ATTACHMENT – 5

PARKING AND TRANSPORTATION IMPACT ASSESSMENT

3

PARKING OPTIONS

3.1 COUNCIL MOTION REGARDING PARK SPACE

In July 2017, a traffic impact analysis was undertaken identifying an anticipated demand of between 90 and 140 parking stalls for the program within the facility, based on projected growth in patrons, a staff and patron survey and a study of other facilities around the Capital Regional District. In keeping with this projection, a surface parking lot with approximately 100 parking stalls as accommodated on the site, which was anticipated to not add a parking burden to the adjacent neighbourhoods.

In July 2018, Victoria City Council passed a motion requiring the Project Team to ensure “no net loss of park space” due to the configuration of the new facility. This implied that the footprint (building, parking & hardscape) of the new facility had to be accommodated within an area equivalent to the park space disturbed by the existing facility. To maintain the program within the new facility, this required a significant reduction in surface parking and the development of new strategies to accommodate anticipated demand.

Based on this motion, a detailed study was undertaken to review other options to accommodate the amount of parking anticipated for the new facility. This process included input from HCMA and City staff along with structural, civil and traffic consultants.

Watt Consulting Group, Traffic Consultants for the project, consolidated all inputs into a multi-criteria analysis that reviewed each option with respect to the following key parameters that were developed in consultation with City staff.

- IMPACT TO NEIGHBOURHOOD - Defined as [a] the anticipated traffic impact of vehicles circulating the neighbourhood searching for parking, [b] the potential for new vehicles to impact the ability for others to access parking in the neighbourhood, and [c] impact to the boulevard in terms loss of trees and green space.
- USER EXPERIENCE - Defined as [a] the overall ability to access the recreation centre from the parking option location, [b] the ability for the patron to find an available parking space [c] impacts to social / economic equity and [d] the proximity to the front door of the recreation centre.
- FINANCIAL IMPACTS - Defined as the estimated capital and operational costs associated with each parking option.

The complete report compiled by Watt Consulting Group has been included n section 4 of this report.

3.2 PARKING OPTIONS

Three new options were reviewed as part of the multi-criteria analysis and these were compared to the existing strategy of the surface parking lot on the project site.

Distributed On -Street Parking in the Neighbourhood
This strategy involves accommodating parking overflow from the reduced on site parking lot on adjoining streets within a 5 minute walk from the new facility. A review of parking opportunities on adjoining streets conducted by Watt Consulting and City staff determined that approximately 64 additional spaces could be accommodated. This option has a high impact on surrounding neighbourhoods, the lowest user experience and low cost to build and operate.

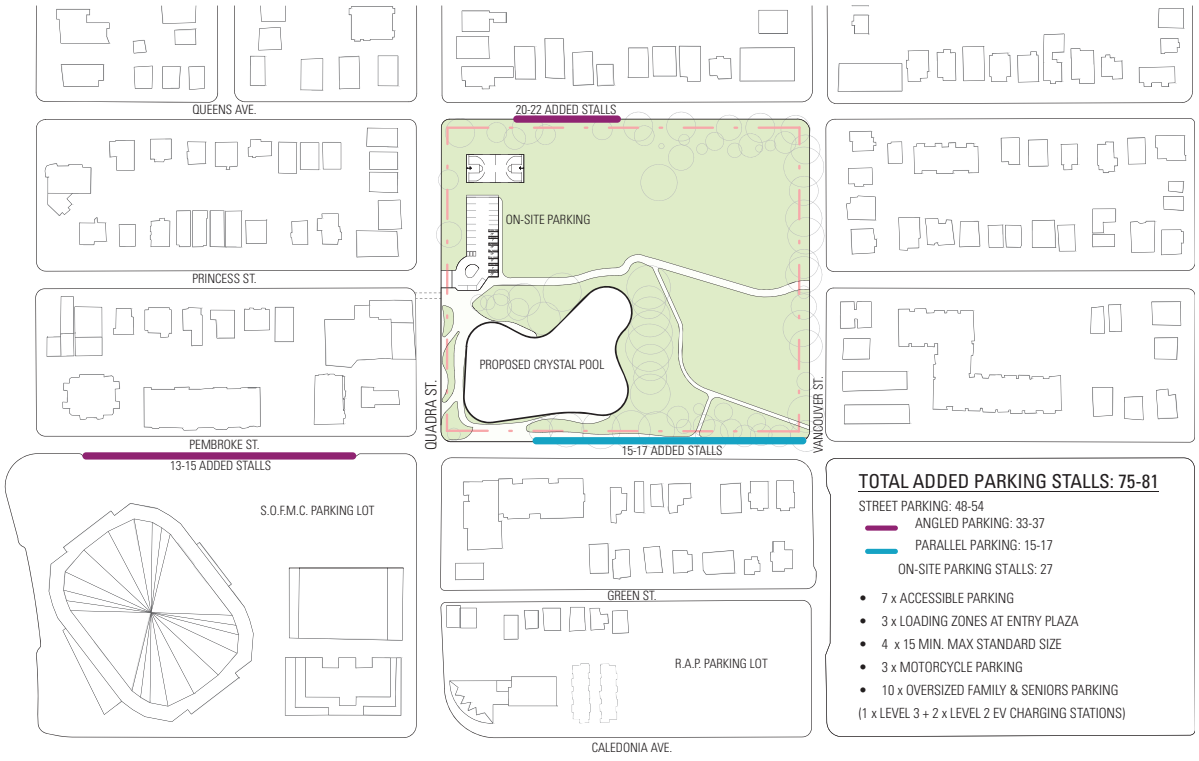

FIGURE 17: Distributed On-Street Parking in the Neighbourhood

On-Site Underground Parking

This option accommodates approximately 120 parking stalls within an underground parkade located on the site. The parkade includes a green roof that allows park space to be constituted over it, thus allowing the required number of stalls to be accommodated on site while meeting the Council directive. This option has a moderate impact on the surrounding neighbourhoods, moderate user experience and high cost to build and operate.

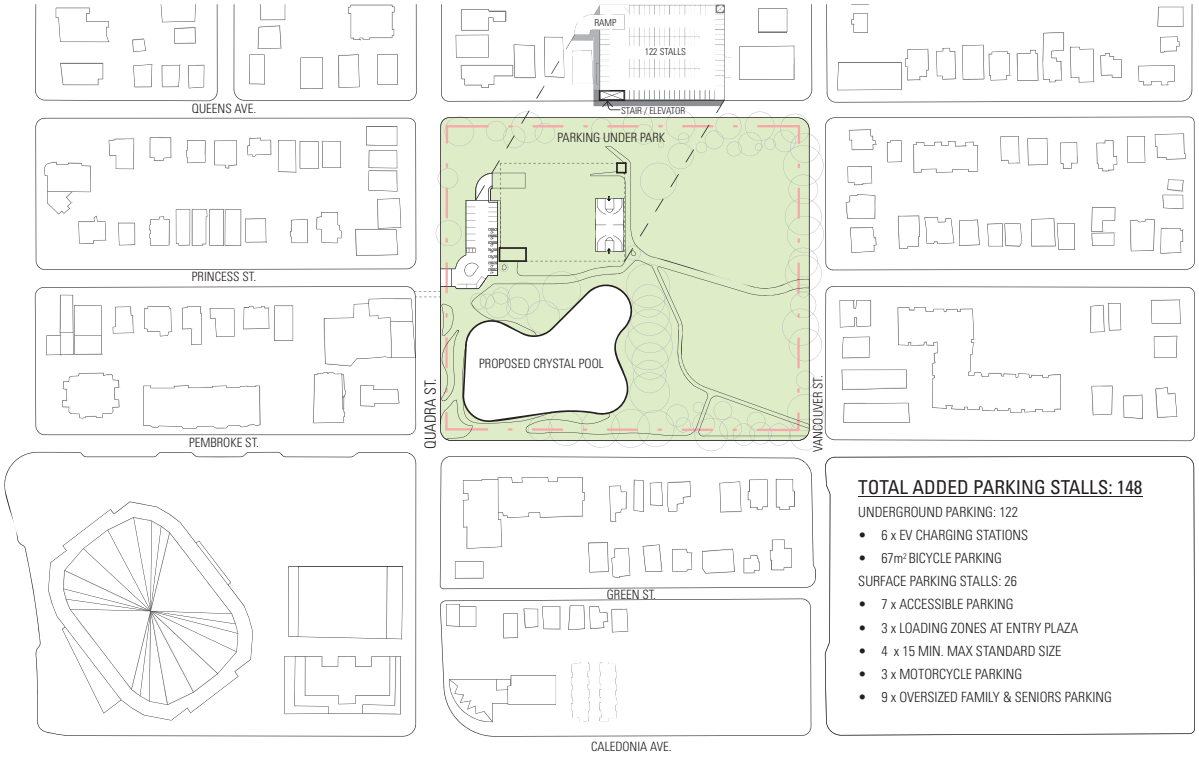

FIGURE 18: On-Site Underground Parking

Modular Parking at Save on Foods Memorial Centre

This option includes the construction of a temporary modular parking tier over existing surface parking within the surface lot at the Save on Foods Memorial Centre that would accommodate approximately 130 parking stalls. This option was considered to have a moderate impact on adjacent neighbourhoods, moderate user experience and high capital and operational costs.

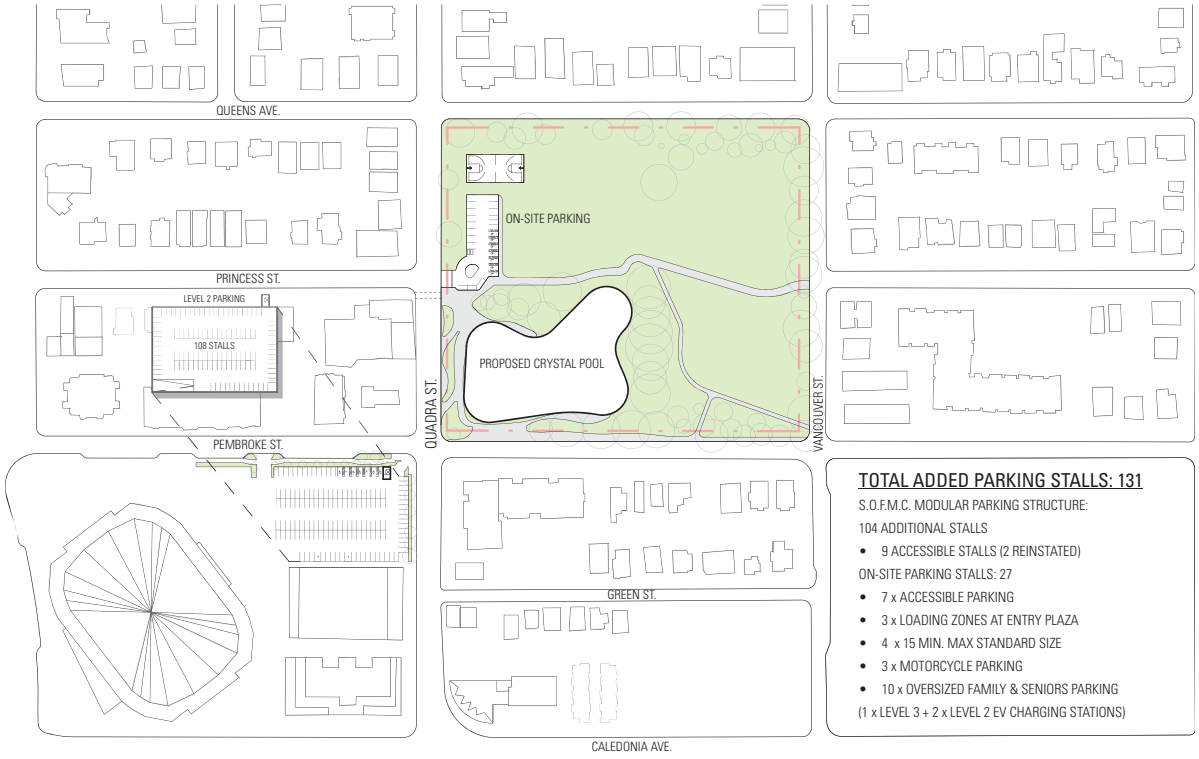

FIGURE 19: Modular Parking at Save on Foods Memorial Centre

On-Site Surface Parking

As a point of comparison, the existing option of accommodating between 95 and 105 parking stalls in a surface parking lot on site was reviewed. This option has the lowest impact to the surrounding neighbourhoods, best user experience and lowest capital and operational costs.

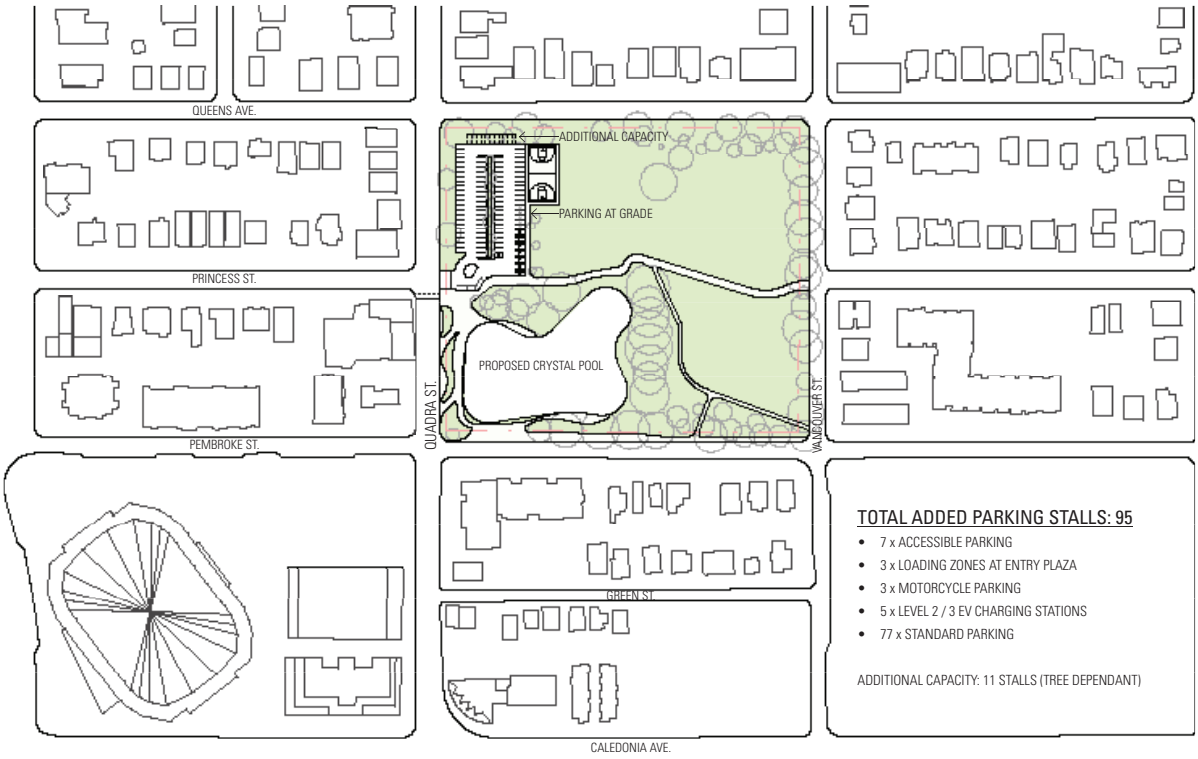

FIGURE 20: On-Site Surface Parking

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MEMORANDUM

To:	**Derrick Newman, City Of Victoria**
From:	Dan Casey, Tim Shah, & Nadine King
Our File #:	2354.B01
Project:	Crystal Pool + Wellness Centre Replacement
Date:	August 24 2018
RE:	**CRYSTAL POOL PARKING AND TRAFFIC IMPACTS**

It was determined at the July 19 2018 Committee of the Whole meeting that the Crystal Pool replacement should not result in a net loss of park space on the Crystal Pool / Central Park site. The most recent building design indicates that the new Crystal Pool building and a surface parking lot consisting of 20 spaces can be accommodated with no net loss of park space (the alternative options are off-site or an underground parking structure).

This memorandum considers alternative parking solutions. Additional neighbourhood consultation and impact assessments will be required. Specifically, it considers the impacts of the Crystal Pool redevelopment with a surface parking lot consisting of 20 spaces and the remainder of vehicles parked off-site. In addition the alternative parking solution of adding on-street parking in the surrounding neighbourhood and utilization of the Royal Athletic Park Parking lot is assessed from a traffic impact point-of-view.

Central Park will be redesigned in future and may include changes in the activities / uses. Any change in parking and traffic demand from the Park may impact on-street parking demand and/or neighbourhood traffic conditions, and should be considered at that time.

1. Neighbourhood Parking Conditions

The *Crystal Pool Traffic Impact Assessment + Parking Study* – dated July 12 2017 – includes a comprehensive review of on-street parking conditions for the area bound by Caledonia Avenue, Dowler Place, Bay Street, and Cook Street (257 parking spaces in total excluding “Residential Parking Only” and “Residential Permit Parking”).

On-street parking observations were conducted during four periods:

1. Friday May 26, 9:00am
2. Monday May 29, 4:00pm
3. Monday June 5, 6:30pm (Victoria HarbourCats game night)
4. Saturday June 10, 9:00am

The peak observation period was a Friday morning at 9:00am. During this observation the on-street parking supply available to Crystal Pool patrons and staff (excludes Residential Parking Only and Residential Permit Parking) was 35% occupied, with 168 parking spaces vacant.

On-street parking that is the most “sought-after” for patrons of the Crystal Pool are those spaces restricted to 2-hour maximum on Queens Avenue between Quadra Street and Vancouver Street, Pembroke Street between Quadra Street and Vancouver Street, and Quadra Street between Queens Avenue and Pembroke Street. Peak total occupancy for these streets was 59% with 30 parking spaces still available. This peak occurred on Friday morning, when commercial businesses in the area are operating; occupancy was observed significantly less on Monday afternoon at 33% occupancy, when businesses are starting to shut down for the day.

Other street blocks in proximity to the site, which may be used by some of the patrons of the Crystal Pool, include Pembroke Street between Dowler Street and Quadra and Pembroke Street between Vancouver and Cook Street, where peak occupancy was 38% and 42%, respectively.

These findings indicate that a small number of vehicles related to the Crystal Pool could be parked on the adjacent blocks without impacting the ability for other vehicles to access available parking. These findings represent the busiest period for the Pool facility, although further observations may be required to confirm on-street parking conditions during the weekday mid-day period[1].

[1] Note: Mid-day weekday observations were not completed as part of the July 2017 Study as this work was focused on understanding the parking demand associated with the Pool facility and therefore focused on the busiest periods for the Pool facility (and not necessarily surrounding parking conditions)

2. Parking Demand

The July 2017 study concluded that peak site parking demand will be 139 vehicles. Specifically, it found that during busy periods, the site contributes 29 vehicles parking on-street. In order to retain current neighbourhood parking conditions (i.e., the same number of vehicles parking on-street in future), it was concluded that approximately 110 parking spaces should accompany the proposed new Crystal Pool. The provision of 110 parking spaces would result in the same number of vehicles (approximately 29) parking on-street as today (i.e., no change from existing conditions), and more importantly, would be enough spaces to accommodate peak demand.

The latest site plan identifies 20 parking spaces on-site, requiring that approximately 90 spaces are identified off-site if existing on-street parking conditions are to be retained.

3. Off-Site Parking Options

3.1 On-Street Parking

A number of opportunities to increase the on-street parking supply nearby the site were identified in cooperation with City staff. The following are considered most appropriate given their proximity to the Crystal Pool entry (no more than 350m walking distance) and clear visibility between parking and the facility:

a. Queens Avenue between Quadra Street and Vancouver Street;
b. Pembroke Street between Dowler Place and Quadra Street;
c. Pembroke Street between Quadra Street and Vancouver Street; and
d. Pembroke Street from Vancouver Street and Cook Street.

It was determined that an increase of approximately 65 parking spaces could be achieved if all four blocks were pursued in combination[2].

[2] Based on figures prepared by Herold Engineering, August 23 2018. Approximately 21 spaces on Queens Avenue between Quadra Street and Vancouver Street, approximately 15 spaces on Pembroke Street between Dowler Place and Quadra Street, approximately 16 spaces on Pembroke Street between Quadra Street and Vancouver Street, and approximately 13 spaces on Pembroke Street between Vancouver Street and Cook Street.

The following should be given further consideration for the Queens Avenue (a) and Pembroke Street (c) segments before confirming these locations as suitable for additional on-street parking:

1. An increase in on-street parking on these blocks will lead to a greater number of vehicles circulating through the neighbourhood. Consideration may be given to traffic calming at the Queens Avenue / Vancouver Street and Pembroke Street / Vancouver Street intersections to prevent eastbound traffic circulating via the Vancouver Street AAA bikeway.
2. Central Park will be redesigned in future and may include changes in the activities / uses and associated parking demand. Any change in parking demand from the Park is likely to impact on-street parking demand on these blocks.

3.2 Off-Street Parking

Opportunities to accommodate Crystal Pool patrons and/or staff on nearby off-street parking lots were also identified and are currently being explored by City staff. These include the Save-on-Food Memorial Centre parking lot and the public parking lot on Caledonia Avenue / Vancouver Street immediately opposite Royal Athletic Park. The Save-on-Foods Memorial Centre parking lot is not being pursued, and therefore th Royal Athletic Parking location is the most suitable off-street option.

The preferred parking allocation is approximately 25 parking spaces, which would meet the Crystal Pool parking demand (in combination with the additional on-street parking supply). The ability to secure parking in this facility and any possible impacts on existing lot users will be determined in coordination with the City's Parking Services staff.

4. Traffic Conditions

The following figure illustrates the distribution of parking stalls (on-site, new on-street, and other area lots) for the New Crystal Pool and Wellness Centre. The figure illustrates the numbers of stalls and the percentage of the total number of stalls per block.

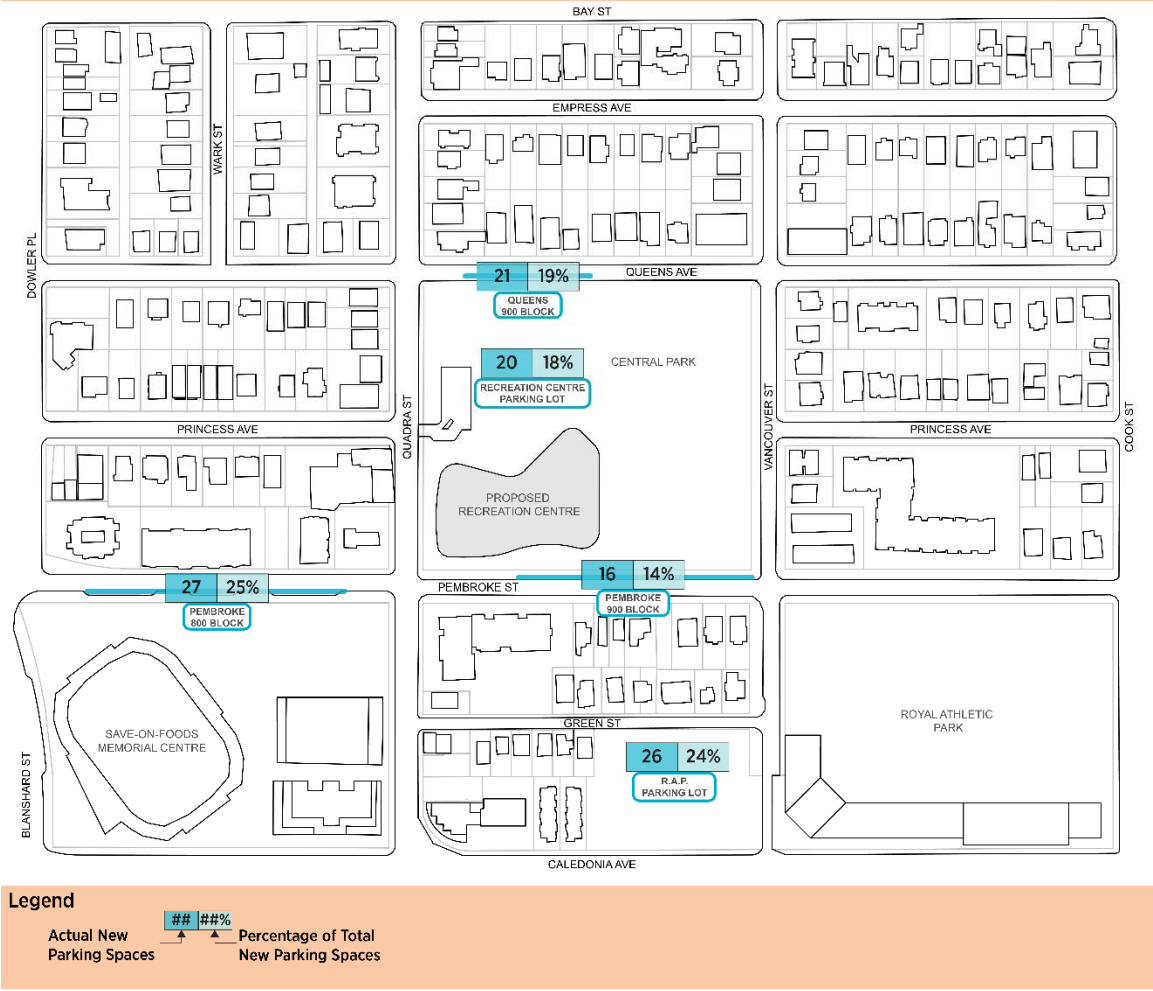

Figure 1: Crystal Pool Revitalization Parking Stall Distribution

4.1 Time of Day

The PM peak hour (i.e. rush hour, which is between 4:00pm and 6:00pm) was selected to assess the traffic operations within the surrounding area. This selection is based on the fact that the PM peak hour traffic volumes, in the surrounding area, are 15 to 30% higher during the PM peak hour than during the peak hour at the site (Pool) which is considered to be after 6:30pm in the evenings. The difference between the number of trips generated by the Pool during the PM Peak hour (rush hour) and the highest number of trips in afternoon/evening is 45 vph. Therefore the combination of existing PM peak hour traffic plus the traffic generated by the Pool between 4:30pm and 5:30pm is the same or greater than the combination of the 6:30pm to 7:30pm existing traffic volumes with the higher Pool traffic generation (when swim lessons occur).

Additional traffic may be in the neighbourhood during Monday-Thursday home hockey games (maximum 10 days per year or average of 2 per month during season) or when a weekday concert is on (typically one to three per month). These events generally start in the evenings (6:30-7:30pm). There may be an overlap between the Pool and users of Save on Foods Memorial Centre in the Monday – Friday evenings up to four times per month. However, it is expected that this overlap will be similar or less than the PM peak hour (rush hours) volumes with the revitalized Pool. Therefore the PM peak hour of the (week)day is the worst case scenario.

4.2 Trip Generation and Assignment

Trips generated for the new Crystal Pool are based PM peak hour volumes generated in the *Crystal Pool Traffic Impact Assessment + Parking Study* – dated July 12 2017. Previously it was assumed that all trips would utilize the main parking lot at Princess Avenue at Quadra Street; however, with the reduction in the size of the on-site parking lot and addition of the on-street stalls within the neighbourhood the traffic for the site was reassigned to the neighbourhood and the small lot on-site. The revised trip assignment is now based on the location of the proposed parking stalls on-site, in the neighbourhood, and Royal Athletic Park. Trips were assigned to the network based on the location of the parking stalls within the neighbourhood based on the percentage of stalls in that location/block. It is expected that these stalls will be access from Quadra Street, Cook Street and Blanshard Street.

Figure 1 provides the percentages of the total trips used to assign the traffic to the network. **Figure 2** illustrates the total number of trips entering and exiting per block with the revised parking layout. The estimated trips per block is less than 50 vph during the PM peak hour (one vehicle every 1.2 minutes). There is the potential for a small number of additional trips within the neighbourhood blocks due to vehicles circulating to find a stall. For example a vehicle may enter main parking lot and then exit and head to Queens Avenue than then onto Vancouver Street and Pembroke Street in search of an available stall rather than heading directly for a specific parking area. However, there is no method to estimate / determine the number of existing circulating vehicles when the existing lot is full (and would need to be removed from the network with the new building) nor determine how many vehicles may have to travel between locations (and in what order) to find parking with the new design.

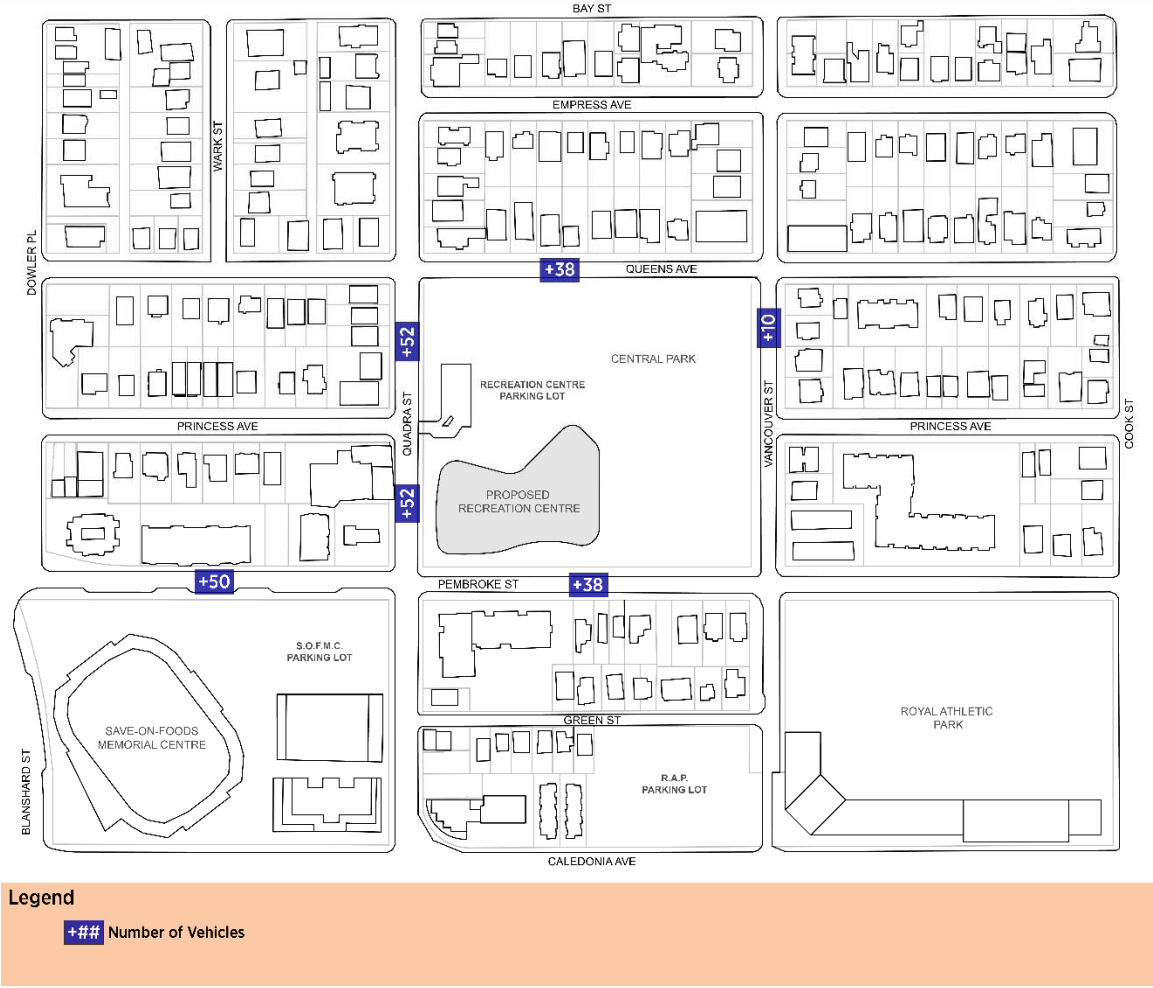

Figure 2: PM Peak Hour (Rush Hour) Additional Traffic by Block

4.3 Traffic Operations

It was also assumed that the main parking lot would operate as a right in/right out, similar to existing conditions due to the relatively small size of the lot.

In the AM peak hour the all movements operate at the same LOS as existing with the exception of the eastbound movement at Pembroke / Quadra which drops to a LOS E; however, the volume of traffic on these two legs are relatively low (less than 35 vph or one car every 1.7 mins).

In the PM peak hour all movements operate at the same LOS as existing except the eastbound movement at Pembroke Street / Quadra Street which will drop to a LOS F (from an E).
At Princess Avenue / Quadra Street the intersection will operate at a LOS B for the driveway (Princess operates at a LOS D before and after) with the parking lot access

restricted to right in/right out. If left turn movements are permitted from the main parking lot the access will operate at a LOS E due to the limited gaps to turn left. However, the volume of traffic is too low to warrant a traffic signal. See **Figure 3** and **Figure 4** for the existing and post-revitalization results.

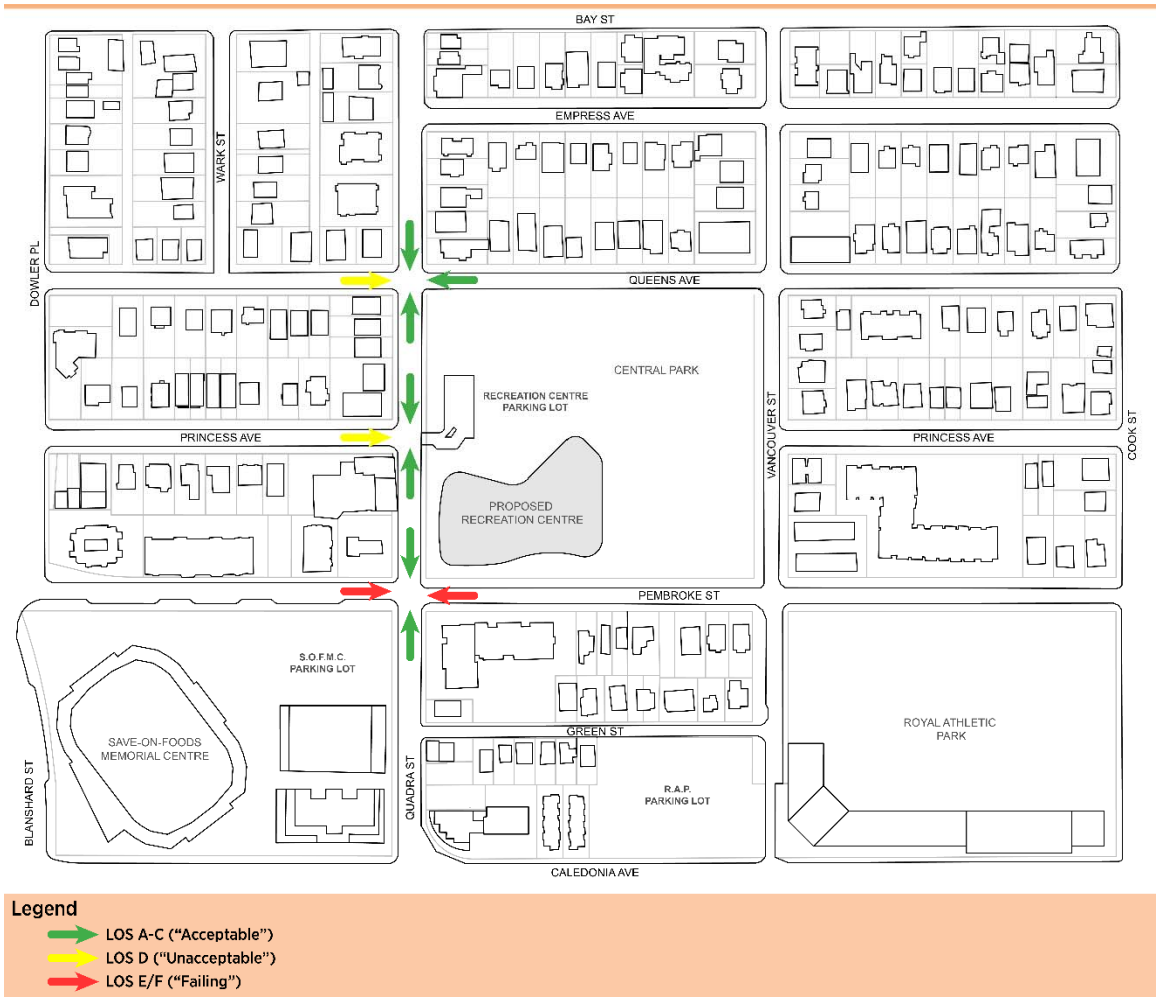

Figure 3: Existing PM Peak Hour Traffic Operations

Figure 4: Post-Revitalization PM Peak Hour Traffic Operations

5. Summary

The July 2017 study concluded that 110 parking spaces are needed to accommodate Crystal Pool parking demand with no change in neighbourhood parking conditions. The following, pursued in combination, identifies how this objective may be achieved:

1. On-site surface parking lot – **20 spaces**
2. Increase on-street parking supply:
    a. Queens Avenue (Quadra St – Vancouver St) – **21 spaces**
    b. Pembroke Street (Dowler Pl – Quadra St) – **15 spaces**
    c. Pembroke Street (Quadra St – Vancouver St) – **16 spaces**
    d. Pembroke Street (Vancouver St – Cook St) – **13 spaces**
3. Secure access to parking at the Royal Athletic Park parking lot – **25 spaces**

The existing on-street parking conditions on those blocks directly adjacent the Crystal Pool site where 2-hour parking is permitted were observed to be moderately utilized. It is anticipated that these blocks will witness similar utilization once the new facility is constructed. A portion of Crystal Pool parking demand could be accommodated on those blocks without displacing pre-existing vehicles.

An assessment of the worst time of day traffic, PM peak hour, found that the additional traffic per block is less than 50 vehicles per hour and will have limited impact on the road network. Although the side street movements at Pembroke Street / Quadra Street have periods of LOS F (up to two hours per day per direction) a signal is not required at this intersection. The parking lot access at Princess Avenue / Quadra Street will operate at a LOS B as a right in/right out. The existing Princess Avenue / Quadra Street pedestrian signal is acceptable with the main parking lot access as a right in/right out.

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Please do not hesitate to contact the undersigned with questions in regards to this assessment.

Sincerely,
Watt Consulting Group

Dan Casey, MCIP, RPP
Sr Transportation Planner

Tim Shah, MA (Planning)
Transportation Planner

Nadine King, P.Eng., PTOE
Sr Transportation Engineer

Crystal Pool Wellness Centre

Crystal Pool - Parking Options Matrix			
	Option 1	**Option 2**	**Option 3**
DESCRIPTION	**DISTRIBUTED PARKING**	**MODULAR PARKING**	**UNDERGROUND PARKING**
Number of Parking Stalls	52	115	120
Estimated Cost Per Stall	$30,000-$37,000	$45,000-$56,000	$85,000-$100,000
Total	$1,560,000-$1,924,000	$5,175,000-$6,440,000	$10,200,000-$12,000,000

Disclaimer:

- The values noted in the above table are gross order of magnitude costs developed in 2018 for Project A.
- Values are inclusive of direct hard costs, and indirect soft costs.
- Values are subject to change depending on site conditions.
- Values are subject to 10% escalation per annuum.