THE MUNICIPALITY OF THE VILLAGE OF LIONS BAY

INFRASTRUCTURE COMMITTEE MEETING
OF THE VILLAGE OF LIONS BAY
HELD ON THURSDAY, SEPTEMBER 24, 2020 at 7:00 PM
COUNCIL CHAMBERS, 400 CENTRE ROAD, LIONS BAY
AND ELECTRONICALLY VIA ZOOM

Please register in advance for this meeting:
https://us02web.zoom.us/meeting/register/tZ0of-GgrTgjEtCThh5E5eBEn3iXWVkXMJfw

Once registered, to access the meeting by Computer, Tablet, or Mobile Device, click the following link: https://us02web.zoom.us/j/89588833984

(When prompted, please download Zoom to your device prior to the meeting if you don't already have the program).

You can also phone in from your landline phone or mobile phone by dialing 1-778-907-2071 and entering the Conference ID: 895 8883 3984

AGENDA

1. Call to Order

2. Appointment of Recorder

3. Approval of the Agenda

4. Public Questions & Comments

5. Approval of Minutes
- A. Infrastructure Committee Meeting – June 18, 2020 (Page 3)

6. Business Arising from the Minutes

7. Unfinished Business
- A. Kelvin Grove WWTP – Verbal Update
- B. 3 PRV Project – Verbal Update
- C. 2020 Road Paving – Verbal Update (Page 5)
- D. Communications Tower – Verbal Discussion
- E. EV Charger (Page 7)

8. New Business

A. Preliminary Oceanview Drainage Improvement
B. Upper Bayview, Bayview Place, Centre Road – Design RFP (Page 71)

9. Public Questions & Comments

10. Next Meeting: TBD

11. Adjournment

LIONS BAY INFRASTRUCTURE COMMITTEE MEETING
THURSDAY, JUNE 18, 2020 AT 7:00 PM
COUNCIL CHAMBERS, 400 CENTER ROAD, LIONS BAY
ONLINE VIDEO MEETING

MINUTES OF THE MEETING

In Attendance:

Committee:	Fred Bain – Councillor and Committee Chair Ron McLaughlin - Regrets Norm Barmeier - Councillor Neville Abbott – Councillor Tony Greville – Resident Karl Buhr – Regrets Brian Ulrich – Resident
Staff:	Naizam Jaffer – Public Works Manager Peter DeJong – CAO (In Chambers)

1. Call to Order

Due to technical difficulties the Meeting was called to order at 7:23 pm.

2. Appointment of Recorder

Fred Bain was appointed Recorder.

3. Approval of the Agenda

The Agenda was adopted with no changes

4. Public Questions & Comments

None

5. Approval of the Minutes

The May 21, 2020 IC meeting minutes were approved with one correction. Item C., fifth bullet should read “will have much more capacity ***than*** the old one…

6. Business Arising from the Minutes

i. Two action items for the Public Works Manager remain outstanding:

- ACTION: Nai to circulate AECOM SCADA Communication report.
- ACTION: Nai to ask Victor Wong, of WSP to come to an IC meeting to discuss communication options.

ii. Nai advised the Vancouver Coastal Health was reviewing the Drinking Water Guideline rule for corrosion and that no timeline was given to him by the Drinking Water Protection Officer.

iii. Nai advised that the PRV project was coming along with no new updates since the last meeting. The goal is to complete the project this year. The tender would go out in July / August with completion by December. Tree work is planned at the Upper Bayview PRV site and this will commence the week of June 28.

7. Unfinished Business

i. Electric Vehicle Charging Station

- Norm advised that the grant application was progressing, and that Pam was assisting with finalizing the balance of the grant application.
- The process is not like a typical grant, rather it is a business case.
- Both Pam and Norm were looking at other possible opportunities including applying for Low Carbon Fuel Credits as a Purveyor of Electricity; however, there are unknown implications with respect to the Municipality becoming a purveyor and more research would be undertaken to ensure we are not putting ourselves at risk.

ii. Kelvin Grove WWTP

- Nai advised that the temporary treatment plant effluent had met the criteria of three successive samples within compliance of our operating permit.
- The next step would be to pump the effluent remaining in the old plant into the temporary plant for treatment before being discharged through the outfall and from there, demolition of the old plant.
- Nai was optimistic that the schedule was on track for completion by the end of September.

iii. UBC Hydrology Study

- Nai advised that he's in contact with Dr. Weijs on a weekly basis and that students continue to perform data gathering. Equipment is stand-alone and plans to implement automated data gathering and transfer to UBC had not yet commenced.

8. New Business

None

9. Public Questions & Comments

None

10. Next Meeting:

September 24, 2020

11. Adjournment

750PM


reconstruct
24,525 ft²
2,279 m²
168 ft²
15.5 m²
Patch
144 ft²
13 m²
Patch
63 ft²
6 m²
Trench Patch
288 ft²
27 m²
Trench Patch
100 ft²
9 m²
Trench Patch
reconstruct
14,560 ft²
1,325 m²
WATER TANK
WATER TANK
WATER TANK
ALBERTA CREEK
HARVEY CREEK
RUNDLE CREEK
UPPER BAYVIEW ROAD
HIGHVIEW PLACE
OCEANVIEW ROAD
OCEANVIEW PLACE
CREEKVIEW
PANORAMA PLACE
PANORAMA ROAD
BAYVIEW ROAD
CENTRE ROAD
CROSSCREEK ROAD
EMERGENCY BUILDING
COMMUNITY COMPLEX
STORE & CAFE
402–420 422–440 CONDOMINIUMS
SOUTHVIEW PLACE
ISLEVIEW PLACE
CLOUDVIEW PLACE
LIONS BAY AVENUE
SEAVIEW PLACE
VILLAGE PARKING LEASE
RIGHT OF WAY
BRITISH COLUMBIA RAILWAY
MARINA
LIONS BAY BEACH PARK
HYDRO SUBSTATION
WORKS YARD
TIDEWATER WAY
PERIWINKLE PL.
SWEETWATER PLACE
KELVIN GROVE WAY
KELVIN GROVE BEACH PARK
HIGHWAY No. 99

200 ft
61 m
Trench Patch

reconstruct
3,725 ft²
345 m²

WATER TANK
MAGNESIA CREEK
B.C. HYDRO RIGHT OF WAY
SUNSET DRIVE
MOUNTAIN DRIVE
TENNIS COURTS
TIMBERTOP DRIVE
BAYVIEW PLACE
BAYVIEW ROAD
BAYVIEW ROAD
STEWART ROAD
LIONS BAY ELEMENTARY SCHOOL
WADE PARK
MAGENSIA SPRINGS ROAD
GOLDENROD AVENUE
GLENDALE AVENUE
CRYSTAL FALLS ROAD
HIGHWAY No. 99
B.C. RAIL RIGHT OF WAY
BRUNSWICK BEACH ROAD
BRITISH COLUMBIA RAILWAY RIGHT OF WAY

THE MUNICIPALITY OF THE VILLAGE OF LIONS BAY

Type	**Information Report**		
Title	**Lions Bay ZEV initiative – fast charger revenue projections**		
Author	**Norman Barmeier**	**Reviewed By:**	
Date	**September 16, 2020**	**Version**	**0**
Issued for	**September 22, 2020**		

Recommendation:

THAT the Information Report, "Lions Bay ZEV initiative – fast charger revenue projections" be received.

Attachments:

(1) Revenue Projection Worksheet
(2) City of Vancouver – Parking Meter By-Law No. 2952
(3) Administrative Report – User Fees for City Owned and Operated Public Electric Vehicle Charging Stations.
(4) May 3, 2019 Village Update

Key Information:

The proposed fast EV charger project promises to provide a continuous and reliable stream of revenue for the Village.
Council approved the investigation of fast EV charging infrastructure in the spring of 2019. A preliminary plan was designed and used to support an EVIFIDI grant application which was submitted in July 2020.
The grants if won may offset as much as 75% (up to a maximum of $75,000) of the capital cost of the fast EV charging station. The grant can also be used to cover an extended service and maintenance plan.
With widely adopted service fees in the lower mainland for fast EV chargers, the Village has the potential to generate annual revenue for the life of the fast EV charger.
The current going rate for fast EV chargers in the lower mainland is $0.27 per minute of use, or $16 per hour.

The City of Vancouver published usage data for their EV infrastructure in 2017 an average usage of 4.5 hours per day, with more popular locations seeing usage over 12 hours per day. EV adoption and usage have and will continue to increase as more drivers switch to electric vehicles. As a result of increased usage, increased fast EV charger meter revenue will be realized over time.

Table below summarizes potential annual net revenue from one metered fast EV charger:

Utilization	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
2hr/day	$8,238	$8,485	$8,740	$9,002	$9,272	$9,551	$9,837	$10,132	$10,436	$10,749	$94,448
4hr/day	$17,626	$18,154	$18,699	$19,260	$19,838	$20,433	$21,046	$21,677	$22,328	$22,997	$202,062
8hr/day	$23,884	$24,600	$25,338	$26,098	$26,881	$27,688	$28,518	$29,374	$30,225	$31,163	$273,804
12hr/day	$33,271	$34,269	$35,297	$36,356	$37,447	$38,570	$39,727	$40,919	$42,147	$43,411	$381,418

While these numbers are projections only, they demonstrate the potential for reliable and increasing revenue over time.

The proposed fast EV charger infrastructure project allows for expansion of up to 4 fast EV chargers at an incremental cost. For each additional charger an additional revenue stream may be realized.

Follow Up Action: Staff to confirm BC Hydro billing model, demand charges, and any potential EV charger incentives or discounts available. CAC to do further research on current demand and use scenarios.

Communication Plan: Once we receive notice from the EVIFIDI grant award, win or lose, I'd like to write a Village Update article summarizing the effort to date.

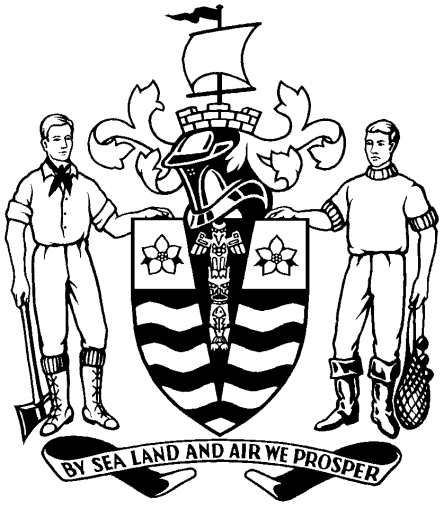
BC hydro rate	0.09	$/KWhr		Demand charge/month	$4.76	35 - 115 kW
Charger fee	16	hour		Demand charge/month	$9.13	115 kW and above
Charger capacity	50	KW/hr				

			Utilization		kw/day	Electrical cost	Demand charge	Transaction fees	Annual meter fees	Annual Net Revenue
Operating time	832.2	hr/year	10%	2 hr/day	35	$ 3,744.90	$ -	$ 1,331.52	$ 13,315.20	$ 8,238.78
	2080.5	hr/year	25%	4 hr/day	87	$ 9,362.25	$ 2,970.95	$ 3,328.80	$ 33,288.00	$ 17,626.00
	2912.7	hr/year	35%	8 hr/day	121	$ 13,107.15	$ 4,951.59	$ 4,660.32	$ 46,603.20	$ 23,884.14
	4161	hr/year	50%	12 hr/day	173	$ 18,724.50	$ 7,922.54	$ 6,657.60	$ 66,576.00	$ 33,271.36

Available time	8322	hr/year
Uptime	95%	
Annual increase in usage	3%	

1	2	3	4	5	6	7	8	9	10	
$ 8,238.78	$ 8,485.94	$ 8,740.52	$ 9,002.74	$ 9,272.82	$ 9,551.00	$ 9,837.53	$ 10,132.66	$ 10,436.64	$ 10,749.74	$ 94,448.37
$ 17,626.00	$ 18,154.78	$ 18,699.42	$ 19,260.40	$ 19,838.21	$ 20,433.36	$ 21,046.36	$ 21,677.75	$ 22,328.08	$ 22,997.93	$ 202,062.29
$ 23,884.14	$ 24,600.66	$ 25,338.68	$ 26,098.84	$ 26,881.81	$ 27,688.26	$ 28,518.91	$ 29,374.48	$ 30,255.71	$ 31,163.39	$ 273,804.88
$ 33,271.36	$ 34,269.50	$ 35,297.58	$ 36,356.51	$ 37,447.20	$ 38,570.62	$ 39,727.74	$ 40,919.57	$ 42,147.16	$ 43,411.57	$ 381,418.81

CITY OF VANCOUVER
BRITISH COLUMBIA



PARKING METER BY-LAW NO. 2952

This By-law is printed under and by authority of the Council of the City of Vancouver

(Consolidated for convenience only to March 10, 2020)

BY-LAW NO. 2952

A By-law to provide for the reservation of certain streets or portions thereof for parking purposes and to charge and collect a fee for their use or occupation

(Consolidated for convenience only, amended to include By-law No. 12651 effective March 10, 2020)

THE COUNCIL OF THE CITY OF VANCOUVER, in open meeting assembled, enacts as follows:

1. This by-law may be cited as the "Parking Meter By-law".

2. **INTERPRETATION**

The following terms whenever used in this by-law or in any resolution of the Council dealing with parking meters, shall have the meanings given to them in this section unless the context otherwise requires:

"Adjacent Curb Lane" means the lane designed for travel or parking of motor vehicles that is nearest to a parking meter or pay station.

"Bicycle Lane Separation" means a curb or an area which is raised, painted, or otherwise marked, separating a portion of street designated by the City Engineer for the exclusive use of bicycle traffic, from the roadway.

"Block" means the portion of street between two intersections, which do not involve a lane.

"Clearance Parking Area" means an area on a street adjacent to the curb located between a crosswalk and the nearest area available for vehicle parking that is not specifically signed for motorcycle and motor assisted cycle parking, and that the City Engineer has marked and signed for motorcycle parking and motor assisted cycle parking or has installed bicycle racks for bicycle parking.

"Direct Current Fast Charging Station" or "DCFC" is a battery charging station with a specified nominal power output of at least 24kW (and if not specified is assumed to be 50kW) that is available for public use for the purpose of transferring electric energy (by conductive or inductive means) to a battery or other energy storage device in an electric vehicle.

"Electric Vehicle" means any vehicle that operates, either partially or exclusively, on electrical energy from an off-board source, that is stored on-board for motive purpose; but, for the purposes of this by-law, does not include vehicles that cannot be licensed by the Insurance Corporation of British Columbia.

“Electric Vehicle Charging Station” means a Direct Current Fast Charging Station or a Level 2 Charging Station.

“Electric Vehicle Parking Space” means any marked parking space that identifies the use to be exclusively for the parking of an electric vehicle. Electric vehicle parking spaces may or may not be situated adjacent to an Electric Vehicle Charging Station.

“Existing Metered Zone" means any street or portion of a street in any area contained within bold black lines in any of the maps attached as Schedule A to this By-law.

“Gas Powered Motorcycle” means a two wheeled self-propelled vehicle that has a gas powered engine.

“Interim Maximum Daytime Charging Station Occupancy” is the ratio of occupied Electric Vehicle Charging Stations during the hours of 9:00am and 6:00pm to the total number of Electric Vehicle Charging Stations on a block, expressed as a percentage that is calculated based on all data collected by the City over a 30 day period.

“Interim Maximum Evening Charging Station Occupancy” is the ratio of occupied Electric Vehicle Charging Stations during the hours of 6:00pm and 10:00pm to the total number of Electric Vehicle Charging Stations on a block, expressed as a percentage that is calculated based on all data collected by the City over a 30 day period.

“Interim Maximum Overnight Charging Station Occupancy” is the ratio of occupied Electric Vehicle Charging Stations during the hours of 10:00pm and 9:00am to the total number of Electric Vehicle Charging Stations on a block, expressed as a percentage that is calculated based on all data collected by the City over a 30 day period.

“Interim Peak Daytime Curbside Occupancy Rate” is the ratio of the number of occupied spaces on a block during the hours of 9:00 am to 6:00 pm to the total number of spaces on a block, expressed as a percentage that is calculated based on all data collected by the City within a 30 day period.

“Interim Peak Evening Curbside Occupancy Rate” is the ratio of the number of occupied spaces on a block during the hours of 6:00 pm to 10:00 pm to the total number of spaces on a block, expressed as a percentage that is calculated based on data collected by the City within a 30 day period.

“Level 2 Charging Station” is a battery charging station with a specified nominal power output of less than 24kW that is available for public use for the purpose of transferring electric energy (by conductive or inductive means) to a battery or other energy storage device in an electric vehicle.

“Maximum Daytime Charging Station Occupancy” is the ratio of occupied Electric Vehicle Charging Stations on a block during the hours of 9:00am and 6:00pm to the total number of Electric Vehicle Charging Stations on a block, expressed as a percentage that is calculated based on all data collected by the City throughout the calendar year.

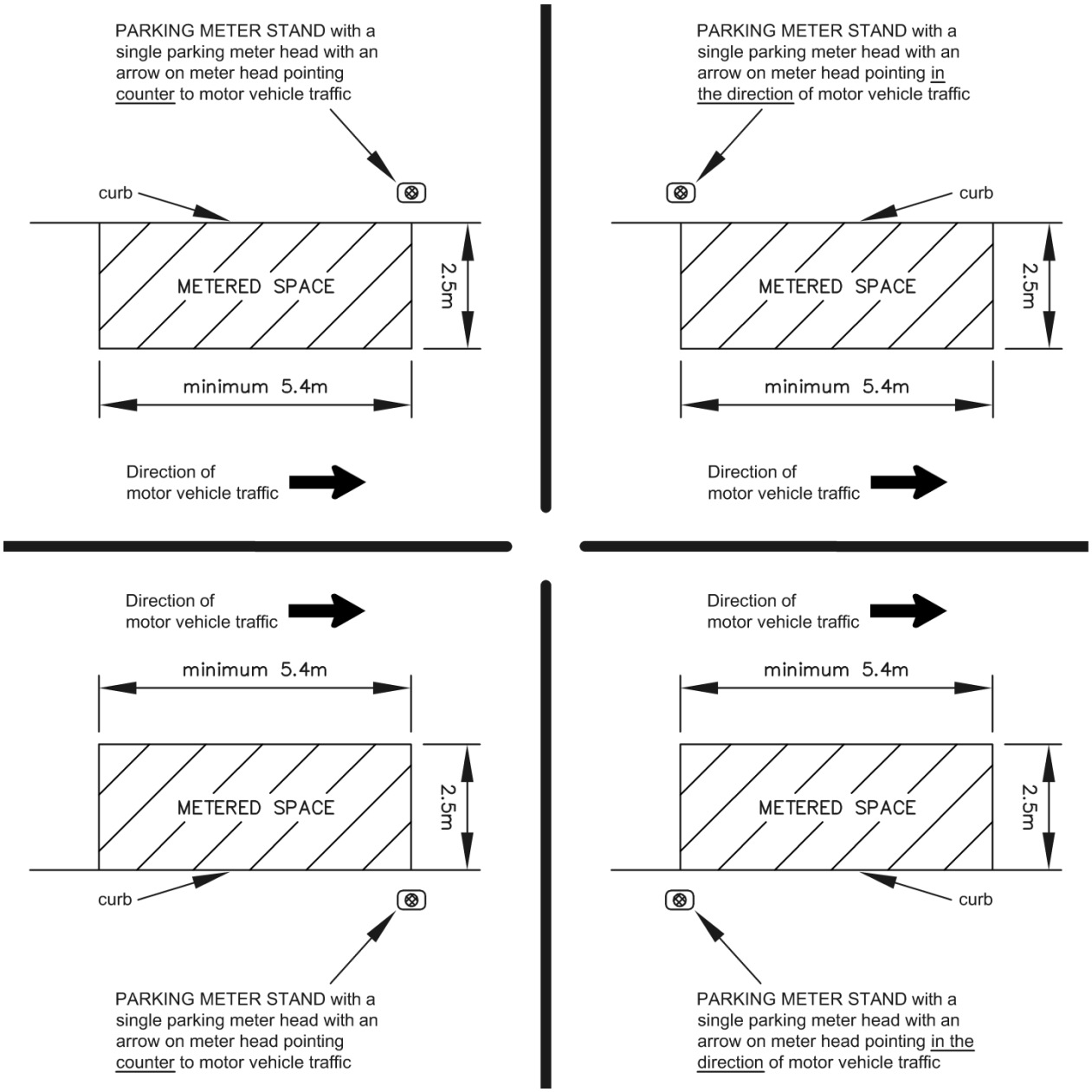
“Maximum Evening Charging Station Occupancy” is the ratio of occupied Electric Vehicle Charging Stations on a block during the hours of 6:00pm and 10:00pm to the total number of Electric Vehicle Charging Stations on a block, expressed as a percentage that is calculated based on all data collected by the City throughout the calendar year.

““Maximum Overnight Charging Station Occupancy” is the ratio of occupied Electric Vehicle Charging Stations on a block during the hours of 10:00pm and 9:00am to the total number of Electric Vehicle Charging Stations on a block, expressed as a percentage that is calculated based on all data collected by the City throughout the calendar year.

“Metered Block” means any city block containing one or more metered spaces.

"Metered Space" means:

(1) in the case of a parking meter stand with a single parking meter head, that rectangular portion of the adjacent curb lane measuring not less than 5.4 metres from the centre of the base of the parking meter stand in the direction indicated by the arrow on the parking meter head and measuring not more than 2.5 metres from the curb in the direction of the roadway, as illustrated in the following diagrams:


PARKING METER STAND with a single parking meter head with an arrow on meter head pointing counter to motor vehicle traffic
curb
METERED SPACE
2.5m
minimum 5.4m
Direction of motor vehicle traffic
PARKING METER STAND with a single parking meter head with an arrow on meter head pointing in the direction of motor vehicle traffic
curb
METERED SPACE
2.5m
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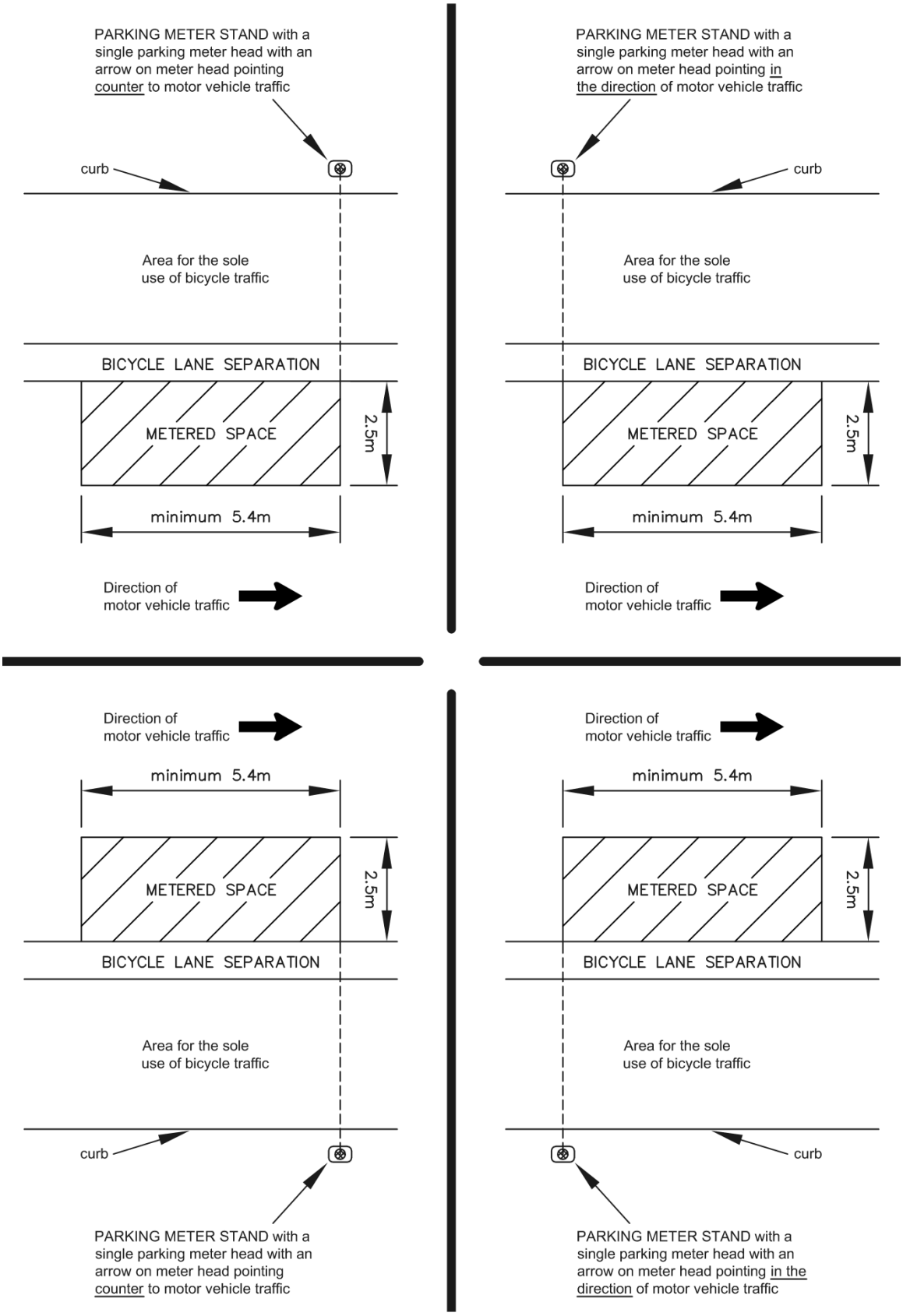
Direction of motor vehicle traffic
minimum 5.4m
METERED SPACE
2.5m
curb
PARKING METER STAND with a single parking meter head with an arrow on meter head pointing in the direction of motor vehicle traffic

except that:

(a) in the case of a parking space signed for motorcycles only, the measurement of 5.4 metres changes to 2.7 metres; and

(b) in the case of a parking meter stand separated from the adjacent curb lane by a portion of street designated by the City Engineer for the exclusive use of bicycle traffic, the measurement of 2.5 metres must be from the adjacent curb lane edge of the bicycle lane separation, as illustrated in the following diagrams:


PARKING METER STAND with a single parking meter head with an arrow on meter head pointing counter to motor vehicle traffic
curb
Area for the sole use of bicycle traffic
BICYCLE LANE SEPARATION
METERED SPACE
2.5m
minimum 5.4m
Direction of motor vehicle traffic
PARKING METER STAND with a single parking meter head with an arrow on meter head pointing in the direction of motor vehicle traffic
curb
Area for the sole use of bicycle traffic
BICYCLE LANE SEPARATION
METERED SPACE
2.5m
minimum 5.4m
Direction of motor vehicle traffic
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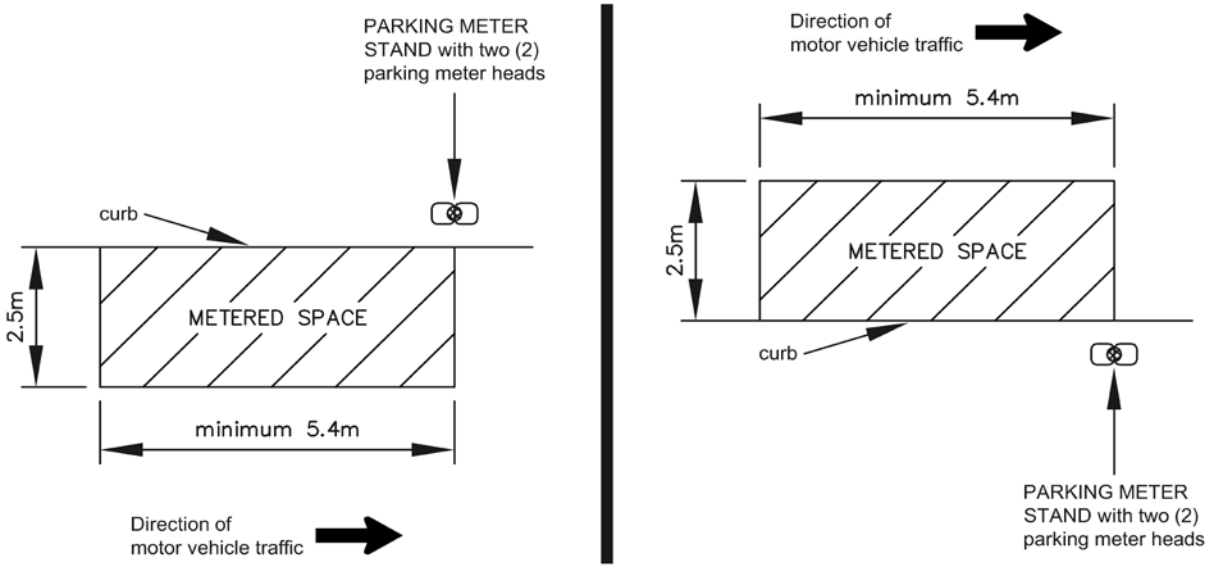
2.5m
BICYCLE LANE SEPARATION
Area for the sole use of bicycle traffic
curb
PARKING METER STAND with a single parking meter head with an arrow on meter head pointing counter to motor vehicle traffic
Direction of motor vehicle traffic
minimum 5.4m
METERED SPACE
2.5m
BICYCLE LANE SEPARATION
Area for the sole use of bicycle traffic
curb
PARKING METER STAND with a single parking meter head with an arrow on meter head pointing in the direction of motor vehicle traffic

(2) in the case of a parking meter stand equipped with two (2) parking meter heads, for the parking meter head first in sequence in the direction of the curb lane traffic, that rectangular portion of the adjacent curb lane measuring not less than 5.4 metres from the centre of the base of the parking meter stand in the direction counter to the direction of the curb lane traffic and measuring not more than 2.5 metres from the curb in the direction of the roadway, as illustrated in the following diagrams:



except that:

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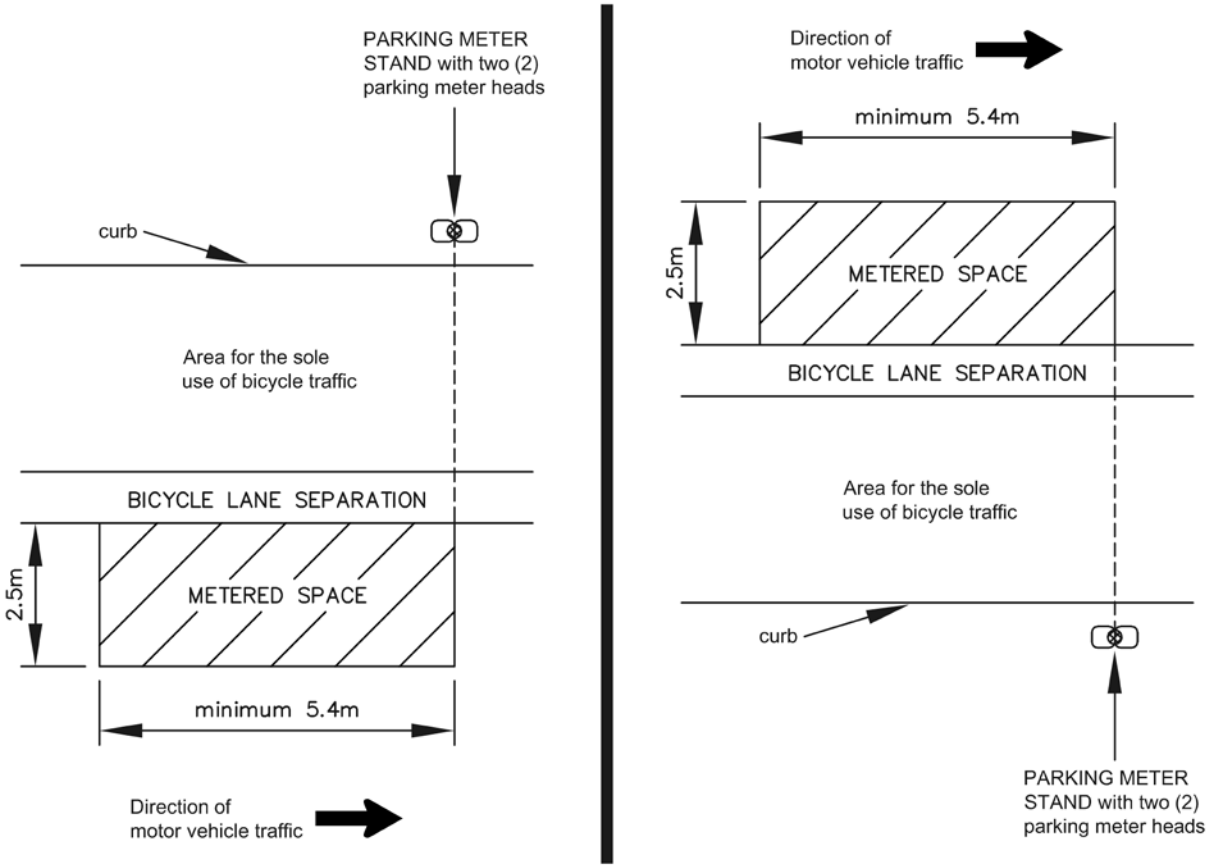
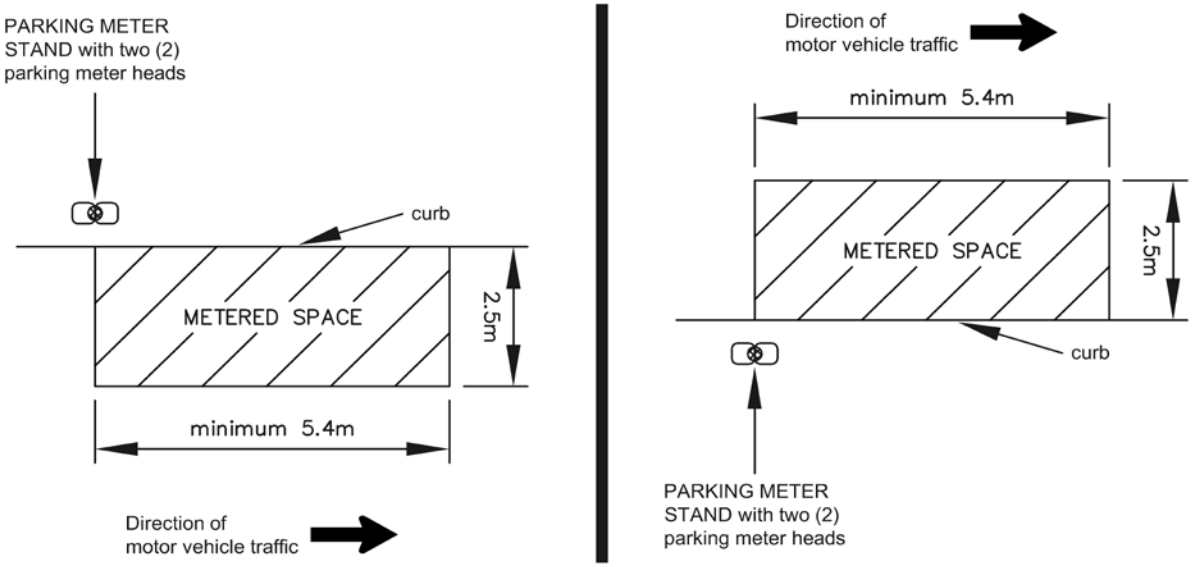
(b) in the case of a parking meter stand separated from the adjacent curb lane by a portion of street designated by the City Engineer for the exclusive use of bicycle traffic, the measurement of 2.5 metres must be from the adjacent curb lane edge of the bicycle lane separation, as illustrated in the following diagrams:



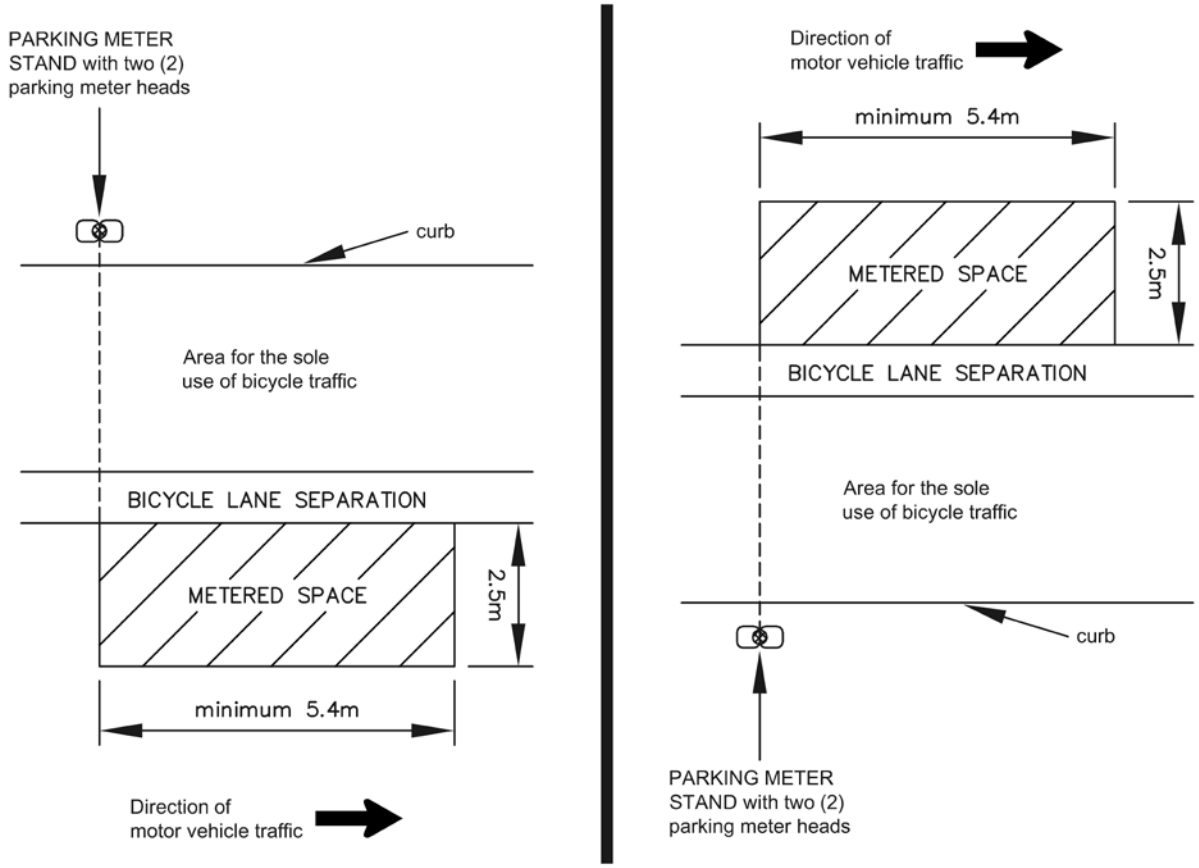
(3) in the case of a parking meter stand equipped with two (2) parking meter heads, for the parking meter head second in sequence in the direction of the curb lane traffic, that rectangular portion of the adjacent curb lane measuring not less than 5.4 metres from the centre of the base of the parking meter stand in the direction of the curb lane traffic and measuring not more than 2.5 metres from the curb in the direction of the roadway, as illustrated in the following diagrams:



except that:

(a in the case of a parking space signed for motorcycles only, the measurement of 5.4 metres changes to 2.7 metres; and

(b) in the case of a parking meter stand separated from the adjacent curb lane by a portion of street designated by the City Engineer for the exclusive use of bicycle traffic, the measurement of 2.5 metres must be from the adjacent curb lane edge of the bicycle lane separation, as illustrated in the following diagrams:



(4) in the case of a parking meter stand installed adjacent to a curb lane which is marked with parallel angular lines or other markings, that portion of the adjacent curb lane designated for the accommodation of vehicles by said lines or markings and being nearest the applicable meter head;

(5) in the case of a pay station, notwithstanding any street markings delineating the boundaries of a rectangle, any lawful parking space on a street between the curb adjacent to the roadway and an imaginary line on the roadway parallel to and 2.5 metres from the curb, where the street

sign that regulates parking in such space indicates that the parking fee may be paid at a pay station, except that:

a. in the case where the signage is separated from the adjacent curb lane by a portion of street designated by the City Engineer for the exclusive use of bicycle traffic, the measurement of 2.5 metres must be from the adjacent curb lane edge of the bicycle lane separation; and

b. in the case where the signage is installed adjacent to a curb lane which is marked with parallel angular lines, the metered space means that portion of the adjacent curb lane designated for the accommodation of vehicles by such markings;

(6) where a parking meter stand is installed in a clearance parking area, that portion of the adjacent curb lane located within the clearance parking area markings installed by the City Engineer.

(7) in the case of a location where there is signage installed that indicates that pay parking is in effect only through the pay by phone system, notwithstanding any street markings delineating the boundaries of a rectangle, any lawful parking space on a street between the curb adjacent to the roadway and an imaginary line on the roadway parallel to and 2.5 metres from the curb, except that:

a. in the case where the signage is separated from the adjacent curb lane by a portion of street designated by the City Engineer for the exclusive use of bicycle traffic, the measurement of 2.5 metres must be from the adjacent curb lane edge of the bicycle lane separation; and

b. in the case where the signage is installed adjacent to a curb lane which is marked with parallel angular lines, the metered space means that portion of the adjacent curb lane designated for the accommodation of vehicles by such markings;

(8) in the case of an Electric Vehicle Charging Station any lawful parking space on a street between the curb adjacent to the roadway and an imaginary line on the roadway parallel to and 2.5 meters from the curb in an area marked as an Electric Vehicle Parking Space.

“Motor Assisted Vehicle” means a vehicle that combines the pedal power of a bicycle with the power assistance of an electric motor.

“Motorcycle” means a gas powered motorcycle or zero emission motorcycle.

“New Metered Zone” means any street or portion of a street that is not in an Existing Metered Zone.

“One-way Shared Vehicle Organization” means a shared vehicle organization that allows its members to begin and end their rental periods at any lawful and authorized space within the operating area of the shared vehicle organization.

"Operator" includes every person who drives or operates a vehicle as the owner thereof, or as the agent, employee or permittee of the owner.

"Park" includes causing, permitting or allowing a vehicle, whether occupied or not, to stand on a street. “Parked” and “Parking” shall have a corresponding meaning.

"Parking Debit Card" means a plastic card which has been authorized for use in parking meters by the City Engineer and which contains a computer chip which enables a monetary value to be added to and subtracted from the card.

"Parking Meter" means a parking meter stand and the single or double parking meter head that it supports or an Electric Vehicle Charging Station.

"Parking Meter Head" means a mechanical or electronic appliance designed for the purpose of gauging and indicating a time within which a vehicle is, or may be, parked in a metered space or a sign mounted as a facsimile for such mechanical or electronic device that displays information regarding the pay by phone system.

"Parking Meter Rate" means the rate calculated in accordance with section 5A of this By-law.

"Parking Meter Stand" means that pole or stand supporting a single or double parking meter head.

"Passenger Directed Vehicle" means taxis, limousines, and vehicles operated under a license held by a transportation network service provider under the Passenger Transportation Act.

“Pay by Licence Plate”, or grammatical variations of that term, means a system established by or on behalf of the city under which the operator of a vehicle may pay the fee for parking the vehicle in a metered space remotely at a pay station in accordance with the requirements of that system as indicated on or at the pay station.

“Pay by Phone”, or grammatical variations of that term, means a system established by or on behalf of the city under which a person may:

(i) set up a cash or credit card account with the city, and

(ii) pay the fee for parking a vehicle in a metered space remotely by telephone in accordance with the requirements of that system.

“Pay Station” means an electronic appliance designed for the purpose of gauging and indicating a time within which the operator of a vehicle may park the vehicle in a metered space.

"Peak Daytime Curbside Occupancy Rate" is the ratio of the number of occupied spaces on a block during the hours of 9:00 am to 6:00 pm to the total number of spaces on a block, expressed as a percentage that is calculated based on all data collected by the City throughout the calendar year.

"Peak Evening Curbside Occupancy Rate" is the ratio of the number of occupied spaces on a block during the hours of 6:00 pm to 10:00 pm to the total number of spaces on a block, expressed as a percentage that is calculated based on all data collected by the City throughout the calendar year.

"Person" includes an owner, registered owner, lessee or operator of a vehicle.

"RFID EV network card" is a card provided by a data network operator of Electric Vehicle Charging Stations on a block that activates an Electric Vehicle Charging station through radio frequency identification technology for the purposes of providing electricity to an electric vehicle and collecting payments.

"Shared Vehicle" means a four-wheeled automobile, van, or pick-up truck owned and operated by a shared vehicle organization.

"Shared Vehicle Organization" means a legal entity whose principal business objective is to provide its members, for a fee, with a car-sharing service by which such members have access to a fleet of shared vehicles which they may reserve for use on an hourly basis, and which the City Engineer has approved.

"Vehicle" includes any means of conveyance in, upon or by which any person or property is or may be transported or drawn upon a highway irrespective of the motive power, but shall not include any conveyance which is operated on rails or tracks.

"Zero Emission Motorcycle" means a two wheeled self-propelled vehicle that is electrically powered but does not include a cycle that combines the pedal power of a bicycle with the power assistance of an electric motor.

"Zero Emission Vehicles" means vehicles approved by the City Engineer as zero emission vehicles.

3. **PLACING PARKING METERS AND PAY STATIONS:**

(1) The City Engineer may:

(a) establish and mark out metered spaces;

(b) install a parking meter at each metered space by firmly fastening the parking meters to the curb, sidewalk, or concrete pad adjoining, or close to the metered space;

(c) install a pay station by firmly fastening the pay station to the curb, sidewalk, or concrete pad adjoining the roadway of the street; and

(d) install signage that indicates that the metered spaces must be paid using the pay by phone system.

(2) Each parking meter is to:

(a) indicate the parking rate required and time allowed for parking in the corresponding metered space; and

(b) display information that indicates how an operator may pay by phone or, in the case of a parking meter that is an Electric Vehicle Charging Station, display information that indicates how an operator may pay.

(3) Each pay station is to indicate the parking rate required and time allowed for parking in the metered space to which the pay station applies.

3A. **PAY BY PHONE**

A person who chooses to pay by phone must comply with the city's requirements regarding the pay by phone system.

3B. **PAY BY LICENCE PLATE**

A person who pays by licence plate must comply with the city's requirements regarding the pay by licence plate system.

4. **METHOD OF PARKING:**

(1) A person must park a vehicle entirely within a metered space.

(2) In metered spaces parallel to the closest curb or sidewalk, a person must park a vehicle parallel to the curb or sidewalk, except motorcycles or motor assisted vehicles can park at an angle.

(3) In metered spaces that are not parallel to the closest curb or sidewalk, a person must park a vehicle in the same direction as the general direction of traffic.

5. **PARKING TIME AND FEE:**

(1) A person who parks a vehicle in a metered space must immediately:

(a) deposit in the mechanical parking meter installed at the metered space one or more coins of Canada of a denomination indicated on the parking meter head and fully turn the handle on the meter head;

(b) in the case of an electronic parking meter, deposit in the parking meter installed at the metered space one or more coins of Canada of a denomination indicated on the parking meter head;

(c) in the case of an electronic parking meter designed to accept a parking debit card, insert a parking debit card in the parking meter installed at the space;

(d) pay using the pay by phone system by calling the telephone number provided at the meter space or using an internet-connected software application to enter the person's account, metered space location, licence plate, and amount of parking time required;

(e) pay by licence plate by:

(i) entering, at the pay station, the licence plate number of the person's vehicle, and the amount of parking time required, and

(ii) pay the fee indicated by the pay station by a method of payment prescribed at the pay station; or

(f) in the case of an electronic parking meter designed to accept a credit card, insert a credit card in the parking meter installed at the metered space;

(g) in the case of an Electric Vehicle Charging Station designed to accept payments via a network subscription, tap the appropriate RFID EV network card on the appropriate part of the Electric Vehicle Charging Station and connect the electric vehicle to the Electric Vehicle Charging Station via conductive or inductive means to initiate a charging session;

(h) in the case of an Electric Vehicle Charging Station designed to accept payments via a smartphone application, use the smartphone application appropriate to the Electric Vehicle Charging Station and connect the electric vehicle to the Electric Vehicle Charging Station via conductive or inductive means to initiate a charging session;

(i) in the case of an Electric Vehicle Charging Station designed to accept payments via an RFID-enabled credit card, tap the credit card on the appropriate part of the Electric Vehicle Charging Station and connect the electric vehicle to the Electric Vehicle Charging Station via conductive or inductive means to initiate a charging session; or

(j) in the case of an Electric Vehicle Charging Station designed to accept credit card payments by phone, call the phone number printed on the Electric Vehicle Charging Station and provide the appropriate details to initiate a session, and connect the electric vehicle to the

Electric Vehicle Charging Station via conductive or inductive means to initiate a charging session.

(2) When, after the action taken in subsection (1):

(a) the window in a parking meter head;

(b) the time recorded by the city under the pay by phone option;

(c) the time recorded by the pay station; or

(d) the time recorded on the Electric Vehicle Charging Station;

shows a time period that is greater than 0, the meter space may be lawfully occupied by a vehicle during the period of time shown, subject to all other restrictions, limitations or conditions of this by-law, including but not limited to subsection (3), and of the Street and Traffic By-law.

(3) A person who parks a vehicle in a metered space must comply with the following time limits and parking meter rates:

(a) despite subsection (2), a person must not leave a vehicle continuously in a metered space for longer than the indicated time limit for that metered space that is indicated;

(b) unless another rate is indicated on the meter head or at the pay station, a person who parks a vehicle other than a motorcycle in a metered space must pay the parking meter rate, except that in an area where an event rate is also listed in Schedule A, the City Engineer may determine the events and hours during which that event rate applies; and

(c) a person who parks a motorcycle in a metered space must pay the parking meter rate, except that the rate:

(i) for gas powered motorcycles, under the pay by phone system, is 50% of the parking meter rate for the block,

(ii) for zero emission motorcycles, under the pay by phone system, in all metered spaces except metered clearance spaces, is 25% of the parking meter rate for the block, and

(iii) for zero emission motorcycles and motor assisted cycles in metered clearance parking areas, is 0% of the parking meter rate for the block.

(4) A person must not park a vehicle in a metered space if:

(a) the parking meter head placed at such metered space:

(i) displays a “FAIL” text in a window; or

(ii) displays four flashing zeros in a window; or

(iii) displays an "OUT OF ORDER" text in a window;

(b) the time recorded by the operator under the pay by phone or pay by licence plate option has expired; or

(c) parking of a vehicle therein is otherwise restricted or prohibited.

(5) A person may:

(a) use the unexpired time remaining on the meter from its previous use;

(b) not use the unexpired time remaining at a parking space under a pay by phone or pay by licence plate use at another parking space.

5A. **METER RATES:**

(1) The initial metered rates for all parking spaces in an existing metered zone shall, prior to adjustment in accordance with this section 5A, be the rate shown for that zone in Schedule A, increased in all cases to the nearest dollar.

(2) Every new meter installed in a new metered zone pursuant to this By-law shall, when first installed, be subject to same rate at the time of installment as the present rate imposed under this By-law for the closest metered spaces already operating when installment began, unless the closest metered spaces are more than 2 full city blocks away from the new meters, in which case the new meters shall have a rate at the time of installment of $1.00 per hour.

(3) Every new meter installed in an existing metered zone pursuant to this By-law shall, when first installed, be subject to the same rate at the time of installment as the present rate imposed under this By-law for the closest metered spaces in that zone already operating when installment began.

(4) If the Peak Daytime Curbside Occupancy Rate on a metered block exceeds 85% in a calendar year, then the fee between 9 AM and 6 PM for the subsequent calendar year shall be increased by $1.00 per hour no later than March 1 of that year.

(5) If the Peak Daytime Curbside Occupancy Rate in a metered block is less than 60% in a calendar year, then the fee between 9 AM and 6 PM for the subsequent calendar year shall be decreased by $1.00 per hour no later than March 1 of that year, but no meter shall be subject to a fee less than $1.00 per hour.

(6) If the Peak Evening Curbside Occupancy Rate in a metered block exceeds 85% in a calendar year, then the fee between 6 PM and 10 PM for the subsequent calendar year shall be increased by $1.00 per hour no later than March 1 of that year.

(7) If the Peak Evening Curbside Occupancy Rate in a metered block is less than 60% in a calendar year, then the fee between 9 PM and 10 PM for the subsequent calendar year shall be decreased by $1.00 per hour no later than March 1 of that year, but no meter shall be subject to a fee less than $1.00 per hour.

(8) If there are fewer than five metered spaces on a block in a metered zone, the rate shall match the highest rate imposed under this By-law on any adjacent block in that zone.

(9) If a block in a Business Improvement Association contains more than five metered spaces and the parking meter rate has been increased in accordance with this by-law in the previous six months, that Business Improvement Association may request the City Engineer to calculate an Interim Peak Daytime Curbside Occupancy Rate once per a calendar year.

(10) If a block in a Business Improvement Association contains more than five metered spaces and the parking meter rate has been increased in accordance with this by-law in the previous six months, that Business Improvement Association may request the City Engineer to calculate an Interim Peak Evening Curbside Occupancy Rate once per calendar year.

(11) If the Interim Peak Daytime Curbside Occupancy Rate on a metered block is less than 60% then the rate between 9 AM and 6 PM shall revert to the previous calendar year’s rate.

(12) If the Interim Peak Evening Curbside Occupancy Rate on a metered block is less than 60% then the rate between 6 PM and 10 PM shall revert to the previous calendar year’s rate.

(13) The initial metered rates for all Level 2 Charging Stations in an existing meter zone shall, prior to adjustment in accordance with this section 5A, be the metered rate for that block plus an additional $2.00 per hour.

(14) The initial metered rates for all Level 2 Charging Stations not in an existing meter zone shall, prior to adjustment in accordance with this section 5A, be $2.00 per hour.

(15) The initial metered rates for all Direct Current Fast Charging Stations with a nominal power output of 50kW in an existing meter zone shall, prior to adjustment in accordance with this Section 5A, be the metered rate for that block plus an additional $16.00 per hour.

(16) The initial metered rates for all Direct Current Fast Charging Stations with a nominal power output of 50kW not in an existing meter zone shall, prior to adjustment in accordance with this Section 5A, be $16.00 per hour.

(17) The initial metered rates for Direct Current Fast Charging Stations with nominal power outputs greater or less than 50kW in an existing meter zone shall, prior to adjustment in accordance with this Section 5A, be the metered rate for that block plus an amount calculated proportionally to the hourly rate of the nearest existing Direct Current Fast Charging Station as follows:

$R_{Near} \times (P_{New}/P_{Near}) = R_{New}$

Where

R_{Near} = Hourly Meter Rate of Nearest DCFC ($)

P_{New}= Power Output of New DCFC (kW)

P_{Near} = Power Output of Nearest DCFC (kW)

R_{New} = Hourly Meter Rate of New DCFC ($)

R_{New} = Hourly Meter Rate of New DCFC ($)

(18) The initial metered rates for Direct Current Fast Charging Stations with nominal power outputs greater or less than 50kW not in an existing meter zone shall, prior to adjustment in accordance with this Section 5A, be an amount calculated in accordance with the formula set out in subsection 5A(17) above without the metered rate.

(19) If the Maximum Daytime Charging Station Occupancy on a block exceeds 75% in a calendar year, then the metered rate for Electric Vehicle Charging Stations on that block between 9am and 6pm for the subsequent calendar year shall be increased by $1.00 per hour no later than March 1 of that year.

(20) If the Maximum Daytime Charging Station Occupancy on a block is less than 40% in a calendar year, and that block is an existing meter zone, then the metered rate for Electric Vehicle Charging Stations on that block between 9am and 6pm for the subsequent calendar year shall be decreased by $1.00 per hour by no later than March 1 of that year provided that the rate shall not be less than the metered rate for that block.

(21) If the Maximum Daytime Charging Station Occupancy on a block is less than 40% in a calendar year, and that block is not an existing meter zone, then the metered rate for Electric Vehicle Charging Stations on that block between 9am and 6pm for the subsequent calendar year shall be decreased by $1.00 per hour by no later than March 1 of that year provided that the rate shall not be less than $1.00 per hour.

(22) If the Maximum Evening Charging Station Occupancy on a block exceeds 75% in a calendar year, then the metered rate for Electric Vehicle Charging Stations on that block between 6pm and 10pm for the subsequent calendar year shall be increased by $1.00 per hour no later than March 1 of that year.

(23) If the Maximum Evening Charging Station Occupancy on a block is less than 40% in a calendar year, and that block is an existing meter zone, then the metered rate for Electric Vehicle Charging Stations on that block between 6pm and 10pm for the subsequent calendar year shall be decreased by $1.00 per hour no later than March 1 of that year provided that the rate shall not be less than the metered rate for that block.

(24) If the Maximum Evening Charging Station Occupancy on a block is less than 40% in a calendar year, and that block is not an existing meter zone, then the metered rate for Electric Vehicle Charging Stations on that block between 6pm and 10pm for the subsequent calendar year shall be decreased by $1.00 per hour no later than March 1 of that year provided that the rate shall not be less than $1.00 per hour.

(25) If the Maximum Overnight Charging Station Occupancy on a block exceeds 75% in a calendar year, then the metered rate for Electric Vehicle Charging Stations on that block between 10pm and 9am for the subsequent calendar year shall be increased by $1.00 per hour no later than March 1 of that year.

(26) If the Maximum Overnight Charging Station Occupancy on a block is less than 40% in a calendar year, and that block is an existing meter zone, then the metered rate for Electric Vehicle Charging Stations on that block between 10pm and 9am for the subsequent calendar year shall be decreased by $1.00 per hour no later than March 1 of that year provided that the rate shall not be less than the metered rate for that block.

(27) If the Maximum Overnight Charging Station Occupancy on a block is less than 40% in a calendar year, and that block is not an existing meter zone, then the metered rate for Electric Vehicle Charging Stations on that block between 10pm and 9am for the subsequent calendar year shall be decreased by $1.00 per hour no later than March 1 of that year provided that the rate shall not be less than $1.00 per hour.

(28) If the Interim Maximum Daytime Charging Station Occupancy is more than 75%, then the metered rate for Electric Vehicle Charging Stations on that block between 9am and 6pm shall be increased by $1.00 per hour.

(29) If the Interim Maximum Daytime Charging Station Occupancy is less than 40%, and that block is an existing meter zone, then the metered rate for Electric Vehicle Charging Stations on that block between 9am and 6pm shall be decreased by $1.00 per hour provided that the rate shall not be less than the metered rate for that block.

(30) If the Interim Maximum Daytime Charging Station Occupancy is less than 40%, and that block is not an existing meter zone, then the metered rate for Electric Vehicle Charging Stations on that block between 9am and 6pm shall be decreased by $1.00 per hour provided that the rate shall not be less than $1.00 per hour.

(31) If the Interim Maximum Evening Charging Station Occupancy is greater than 75% then the metered rate for Electric Vehicle Charging Stations on that block between 6pm and 10pm shall be increased by $1.00 per hour.

(32) If the Interim Maximum Evening Charging Station Occupancy is less than 40%, and that block is an existing meter zone, then the metered rate for Electric Vehicle Charging Stations on that block between 6pm and 10pm shall be decreased by $1.00 per hour provided that the rate shall not be less than the metered rate for that block.

(33) If the Interim Maximum Evening Charging Station Occupancy is less than 40%, and that block is not an existing meter zone, then the metered rate for Electric Vehicle Charging Stations on that block between 6pm and 10pm shall be decreased by $1.00 per hour provided that the rate shall not be less than $1.00 per hour.

(34) If the Interim Maximum Overnight Charging Station Occupancy is greater than 75% then the metered rate for Electric Vehicle Charging Stations on that block between 10pm and 9am shall be increased by $1.00 per hour.

(35) If the Interim Maximum Overnight Charging Station Occupancy is less than 40%, and that block is an existing meter zone, then the metered rate for Electric Vehicle Charging Stations on that block between 10pm and 9am shall be decreased by $1.00 per hour provided that the rate shall not be less than the metered rate for that block.

(36) If the Interim Maximum Overnight Charging Station Occupancy is less than 40%, and that block is not an existing meter zone, then the metered rate for Electric Vehicle Charging Stations on that block between 10pm and 9am shall be decreased by $1.00 per hour provided that the rate shall not be less than $1.00 per hour.

6. **EXEMPTIONS:**

(1) The following vehicles are exempt from the provisions of Section 5 of this by-law:

(a) Vehicles identified by sign or insignia as belonging to the City of Vancouver.

(b) Emergency vehicles, as defined by the "Street and Traffic By-law".

(c) Such other classes of vehicles as the Council may by resolution exempt (subject to such limitations as the Council may prescribe). But such exemption shall only apply when such vehicles have attached thereto in a place satisfactory to the City Engineer an identification card, sticker or certificate providing for such exemption.

(d) Shared vehicles belonging to a one-way shared vehicle organization that are parked in a metered space by a member at the end of each of their rental periods, provided that the one-way shared vehicle organization has an agreement with the City Engineer to pay:

(i) 65% of the metered parking charges for parking time that is less than the parking time limit, and

(ii) 100% of the metered parking charges for parking time that exceeds the parking time limit.

The shared vehicle may remain parked in the metered space, without time limit, as long as it is not in contravention of any other stopping or parking regulations.

(2) It shall be unlawful for any person to display on any vehicle any card, sticker or certificate purporting to provide for any exemption from the provisions of this by-law unless such card, sticker or certificate has been duly authorized by the City Engineer.

(3) Every metered space may be used without charge on any day of the week between 10:00 p.m. and 9:00 a.m., subject, however, to the parking time limits or prohibitions set out in the Street and Traffic By-law and subject to the metered rates set out in Section 5A that are applicable to Electric Vehicle Charging Stations.

(4) The owners or operators of commercial vehicles displaying a valid permit obtained under section 21.6 or 21.6A of the Street and Traffic By-law may use a metered space without charge on any day up to 10:30 a.m. except a metered space that is adjacent to an Electric Vehicle Charging Station.

(5) The operators of passenger directed vehicles may use a metered space without charge, but only when taking on or discharging passengers and, in any event for a period not exceeding two (2) minutes.

(6) Members of shared vehicle organizations may use a metered space for up to 2 hours without charge to park the shared vehicle during the member's rental period.

7. **TEMPORARY DISCONTINUANCE OF METERED SPACE:**

In case the City Engineer is of the opinion that any metered space or spaces should be temporarily discontinued as a parking space, the City Engineer may place or erect, or cause to be placed or erected, one or more signs prohibiting parking or stopping at such metered space, and it shall be unlawful for any person to park or stop a vehicle at such metered space or spaces while such sign is so placed or erected.

8. Repealed.

9. **SUBSTITUTES PROHIBITED:**

No person shall deposit, or cause to be deposited in any parking meter or pay station, a slug or similar device or a plastic or metallic substitute for the coins or debit cards prescribed by this by-law.

10. **UNLAWFUL PARKING:**

It shall be unlawful for any person to cause, allow, permit or suffer any vehicle to be parked in any metered space except as permitted by the provisions of this by-law.

11. **RESPONSIBILITY OF OWNER:**

The owner or lessee of a vehicle shall incur the penalties provided for any violation of this by-law with respect to the vehicle unless at the time of such violation the vehicle was in the possession of some person other than the owner or lessee without the consent of the owner or lessee; but nothing in this section shall relieve an operator of a vehicle who is not the owner or lessee from incurring the penalties provided for any violation.

12. **COLLECTION OF PARKING FEES:**

(1) The General Manager of Engineering Services and City Comptroller shall:

(a) designate and appoint such persons as are required to make regular collections of the money deposited in parking meters or at pay stations;

(b) make such rules and regulations as deemed necessary for the:

(i) proper and safe collection and accounting of such fees,

(ii) proper accounting of fees paid by phone, and

(iii) proper accounting of fees paid by credit cards, debit cards, or other means.

(2) All fees collected from parking meters or pay stations, and fees derived from other methods of payment, shall be the property of the City and shall be disbursed and used only for the following purposes, or any of them:

(a) There shall be paid first the costs of inspection, supervision, operation, maintenance, depreciation and replacement of parking meters and pay stations and other costs and expenses incidental thereto, including the cost of collection of the fees deposited in the parking meters or pay stations, and the cost of applying and operating the said by-law.

(b) After payment of the amounts described in paragraph (a) hereof an amount shall be set aside for traffic control purposes in a fund to be

known as the "Reserve for Traffic Control". Such amount shall be designated from time to time by a resolution of the Council as a percentage of the net revenue (being the gross revenue less the amounts paid in accordance with paragraph (a) hereof).

(c) After payment of the amounts described in paragraphs (a) and (b) hereof the cost of extensions and additions to the parking meter system, pay by phone system, or pay by licence plate system shall be paid.

(d) After payment of the amounts described in paragraphs (a), (b) and (c) hereof such an amount as may be determined by resolution of Council from time to time may be transferred to the General Revenue of the City.

(e) After payments of the amounts described in paragraphs (a), (b), (c) and (d) hereof the balance remaining shall be transferred to a fund, to be known as the "Reserve for Parking Sites", and to be used for the provision of off-street parking facilities.

13. **VIOLATION OF BY-LAW:**

Every person who violates any of the provisions of this by-law or who suffers or permits any act or thing to be done in contravention or in violation of any of the provisions of this by-law, or who neglects to do or refrains from doing anything required to be done by any of the provisions of this by-law, or who does any act which violates any of the provisions of this by-law shall be deemed to be guilty of an infraction thereof and liable to the penalty hereinafter provided.

14. **PENALTY SECTION:**

(1) Every person who commits an offence against this by-law is liable to a fine not less than $77.00 and not more than $10,000.00.

(2) Every person who commits an offence of a continuing nature against this By-law is liable to a fine not less than $250.00 and not more than $10,000.00 for each day such offence continues.

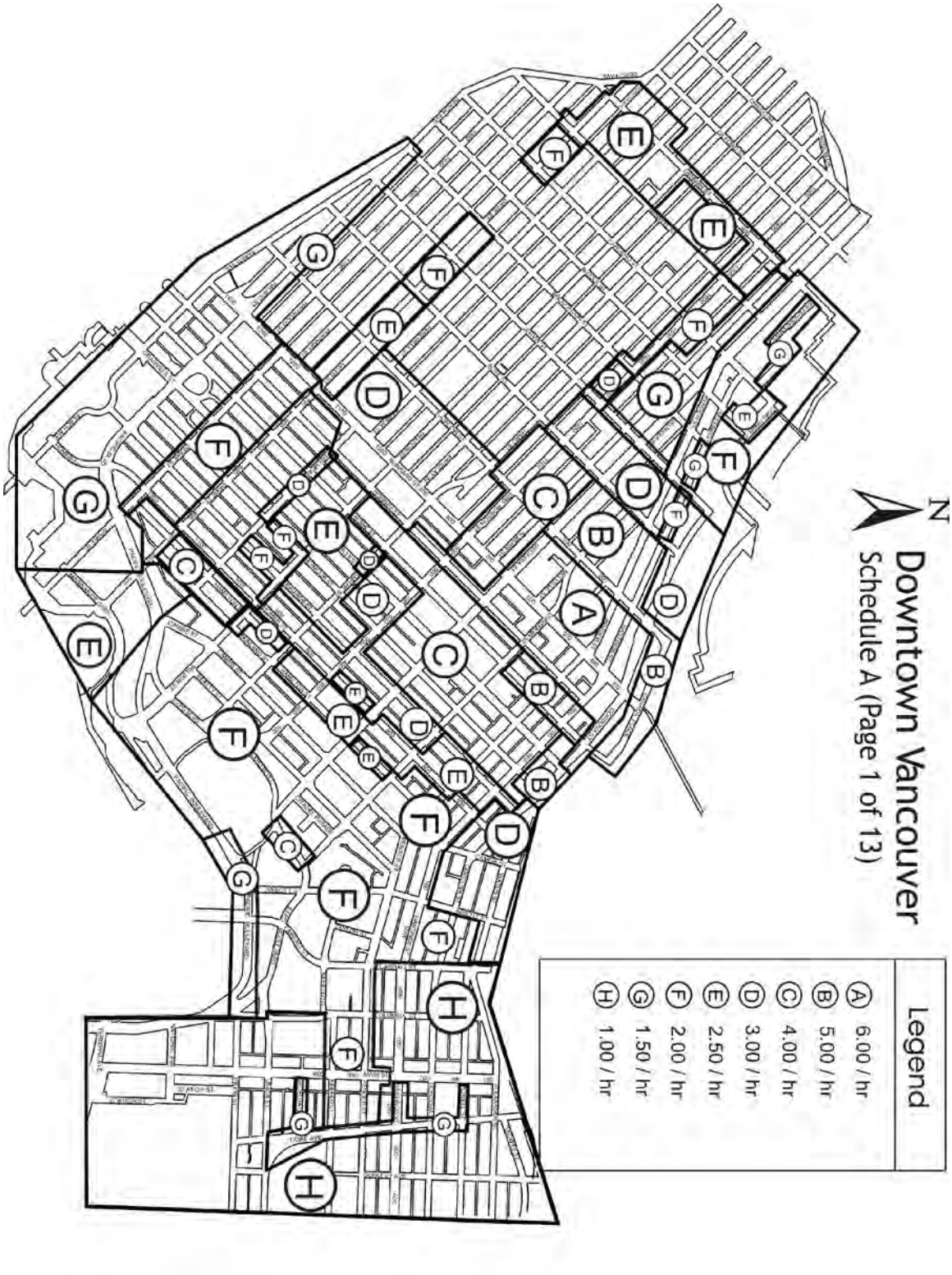
15. This by-law shall come into force and take effect on and after the date of the final passing hereof.

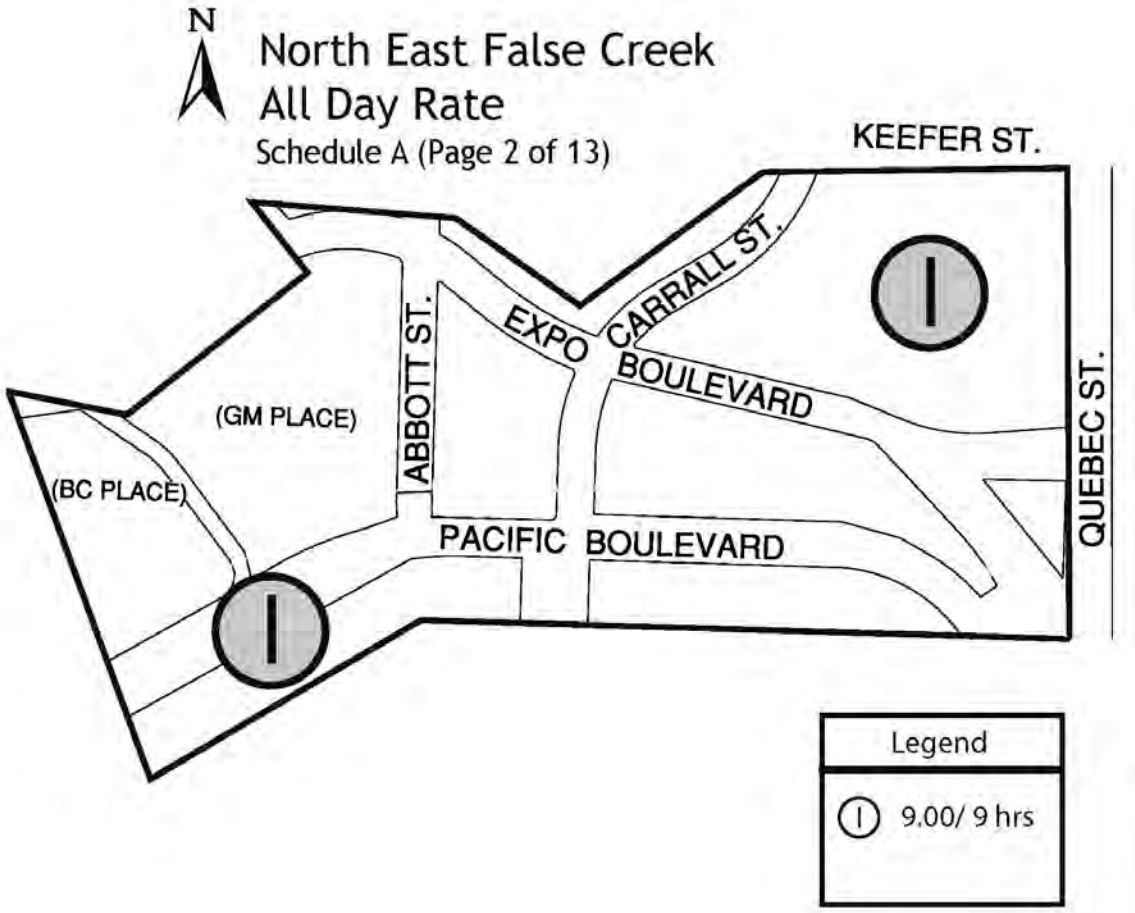
DONE AND PASSED in open Council this 15th day of October, 1946.

(Sgd.) "J.W. CORNETT"
Mayor

(Sgd.) "R. THOMPSON"
City Clerk

Schedule “A”


N
Downtown Vancouver
Schedule A (Page 1 of 13)
Legend
A 6.00 / hr
B 5.00 / hr
C 4.00 / hr
D 3.00 / hr
E 2.50 / hr
F 2.00 / hr
G 1.50 / hr
H 1.00 / hr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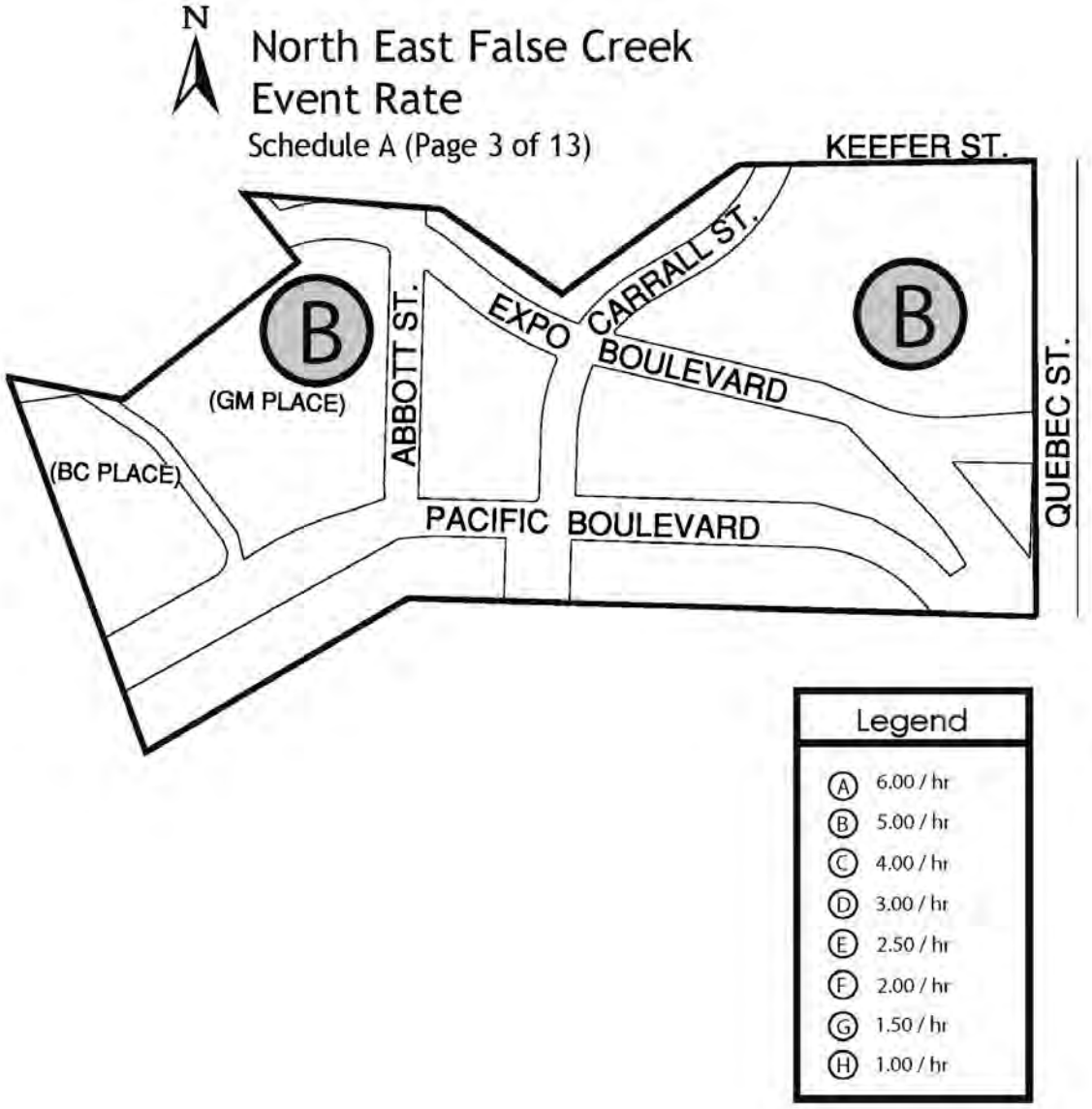
North East False Creek
All Day Rate
Schedule A (Page 2 of 13)
KEEFER ST.
CARRALL ST.
EXPO
BOULEVARD
ABBOTT ST.
(GM PLACE)
(BC PLACE)
PACIFIC BOULEVARD
QUEBEC ST.
Legend
9.00/ 9 hrs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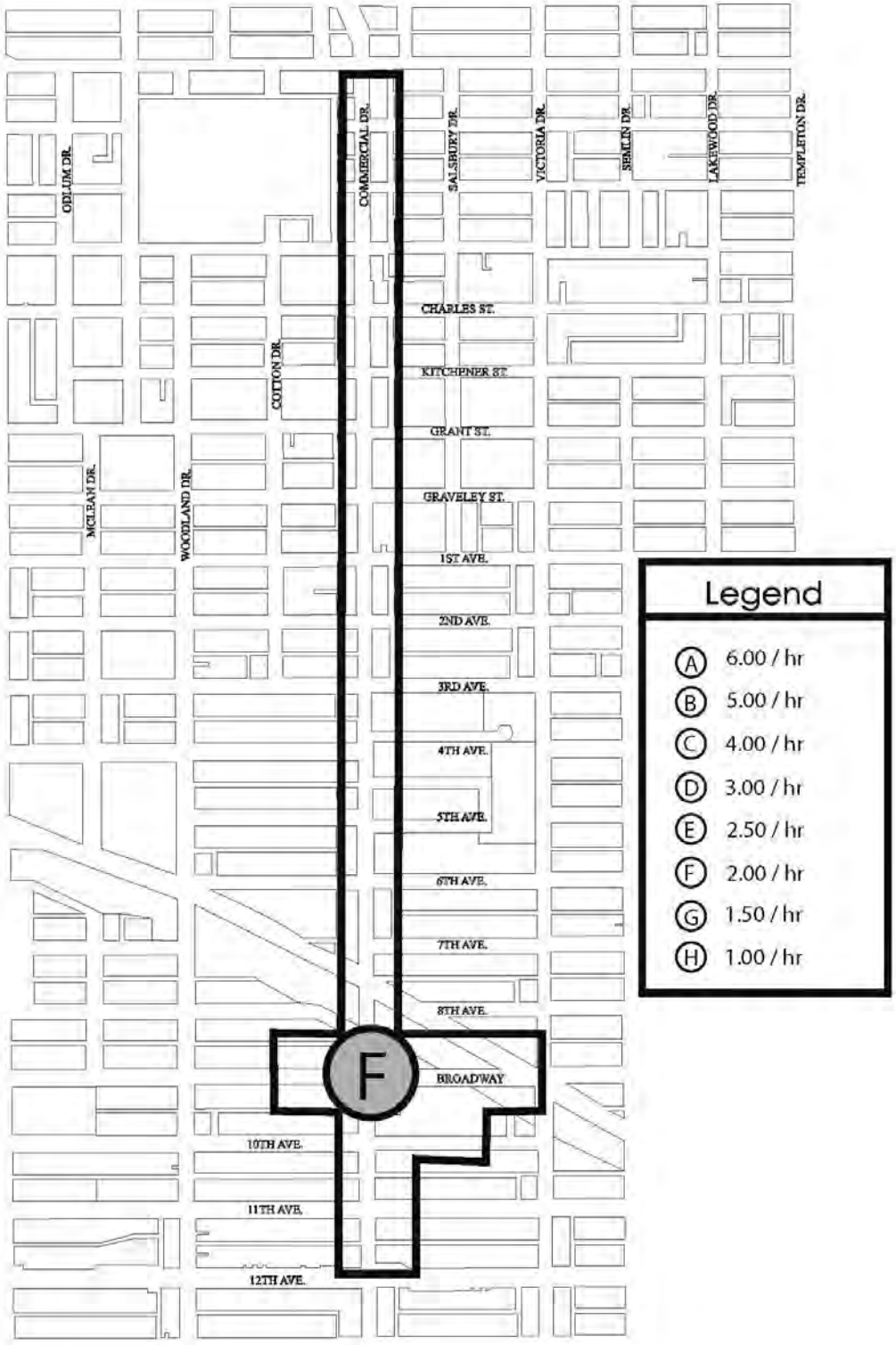
North East False Creek
Event Rate
Schedule A (Page 3 of 13)
KEEFER ST.
CARRALL ST.
EXPO
BOULEVARD
QUEBEC ST.
B
B
(GM PLACE)
ABBOTT ST.
(BC PLACE)
PACIFIC BOULEVARD
Legend
A 6.00 / hr
B 5.00 / hr
C 4.00 / hr
D 3.00 / hr
E 2.50 / hr
F 2.00 / hr
G 1.50 / hr
H 1.00 / hr

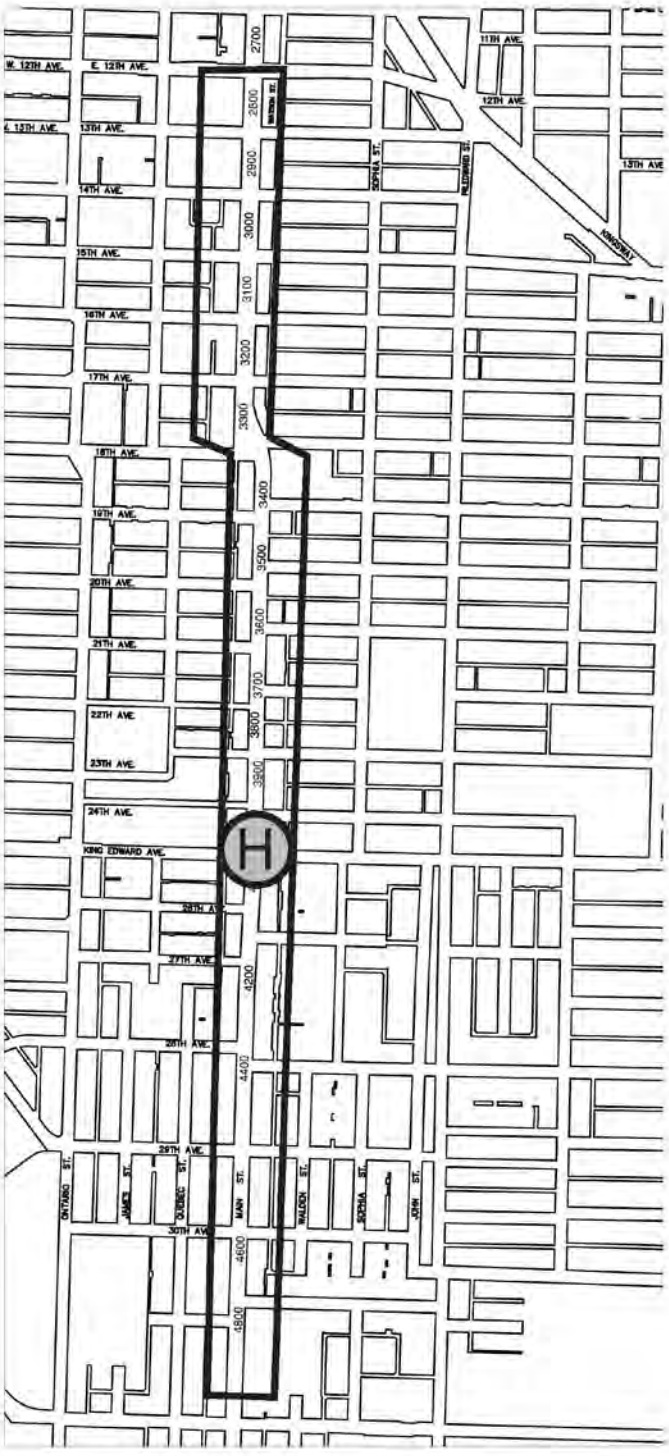
Commercial Drive

Schedule A (Page 4 of 13)



Main Street

Schedule A (Page 5 of 13)



Legend	
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C	4.00 / hr
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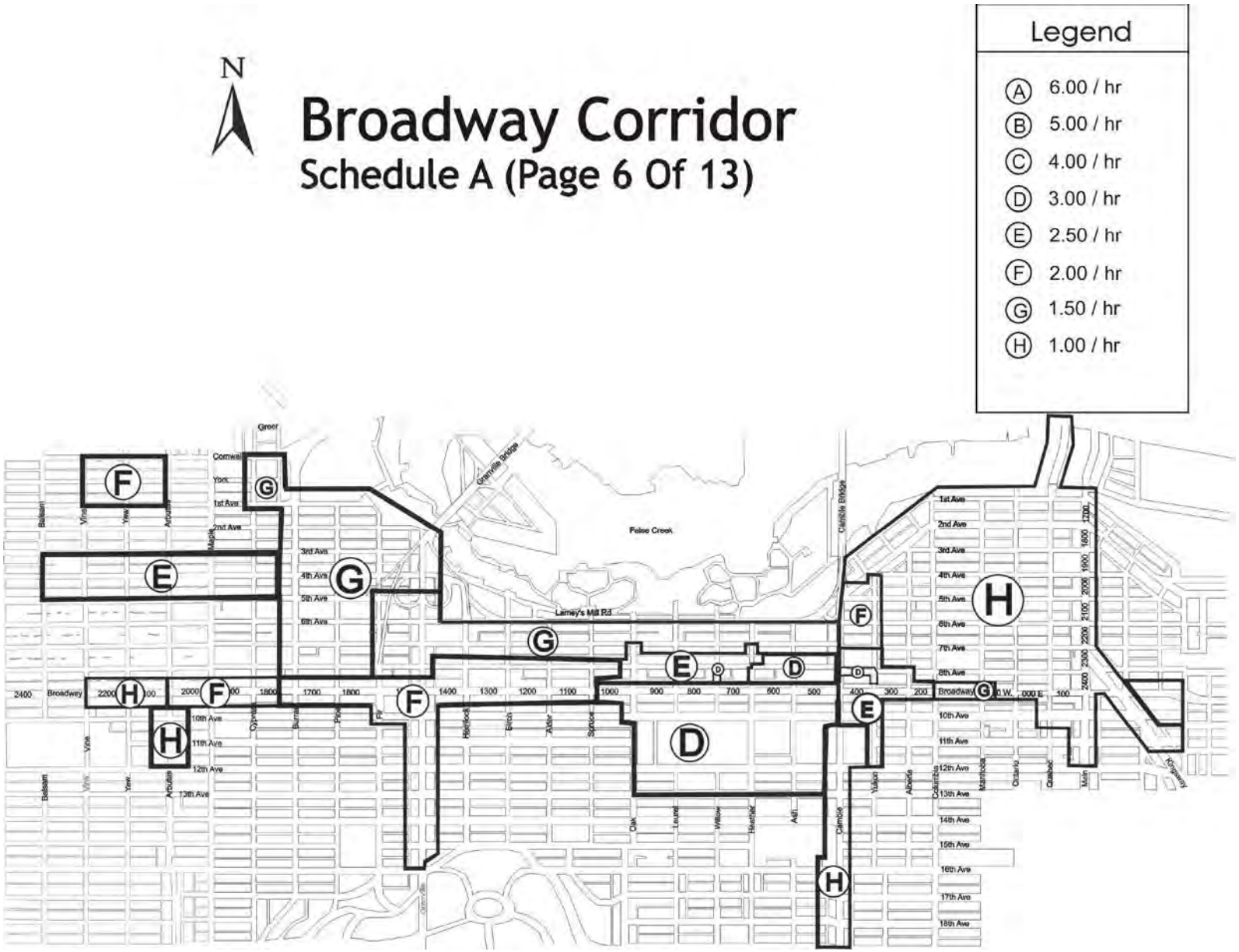
E	2.50 / hr
F	2.00 / hr
G	1.50 / hr
H	1.00 / hr

Broadway Corridor
Schedule A (Page 6 Of 13)



West Broadway

Schedule A (Page 7 of 13)

N

Legend	
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B	5.00 / hr
C	4.00 / hr
D	3.00 / hr
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F	2.00 / hr
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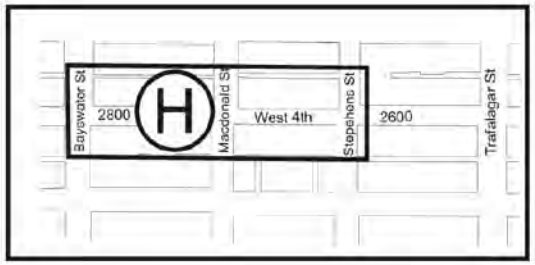
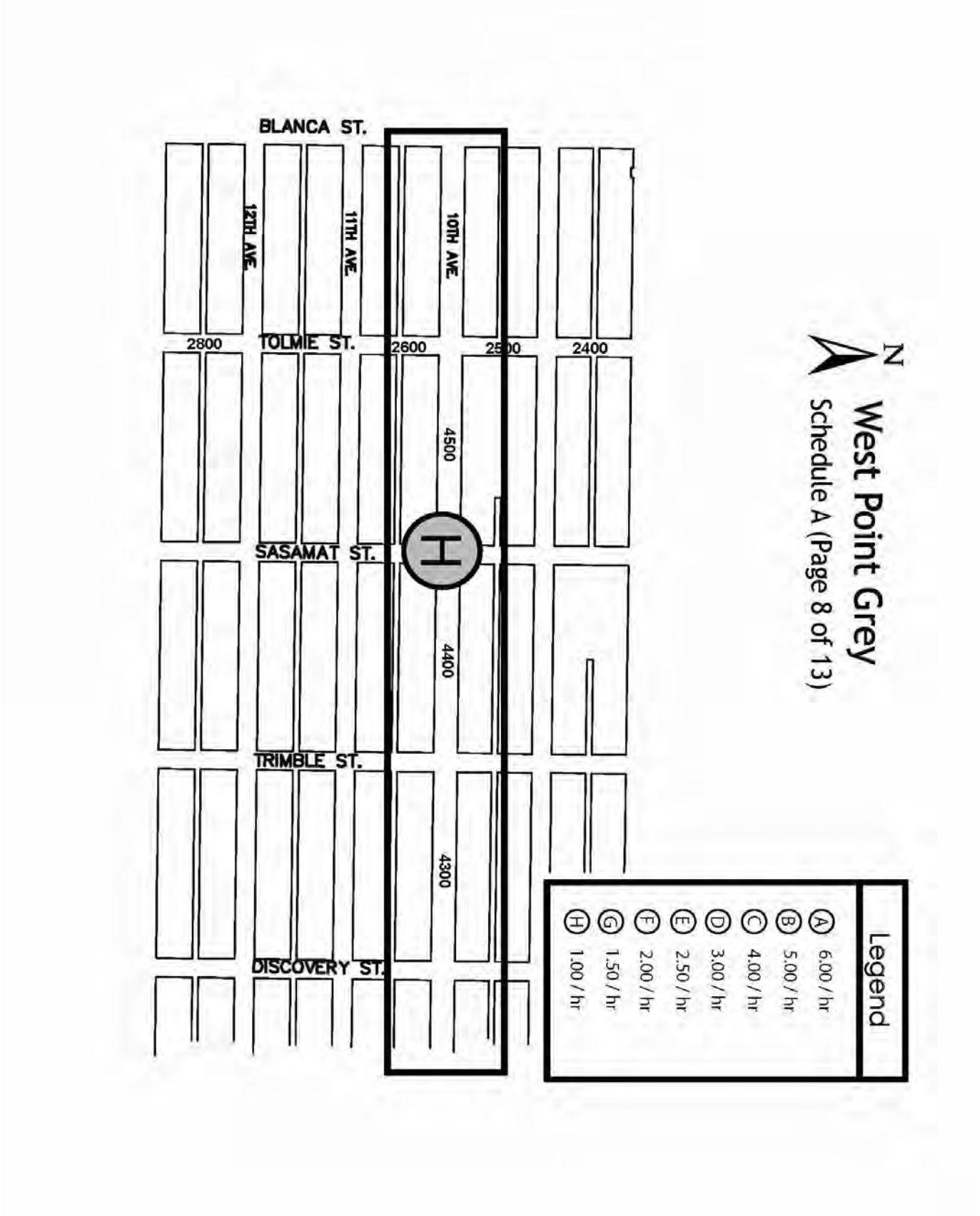
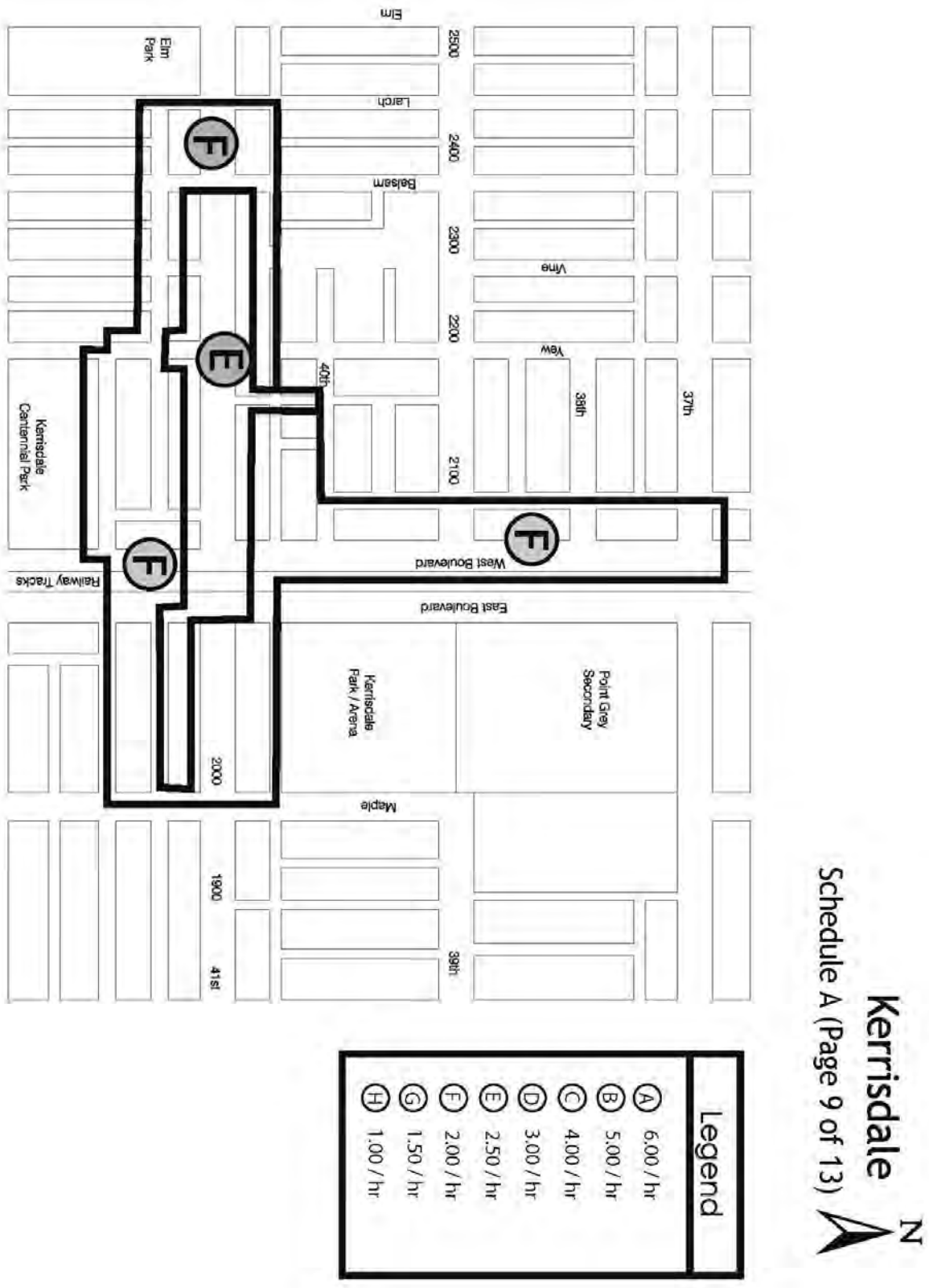
H	1.00 / hr




West Point Grey
Schedule A (Page 8 of 13)
N
BLANCA ST.
TOLMIE ST.
SASAMAT ST.
TRIMBLE ST.
DISCOVERY ST.
12TH AVE.
11TH AVE.
10TH AVE.
2800
2600
2500
2400
4500
4400
4300
H
Legend
A 6.00 / hr
B 5.00 / hr
C 4.00 / hr
D 3.00 / hr
E 2.50 / hr
F 2.00 / hr
G 1.50 / hr
H 1.00 / hr

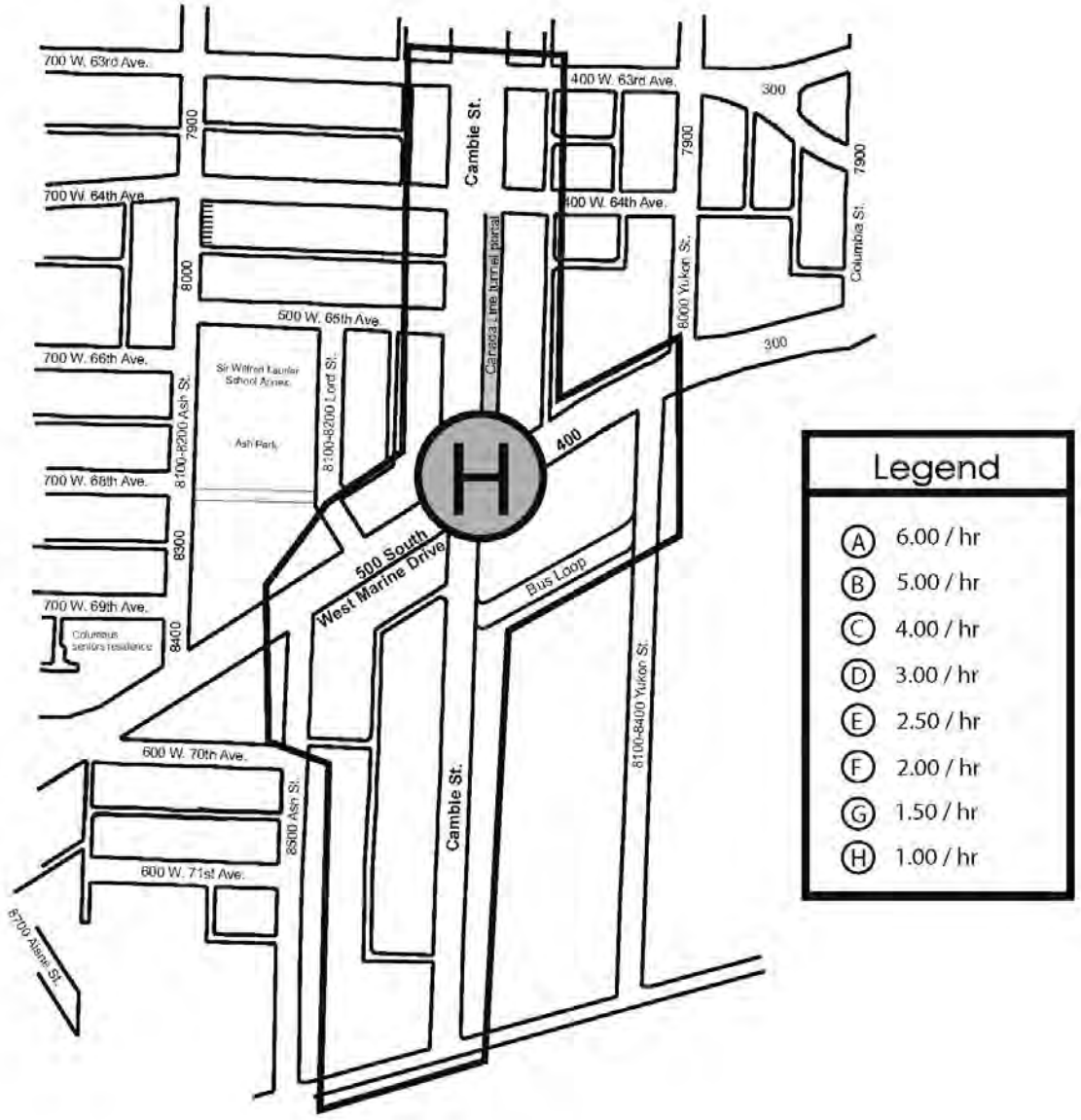
Kerrisdale

Schedule A (Page 9 of 13)



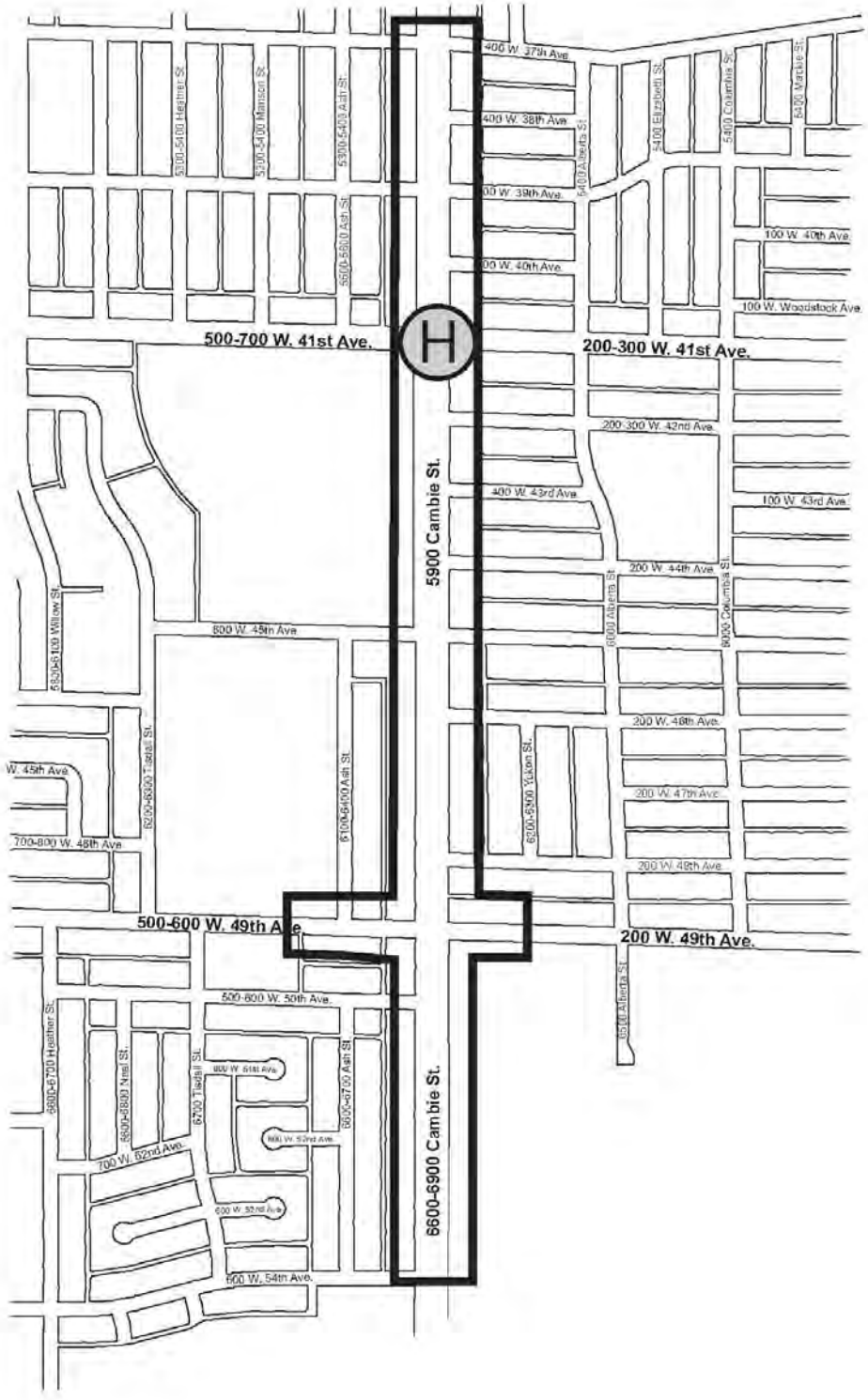
Marine Drive Station

Schedule A (Page 10 of 13)



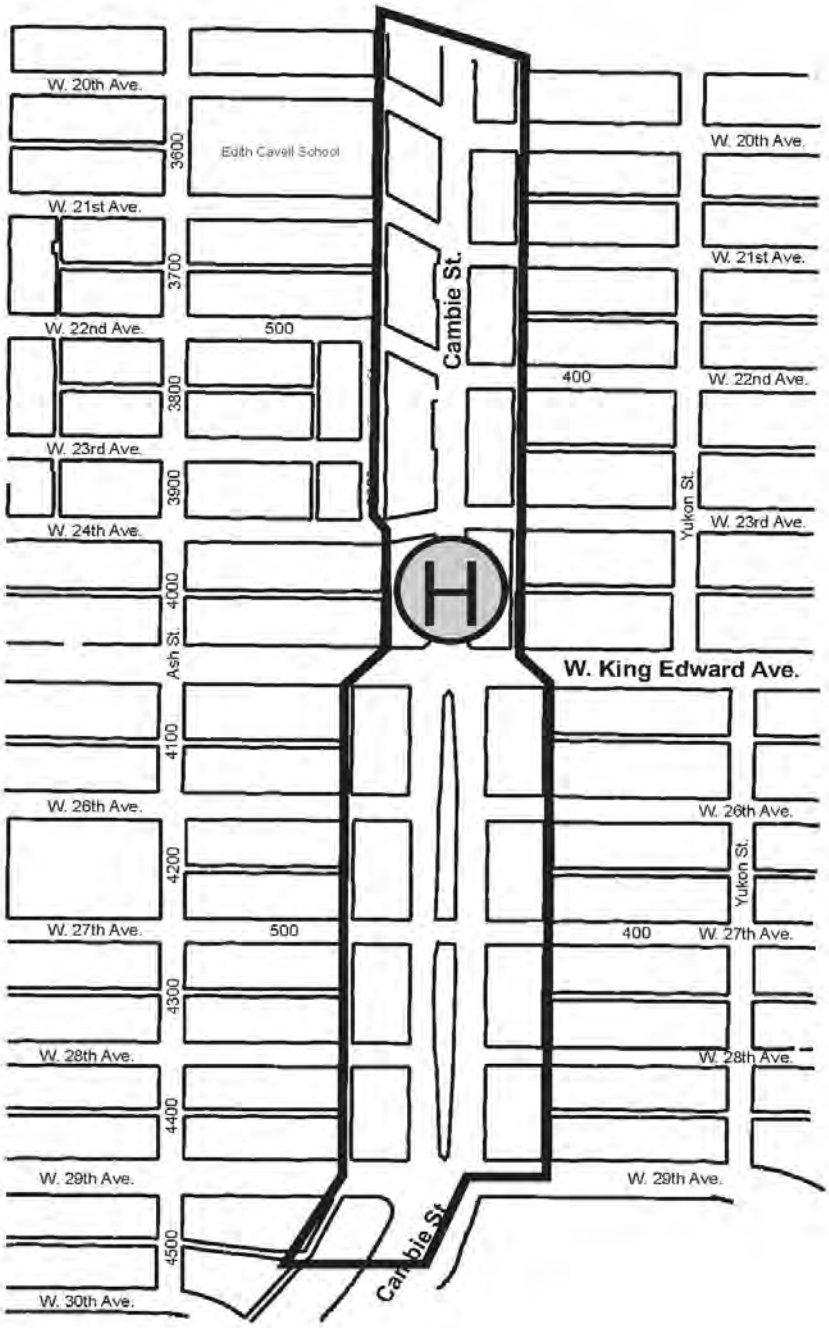
41st & 49th Avenue Stations

Schedule A (Page 11 of 13)



King Edward Station (Cambie Village)

Schedule A (Page 12 of 13)

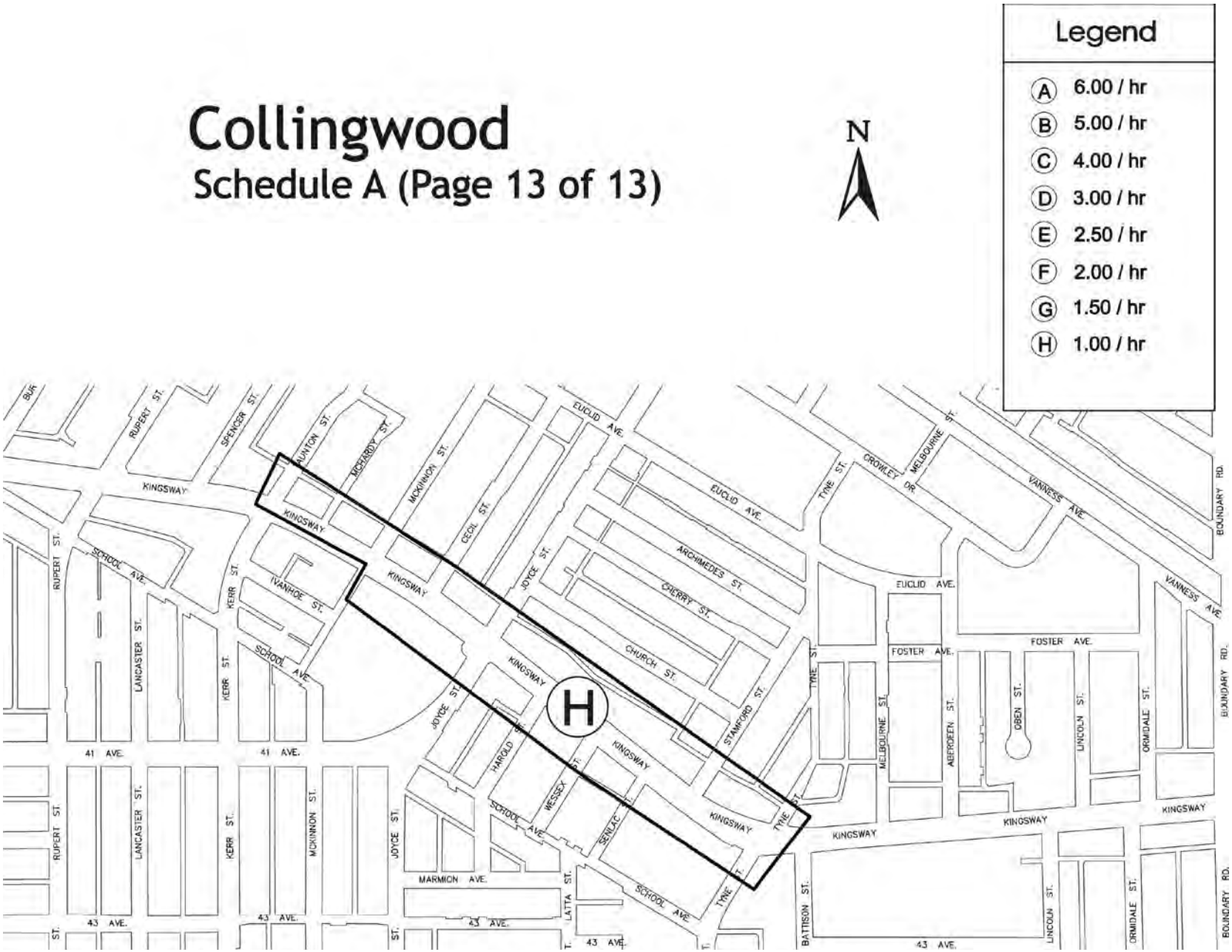


Legend

- (A) 6.00 / hr
- (B) 5.00 / hr
- (C) 4.00 / hr
- (D) 3.00 / hr
- (E) 2.50 / hr
- (F) 2.00 / hr
- (G) 1.50 / hr
- (H) 1.00 / hr

Collingwood

Schedule A (Page 13 of 13)



RR-1(d)

CITY OF VANCOUVER

ADMINISTRATIVE REPORT

Report Date: June 20, 2017
Contact: Doug Smith
Contact No.: 604.829.4308
RTS No.: 12009
VanRIMS No.: 08-2000-20
Meeting Date: June 27, 2017

TO: Vancouver City Council

FROM: General Manager of Planning, Urban Design and Sustainability

SUBJECT: User Fees for City Owned and Operated Public Electric Vehicle Charging Stations

RECOMMENDATION

A. THAT Council approve the charging of user fees at City owned and operated public Electric Vehicle (EV) charging stations as described herein.

B. THAT Council approve, in principle, changes to the Parking Meter By-law No. 2952, as generally outlined in this report and Appendix A, to effect the charging of user fees at City owned and operated public EV charging stations.

C. THAT Council authorize the Director of Legal Services to prepare and bring forward for enactment amendments to the Parking Meter By-law No. 2952 as generally outlined in Appendix B.

REPORT SUMMARY

The City committed to introducing user fees for public electric vehicle ("EV") charging stations as part of the 2016 EV Ecosystem Strategy. The intent of this report is to seek Council approval to charge user fees at City owned and operated public EV charging stations and to amend the Parking Meter By-law to allow implementation and enforcement of these fees.

User fees will be introduced with the intention of increasing turnover at EV charging stations, and encouraging EV drivers with access to home or workplace charging to use those preferentially.

The City consulted with stakeholders and thought leaders on EV infrastructure in early 2017 as part of the development of this program.

COUNCIL AUTHORITY/PREVIOUS DECISIONS

The City has the legal authority to own and operate EV charging stations in the City of Vancouver pursuant to section 145 of the *Vancouver Charter*. As part of the City's authority to operate EV charging stations, the City may charge user fees.

In November 2016, Council unanimously adopted the EV Ecosystem Strategy, providing a five-year strategy on the City's approach to home, workplace and public charging infrastructure; and, defined the City's role as a provider of and a market enabler for electric vehicle charging access as a community amenity to 2021. The introduction of user fees was the Fair Access Quick-Start committed to under the EV Ecosystem Strategy.

In November 2015, Council adopted the *Renewable City Strategy*, committing to derive 100 per cent of all energy used in Vancouver from renewable sources before 2050; and, to reduce greenhouse gas emissions by 80 per cent from 2005 levels before 2050.

In August 2013, Council adopted new minimum requirements for all parking stalls in new one- and two-family homes, 20 per cent of parking stalls in multi-unit residential buildings, and ten per cent of parking stalls in new commercial buildings, such that they be equipped with a "Level 2" charging circuit under the *Vancouver Building By-law*.

In October 2012, Council adopted *Transportation 2040*, which includes actions to support electric vehicle deployment and the provision of charging infrastructure.

In July 2011, Council adopted the *Greenest City Action Plan (GCAP)*. Goal 9 (Clean Air) of GCAP includes encouraging electric vehicle transport. Goal 2 of GCAP includes carbon reduction goals to reduce greenhouse gas emissions by 33 per cent by 2020 over 2007 levels. In 2009, Council adopted requirements in the *Vancouver Building By-law* for electric vehicle charging circuits in new homes and multi-unit residential buildings. These were the first such requirements in North America.

For many years preceding this, Council has directed staff to develop policy and plans that have been built upon in the current Greenest City work including *Clouds of Change*, the *Community Climate Change Action Plan*, EcoDensity and others.

CITY MANAGER'S/GENERAL MANAGER'S COMMENTS

The City Manager recommends approval of the foregoing.

REPORT

Background/Context

The 2016 EV Ecosystem Strategy describes how different approaches to deploying electric vehicle charging infrastructure in the home, workplace, and public settings can create an interdependent network that will support the electrification of light-duty vehicles in Vancouver. The different approaches build on an existing public network of charging stations (currently numbering approximately 250, of which approximately 75 are City owned)), and on a growing number of homes and commercial buildings that have been constructed with EV charging circuits since 2011.

A public survey of over 2,000 Vancouver residents in 2016 indicated that 85% of people planning to buy new cars in the next five years would or would consider buying an electric vehicle, a number greater than total EVs registered in Vancouver at the time.

Challenges

Presently, the City does not require payment for the use of City owned and operated public charging stations, although the standard parking rates for each block or parking lot apply. Use of City owned and operated EV charging stations has more than doubled in the past two years, with over 17,000 charging sessions averaging nearly five hours per day per station, but with some locations having up to approximately 13 hours of use per port, per day. Increasing congestion at many of the City owned and operated public access EV charging stations is reducing their utility to members of the public who rely on them. The significant growth in EV uptake (a 63% increase between 2015 and 2016) is likely to exacerbate this issue under current conditions.

In 2016, City owned and operated public access EV charging stations logged over 17,000 charging sessions. Data shows that approximately half of all time spent at City owned and operated EV charging stations occurs after the battery is full, suggesting a need for greater turnover.

Solutions

If approved, user fees will be introduced and phased in at City owned and operated EV charging stations with the intention of increasing turnover at such stations, and encouraging EV drivers with access to home or workplace charging to use those preferentially.

The City consulted with stakeholders and thought leaders, including BC Hydro, SFU Sustainable Transportation Action Research Team, Metro Vancouver, and the BC Institute of Technology, among others, on EV infrastructure in early 2017 as part of program development.

The user fee program for City owned and operated EV charging stations will be guided by the following principles, in order of importance:

1. Increasing turnover
2. Ease of understanding
3. Encourage home use where possible and use of lowest power infrastructure
4. Eventual return on investment on infrastructure
5. Fairness
6. Rates that encourage the transition to electric vehicles

Roll-out of User Fees to initial City owned and operated EV Chargers

Initially, user fees will be introduced at City owned and operated EV charging stations located at 16 different locations – all of which are City or Park Board jurisdiction sites. For context, EV charging stations presently exist under four different operating models in Vancouver, as described in the table below. User fees proposed in this report will be applied to Groups 'A' and 'D' initially. The EV charging station in Group D is the only one that is not City owned and operated. That charger is owned by BC Hydro and operated by

the City. EV charging stations that fall within Groups B and C are not under consideration for user fees at this time.

Group	Owner	Operator	City to Apply User Fees	Example(s)
A	City	City	Yes	City Hall Main Library Branch Hillcrest Community Centre Curbside locations
B	City	Third Party Site Host	No	Oakridge Mall Bentall Centre
C	Third Party	Third Party	No	Fairmont Pacific Rim Vancity Credit Union
D	Third Party	City	Yes	Empire Fields (BC Hydro owns station, City operates).

A separate approval process for charging stations at Park Board jurisdiction sites is required by the Park Board and this may be scheduled in the fall of 2017.

Proposed Fees

Fees will be charged hourly instead of per unit of energy, to encourage turnover once batteries are fully charged. Charging hourly is also a more familiar and easily understood method of payment. For more details on the fee models considered please see Appendix A.

User fees are initially proposed as follows:

- Level 2[1]: $2.00/hour plus regular meter rate (as applicable)
- DC Fast Charge[2]: $16/hour plus regular meter rate (as applicable)

[1] Typically provides up to 30km of range per hour plugged in
[2] Typically provides up 200km of range per hour plugged in

The above pricing equates to about $0.46/L and $0.50/L of gasoline equivalent respectively[3]. The City's existing EV infrastructure on those City owned and operated EV chargers that are part of the initial rollout is capable of collecting user fees based on rates set by the City. With the exception of three charging stations at Hillcrest Community Centre, which are being upgraded, no additional changes or upgrades to City EV infrastructure is anticipated to implement the user fee system. The City will also ensure that, before applying a user fee at any particular City owned and operated EV charger, the party that has been hired by the City to electronically process payment at that EV charger complies with the standards established by the Payment Card Industry's PCI Security Standards Council.

For more detail on rates, please refer to Appendix A and page 41 in the EV Ecosystem Strategy.

Strategic Analysis

Pricing will be designed so that residential charging will cost less than public charging, and Level 2 to cost less than Fast Charging. The primary goal of this graded pricing model is to encourage drivers with home or workplace charging options to use them when possible. Because of the large price differential between electricity and liquid fuels in the region, it will be possible to implement charge station pricing that is effective in minimizing abuse while at the same time being far less expensive than gasoline or diesel. Also these rates will help ensure that other modes like walking, biking and transit will remain more attractive financially than driving an EV.

The pricing structure will be developed as an "add-on" to existing parking fees to optimize station utilization. In other words, the Level 2 and DCFC rates that are developed under the above criteria will be in addition to a given parking lot price or fee zone prices.

It should be noted that those City owned and operated EV charging stations that are part of the initial rollout and that are located in parking lots should not require a change in pricing policy by the parking management company. The City will set rates through the EV charging stations that will include the usual parking fee at a given lot and remit the parking fee to the lot operator. The City will agree upon the terms and conditions of such an arrangement with the parking lot operator before applying a user fee to such EV chargers.

Implications/Related Issues/Risk (if applicable)

Financial

Details of financial implications of introducing user fees are provided in Appendix A of this Council Report. The existing thirty (30) Level 2 stations and one (1) DC Fast Charging station will not incur any additional capital costs. Future installations, as approved under the 2016 EV Ecosystem Strategy, will have capital costs that will be funded within the approved 2015-2018 capital plan and expenditures will be managed with existing budget.

[3] Equivalency with gasoline is strictly an estimate, and can vary based on the energy efficiency of vehicles being compared. Typically, an EV can travel approximately nine to ten times further on a unit of energy than a similar internal combustion engine vehicle. Home charging would be closer to $0.20/litre equivalent.

It is estimated that annual revenues from all stations will be $23,500 with annual operating (excluding the investment for capital costs and installation) of approximately $14,500. It is anticipated that the currently proposed user fees will achieve a positive return-on-investment ("ROI") for Level 2 charging stations in approximately 1.25 years. It is anticipated that the currently proposed user fees for DC Fast Charge stations will not achieve a short-term ROI, however, revenues will increase significantly as electric vehicles become more common.
\
It is not presently known how sensitive EV drivers will be to user fees. As more market data is obtained and as the number of EVs on the road increases, it is expected that user fees will be adjusted and that positive ROIs will be achievable during the useful lifetime of the infrastructure.

The framework for rate-setting is described in detail in Appendix A.

Human Resources/Labour Relations

The introduction of user fees for City owned and operated public EV charging stations, and the concurrent inclusion of EV infrastructure within the Parking Meter By-law will generate the need for, and the ability of the City to, enforce the appropriate use of such public charging stations. This in turn will generate training needs for City Parking Enforcement staff and external partners, including parking management companies such as Easypark. Sustainability will support such training prior to the launch of user fees.

The collection of user fees will be via electronic means through existing data network providers that support the City owned and operated public EV charging stations. Human resources implications for this are therefore expected to be minimal and no new resources will be required.

Legal

The City may sell electricity through City owned and operated EV charging stations for a user fee without attracting public utility regulation under the British Columbia *Utilities Commission Act*. The definition of "public utility" under the *Utilities Commission Act* excludes municipalities.

Notwithstanding the above, the sale of electricity by the City through a City owned and operated EV charging station would trigger certain filing requirements under "energy supply contract" section (s. 71) of the *Utilities Commission Act*. This includes the need to file a generic sales contract as well as quarterly and annual sales information.

Public Notifications

City staff will provide public notifications for at least one month prior to implementing new user fees. Notifications will be provided through four modes simultaneously:

1. Messages displayed on EV charging station displays at affected sites.
2. Messages posted online at Vancouver.ca and to EV infrastructure mapping sites like Chargehub.com and plugshare.com outlining new pricing and implementation
3. Signage posted adjacent to EV charging stations at affected locations.

4. Regular social media reminders leading up to implementation.

The City will continue to gather input via 311 and social media to monitor implementation and may convene future user workshops to get input on evolving the program to best suit user's needs.

CONCLUSION

As directed by Council via the EV Ecosystem Strategy, the introduction of user fees at City owned and operated public access EV charging stations will increase turnover and ensure that the infrastructure is used more optimally and make owning an EV easier and more attractive. To implement a user fee system, Sustainability staff will work with Easypark, EV charging station data network providers, and City staff in affected departments and the Park Board. Public notifications will be provided approximately one month before the initiation of user fees, expected during summer 2017.

* * * * *

Financial Plan for COV Owned and Operated Public Electric Vehicle Charging Station Rates

1. Summary

The City committed to introducing user fees for public electric vehicle ("EV") charging stations as part of the 2016 EV Ecosystem Strategy. Sustainability will present an update to City Council on June 27, 2017 that will include proposed rates and changes to the *Parking Meter Bylaw*.

Presently, the City does not charge any fees at any of its public charging stations. Increasing congestion at many of the City's public access EV charging stations is reducing their utility to members of the public who rely on them. The significant growth in EV uptake (a 63% increase between 2015 and 2016) is likely to exacerbate this issue under current policy.

In 2016, City public access EV charging stations logged over 17,000 charging sessions. Data shows that approximately half of all time spent at City-owned EV charging stations occurs after the battery is full, suggesting a need for greater turnover.

The City consulted with stakeholders and thought leaders on EV infrastructure in early 2017 as part of program development.

2. Guiding Principles

User fees will be introduced with the intention of increasing turnover at City owned and operated EV charging stations, and encouraging EV drivers with access to home or workplace charging to use those preferentially.

The user fee program for City owned and operated EV charging stations will be guided by the following principles, in order of importance:

1. Turnover
2. Ease of Understanding
3. Encourage home use, lowest power use infrastructure
4. Return on investment on infrastructure
5. Public perception of fairness
6. Inexpensive compared to fossil fuels (maintain attractiveness of EVs over ICEs)

3. Consultation & Fee Models

Three potential models for fees were considered as part of the program design and consultation. The City plans to implement a time-based ($/hour) model as described below due to its alignment with the program principles as described above. A brief description of the three fee options is below.

Time-based ($ / hour)

Charging fees based on the length of time a station is occupied, and will encourage turnover so that charging stations are used by those who need them for EV charging and not simply as parking spaces, and optimize access through improved availability. Hourly fees are simple to understand, and would mirror existing rate structures for parking meters.

Energy-based ($/ kWh)

An alternate argument suggests that a fee based on energy (per kWh) would be more equitable between different models of vehicles with different on-board charging speeds, since users would only pay for energy received regardless of the length of time to charge. This, however, may hamper the ability for users who may be queuing to use station to determine wait times, and the ability for enforcement staff to manage these systems becomes increasingly complex.

Hybrid rate ($/kWh until battery full, then $/hour)

The third, hybrid option, would ensure equity in terms of pricing of energy delivered, while at the same time ensuring that users continue to pay a rate for staying at a charging station. Some jurisdictions have examined using relatively high hourly rates once a battery is fully charged to more strongly disincentivize “squatting”. However, a hybrid rate is also more difficult for users to understand, and may possibly lead to a less positive user experience. Some jurisdictions have introduced a ‘punitive’ hybrid rate such that the price is dramatically higher after a given time. However, more conventional parking enforcement measures can be employed by the City to prevent drivers staying beyond time limits at a given location.

It should be noted that upper limits on parking / charging times will be imposed, in line with the lot or city block that the charger is located on.

4. Station Usage

The City will only be bringing in user fees at locations where the City owns and operates the EV charging stations. The only exception is the DC Fast Charge Station located at Empire Fields, where BC Hydro owns the charge station and the City operates it. At these locations, the City owns the electrical supply, which is limited to City/Park Board buildings, City parking lots and stations on City ROW.

Such stations are present at 16 locations, as follows:

Level 2 Stations (7kW)

1. Arbutus St. adjacent to Kits Beach tennis courts
2. Britannia Community Centre
3. City Hall
4. Pacific National Exhibition

5. Mainland St. at Nelson
6. 180 Keefer St.
7. Mt. Pleasant Community Centre
8. Laneways at Oak & 49th Ave.
9. Coal Harbour Community Centre
10. Vancouver Aquarium
11. Vancouver Public Library Main Branch
12. Hillcrest Community Centre
13. Beach Ave. at Cardero St.
14. Beach Ave. at Bute St.
15. Beach Ave. at Bidwell St.

DC Fast Charge Station (50kW)

16. Empire Fields

Analysis of usage at 15 Level 2 locations was conducted for the period from January 10, 2016 to January 9, 2017 to determine the variations in usage at each location, and the typical session length and power obtained by users. It should be noted that usage at all locations has been increasing since 2013 when analysis began.

Usage of the Empire Fields location is not presently monitored, but is anecdotally reported to be high.

Analysis determined that the public Level 2 stations are used quite frequently, but not necessarily in a way that provides maximum public benefit. In the period mentioned above, a total of 17,016 charging sessions were recorded across the network.

The Level 2 stations were used on average for approximately three hours per session, consuming an average of approximately 8.2kWh. This suggests that the users of these stations are remaining longer than is necessary: a Level 2 charging station dispenses between 6.7kWh and 7.7kWh, indicating that on average, stations stop dispensing power less than halfway through a session.

The table below provides the breakdown, for illustration purposes, of the usage at Level 2 charging stations on City property.

Table 1 - EV Infrastructure Usage at City Properties

Station Name	Average Session Length	Avg. Energy (kWh/ session)	Total Sessions	Avg. Sessions / Month	Avg Session / per port	Avg Sessions (port/mo)	Average Usage per Day (hh:mm/port/d)
Kits Beach	2:40:18	8.76	1668	139.0	834	70	6:06
Britannia Community Centre	2:31:43	7.58	1910	159.2	955	80	6:36
City Hall	4:01:17	5.65	3035	252.9	759	63	8:21
Hastings Park	3:23:05	10.8	619	51.6	310	26	2:52
Mainland St.	2:53:41	10.8	3253	271.1	1627	136	12:53
Mt. Pleasant Community Centre	2:10:09	7.25	418	34.8	139	12	0:49
Oak St. / W.49th Ave.	1:30:10	5.03	177	14.8	177	15	0:43
Coal Harbour Community Centre	7:50:24	15.3	746	62.2	373	31	8:00
Vancouver Aquarium	1:38:31	5.33	965	80.4	483	40	2:10
VPL Main Branch	5:22:46	9.78	746	62.2	249	21	3:39
Hillcrest Community Centre	1:47:47	6.54	2475	206.3	825	69	4:03
Beach Ave (all)	1:25:19	5.47	1004	83.7	167	14	0:39
180 Keefer St.	1:40:10	5.143	471	39.3	236	20	1:04
Overall Average	**3:06:16**	**8.19**	**1418**	**118.17**	**575**	**48**	**4:44**
Overall Total			**17,016**				

5. Framework for Rate-Setting

The introduction of user fees will follow the City's model set out in the December 2016 *Parking Meter Bylaw* update. This framework is data-driven, and allows for adjustments to pricing based on a pre-determined objective for occupancy / availability. With respect to charging infrastructure, little is known on consumers' sensitivity to pricing, as few jurisdictions have introduced user fees to-date. Vancouver has significantly higher rates of use (and therefore of congestion) compared to many jurisdictions.

Generally, public understanding of energy consumption is quite low. Based on consultation with other local governments and thought leaders in this field, it was determined that a time-based system of user fees was simpler to integrate into existing parking regimes; and, was more likely to be understood by users. Further, pricing by time ensures an incentive for turnover, as public charging stations will continue to accumulate costs to a user's account; an energy-based system would cease to charge fees once a battery became completely charged.

Due to variations between vehicles, some EVs will obtain less energy over a given charging time than others, giving rise to concerns about equity between users. However, this disparity is not dissimilar from conventional fossil-fueled vehicles, whereby vehicles with poorer fuel economy derive less range per dollar spent compared with more fuel efficient models. Access to the infrastructure is arguably the value proposition behind introducing user fees. Therefore, that access, measured over time, appears the simplest method to ensure fairness.

Rates will be set as follows:

- Price per hour continuously while vehicles are connected
    - In some locations, this will likely be accompanied by an enforced upper limit on parking time.
    - For DC Fast Charge stations, this will be presented as a price-per-minute
- Structured as an 'add-on' to parking fees in a given lot or zone
- Correlated roughly to the power provided
- Tiered such that the charging stations providing the most range per hour will be the most expensive, and all public charging locations will be more expensive than residential electricity rates
- Fees for charging (not including the local parking rate) will be significantly lower than the equivalent fossil fuel costs.

6. Introductory Rates

The City will introduce the following rates, with adjustments expected as user sensitivity to pricing is better understood. The following introductory rates are additional to the parking rate at a given location, although the two fees will likely be collected at the charging station.

- AC Level 2: $2.00/hr
- DC Fast Charging (50kW): $16/hr.

7. Profit-Loss Expectations / Cost-Revenue

All public charging stations have both fixed and variable operating costs, as follows:

Fixed costs:

- Equipment lease or interest on capital investment
- Network services

- Utility basic charges
- Rate rider

Variable costs:

- Utility charges (electricity usage)
- Demand charges
- Transaction fees (network charge)

In order to be remotely monitored and collect payments, a fixed network fee is charged by a third-party operator that provides a cellular data connection to the charger. In addition, BC Hydro rates include a fixed daily charge. Operating costs include the cost of electricity, transaction charges from network providers, and demand charges[1]. It is expected that the introduction of user fees will cover the operating costs of EV charging infrastructure. It is also expected that a 5 year return-on-investment is possible even with a modest decrease in utilization. Because few jurisdictions in North America have implemented pricing for the purposes of easing congestion, projections will be challenging prior to implementing the program.

[1] As of April 1, 2017, BC Hydro now includes a demand charge for all medium and large site accounts (previously, only peak consumption over a specific threshold triggered demand charges).

Typical Cost-Revenue for a Level 2 (~7kW) charging station is provided in the table below.

Table 2 – Proposed Initial Profit-Loss Calculations for a Level 2 EVSE

Item	Unit Qty.	Per Session	Monthly
Typical Session Energy (kWh)		**8**	
Installed Capacity (kW)	**6.65**		
# Sessions	**-**	**1**	**125**
Usage Length (regardless of energy consumption) (hours)	**3**	**3**	**375**
Fixed			
Capital cost	**$4,500**		
Labour & Installation	**$2,500**		
Annual Network Fee	**$225**		**$18.75**
Basic Daily Utility Charge	**$0.2429**		**$7.39**
Annual Maintenance	**$200.00**		**$16.67**
Variable			
Electricity Cost ($/kWh)	**0.0880**	**$0.70**	**$88.00**
Demand Charge ($/kW)	**4.92**		**$32.72**
Rate Rider	**5%**		**$6.41**
Swipe Transaction Fee ($/txn)	**0.91**	**0.91**	**$113.75**
Total Variable Costs		**$1.61**	**$240.87**
Total Operating Costs			**$283.68**
User Fees Revenue	**$2.00**	**$6.00**	**$750.00**
Net Revenue over operating			**$466.32**
Annual Revenue over operating			**$5,595.86**
Simple Payback (yrs)			1.251

Overall, revenues for a Level 2 station could be as high as $750 per month, based on current usage rates. However, it is expected that this will be lower in practice. From a consumer perspective, $2.00/hour translates into about $0.30 per kWh, or the approximate equivalent energy as $0.46 per L of gasoline[2].

[2] Estimates of electricity vs. gasoline fuels' price equivalency are highly imprecise due to broad differences in vehicle efficiency between EVs and fossil-fueled vehicles. An EV can go approximately nine times further per unit of energy compared with a similar fossil fueled vehicle. As the two fuels themselves cannot be easily compared (electricity does not have a physical volume to be priced by), comparisons rely on estimated range per dollar of fuel purchased.

Table 3 - Proposed Initial Profit-Loss Calculations for a DC Fast Charging Station

Item	Unit Qty.	Per Session	Monthly
Typical Session Energy (kWh)		**25**	
Installed Capacity (kW)	**50**		
# Sessions	**-**	**1**	**125**
Usage Length (regardless of energy consumption) (hours)	**0.5**	**0.5**	**62.5**
Fixed Costs			
Capital cost	**$40,000**		
Labour & Installation	**$50,000**		
Annual Network Fee	**$225**		**$18.75**
Basic Daily Utility Charge	**$0.2429**		**$7.39**
Annual Maintenance	**$200.00**		**$16.67**
Variable			
Electricity Cost ($/kWh)	**0.0880**	**$2.20**	**$275.00**
Demand Charge ($/kW)	**4.92**		**$246.00**
Rate Rider	**5%**		**$26.42**
Swipe Transaction Fee ($/txn)	**0.91**	**0.91**	**$113.75**
Total Variable Costs		**$3.11**	**$661.17**
Total Operating Costs			**$703.97**
User Fees Revenue	**$16.00**	**$8.00**	**$1,000.00**
Net Revenue over operating			**$296.03**
Annual Revenue over operating			**$3,552.31**
Simple Payback (yrs)			25.336

The above table provides a sample calculation of the costs and revenues from a DC Fast Charging Station. Note that the simple payback period is significant. However, this assumes an initial usage of approximately 125 sessions per month. As EV adoption grows, it is likely that more than 300 sessions per month would occur, significantly reducing the payback period.

As the primary goal of the User Fees program is to create turnover, but also to ensure that electricity remains a significantly less expensive option, an hourly rate of $16.00 is proposed. From a consumer perspective, this translates into an approximately $0.50/L gasoline price.

8. Adjustments

Rate adjustments will be controlled through a similar methodology to the supply and demand based system applied to parking meters under the *Parking Meter Bylaw*. This is a data-driven system that sets rates to maintain a target occupancy/vacancy in a given area. When the number of vacant parking stalls is too low, parking rates are increased to create turnover and availability; when the number of vacant parking stalls is higher than targeted, parking rates are

reduced to increase demand for those stalls. A similar approach can easily be taken with EV charging, since networked stations are able to track their own availability and use.

Parking meter rates are adjusted based on the Peak Daytime Curbside Occupancy Rate over a calendar year, with adjustments occurring in the following calendar year. The Peak Daytime Curbside Occupancy Rate is defined as "the ratio of the number of occupied spaces on a block during the hours of 9:00 am to 6:00 pm to the total number of spaces on a block, expressed as a percentage that is calculated based on all data collected by the City throughout the calendar year."

In the case of EV charging infrastructure, different target occupancies and availabilities are proposed initially because the sensitivity of consumers to price changes is unknown, and the relative availability of public infrastructure is quite low compared to that of metered parking stalls. Additionally, rate adjustments are recommended on a semi-annual basis for the first two years following the introduction of user fees.

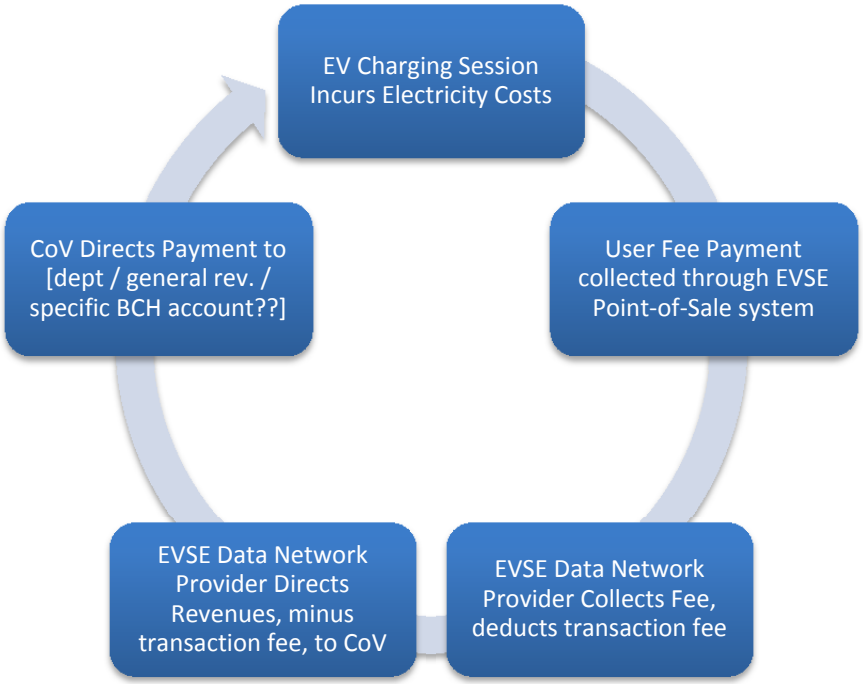
9. Use of Revenues

Two separate arrangements currently exist for electricity costs associated with EV charging stations on City properties.

1. EV infrastructure connected to an electrical panel that supports other loads and is not metered separately from other loads.
2. EV infrastructure is on a separate electrical panel that has a dedicated BC Hydro meter that bills only for EV charging loads.

A project to retrofit all locations captured under 1., above, is presently underway. However, it is anticipated that at some locations, installation of a separate BC Hydro meter may not be possible. In such scenarios, a revenue-grade submeter, as specified by Real Estate and Facilities Management, will be installed to determine the EV infrastructure-specific loads.

Under any of the above scenarios, the intended use of EV infrastructure revenues will be first to ensure cost recovery to the sites or departments responsible for them.



In the case of pay parking lots (i.e. – off-street parking), parking fees will be rolled into fees charged at the charging station, to avoid users needing to pay at multiple locations (i.e. – once at the charger, again at a payment kiosk). In such situations, the portion of revenues from EV charging stations equivalent to the parking rate will be directed back to the parking management company by the City.

10. User Fee Program Responsibilities

Department	Role
Sustainability	• Develop policy for User Fees and Oversee Implementation
Engineering	• Integrate EV Infrastructure User Fees Into Parking Management Policies, Consult with Sustainability on fee adjustments for two years following implementation • Quarterly and annual reporting to BCUC under S.71 of the Utilities Commission Act, supported by SUS • Direct payments to Easypark for portion of revenues equivalent to parking rates.
REFM Energy Management	• Manage Utility bills associated with EV charging
Finance	• Ensure flow of revenues to appropriate departments / accounts
EVSE Network Provider	• Provide monitoring data and remit revenues to CoV
Parking Enforcement (Internal to CoV or Easypark)	• Ensure that time limits at all EV infrastructure are enforced, and the any parking stalls associated with EV infrastructure are used only for that purpose.

May 3, 2019

Village Update

Your Weekly News & Updates

Updates from Mayor and Council

From the desk of Councillor Barmeier

Back to the Future in Lions Bay – Supporting the Adoption of ZEVs in BC

With gas prices soaring and the need for environmental protection on everyone's mind, alternative fuel vehicles are gaining in popularity. In fact, by 2025 10% of all cars sold in BC will have to be ZEV, 30% by 2030, and 100% by 2040. Currently you will find almost every auto manufacturer has ZEV models on offer.

The Lions Bay Official Community Plan outlines our goals in policy and action for the protection of air quality and noise levels.

Electric vehicles do both of these things; zero emissions and near silent operation.

On March 19th, 2019 council carried my motion to investigate DC Fast charging in Lions Bay and allocated up to $5,500 for this first step. We want to take direct action to provide ZEV fueling infrastructure for Lions Bay residents as well as passers-by. Wouldn't it be nice to have cleaner air to breathe and reduce the amount of noisy petrol vehicles passing through? It's a win-win for everyone.

What is a ZEV?

Specifically, ZEV stands for zero emission vehicle. Examples of these are BEV (battery electric vehicle) and FCEV (fuel cell electric vehicle). Currently the majority of ZEVs on offer are battery electric.

What is DC fast charging?

DC fast charging is a quick way to charge the battery in your electric car. BEVs can be charged in 3 different ways. The industry jargon refers to level 1, level 2, and level 3 charging. Where level 1 is a conventional 120V AC plug found around your house. Level 2 is similar in power supply to a stove's 208-240V AC, 30-40 amp circuit. Level 2 chargers are generally installed in your garage or driveway by an electrician. Level 3 is a high voltage direct current (DC) charging station.

Level 3 chargers, or DC fast chargers, are generally reserved for municipal, institutional, or commercial settings.

Table 1. Typical charging times for various chargers.

Charging level	Charging voltage	Typical installation	Charger output	Range gained in 30 minutes	Charge time for 100km range
Level 1	120 V AC	Ordinary household plug	7 kW	~25 km	~4 hours
Level 2	208-240 V AC	Home based charger	22 kW	~75 km	~80 minutes
Level 3 – DC fast charging	600-1000 V DC	Municipal or institutional	150 kW	~300 km	~20 minutes

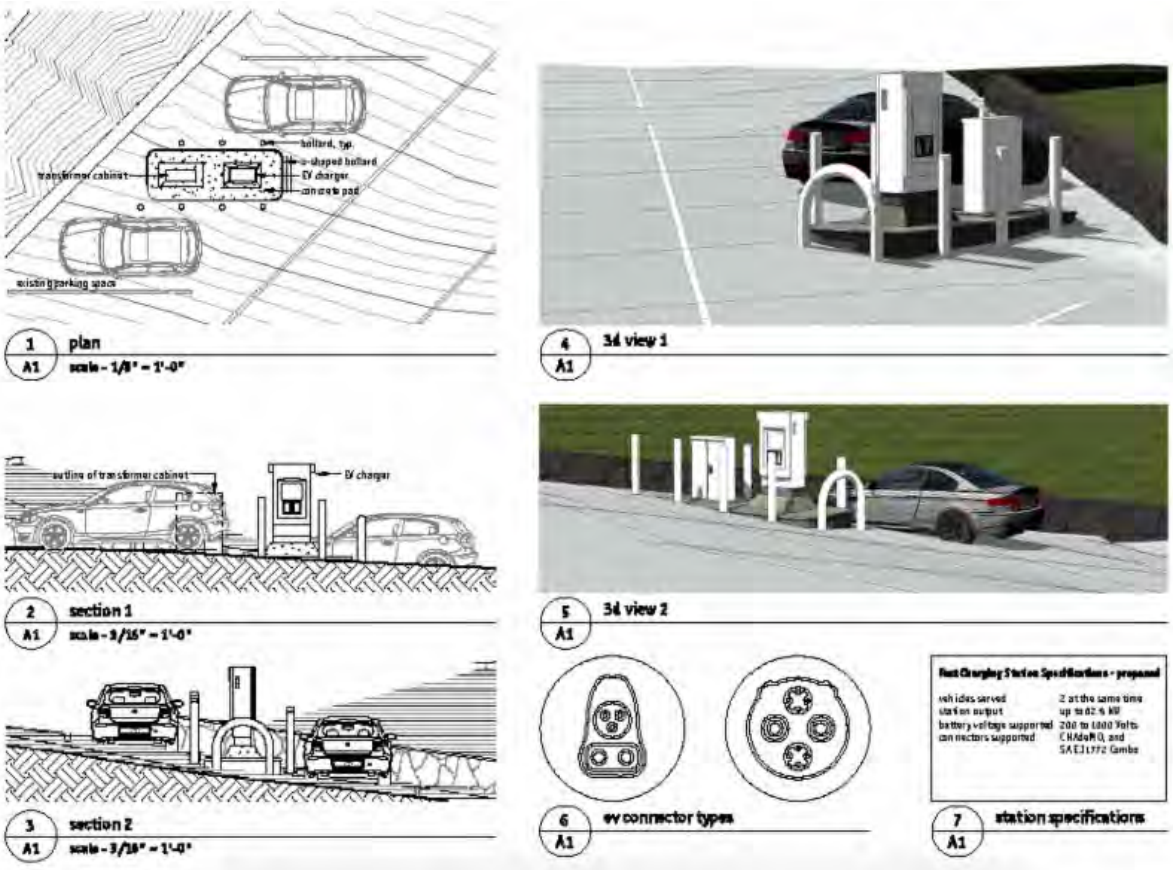
How much does it cost to drive 100 km in an average petrol vehicle versus an average electric vehicle?

Energy source	Cost per unit	Total required to travel 100 km	Cost per 100 km
Petrol	$1.70 per L	10 L	$17.00
Electricity	$0.0945 per kWh	18 kWh	$1.70

*the numbers here are average best estimates only.

What does a DC fast charging station look like?

We had a local architect develop a concept sketch for us. They believe in this initiative so they did the work for free.



What would a DC fast charging station cost and how would we pay for it?

While costs may vary due to a few factors, typical costs for a DC fast charging station are about $80,000. The federal government, through the Electric Vehicle and Alternative Fuel Infrastructure Deployment Initiative is paying anywhere from 75-100% of the cost of eligible stations in the form of a grant. Of course, we need to apply and just like our infrastructure grants we are not guaranteed to win, but at least we've agreed to try.

We welcome your thoughts and feedback on this initiative. Click here or email feedback@lionsbay.ca or drop off your comments at the Village Office or through their afterhours mail slot. Your feedback will be reported back to Council next month.

With kind regards and an eye on the future,
Your councillor and engineer at heart, Norman Barmeier, P.Eng.

For more information on the Province's zero emission mandate click here.

To find out about current ZEV incentive programs click here.

Updates from the Municipality

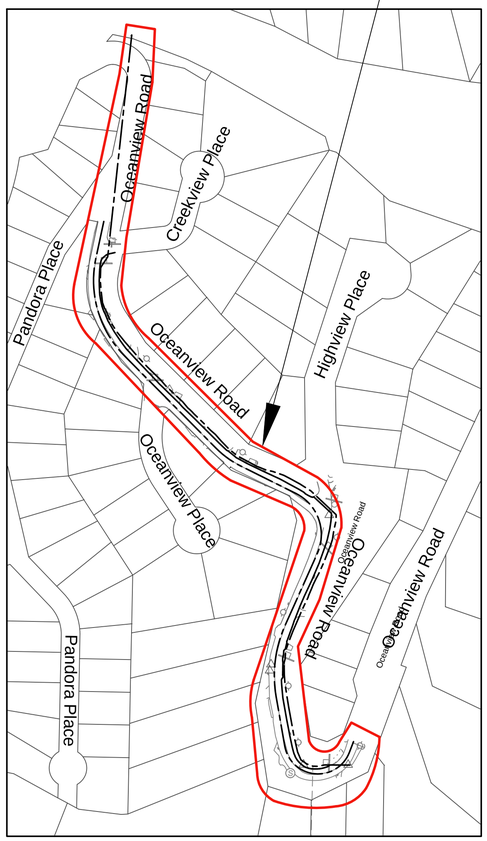
Being so close to thriving natural ecosystems, Lions Bay shares its urban environment with wildlife big and small – and that means that we need to be mindful of potential conflicts between humans and wildlife.

THE MUNICIPALITY OF THE VILLAGE OF LIONS BAY

LIONS BAY 2020 OCEANVIEW DRAINAGE IMPROVEMENT

DRAWING SCHEDULE	
SHEET NUMBER	SHEET DISCRIPTION
1	COVER
2	OCEANVIEW DRAINAGE DITCH PLAN PROFILE 1+000 TO 1+240
3	OCEANVIEW DRAINAGE DITCH PLAN PROFILE 1+240 TO 1+450

PROJECT LOCATION



LOCATION PLAN

GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH
   - THE LATEST REVISION OF THE VILLAGE OF LIONS BAY SUBDIVISION AND DEVELOPMENT CONTROL BYLAW
   - THE MASTER MUNICIPAL CONSTRUCTION DOCUMENT AND STANDARD DETAIL DRAWINGS (MMCD 2009), LATEST EDITION (PLATINUM EDITION);
   - CONSTRUCTION PLANS, ACCEPTED BY THE VILLAGE OF LIONS BAY;
   - WORKSAFE BC, LATEST EDITION.

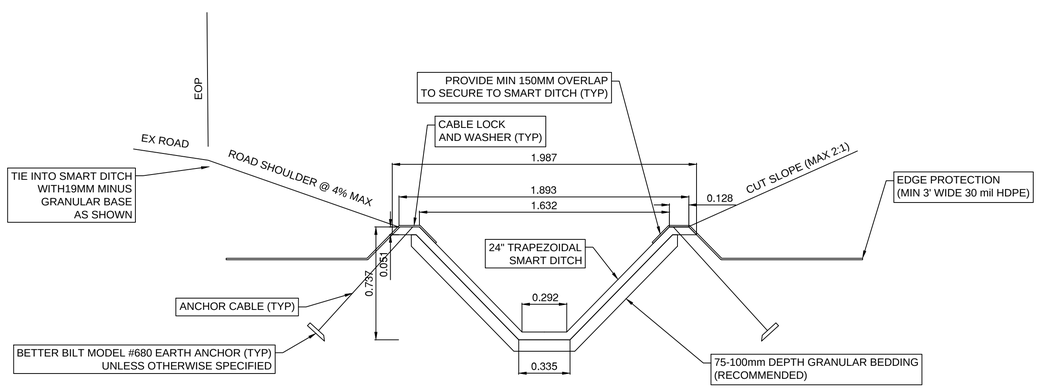
   THE CONTRACTOR SHALL MAINTAIN ON SITE COPIES OF THE ABOVE DOCUMENTS AND SHALL ENSURE THAT ALL SUB CONTRACTORS ARE THOROUGHLY FAMILIAR WITH THE APPLICABLE SECTIONS OF THE DOCUMENTS.
2. ALL ASPHALT CUTS SHALL BE STRAIGHT WITH CLEAN VERTICAL EDGES.
3. ALL EXISTING SURFACES SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION SUBSEQUENT TO CONSTRUCTION. RESTORATION OF EXISTING DRIVEWAYS, CURBS & WALKWAYS TO CONFORM TO VILLAGE OF LIONS BAY SPECIFICATIONS AND TO BE INCIDENTAL TO THE UNIT PRICES IN THE CONTRACT.
4. ALL EXISTING SIGNAGE, BOULEVARDS, CURBS, GUTTERS, SIDEWALKS, UTILITIES, WALLS, LANDSCAPING, FENCES, PAINT MARKINGS AND SURFACES DISTURBED BY CONSTRUCTION ARE TO BE RESTORED TO ORIGINAL CONDITION OR BETTER, INCLUDING TO 100mm OF TOPSOIL AND HYDROSEEDING.
5. EXISTING UTILITY TRENCHES ADJACENT TO THE PROPOSED UNDERGROUND UTILITY ARE TO BE ADEQUATELY PROTECTED FROM SLOUGHING IN ORDER TO PREVENT OVER-WIDTH EXCAVATION. NO ADDITIONAL PAYMENT WILL BE MADE FOR TRENCH SLOUGHING OR RESTORATION REQUIRED THAT RESULT FROM UNCONTROLLED TRENCH WIDTH. THE CONTRACTOR SHALL ASSUME ALL RISKS RELATED TO TRENCH WIDTH CONTROL.
6. EXPOSE ALL POTENTIAL UTILITY CONFLICTS PRIOR TO CONSTRUCTION.
7. EXISTING UTILITIES SHOWN ARE BASED UPON AVAILABLE RECORD DRAWINGS AND MAY NOT BE COMPLETE OR ACCURATE. THE CONTRACTOR REMAINS RESPONSIBLE FOR THE FIELD LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION AND FOR THEIR PROTECTION DURING THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL ARRANGE FOR FIELD LOCATES OF EXISTING UTILITIES EITHER BY HAND OR HYDROVAC EXCAVATION TO CONFIRM LOCATION AND ELEVATIONS PRIOR TO CONSTRUCTION CONTRACTOR TO REPORT ANY DISCREPANCIES TO THE ENGINEER TO ACCOMMODATE THE UTILITY UPGRADE.
8. CONTRACTOR TO SCHEDULE WORK 72 HRS IN ADVANCE WITH THE VILLAGE OF LIONS BAY AND COMPLY WITH PERMIT REQUIREMENTS.
9. ALL PUBLIC ROADWAYS AFFECTED BY THE WORKS SHALL BE KEPT IN A CLEAN STATE AT ALL TIMES AND FREE OF EQUIPMENT AND MATERIALS AT ALL TIMES WHEN CONSTRUCTION ACTIVITY IS NOT UNDERWAY. DUST CONTROL MEASURES SHALL ALSO BE EMPLOYED.
10. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING THE VARIOUS PARTS OF THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THERE IS NO DISRUPTION TO SERVICE, AND IF DISRUPTION IS ANTICIPATED, TO NOTIFY THEVILLAGE OF LIONS BAY A MINIMUM OF 72 HOURS PRIOR, AND OBTAIN APPROVAL FOR THE DISRUPTION.
11. THE CONTRACTOR SHALL NOTIFY ALL AFFECTED RESIDENTS A MINIMUM OF 48 HOURS PRIOR TO A SCHEDULED SERVICE DISRUPTION, INCLUDING ROAD AND DRIVEWAY BLOCKAGES.
12. SURVEY PINS OR LEAD PLUGS DISTURBED DURING THE COURSE OF CONSTRUCTION SHALL BE REPLACED BY A B.C. LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
13. ALL SURVEY MONUMENTS WITHIN THE PROJECT BOUNDARIES SHALL BE PROTECTED DURING THE COURSE OF THE WORK. SHOULD ANY SURVEY MONUMENT REQUIRE RAISING OR RELOCATION, THE CONTRACTOR SHALL NOTIFY THE VILLAGE AT LEAST 72 HOURS IN ADVANCE OF SCHEDULING WORK.
14. CONTRACTOR TO PROVIDE TRAFFIC CONTROL, SIGNAGE, BARRICADES WITH ILLUMINATION, AND DETOUR ROUTING AS REQUIRED TO MAINTAIN TRAFFIC FLOW AND EMERGENCY VEHICLE ACCESS. A TRAFFIC MANAGEMENT PLAN IS TO BE SUBMITTED IN ADVANCE FOR THE VILLAGE OF LIONS BAY REVIEW AND APPROVAL.
15. CONTRACTOR RESPONSIBLE FOR THE DISPOSAL OF ALL EXCAVATED MATERIAL UNSUITABLE FOR REUSE AT A SUITABLE OFF-SITE DISPOSAL AREA, IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
16. GRANULAR ROAD BASE MAY BE USED AS TEMPORARY SURFACING. IT REMAINS THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ANY TEMPORARY SURFACING IN GOOD CONDITION AT ALL TIMES.
17. CONTRACTOR TO CAREFULLY RELOCATE EXISTING PLANTS, SHRUBS, LANDSCAPE FEATURES, SITE FEATURES AND ROAD SIGNS TO ACCOMMODATE CONSTRUCTION WORK. ALL SUCH ITEMS SHALL BE REPLACED TO ORIGINAL OR BETTER CONDITION, TO THE APPROVAL OF THE VILLAGE OF LIONS BAY EXCEPT WHERE NOTED.
18. EVERY EFFORT IS TO BE MADE TO SAVE EXISTING LANDSCAPING WITHIN THE ROAD R.O.W. LANDSCAPING IS TO BE RESTORED TO ITS ORIGINAL OR BETTER CONDITION. IN THE EVENT OF LANDSCAPING REMOVAL THE PROPERTY OWNER SHALL BE ADVISED OF THE REMOVAL AND THE LANDSCAPING PLACED IN OWNERS PROPERTY UPON THEIR REQUEST.
19. FIGURED DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS.
20. UTILITY SERVICES TO INDIVIDUAL LOTS ARE NOT ALWAYS SHOWN FOR CLARITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING THESE UTILITIES IN THE FIELD.
21. ALL ABANDONED MAINS WHERE CUT SHALL BE FILLED WITH MIN 300mm LENGTH CONCRETE CAP. SANDBAG OR CONCRETE BAGS ARE NOT ACCEPTABLE.

STORM / ENVIRONMENTAL NOTES:

1. AVOID EARTH DISTURBING ACTIVITIES DURING SUBSTANTIAL RAIN EVENTS.
2. AVOID STOCKPILING SOILS, SANDS AND OTHER ERODIBLE MATERIALS ONSITE. IT IS PREFERABLE TO 'HOT-LOAD' SPOIL DIRECTLY INTO TRUCKS FOR OFFSITE DISPOSAL. IF TEMPORARY WASTE OR SOIL STOCKPILES ARE NECESSARY, MAKE SURE THEY ARE FULLY COVERED WITH POLYETHYLENE SHEETING OR TARPS AND WEIGHTED WITH SANDBAGS.
3. TRACKING OF SEDIMENT, SOIL AND/OR ROADBASE FROM WORKSITE TO VEHICLE TRAVEL LANES MUST BE PREVENTED.
4. ROADS MUST BE SWEPT CLEAN OF SOIL, LOOSE ROAD BASE, EARTH AND SEDIMENT. MECHANICAL SWEEPING IS PREFERRED TO MANUAL SWEEPING. HOWEVER, FREQUENT HAND SWEEPING IS PREFERABLY TO ONCE DAILY MECHANICAL SWEEPING.
5. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT NO SEDIMENT OR SEDIMENT LADEN WATER WITH TOTAL SUSPENDED SEDIMENT (TSS) GREATER THAN 75 mg/L IS DISCHARGED FROM THE WORKS TO THE OWNER'S DRAINAGE SYSTEM.
6. SHOULD TRASH-PUMPING OF SEDIMENT LADEN WATER FROM THE EXCAVATION BE REQUIRED, THIS WATER MUST TREATED BEFORE DISCHARGING INTO THE EXISTING SANITARY SEWER SYSTEM.
7. AN EMERGENCY SPILL KIT WILL BE KEPT ONSITE AT ALL TIMES THE CONTRACTOR IS OPERATING. SPILL KITS MUST INCLUDE SPILL BOOMS, SPILL PADS, GLOVES, AND CATCHBASIN BARRIERS. A SPILL KIT WITH AT LEAST 125 LITRES ABSORBENCY IS RECOMMENDED. SANDBAGS AND A SUPPLY OF SAND MUST BE KEPT ONSITE.
8. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DEVELOP A SPILL RESPONSE PLAN THAT PROVIDES WRITTEN SAFE WORK PROCEDURES IN THE EVENT OF A SPILL.
9. THE CONTRACTOR IS TO HAVE ONSITE SODIUM THIOSULPHATE TO TREAT CHLORINATED WATER IN THE EVENT OF A WATER MAIN BREAK.
10. THE CONTRACTOR IS TO DISPOSE OF CHLORINATED WATER AT AN APPROVED LOCATION ONLY AFTER APPROPRIATE TREATMENT WITH SODIUM THIOSULPHATE. AT NO TIME WILL THE CONTRACTOR DISCHARGE CHLORINATED WATER DIRECTLY TO A CATCHBASIN, CREEK, DITCH OR SWALE WITHOUT PRIOR APPROVAL OF A SPECIALIST IN WATERMAIN FLUSHING OR AN ENVIRONMENTAL MONITOR.
11. THE CONTRACTOR IS TO OBTAIN APPROVAL FROM THE OWNER PRIOR TO DISCHARGING FLUSHING WATER OR DISINFECTION WATER TO MUNICIPAL SANITARY SEWER MANHOLES.

TRAFFIC MANAGEMENT, NOTIFICATION AND APPROVALS NOTES:

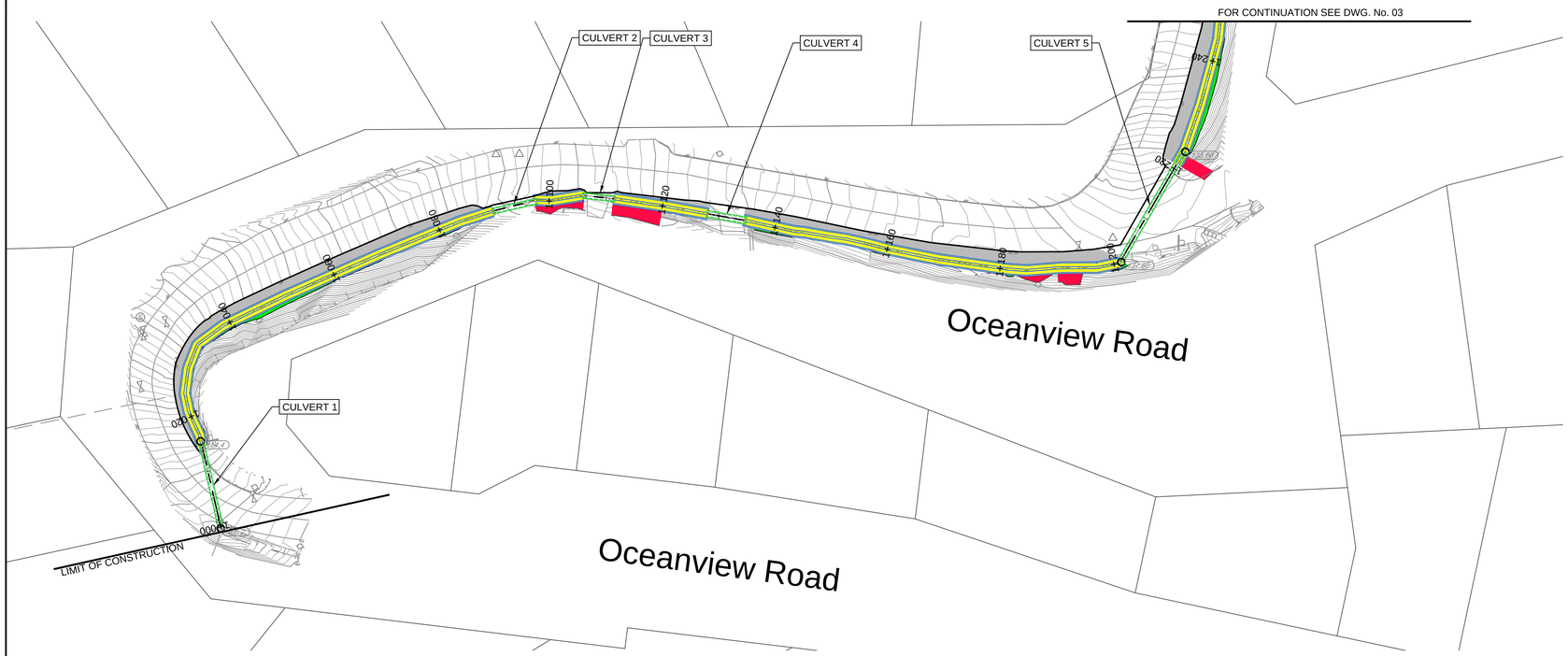
1. THE CONTRACTOR SHALL PROVIDE CONSTRUCTION SIGNAGE, BARRIERS, FLASHING INDICATORS ACCORDING TO MOT, BC TRAFFIC CONTROL MANUAL, ETC, AT ALL TIMES TO ENSURE THE SAFETY OF THE PUBLIC. TRAFFIC CONTROL WILL BE REQUIRED FOR ALL CONSTRUCTION WORKS WITHIN THE TRAVELED PORTION OF THE ROAD. NO ROAD SHALL BE CLOSED WITHOUT THE WRITTEN CONSENT OF THE DIRECTOR OF ENGINEERING AND OPERATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF ALL EXCAVATED MATERIAL UNSUITABLE FOR REUSE AT A SUITABLE OFF-SITE DISPOSAL AREA, IN ACCORDANCE WITH ALL APPLICABLE REGULATIONS.
3. THE CONTRACTOR SHALL ENSURE THAT ALL APPROVALS REQUIRED FOR THE PROPOSED WORKS HAVE BEEN OBTAINED FROM ALL AUTHORITIES AND AGENCIES PRIOR TO COMMENCING THE WORK.
4. THE CONTRACTOR SHALL ARRANGE FOR, AND COORDINATE THE WORKS DONE BY:
   A. THE OWNER
   B. FRANCHISE UTILITIES
5. THE CONTRACTOR SHALL MAKE CONTACT WITH THE OWNER'S TRAFFIC DEPARTMENT AT LEAST 72 HOURS PRIOR TO THE WORK. SCHEDULING AND OTHER CONSTRUCTION CONSTRAINTS IMPOSED BY THESE WORKS SHALL BE TAKEN INTO ACCOUNT.
6. RESIDENTS DIRECTLY AFFECTED BY CONSTRUCTION OF THESE WORKS AND SERVICES SHALL BE GIVEN A MINIMUM OF 5 DAYS WRITTEN NOTICE OF THE PROPOSED START OF CONSTRUCTION. THE CONTRACTOR IS TO DISTRIBUTE A NOTICE OF CONSTRUCTION LETTER TO ALL AFFECTED RESIDENTS AND BUSINESSES. LETTER TO DIRECT ALL INQUIRIES TO THE CONTRACT ADMINISTRATOR. FOLLOWING CONSTRUCTION ACTIVITY ON ANY PRIVATE PROPERTY, A WRITTEN RELEASE MAY BE REQUIRED FROM THE PROPERTY OWNER AT THE DISCRETION OF THE OWNER.
7. A TRAFFIC AND PEDESTRIAN SAFETY CONTROL PLAN SHALL BE SUBMITTED BY THE CONTRACTOR TO THE OWNER AND CONTRACT ADMINISTRATOR PRIOR TO THE PRE-CONSTRUCTION MEETING.
8. APPROVALS FOR REQUIRED TREE CUTTING OR TRIMMING NOT INDICATED IN THE CONTRACT DRAWINGS SHALL BE OBTAINED BY THE CONTRACTOR FROM THE OWNER PRIOR TO WORK BEING PERFORMED.
9. CONTRACTOR TO OBTAIN APPROVED LANE CLOSURE REQUEST FORM FOR ALL WORKS. APPROVED REQUESTS ARE CIRCULATED TO ALL EMERGENCY SERVICES.
10. CONTRACTOR TO SUBMIT A TRAFFIC MANAGEMENT PLAN WITH LANE CLOSURE REQUEST FOR ALL MAJOR ROADS AND ANY LOCAL ROADS WHICH REQUIRE ANY DETOURS.
11. ALL TRAFFIC CONTROL TO CONFORM TO THE LATEST EDITION OF THE "BC TRAFFIC CONTROL MANUAL FOR WORK ON ROADWAYS".
12. NOTICE OF CONSTRUCTION SIGNS TO BE INSTALLED AT ALL PROJECT LIMITS AND PREFERRED DETOUR ROUTES. NOTIFY THE CONTRACT ADMINISTRATOR WITH CONSTRUCTION SCHEDULE AND LOCATIONS.



SMART DITCH TYPICAL SECTION
SCALE NTS

REV. A

ISL
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698



LEGEND

- SMART DITCH
- 19mm MINUS GRANULAR BASE
- CUT 2H:1V
- FILL 2H:1V

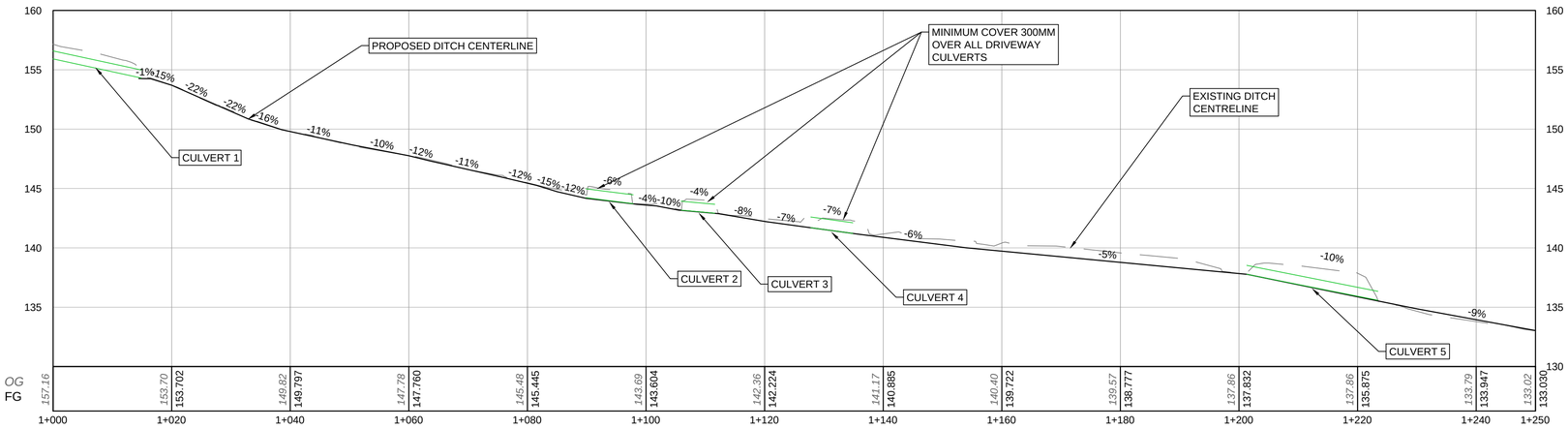
Pipe Table					
Pipe Name	Size	Length	Slope	INLET INV	OUTLET INV
CUL 1	675	14.87	10.79%	155.916	154.311
CUL 2	750	7.91	6.35%	144.223	143.721
CUL 3	750	5.67	4.61%	143.179	142.918
CUL 4	900	7.08	6.79%	141.694	141.213
CUL 5	750	22.11	9.88%	137.769	135.585
CUL 6	675	12.97	12.15%	131.563	129.987
CUL 7	675	6.25	11.35%	129.664	128.955
CUL 8	675	14.19	12.64%	121.910	120.116
CUL 9	675	13.00	11.11%	116.278	114.834
CUL 10	675	10.62	13.53%	111.887	110.450
CUL 11	675	144.77	10.00%	105.884	91.407

PLAN

SCALE 1:500

NOTES:

1. THERE IS TO BE A MINIMUM OF 300MM COVERAGE ON ALL CULVERTS
2. REINSTATE DRIVEWAY CROSSING TO MATCH EXISTING SURFACE



PROFILE

SCALE 1:500 H/ 1:250 V

0 10 30m
1:500

NOT FOR CONSTRUCTION

PRELIMINARY DESIGN

DESIGN NO. 32282

PLOT DATE: July 28, 2020

REV NO	REVISIONS	DATE	DRAWN	APPR'D
A	PRELIMINARY DESIGN	2020/07/13	DRM	ATB

ROAD WORKS

OCEANVIEW ROAD
1+000 TO 1+240

ISL
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2696 F: (604)629-2698

SCALE	VARIES	CREATION DATE	2020/07/13
DRAWN BY	DRM	DESIGN BY	ATB/GSH
CHECKED BY	ATB	APPROVED BY	ATB

DWG. NO. 2 OF 3

REV. A

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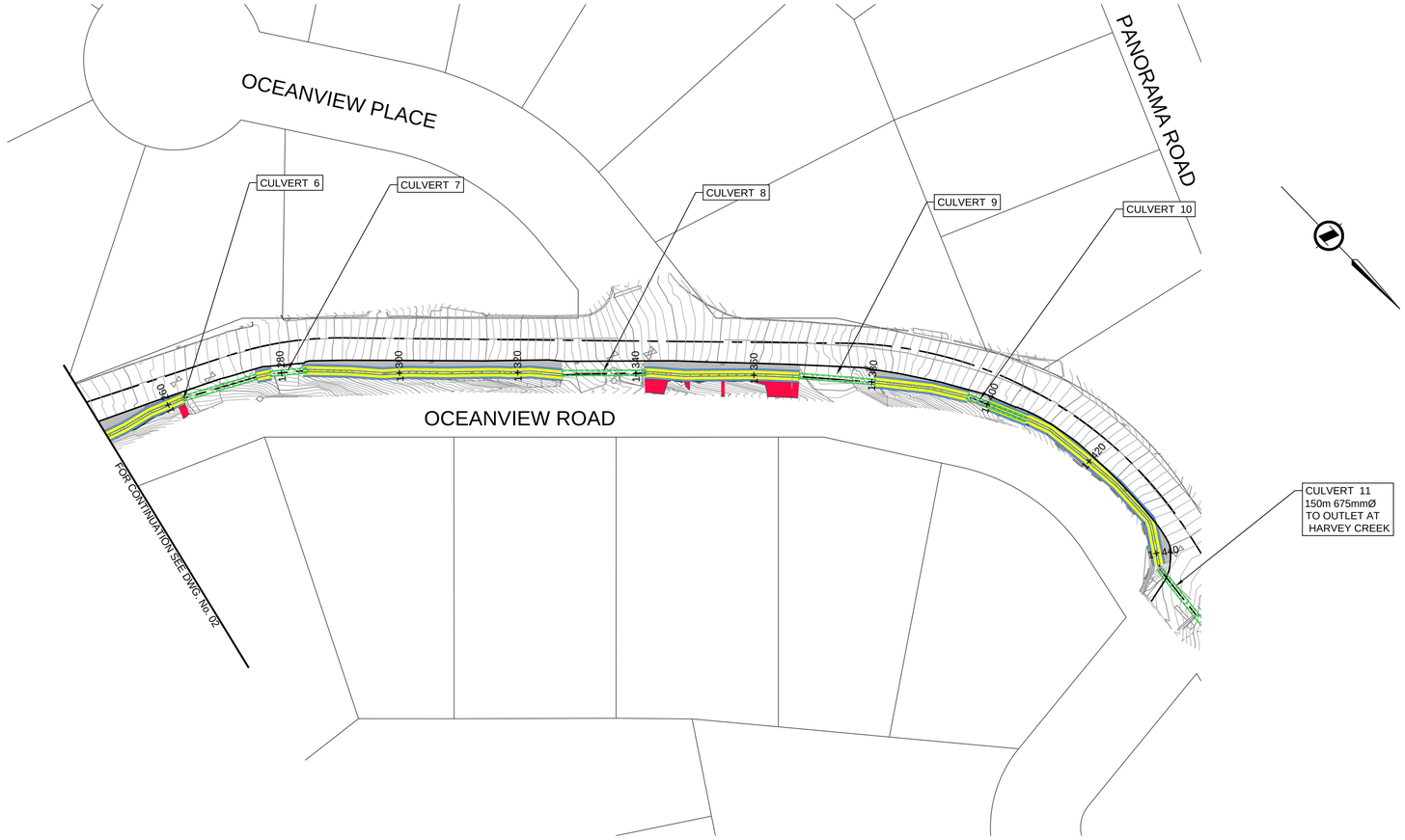

PLAN
SCALE 1:500

LEGEND

- SMART DITCH
- 19mm MINUS GRANULAR BASE
- CUT 2H:1V
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CUL 5	750	22.11	9.88%	137.769	135.585
CUL 6	675	12.97	12.15%	131.563	129.987
CUL 7	675	6.25	11.35%	129.664	128.955
CUL 8	675	14.19	12.64%	121.910	120.116
CUL 9	675	13.00	11.11%	116.278	114.834
CUL 10	675	10.62	13.53%	111.887	110.450
CUL 11	675	144.77	10.00%	105.884	91.407

NOTES:

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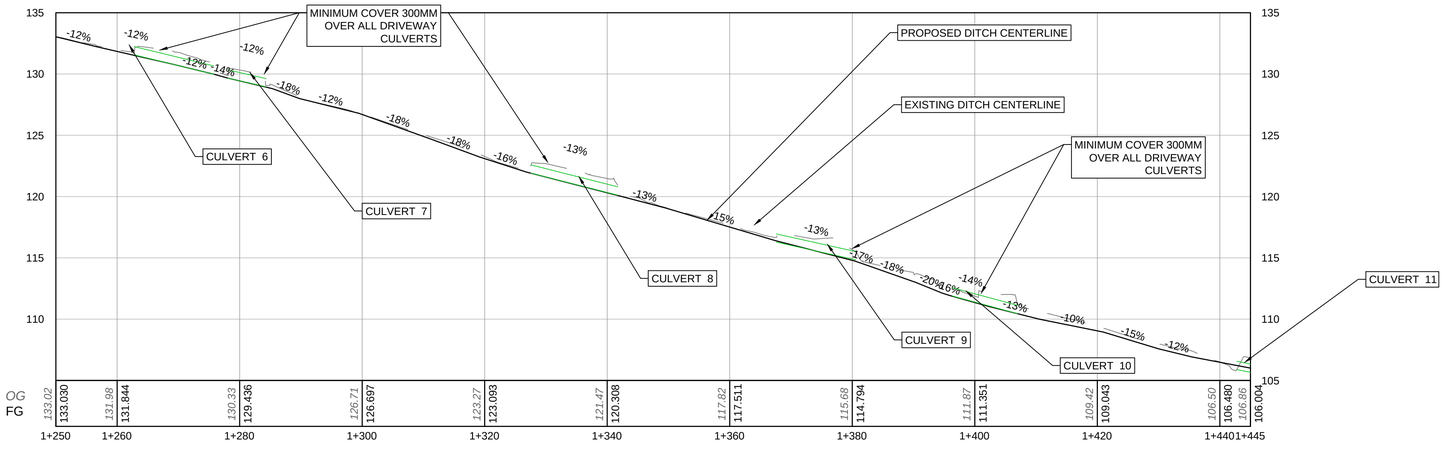
2. REINSTATE DRIVEWAY CROSSING TO MATCH EXISTING SURFACE



PROFILE
SCALE 1:500 H/ 1:250 V

1:500 0 10 30m

NOT FOR CONSTRUCTION

PRELIMINARY DESIGN

DESIGN NO. 32282

PLOT DATE: July 28, 2020

REV NO	REVISIONS	DATE	DRAWN	APPR'D
A	PRELIMINARY DESIGN	2020/07/13	DRM	ATB

ROAD WORKS

OCEANVIEW ROAD
1+240 TO 1+440

ISL
#503, 4190 Lougheed Hwy, Burnaby, B.C. V5C 6A8
T: (604)629-2690 F: (604)629-2698

SCALE	AS SHOWN	CREATION DATE	2020/07/13
DRAWN BY	DRM	DESIGN BY	ATB/GSH
CHECKED BY	ATB	APPROVED BY	ATB

DWG. NO. 3 OF 3

REV. A

File: G:\Projects\32000\32200\32282_VolB_Oceanview_Road_Drainage\02_CAD\20_Drafting\201_production\32282_Plan_profile.dwg