

Considerations and Implications for EV Charging Stations in Saskatoon

1. Choosing Locations

The University of British Columbia has developed a charging location framework for guiding provinces, utilities, and municipalities in how to site and stage charging infrastructure. They recognize that priorities shift as EV adoption increases:

At the beginning of the process, the primary objective is to enhance visibility of the EV charging stations to introduce public confidence, reduce range anxiety, and show support for the EV.

Subsequently, more objectives come into play to bolster consumer confidence through the reliability and affordability of the network. As the continuing good faith of early adopters will be crucial to promoting ongoing adoption, it may be important to prioritize stations that serve high concentrations of early adopters. As the network matures, full functionality, distributed throughout a cluster, will become the goal.¹

When determining where to install chargers for Saskatoon's first public charging pilot, the Administration looked for sites with the following requirements:

- Highly visible;
- Close to amenities such as shopping, Transit or walking/biking infrastructure, recreation, and/or civic services;
- Safe and well-lit;
- Adequate space for charger and electrical trenching; and
- Adequate electrical capacity.

Other factors, while not requirements, were considered important:

- Try to minimize conflicts with other parking constraints, at least during the pilot project by not choosing locations with very high demand for parking. Risk that the demand for the EV charger may be low and spots are often unoccupied.
- At a minimum, require payment for parking if on-street or other paid lot.
- Institute time limits (for example 3 hours) with signage and enforcement to ensure numerous users can have access to the stations and stop users from leaving their vehicle their all day or all night.
- Do not allow non-EV's to use the spots, using signage and enforcement to reduce use by non-EV's.
- Do not allow City fleet vehicles to use public chargers as this could be negatively perceived by the public wanting to use the chargers. The City should install specific chargers for its fleet.

¹ <http://blogs.ubc.ca/tipslab/files/2019/01/Deploying-Staging-and-Citing-EVFC.pdf>

- Provide adequate signage and associated marketing/education to ensure users know how to find and use the chargers.
- At pilot stage – look for locations that the City owns, meet requirements, mitigate risks, and can readily be installed.

A list of possible locations was brainstormed through discussions with internal and external stakeholders that met the above factors and requirements, including:

- Leisure Centres
- Libraries
- On-street parking
- TCU Place, Remail Art Gallery
- Private lots and businesses

Leisure Centres were chosen to host the pilot charging stations since they have land owned by the City, generally have adequate free parking, and provide access to many nearby amenities. Of all the Leisure Centres considered, Lakeview and Lawson were seen to have the least parking constraints. Other benefits of these sites include:

- Within walking distance of many amenities including:
 - Lawson – pool, gym, workout facilities, library, soccer centre, shopping, and transit;
 - Lakewood – pool, gym, workout facilities, recycling depot, BMX track, walking trail, golf dome, golf course, and transit;
- Close to many multi-unit residences, which may face barriers to at-home charging depending on their building;
- No other public charging stations nearby (see Figure 1); and
- Electrical and space capacity was assessed to be sufficient; cost of install was reasonable (\$8,000-\$10,000 per site).

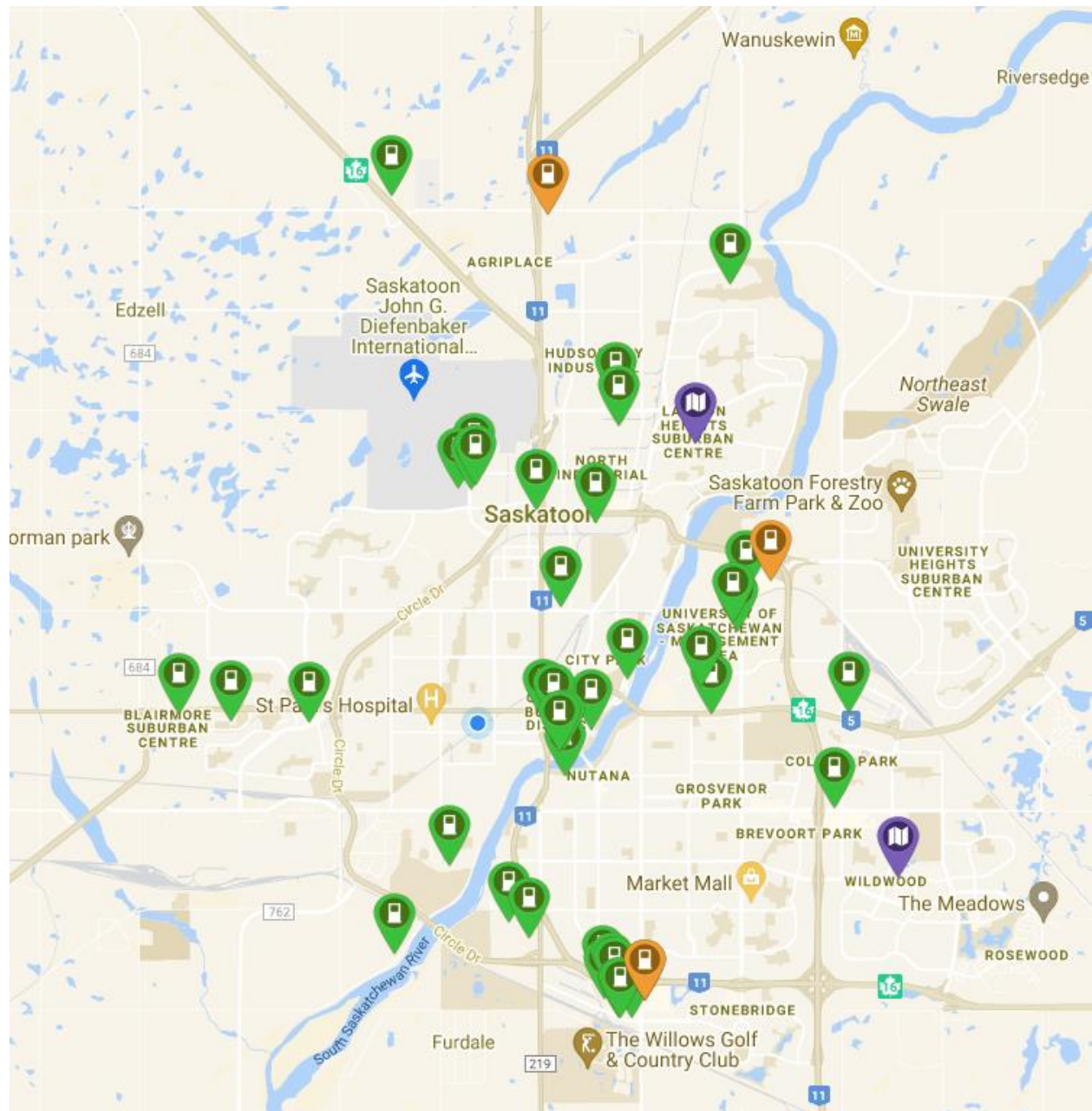


Figure 1. Plugshare map of charging infrastructure in Saskatoon as well as Lakewood and Lawson Civic Centres (purple pins). Source: Plugshare.com

A Request for Information was issued to look for private businesses that would be interested in partnering on charging infrastructure, for instance by installing chargers on private property, but no partners were identified through this process. Given the lack of response, City-owned land was determined to be a higher priority than continuing to look for a partner to supply a location (note that much of this is happening without City involvement). On-street parking was also considered but was ruled out for the pilot due to high-demand of most parking causing additional conflict, more challenges with install,

and that sites already have parking charges. Libraries and the Remai Art Gallery were also seen to be strong candidates for future charging infrastructure.

2. Financial Implications for 2-Year Charging Infrastructure Pilot

Capital Costs

Capital costs such as staff time, communications, the chargers, and installation are the same for all the options presented in the report.

The total cost of the capital project, including operational costs with no cost-recovery fees, is expected to be between \$117,200 and \$122,800.

Table 1: Capital and Operating Cost Summary

	Costs
Staff	\$60,000
Communications	\$7,000
Chargers and install	\$35,000
Electricity and PowerTec Fees	\$17,200 to \$22,800
Total	\$117,200 to \$122,800

There is sufficient funding available for the proposed pilot. Project P.01957.01 received \$100,000 in funding during the 2020-2021 Budget. In 2022, \$175,000 for EV Adoption Roadmap, Infrastructure & Charging was approved.

Should City Council choose not to subsidize electricity and powertec fees, the EV Adoption Roadmap, Infrastructure and Charging project work scope will be adjusted.

Station Usage

Station usage is challenging to estimate because there are few electric vehicles in Saskatoon. According to check-ins on Plugshare, Preston Crossing is the most used station, and is used approximately 3 times per month. However, actual usage may be higher as use of Plugshare is voluntary.

A survey completed by SaskPower² indicated that home charging is the most common place where EV users plug in their vehicles, and that they use public stations approximately 9 times per year. With more charging infrastructure, drivers without consistent access to at-home charging will be able to rely on public charging and could confidently make the switch to EVs, thus increasing public charging station usage. Given the uncertainty, administration used a wide range of usage estimates from each station being used once per month to each station being used for 3 hours daily.

² SaskPower, the Saskatchewan Electric Vehicle Association (SEVA), and the SaskEV Society (Saskatoon) surveyed 121 electric vehicle drivers in Saskatchewan between July 23 to August 4, 2020; results provided to City of Saskatoon.

Operating Costs and Revenues

Table 2 shows the operating costs which include electricity and fixed fees charged by the supplier (PowerTec). Revenue estimates are based on three potential rates – fully subsidized, \$2/hour, and \$4/hour for the three usage scenarios as well as the net costs for each scenario and rate. Revenue estimates have been reduced by 10%, as this is the amount session fees are charged by ChargePoint, the service application provider, in exchange for its collection and processing of session fees on behalf of the City.

Over two years, fully subsidized charging is expected to have a net cost between \$17,200 and \$22,800, \$2/hour rate is estimated cost between \$5,500 to \$11,300 and a \$4/hour rate could cost \$16,800 or generate a surplus of \$11,800.

Ongoing staff costs are not included in the 2-year pilot. Staff costs are anticipated to be covered by operational funding.

Table 2. Two-year total (4 ports) usage and operating costs

	Low	Moderate	High
Usage			
Expected usage per port	1 hour per month	3 hours, 15 days per month	3 hours, 30 days per month
Total hours (4 ports) for two years	96	4320	8640
Operating Costs			
PowerTec Fees	\$4,800	\$4,800	\$4,800
Electricity	\$12,400	\$15,200	\$18,000
Total Operating Cost	\$17,200	\$20,000	\$22,800
Revenues*			
Free	(\$180)	(\$7,830)	(\$15,570)
\$2/hour	(\$360)	(\$15,660)	(\$31,140)
\$4/hour			
Net Cost or (Surplus)	\$17,200	\$20,000	\$22,800
Free	\$17,020	\$12,170	\$7,230
\$2/hour	\$16,840	\$4,340	(\$8,340)
\$4/hour	(\$180)	(\$7,830)	(\$15,570)

*10% of session fees are charged by ChargePoint, the service application provider, in exchange for its collection and processing of session fees on behalf of the City.