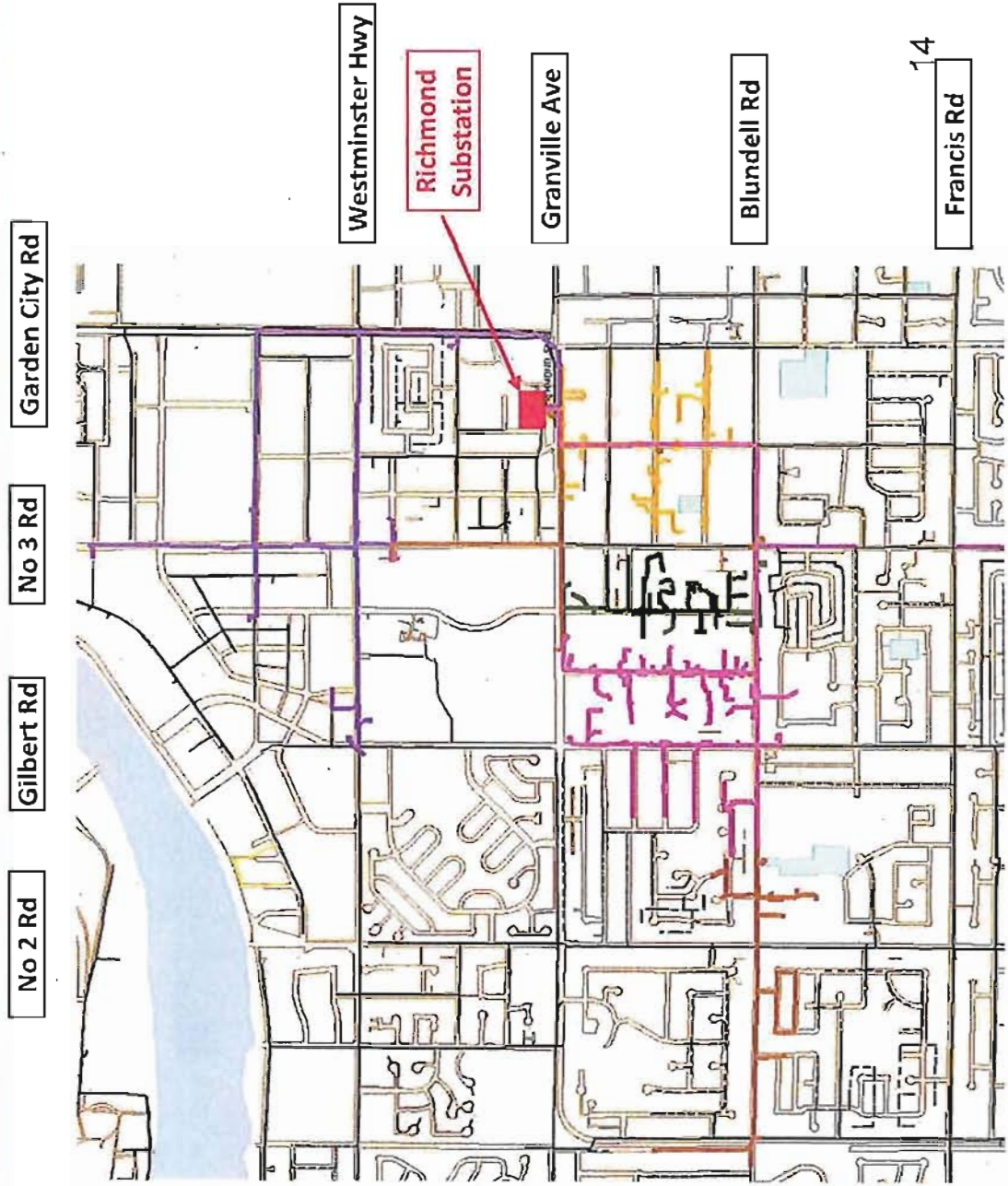
**Underground 16-way duct bank along No 4 Rd
from KI-2 substation to Bridgeport (800m)**



Major Distribution Projects (F2014-F2022)

F2014/15/16

Voltage
Conversion of
Richmond
feeders
12F55, 12F60,
12F63, 12F67,
12F68

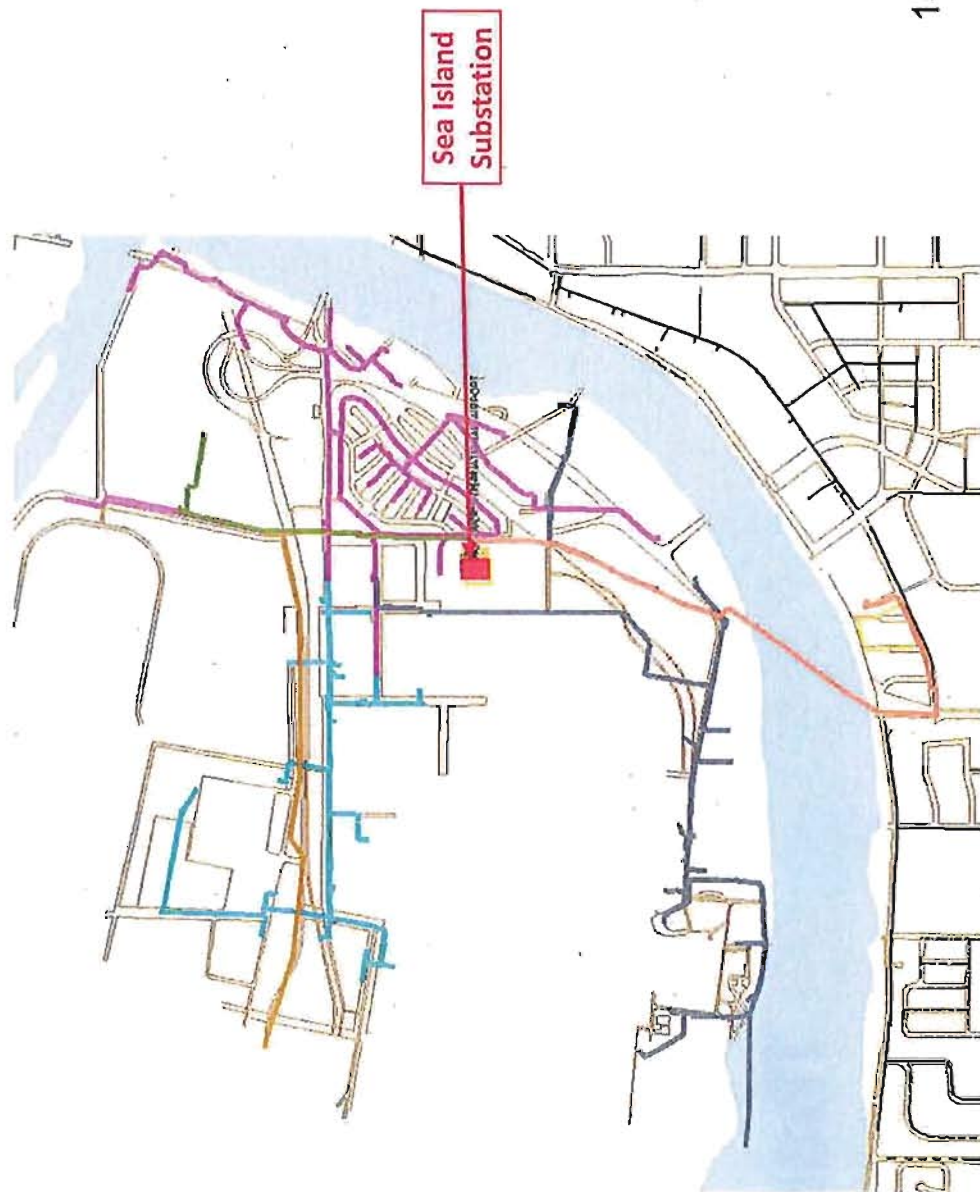


BC hydro 
FOR GENERATIONS

Major Distribution Projects (F2014-F2022)

Voltage
Conversion of
Sea Island
feeders

Timing for
voltage
conversion
will depend
on new load
addition



Thank you!

BChydro 
FOR GENERATIONS