

REPORT TO MAYOR AND COUNCIL

PRESENTED: JULY 23, 2018 - REGULAR AFTERNOON MEETING
FROM: ENGINEERING DIVISION
SUBJECT: ELECTRIC VEHICLE CHARGING REQUIREMENTS

REPORT: 18-119
FILE: 5370-01

RECOMMENDATIONS:

That Council direct staff to conduct industry consultation on proposed amendments to Langley Zoning Bylaw 1987 No. 2500, to require mandatory minimum requirements for electric vehicle supply equipment in new residential construction, and bring forward an updated Bylaw to Council for consideration; and further

That Council direct staff to develop an Electric Vehicle Strategy that encompasses both community and corporate electric vehicle charging infrastructure plans, targets and policies.

EXECUTIVE SUMMARY:

In February 2018, Council directed staff to conduct research into practices of other jurisdictions and bring forward a report with a draft bylaw for Council's consideration with respect to provision of electric vehicle (EV) charging infrastructure as part of new residential developments.

Staff formed an internal working group with representation from Development Planning, Permit, Licence and Inspection Services, and Strategic Initiatives Departments to consider the provision of requiring EV charging infrastructure in new residential developments.

A draft bylaw for EV charging infrastructure in new residential developments has been prepared for Council's consideration. The draft bylaw amendment proposes changes to Section 107.3 Parking and Loading Requirements of Zoning Bylaw No. 2500. Staff propose that an energized outlet capable of providing level 2 charging or higher be required for one (1) parking space per dwelling unit in most residential uses. The amendment also proposes that Seniors' housing, community care facilities, and educational facilities where residential accommodations are provided on site will require energized outlets for a minimum of 20% of all parking spaces used by occupants or residents of dwelling units.

Adoption of an EV charging requirement in new residential construction directly supports the Township's policies, plans and commitments to the BC Climate Action Charter, Sustainability Charter, Green Communities Act, and the recent energy and climate updates to the OCP.

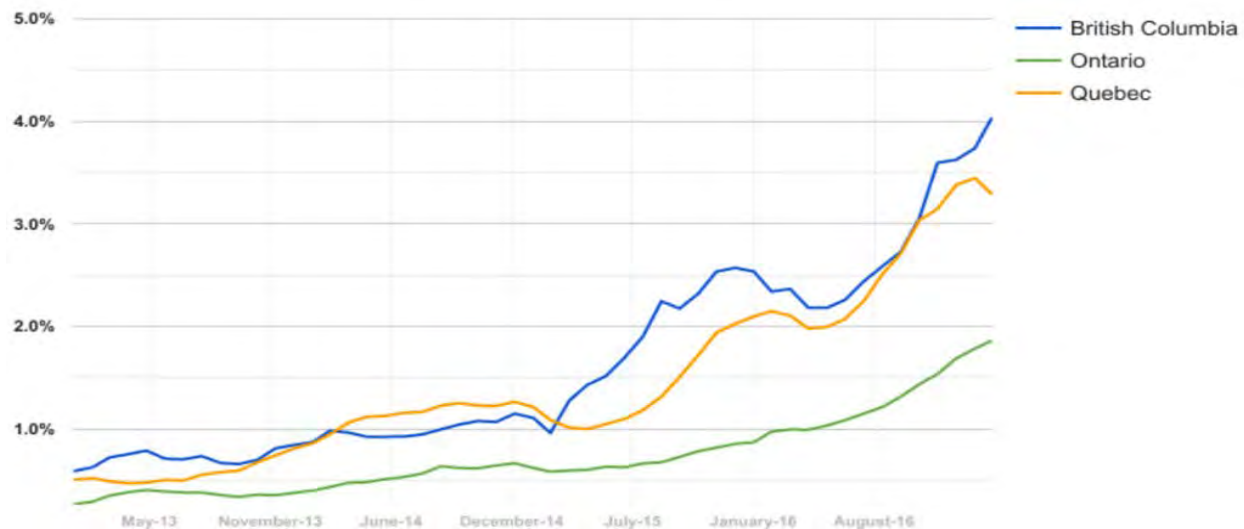
PURPOSE:

The purpose of this report is to obtain Council direction to pursue industry consultation on the proposed EV charging infrastructure requirements for new residential developments, and, to develop an Electric Vehicle Strategy to establish a framework to support a community-wide transition to electric vehicles.

BACKGROUND/HISTORY:

British Columbia has one of the highest electric vehicle adoption rates in North America. Anticipated growth in the EV sector creates a need to facilitate and encourage the development of a consistent and accessible network of EV charging infrastructure to users at home, at work, and in public spaces. In a recent report written by the Pembina Institute, it is estimated that in 20 years one in every three vehicles in BC will be electric. Figure 1 illustrates that as of June 2017, EVs comprised over 4% of passenger cars sold in BC.

Figure 1: EVs as a percent of passenger car sales in Canadian provinces (FleetCarma)



Vehicles represent over 55% of the Township's community emissions profile. Policies that facilitate the adoption of zero emission vehicles, like electric cars, can make a significant impact in the fight against climate change. A major challenge for adoption of these vehicles is ensuring that owners can access charging infrastructure. Adoption of an EV charging requirement in new residential development would support EV adoption and increase market penetration of EVs.

The Township's Sustainability Charter has several goals supporting expansion of electric vehicle supply equipment across the community. Some of these goals are as follows:

- To make innovative green investments in infrastructure;
- To provide safe and affordable transportation infrastructure;
- To promote energy efficiency in new and retrofitted buildings; and
- To provide leadership for sustainability practice and innovation.

The Township's Official Community Plan (OCP) Bylaw No. 5000 contains provisions relating to energy and climate action. A number of policies in the OCP are directly related to electric vehicles and charging stations expansion:

- Policy 3.16.8 suggests supporting the development of and increased access to reduced carbon fuel options such as natural gas, hydrogen, biofuels and electricity;
- Policy 3.16.15 suggests assessing interest in electric, hybrid, or alternative-fuel vehicles, and considering key locations for refueling/charging stations to meet demand; and
- Policy 3.16.16 suggests integrating support for electric vehicle charging infrastructure into relevant municipal development policies.

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At the 2015 UBCM convention, Township Council brought forward a resolution to add a green opt-in provision in the BC Building Code specifying mandatory minimum requirements for electric vehicle charging infrastructure in new construction of single and multi-family dwelling units (Attachment B). This resolution was defeated. The resolution, along with other local government inquiries, led the Province to release a publication entitled “Changes for Local Governments Under Section 5 of the Building Act.” In this publication, the Province indicates that EV Charging Infrastructure requirements are outside the scope of the *Building Act* and can therefore be regulated by local governments to the extent they have authority to do so.

The Township has made significant efforts to improve the availability of public charging stations in the community. In 2013, the Township successfully deployed its first wave of electric vehicle charging stations. Six level 2 stations were deployed in strategic areas across the community to offer complimentary charging for residents and to serve Township staff and fleet electric vehicles. In 2016/2017 the Township added two additional level 2 stations to its municipally-owned EV charging network. In the last year, these level 2 charging stations have dispensed over 40 MWh of electricity to EVs, which is the equivalent of 20,000L of gasoline or \$30,000 in fuel costs to drivers. The alternate clean fuel has resulted in the avoidance of over 40,000 kg of greenhouse gas emissions from entering the atmosphere.

In addition to operating level 2 stations, the Township also became home to one of the Province’s first electric vehicle DC Fast Charger (DCFC) stations at the Langley Events Centre (LEC). This station can fully charge an EV in less than 30 minutes and is part of the Province’s “green highway” across BC. This initiative was funded by the Province, managed by BC Hydro, and the charging station is now operated by the Township of Langley. Due to its high use, BC Hydro is considering adding an additional DCFC at the LEC.




Over the last year, in support of corporate efforts to adopt alternative fuel vehicles, the Township added two fully electric vehicles to its fleet in the place of conventional gasoline powered vehicles.

DISCUSSION/ANALYSIS:

Access to home charging is essential for EV drivers as it is the most convenient and reliable option to charge. EV charging can be installed for relatively low cost at time of construction as opposed to subsequent retrofitting of existing buildings.

There are different levels of EV charging. Due to the larger battery sizes of emerging EV models, it is believed that level 1 charging is an insufficient level of charging. Level 2 charging is widely considered to be the most appropriate level of charging for at home use. Table 1 below describes the three levels of EV charging.

Table 1: EV Charging Levels

Level 1	Level 2	Level 3 - DCFC
120V Same as a regular house plug	240V Requires a dedicated circuit (same as a clothes dryer)	200-500V
8-12 hours for a full charge	3-8 hours for a full charge	15-40 minutes for a full charge
		

Jurisdictional Review

Table 2 summarizes current EV charging requirements of other local governments in the Metro Vancouver Region. Other jurisdictions not listed below, City of Surrey, Fraser Valley Regional District, etc. are also in the process of examining EV charging requirements for new developments.

Table 2: Review of other municipal EV charging requirements

	Single family, duplex	Multi-family	Commercial
Richmond	100% of residential stalls (Level 2)	100% of residential stalls (Level 2)	None
Port Coquitlam	"Roughed in" charging infrastructure (Level 2) for 100% of units	"Roughed in" charging infrastructure (Level 2) for 100% of units	"Roughed in" charging infrastructure (Level 2) for 100% of units
Burnaby	100% of residential stalls (Level 2)	100% of residential stalls (Level 2)	None
Vancouver	100% of homes (Level 2)	100% of stalls (Level 2)	10% of stalls (Level 2)
North Vancouver (City)	Capacity for 100% of spaces (Level 2)	20% of stalls (Level 2); capacity for remaining 80%	None
North Vancouver (District)	None	20% of stalls (Level 1); conduit for 100%	10% of stalls (Level 2)

Proposed Draft Zoning Bylaw Amendment

A draft amendment to Zoning Bylaw 1987 No. 2500 is provided as Attachment A to this report. Further refinements to the bylaw will be considered following consultation with industry stakeholders. Staff propose that an energized outlet capable of providing level 2 charging or higher will be required for 1 parking space per dwelling unit in most residential uses. Seniors' housing, community care facilities, and educational facilities where residential accommodations are provided on site will require energized outlets for a minimum of 20% of all parking spaces used by occupants or residents of dwelling units.

EV charging requirements would become effective for building permits issued six months after the adoption date of the bylaw. A six month grace period has been drafted into the bylaw language in order to accommodate in-stream building applications that may have more difficulty adjusting the design of their parking areas or electrical components. EV charging requirements are not applicable to permits for replacement mobile homes, but will be applicable to permits for mobile homes in new mobile home parks.

Industry Costs

The installation of a fully energized outlet at time of new construction is much more cost effective than retrofitting EV charging infrastructure into existing buildings. A number of costing studies have been conducted by other local governments to realize the potential cost increases for developers to provide EV charging infrastructure in multi-family buildings, townhomes and single-family homes.

Costs for multi-family buildings will range from \$1500-\$2500 per stall to deploy an energized outlet capable of level 2 charging. Costs depend on the size of the building and therefore size of the electrical system required, building layout, and number of units. Staff have consulted with a current builder who has been voluntarily installing energized outlets for EV charging in multi-family buildings in the Township for over five years. This builder spends an additional \$2000/unit.

Costs for townhomes and single-family homes will range from \$500-\$2000 per stall to deploy an energized outlet capable of level 2 charging. Costs depend on the size of the building and size of the electrical system required, building layout, and number of units. These building archetypes require 2 to 2.3 parking spaces per dwelling unit, the draft EV requirement bylaw suggests only requiring an energized outlet for 1 parking space per dwelling unit.

EV Energy Management Systems

The Township can also work with industry to explore the application of energy management systems in multi-family developments to help further reduce the costs of EV infrastructure. Recently, there have been changes in the Canadian and BC Electric Codes that now enable EV Energy Management Systems. EV Energy Management Systems refers to technology that services and controls the rate and timing of EV charging. The advancement of these technologies allow multiple EVs to charge simultaneously on one dedicated electrical circuit. The application of these technologies will be useful for EV charging requirements in multi-family buildings, as they will significantly reduce the costs of providing EV charging infrastructure as they reduce the size of the building electrical systems that must be installed.

Staffing Resources

The adoption of an EV charging bylaw for new residential construction will be administered with current staffing levels in the Permit, Licence, and Inspection Services (PLI) and Development Planning departments.

Industry Consultation

Should Council support the report recommendations, staff would conduct consultation with local industry and stakeholders on the proposed draft bylaw amendment and future EV considerations and return to Council with an updated Zoning Bylaw 1987 No. 2500 for Council's consideration.

FUTURE CONSIDERATIONS:

EV Strategy

The integration of EV infrastructure into a community requires an understanding of the building archetypes, existing EV charging networks, EV adoption rates, resident charging needs and policy options. Should Council support the report recommendations, staff would develop an EV Strategy that encompasses both community and corporate electric vehicle charging infrastructure plans, targets and policies for Council's consideration.

A review of EV infrastructure needs to be conducted to ensure the Township can appropriately support the transition to electric vehicles in the community.

EV Charging in Commercial and Industrial Applications

Access to workplace charging is also essential to EV uptake. Currently, very few local governments have requirements for EV charging infrastructure in commercial and industrial buildings as it is more complex compared to residential development. The private sector also faces more challenges in providing EV chargers under the BC Utilities Commission (BCUC) compared to local governments.

Private businesses operating EV chargers are not able to sell electricity for a fee without an exemption or approval from the BCUC. Local governments do not face these same limitations; this disincentivizes the private sector from installing EV chargers as their cost recovery and positive return on investment is not met. There is currently a BCUC inquiry into the regulation of electric vehicle charging service. The BCUC's independent inquiry will explore the potential regulatory issues, including the level of regulation necessary (if any) in the EV charging stations market, the rates for EV charging service, and any other matters that should be considered by

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the BCUC. If the BCUC begins to allow private businesses to recover costs from EV charging infrastructure, widespread EV infrastructure deployment will be realized.

Further review and stakeholder consultation is required prior to advancing specific policies regarding EV infrastructure requirements in the commercial/industrial sector.

EV Charging in Public Applications

Public charging can help fill in the day-to-day needs of EV drivers, and contribute to the widespread adoption of EVs. The Township's municipally-owned EV charging network is extensively used by the public but still requires expansion to all areas of the community. Through the EV Strategy staff will review the Township's role in this service area including fees for charging, possible partnerships, cost considerations and network expansion.

Township Fleet

As part of the Strategic Energy Management Plan, adopted by Council in 2016, the Township has established sustainable fleet objectives, including: converting 50% of the passenger fleet to EVs by 2026. To ensure these targets are realized, staff would include a fleet review as part of the EV Strategy.

Respectfully submitted,

Tess Rouse
Community Energy Manager
for
ENGINEERING DIVISION

This report has been prepared in consultation with the following listed departments.

CONCURRENCES	
Division / Department	Name
Community Development Division	R. Knall & R. Baker

ATTACHMENT A Draft Amendment to Langley Zoning Bylaw 1987 No. 2500

ATTACHMENT B UBCM Resolution: Charging Infrastructure for Electric Vehicles

**THE CORPORATION OF THE TOWNSHIP OF LANGLEY
TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500
AMENDMENT (ELECTRIC VEHICLE CHARGING)
BYLAW 2018 NO. _____**

EXPLANATORY NOTE

Bylaw 2018 No. _____ amends the Zoning Bylaw by incorporating provisions related to electric vehicle charging for residential uses.

DRAFT

THE CORPORATION OF THE TOWNSHIP OF LANGLEY
TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500
AMENDMENT (ELECTRIC VEHICLE CHARGING)
BYLAW 2018 NO. _____

A Bylaw to amend Township of Langley Zoning Bylaw 1987 No. 2500

WHEREAS it is deemed necessary and desirable to amend “Township of Langley Zoning Bylaw 1987 No. 2500” as amended;

NOW THEREFORE, the Municipal Council of the Corporation of the Township of Langley, in Open Meeting Assembled, ENACTS AS FOLLOWS:

1. This Bylaw may be cited for all purposes as “Township of Langley Zoning Bylaw 1987 No. 2500 Amendment (Electric Vehicle Charging) Bylaw 2018 No. _____.”
2. The “Township of Langley Zoning Bylaw 1987 No. 2500” as amended is further amended

(1) By amending “Section 102 – Definitions” by inserting the following definitions

“**EV (ELECTRIC VEHICLE)**” means a *vehicle* that uses electricity for propulsion, and can use an external source of electricity to charge the *vehicle*’s batteries.

“**ELECTRIC VEHICLE ENERGY MANAGEMENT SYSTEM**” means a system to control *electric vehicle* supply equipment electrical loads comprised of monitor(s), communications equipment, controller(s), timer(s) and other applicable devices.

“**ELECTRIC VEHICLE SUPPLY EQUIPMENT**” means a complete assembly consisting of conductors, connectors, devices, apparatus, and fittings installed specifically for the purpose of power transfer and information exchange between a branch electric circuit and an *electric vehicle*.

“**ENERGIZED OUTLET**” means a connected point in an electrical wiring installation at which current is taken to supply utilization equipment.

“**LEVEL 2 CHARGING**” means a Level 2 electric *vehicle* charging level as defined by SAE International’s J1772 standard.

(2) By amending “Section 107.3 – Required Off Street Parking Spaces” by adding the following text after the first paragraph, immediately before the table of uses and parking requirements:

Parking spaces with *EV* charging requirements, excluding visitor parking spaces, shall feature an *energized outlet* capable of providing *Level 2 Charging* or higher to the parking space.

Where an *electric vehicle energy management system* is implemented, the General Manager of Engineering and Community Development may specify a

minimum performance standard to ensure a sufficient rate of *electric vehicle* charging.

Parking spaces with *EV* charging requirements shall have *energized outlets* labelled for their intended use for *electric vehicle* charging.

- (3) By adding a column headed "EV CHARGING REQUIREMENTS" to the right of the column headed "PARKING REQUIREMENTS" in Section 107.3 a) Residential Uses and in Section 107.3 b) Institutional Uses
- (4) By inserting in Section 107.3 a) the words "1 space per dwelling unit" in the column headed "EV CHARGING REQUIREMENTS" for:
 - i) *single family dwellings, two family dwellings, mobile homes, mobile homes as temporary accessory dwellings*
 - ii) *townhouses*
 - iii) *apartments*
 - iv) *dwelling units* as part of a commercial or industrial *building*
- (5) By inserting in Section 107.3 a) the words "A minimum of 20% of all parking spaces used by occupants or residents of *dwelling units*" in the column headed "EV CHARGING REQUIREMENTS" for:
 - v) *seniors' housing*
- (6) By inserting in Section 107.3 b) the words "A minimum of 20% of all parking spaces used by occupants or residents of *dwelling units*" in the column headed "EV CHARGING REQUIREMENTS" for:
 - ii) *community care facilities* excluding *seniors' housing*
- (7) By inserting in Section 107.3 b) the words "Where residential accommodations are provided on site, a minimum of 20% of all parking stalls used by occupants or residents of *dwelling units*" in the column headed "EV CHARGING REQUIREMENTS" for:
 - iii) *educational uses*: kindergartens, elementary schools and *group children's day care*, secondary schools and other higher education
- (8) By inserting in Section 107.3 a) the words "Not Applicable" in the column headed "EV CHARGING REQUIREMENTS" for:
 - vi) *accessory home occupation*
- (9) By inserting in Section 107.3 b) the words "Not Applicable" in the column headed "EV CHARGING REQUIREMENTS" for:
 - i) *assembly uses*, excluding *educational uses*

Bylaw No. _____
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- iv) government institutional *buildings*
- v) recreational *uses* and facilities including commercial recreational *uses*

3. This bylaw is to come into force and take effect on _____ (bylaw adoption date). Complete and valid building permit applications, submitted prior to the date of adoption of this bylaw are exempt from the EV Charging Requirements provisions in Section 107.3 provided that the building permit is issued by _____ (6 months after bylaw adoption date).

READ A FIRST TIME the	day of	, 2018.
READ A SECOND TIME the	day of	, 2018.
PUBLIC HEARING HELD the	day of	, 2018.
READ A THIRD TIME the	day of	, 2018.
RECONSIDERED AND ADOPTED the	day of	, 2018.

_____ Mayor _____ Township Clerk

UBCM RESOLUTIONS COMMITTEE COMMENTS:

The Resolutions Committee advises that the UBCM membership has not previously considered a resolution that requested the provincial government to rescind Order in Council No. 148 related to the removal of lands within the Site C reservoir from the Agricultural Land Reserve (ALR).

The Committee notes that in 2013, members considered but did not endorse resolution B109 which sought to simplify the procedure and reduce time lines for processing local government applications for removal of land from the ALR. Prior to that, in August 2010, UBCM made a presentation to the Agricultural Land Commission Review Panel, articulating a number of relevant policy positions adopted by the UBCM membership, including:

- *support for targeted reviews with local government input;*
- *broad overall support for retaining the ALR and ensuring that it captures agricultural land;*
- *the need to balance any changes to the ALR with the commitments of local governments under the Climate Action Charter; and*
- *acknowledgment that there is a lack of resources currently to support the ALR.*

Conference decision:

Selected Issues

B100 CHARGING INFRASTRUCTURE FOR ELECTRIC VEHICLES

Langley Township

WHEREAS electric vehicles significantly reduce green house gases (GHGs) emitted to the atmosphere and the adoption of electric vehicles is dependent upon the availability of electric vehicle infrastructure;

AND WHEREAS there are currently no provisions in the Green provisions of the BC Building Code or local zoning bylaws for electrical supply points for electric vehicles and it is costly to retrofit electrical supply points for electric vehicles, as well as to retrofit electrical conduit or cable in buildings or on properties that have already been constructed or developed:

THEREFORE BE IT RESOLVED that UBCM request that the Government of British Columbia consider an addition to the Green (opt-in) provisions of the BC Building Code to provide:

- a. For a rough-in electrical raceway or cable, and electrical panel capacity to accommodate a future level 2, minimum 40 amp electrical circuit for each dwelling unit of one and two family buildings that have parking spaces; and
- b. That each one of twenty per cent of the parking spaces that are required for use by owners or occupiers of dwelling units in multiple family buildings be provided with a roughed-in electrical raceway or cable, electrical panel capacity and sufficient space in the electrical room to accommodate a future level 2, minimum 40 amp electrical circuit and that the electrical room shall include equipment space and panel capacity for 100 per cent of the required resident spaces;

AND BE IT FURTHER RESOLVED that UBCM request that the Government of BC consider a revision to Part 26, Section 906(1)(a) of the *Local Government Act* to “provide spaces and charging infrastructure for use by plug-in electric vehicles,” and a revision to Section 906(1)(b) to include “designation” of the parking spaces.

NOT PRESENTED TO THE LOWER MAINLAND LOCAL GOVERNMENT ASSOCIATION

UBCM RESOLUTIONS COMMITTEE RECOMMENDATION: **No Recommendation**

UBCM RESOLUTIONS COMMITTEE COMMENTS:

The Resolutions Committee advises that the UBCM membership has not previously considered a resolution requesting the provincial government to amend the Green (opt-in) provisions of the BC Building Code, as well as Sections 906(1)(a) and (b) of the Local Government Act, to provide for rough-in infrastructure and capacity for charging electric vehicles.

See also resolution C35.

Conference decision:

B101 SUPPORT FOR PRIORITIZING OF RESOLUTIONS AKBLG Executive

WHEREAS the number of resolutions endorsed by the membership of the local government area associations and UBCM is very large and without ranking or prioritization and results in a large list of resolutions which can in some cases be ignored by the provincial government and is difficult for various executives to take actions on;

AND WHEREAS often the less important resolutions without clear recommendations for support receive the most debate and media attention:

THEREFORE BE IT RESOLVED that the AKBLG encourage other BC area associations and the UBCM to implement a prioritizing practice into their resolutions process.

ENDORSED BY THE ASSOCIATION OF KOOTENAY AND BOUNDARY LOCAL GOVERNMENTS

UBCM RESOLUTIONS COMMITTEE RECOMMENDATION: **No Recommendation**

UBCM RESOLUTIONS COMMITTEE COMMENTS:

The Resolutions Committee notes that this resolution from the AKBLG Executive is encouraging UBCM and other Area Associations to implement a prioritizing practice into their resolutions process, similar to AKBLG Executive. UBCM members have considered a number of resolutions related to the resolutions process and specifically prioritization of resolutions.

The Committee would note that a resolutions process review was initiated by resolution 2008-B137, which requested that each Area Association prioritize and submit their top 5 resolutions for debate at Convention; that the UBCM Executive bring forward a maximum of 25 member resolutions for debate at Convention; and that UBCM develop a tracking system for resolutions.