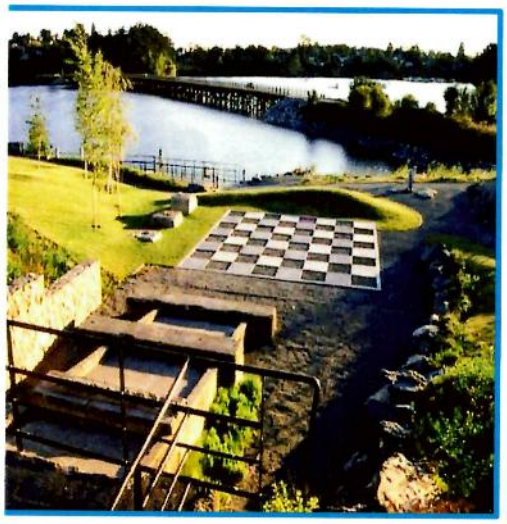
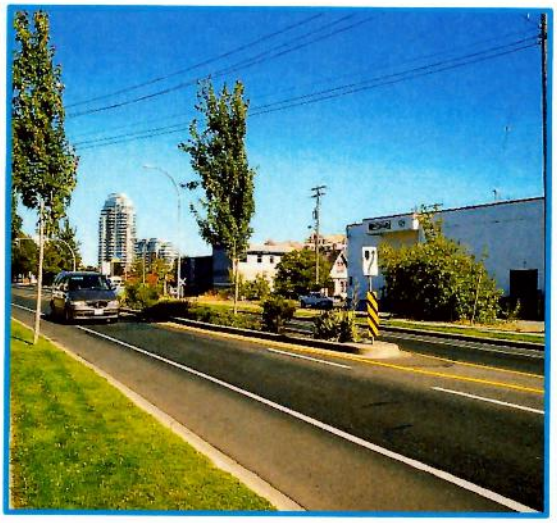
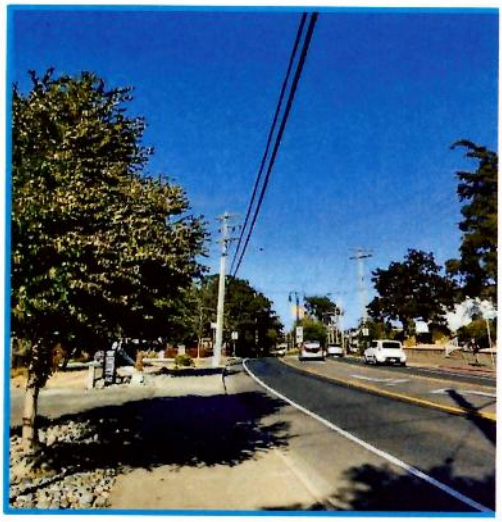
WATT Consulting Group

820 Esquimalt Road

Parking Study – Final

Denciti Esquimalt LP

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May 27, 2022

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820 ESQUIMALT ROAD

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1.0 INTRODUCTION

WATT Consulting Group was retained by Denciti Esquimalt LP to conduct a parking study for the proposed development at 820 Esquimalt Road / 833 & 837 Old Esquimalt Road in the Township of Esquimalt, BC. The purpose of this study is to determine the total expected parking demand for the site and recommend parking management and transportation demand management (TDM) strategies to help the applicant manage and potentially reduce the parking demand.

1.1 Subject Site

The proposed development is located at 820 Esquimalt Road / 833 & 837 Old Esquimalt Road (see Figure 1). It is currently zoned C-2: Neighbourhood Commercial and RD-3: Two Family / Single Family Residential.

Figure 1. Subject Site

1.2 Site Characteristics & Policy Context

The following provides information regarding services and transportation options in proximity to the subject site. In addition, the Township of Esquimalt's Official Community Plan (OCP) and other community policies pertaining to sustainable transportation and parking management are summarized.

COMMUNITY POLICIES

The Esquimalt Official Community Plan (OCP) contains policies that provide direction on future planning and land use management within the Township.[1] Per Schedule B of the OCP (Proposed Land Use Designations), the subject site is designated as a combination of Medium and High Density Residential. According to Section 5.3 of the OCP (Medium/High Density Residential Development), the Township will "prioritize medium density and high-density residential development in proposed land use designated areas that:

- Reduce single occupancy vehicle use;
- Support transit service;
- Are located in proximity to employment centres; and
- Accommodate young families."

Section 11 of the OCP (Transportation) and Section 13.3 (Reduction of Greenhouse Gas Emissions) contain a series of policies focused on promoting multi-modal and low-carbon transportation. The most relevant policies for the subject site are as follows:

- Prioritize walking, cycling and public transit as preferred modes of transportation in infrastructure improvements.

[1] Township of Esquimalt (2018). Corporation of the Township of Esquimalt Official Community Plan. Available online at: https://www.esquimalt.ca/sites/default/files/docs/business-development/OCP/Esquimalt_OCP_2020-01-09.pdf

- Consider prioritizing transit along frequent and regional transit corridors.
- Where feasible, improve the continuity of the bike network by linking existing and future bikeways and trails.

Additionally, the Township recently published its Active Transportation Network Plan (ATNP)[2] that identifies how active transportation can play a multifaceted role in achieving Esquimalt's broader strategic priorities including a healthy, livable, and diverse community. Some of the "Big Moves" included in this plan are:

- Implement a 5.3km quick-build cycling network on three major roads over the next five years
- Lower vehicle speeds to create a more friendly pedestrian and bike environment
- Short-term intersection reviews and improvements
- Fill in sidewalk gaps

The ATNP also recommends several design parameters for bicycle parking in new developments for consideration in the Township's Parking Bylaw Update, which will be undertaken in 2022. Recommendations are provided for long-term and short-term bicycle parking, location and access, dimensions and layout, oversized bicycle parking spaces, and cycling end-of-trip facilities. Providing bicycle parking in alignment with these parameters is anticipated to make cycling a more attractive and convenient mode of transportation.

[2] Township of Esquimalt (2022). Esquimalt Active Transportation Network Plan. Available online at: https://www.esquimalt.ca/sites/default/files/docs/municipal-services/engineering/roads-transportation/Esquimalt_ATNP_Final_Plan_Feb28-22-Rev_4.pdf

SERVICES

The site is located approximately 400m or a 5-minute walk from several retail stores (including a Shoppers Drug Mart), a liquor store, medical services, and several small-scale restaurants at the intersection of Esquimalt Road and Head Street.

Furthermore, the development is within 1.4km of Esquimalt Plaza (about a 17-minute walk or 4-minute bike ride), which offers a number of additional amenities and is also adjacent to Esquimalt Recreation Centre, Bullen Park, and Memorial Park. Downtown Victoria is also 2km from the site (about a 6-minute bike ride), allowing access to many more stores and services that residents may require.

Nearby schools include École Victor-Brodeur (550m or a 7-minute walk), Victoria West Elementary (900m or an 11-minute walk), Esquimalt High School (1.2km or a 15-minute walk), and Rockheights Middle School (1.5km or a 21-minute walk).

Barnard Park and the waterfront Songhees Walkway are also 260m away (about a 3-minute walk), providing recreational opportunities.

TRANSIT

The site is well-situated with respect to transit. **Route 15** runs along Esquimalt Road with eastbound and westbound stops within 200m of the site. Additionally, **Route 24** runs along Old Esquimalt Road and has stops within 100m of the site. **Route 25** is also in close proximity, with stop on Dunsmuir Road (90m away) and Esquimalt Road (120m away).

- **Route 15 Esquimalt / UVic |** This is a Regional Route with limited stops that provides 15- to 60-minute service between about 5:45am and 12:30am, every day (with later service on Fridays). It serves key locations including Downtown Victoria, the Royal Jubilee Hospital, and the UVic Exchange.

- **Route 25 Maplewood / Admirals Walk and Route 24 Cedar Hill / Admirals Walk |** These local routes provide 30- to 60-minute service between about 6:30am and 11:30pm, Monday through Friday (as well as service about every hour on weekends), and connect with Admirals Walk Shopping Centre, Downtown Victoria, and Saanich Centre.

BC Transit's Victoria Region Transit Future Plan[3] identifies Esquimalt Road as a "Frequent Transit Corridor" with the goal of providing frequent service (15 minutes or better between 7am and 10pm, 7 days/week). Another goal of Frequent Transit Corridors is to enhance bus stop infrastructure. Thus, the subject site will benefit from frequent, reliable, and convenient transit service. In addition to the above, the Township's OCP contains policy direction to enhance transit specifically along Esquimalt Road. Under Section 11.4 of the OCP, the following policies are identified:

- Consider the designation of Esquimalt Road as a future rapid bus route.
- Consider including transit priority measures such as transit signal priority and queue jump lanes along Esquimalt Road. This should ensure the transition from frequent transit to rapid transit can occur and transit is prioritized through the corridor.

Furthermore, Phase 3 of BC Transit's Victoria Regional RapidBus Implementation Strategy[4] includes the Esquimalt-UVic corridor (specifically Route 15) as one of the key corridors for future RapidBus service.

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[3] BC Transit (2011). Victoria Regional Transit Future Plan. Available online at: https://www.bctransit.com/documents/1507213421003

[4] BC Transit (2021). Victoria Regional RapidBus Implementation Strategy. Available online at: https://www.bctransit.com/documents/1529712854568

WALKING

The site has a walk score[5] of 65, meaning that some errands can be accomplished on foot. The streets immediately adjacent to the site provide a reasonably safe pedestrian environment, with sidewalks on both sides of Esquimalt Road and a sidewalk on the south side of Old Esquimalt Road (along the site's frontage). There are also crosswalks at major intersections and mid-block locations along Esquimalt Road.

One of the actions in the Esquimalt Active Transportation Network Plan is to construct short-term sidewalk facilities. The first priority location is the north side of Old Esquimalt Road west of Lampson Street, which is 600m from the proposed development. Other actions that will improve the pedestrian environment in the Esquimalt area more broadly include implementing separated sidewalks, undertaking a pedestrian wayfinding strategy, and developing a Township walking map. A review of crossing improvements at the Esquimalt Road / Dunsmuir Road intersection (about 50m from the subject site) has also been recommended, as well as an intersection study at Esquimalt Road / Head Street (about 400m from the subject site).

CYCLING

Esquimalt Road has unbuffered bike lanes on both sides of the street providing a direct connection to downtown, the E&N Rail Trail, and the Galloping Goose Regional Trail. The site is also near the future Kimta Road / E&N Connector, which is part of the City of Victoria's All Ages and Abilities bike network and is planned for completion in 2022. This will include an off-street bike facility on Esquimalt Road from Robert Street to

[5] More information about the site's Walk Score is available online at: https://www.walkscore.com/score/820-esquimalt-rd-victoria-bc-canada

Catherine Street, which is anticipated to improve safety and connectivity for future residents who cycle to downtown Victoria.[6]

Additionally, the Esquimalt Active Transportation Network Plan prioritizes the implementation of a quick-build cycling network that will include improved bike facilities along Esquimalt Road, Head Street, and Lamspon Street in proximity to the subject site. Ultimately, the Township's cycling network is planned to provide more separation and protection from motor vehicles and greater connectivity.

CARSHARING

Carsharing programs are an effective way for people to save on the cost of owning a vehicle while having access to a convenient means of transportation. The Modo Car Cooperative (Modo) is a popular carsharing service in Greater Victoria with about 87 Modo vehicles and 3,040 members across the Greater Victoria region. There is one Modo vehicle 110m or a 1-minute walk from the subject site, at Esquimalt Road and Dominion Road. The next closest Modo vehicle is available at Esquimalt Road and Carlton Terrace; 550m or a 7-minute walk from the subject site.

[6] More information about the Kimta Road / E&N Connector Project is available online at: https://www.victoria.ca/assets/Departments/Engineering~Public~Works/Documents/Kimta%20Road%20Info%20Sheet%20DIGITAL.pdf

2.0 PROPOSED DEVELOPMENT

2.1 Land Use

The proposed development is a six-storey multi-family residential building with 136 units. The unit breakdown is shown in Table 1.

Table 1. Unit Breakdown

Unit Type	Number of Units
One-Bedroom	70
Two-Bedroom	61
Three-Bedroom	5
Total	**136**

3.0 PARKING REQUIREMENT

3.1 Vehicle Parking

The Township's Parking Bylaw No. 2011 requires that 1.3 spaces per dwelling unit are provided for medium and high-density apartments. Furthermore, one of every four required parking spaces must be designated as a visitor space. Applied to the subject site, this results in 177 parking spaces (133 resident and 44 visitor spaces).

3.2 Bicycle Parking

The site is not required to provide any bicycle parking. However, it is recommended that long-term and short-term bicycle parking spaces are provided given the site's proximity to cycling infrastructure. Further, the Esquimalt ATNP recommends including requirements for long-term and short-term bicycle parking spaces in the Township's Parking Bylaw update, which will be undertaken in 2022.

The Esquimalt ATNP defines long-term and short-term bicycle parking as follows:

- **Long-Term Bicycle Parking |** also referred to as "Class A" or "Class I" bicycle parking, this refers to a secure weather protected bicycle parking facility used to accommodate long-term parking, such as for residents or employees, usually within a room or covered, fenced area.
- **Short-Term Bicycle Parking |** also referred to as "Class B" or "Class II" bicycle parking, this refers to a short-term visitor bicycle parking facility, which may offer some security and be partially protected from the weather.

It is recommended that the site provide at least one long-term bicycle parking space per residential unit (136 long-term bicycle spaces) and six short-term bicycle spaces for visitors.

4.0 EXPECTED PARKING DEMAND

Expected parking demand for this site was estimated in the following sections to determine if the proposed supply will adequately accommodate the parking demand. Expected demand is based on [a] parking observations collected from representative sites in the Township of Esquimalt, and [b] research based on previous parking studies. Calculations for expected parking demand have been rounded up to align with the Township's bylaw requirement for calculating number of parking spaces.

At the time of analysis, the housing tenure was not specified. It should be noted that if the applicant decides to provide market rental units, they would need to be secured through a formal agreement that guarantees those units will remain market rental in perpetuity or for the lifetime of the building.

This study analyzed multi-family condominium apartments to estimate the expected parking demand. Research demonstrates that parking demand among condominium units can be up to 1.5 times higher than in rental apartment units.[7] As such, condominium units generally have a more conservative parking demand compared to rental units. Should the applicant decide to provide market rental apartments, a 20% reduction in resident parking demand would be supported from what is recommended in Section 4.3. This is consistent with findings from technical studies and with minimum off-street parking supply requirements in other communities. The City of Victoria, for example, has a 20-30% higher minimum parking supply requirement for condominiums than apartments.[8]

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[7] Casey, D, Bosomworth, M, & T. Shah. (2017). Innovative Parking Solutions, Part 1: Getting Minimum Parking Supply Rates "Right". Planning West, Volume 59(4). Available online at: https://www.pibc.bc.ca/sites/default/files/2019-06/PlanningWest-v59-No4-Fall2017.pdf

[8] City of Victoria, Zoning Regulation Bylaw, Schedule C, available online at: https://www.victoria.ca/assets/Departments/Planning-Development/Development-Services/Zoning/Bylaws/Schedule%20C.pdf

4.1 Residential Parking

Observations of parked vehicles were completed at 11 condo buildings in the Township of Esquimalt representing a total of 335 units. A summary of the representative sites is outlined in Table 2. Each location was chosen based of the following criteria:

- Proximity of Frequent Transit Network (FTN). The proposed location of this development is in proximity to the FTN on Esquimalt Road. The BC Transit Future Plan describes the FTN as receiving reliable and frequent service (every 15 minutes or better) between 7:00am and 10:00pm seven days a week. Representative sites were selected based on the criteria that they were either on the FTN or within 400m.
- Walk Score. This is a tool that ranks the walkability of a location based on its proximity to seven types of amenities: Dining and drinking, groceries, shopping, errands, parks, schools/education, and culture and entertainment. It is a useful tool for determining if a trip will require a vehicle, and may inform parking needs. The Walk Score of this development is 65, and the average Walk Score of the chosen representative sites is **60**.
- Countable parking stalls. To accurately collect observational data, parking lots must be accessible to a data collector. Sites with gated or underground parking were ruled out as they prohibited data collection.

Table 2. Summary of Representative Sites

Site / Address		Walk score	Proximity to FTN (m)	Units
955 Dingley Dell		36	400	29
853 Selkirk Avenue		55	152	38
885 Ellery Street		62	730	20
726 Lampson Street		75	555	33
614 Fernhill Place		68	100	21
1121 Esquimalt Road		65	20	20
1124 Esquimalt Road		66	20	29
477 Lampson Street		39	347	44
848 Esquimalt Road		62	45	50
830 Esquimalt Road		63	30	21
826 Esquimalt Road		65	20	30
	Average	**60**	**219**	

4.1.1 Observations

Observations of parking utilization were conducted at representative sites during the typical weekday peak hour period for residential land uses. For the purposes of this study, the greater number of observed vehicles between each data collection exercise were used for the representative peak demand at each location. Parking demand ranged from 0.65 vehicles per unit to 1.05 vehicles per unit, with an average parking demand of 0.87 vehicles per unit as shown in Table 3.

Observations were conducted on November 3 and 4, 2020 at 9:30pm.

Table 3. Observations at Representative Sites

Site / Address	Units	Observed Vehicles	Parking Demand (Vehicles/Unit)
955 Dingley Dell	29	27	0.97
853 Selkirk Avenue	38	36	0.97
885 Ellery Street	20	20	1.00
726 Lampson Street	33	28	0.91
614 Fernhill Place	21	22	1.05
1121 Esquimalt Road	20	12	0.65
1124 Esquimalt Road	29	26	0.97
477 Lampson Street	44	39	0.89
848 Esquimalt Road	50	31	0.68
830 Esquimalt Road	21	16	0.76
826 Esquimalt Road	30	20	0.70
		Average	**0.87**

4.1.2 Adjustment Factors

Observations are a useful method of assessing parking demand rates; however, there are limitations to this method. The main limitation is that resident(s) vehicles may not be present at the time of observation. To mitigate this factor, observations were conducted after 9:30pm to maximize likelihood of residents being present. There is still a chance that residents' vehicles may not be present for a multitude of factors including being out of town.

This would typically by addressed with a 10% adjustment in accordance with a Metro Vancouver Apartment Parking Study.[9] This resulted in an adjusted parking demand ranging from 0.72 vehicles per unit to 1.15 vehicle per unit, with an average parking demand of 0.95 vehicles per unit as shown in Table 4.

Table 4. Adjusted Observations at Representative Sites

Site / Address	Units	Parking Demand (Vehicles/Unit)	Adjusted Parking Demand
955 Dingley Dell	29	0.97	1.06
853 Selkirk Avenue	38	0.97	1.07
885 Ellery Street	20	1.00	1.10
726 Lampson Street	33	0.91	1.00
614 Fernhill Place	21	1.05	1.15
1121 Esquimalt Road	20	0.65	0.72
1124 Esquimalt Road	29	0.97	1.06
477 Lampson Street	44	0.89	0.98
848 Esquimalt Road	50	0.68	0.75
830 Esquimalt Road	21	0.76	0.84
826 Esquimalt Road	30	0.70	0.77
	Average	**0.87**	**0.95**

[9] Metro Vancouver. (2012). The Metro Vancouver Apartment Parking Study, Technical Report. Available online at: http://www.metrovancouver.org/services/regional-planning/PlanningPublications/Apartment_Parking_Study_TechnicalReport.pdf

4.1.3 Parking Demand by Unit Type

Unit size type refers to the number of bedrooms provided within a residential unit. Research has shown that larger units will generally have more occupants or a family, therefore increasing the likelihood that additional vehicles will be owned by occupants and growing the parking demand. [10] Parking data collected for this study was assessed to reflect unit type using the following steps:

- Parking demand was calculated and adjusted by 10%;
- Parking Demand by unit type was calculated based on the demand ratios of bedrooms per unit at each site acquired from the Metro Vancouver Parking Study from 2018; and
- The assumed "ratio differences" (from 2018 Metro Vancouver Parking study) for parking demand between each site was applied to unit data and vehicle observations. These "ratio differences" are as follows.[11]
  - 1-Bedroom units' parking demand rates will be 19% higher than studio units rates;
  - 2-Bedroom units' parking demand rates will be 30% higher than 1-Bedroom rates; and
  - 3-Bedroom units' parking demand rates will be 23% higher than 2-Bedroom rates.

Table 5 illustrates the average parking demand by unit type.

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[10] Potoglou, D., & Kanaroglou, P.S. (2008). Modelling car ownership in urban areas: a case study of Hamilton, Canada. *Journal of Transport Geography*, 16(1): 42–54.

[11] Metro Vancouver. (2018). Regional Parking Study – Technical Report, pg. 18. Available online at: http://www.metrovancouver.org/services/regional-planning/PlanningPublications/RegionalParkingStudy-TechnicalReport.pdf

Table 5. Parking Demand by Unit Type at Representative Sites

Site / Address	Adjusted Parking Demand	One-Bedroom	Two-Bedroom	Three-Bedroom
955 Dingley Dell	1.06	0.83	1.08	--
853 Selkirk Avenue	1.07	0.82	1.07	1.32
885 Ellery Street	1.10	--	1.18	--
726 Lampson Street	1.00	--	1.11	--
614 Fernhill Place	1.15	--	1.15	--
1121 Esquimalt Road	0.72	0.58	0.76	0.93
1124 Esquimalt Road	1.06	--	0.91	1.12
477 Lampson Street	0.98	--	0.80	0.98
848 Esquimalt Road	0.75	0.71	0.93	--
830 Esquimalt Road	0.84	0.70	0.91	--
826 Esquimalt Road	0.77	0.68	0.89	--
Average	**0.95**	**0.75**	**1.0**	**1.10**

Results show that the average parking demand when factored for number of bedrooms and applied to the proposed development, are as follows:

- 1-Bedroom Units | 0.75 stalls per unit X 70 units = 53 stalls (52.5, rounded)
- 2-Bedroom Units | 1.0 stall per unit X 61 units = 61 stalls
- 3-Bedroom Units | 1.10 stalls per unit X 5 units = 6 stalls (5.5, rounded)

Total Resident Parking Demand = 120 stalls

4.2 Visitor Parking

Observations of visitor parking were conducted at each of the representative sites. The findings showed that average rate was 0.10 vehicles per unit. This is similar to what has been reported in other studies such as the 2012 Metro Vancouver Apartment Parking Study which concluded that visitor parking typically has a demand of less than 0.10 vehicles per unit.[12] Additional findings from similar studies conducted by WATT in the City of Langford and the City of Victoria also support these findings and suggest that visitor parking is not strongly linked to location. A recently completed development near to this location, 826 Esquimalt Road, is a 30-unit condo building where the developer provided three visitor parking stalls, a rate of 0.1 stalls per unit.[13]

Based on the available research and observational data, a rate of 0.1 is recommended. With 136 units and applying a visitor demand rate of 0.1, the visitor parking demand is 14 stalls (13.6, rounded).

4.3 Summary of Expected Parking Demand

Based on the analysis and assuming that the units are condominiums, the total expected parking demand for the site is 134 stalls (see **Table 6**).

Should the applicant decide to provide market rental apartments, a 20% reduction in resident parking demand would be supported from what is recommended. This is consistent with findings from technical studies and with minimum off-street parking supply requirements in other communities, as outlined in **Section 4.0**.

With a 20% reduction applied to the resident parking rates, the development has an expected parking demand of 109 stalls (see **Table 7**).

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[12] Metro Vancouver. (2012). The Metro Vancouver Apartment Parking Study, Technical Report. Available online at: http://www.metrovancouver.org/services/regional-planning/PlanningPublications/Apartment_Parking_Study_TechnicalReport.pdf

[13] More information about the 826 Esquimalt Road Parking Study is available online at: https://esquimalt.ca.legistar.com/LegislationDetail.aspx?ID=3663&GUID=B883D3FE-6D24-4C02-9550-0339E2D847A4

Table 6. Summary of Expected Parking Demand – Condominium

Land Use		Units	Expected Parking Demand	
			Rate	Demand
Multi-Family Residential (Condominium)	One-Bedroom	70	0.75	53
	Two-Bedroom	61	1	61
	Three-Bedroom	5	1.1	6
Visitor		136	0.1	14
	Total Expected Parking Demand			**134**

Table 7. Summary of Expected Parking Demand – Market Rental

Land Use		Units	Expected Parking Demand	
			Rate	Demand
Multi-Family Residential (Rental)	One-Bedroom	70	0.6	42
	Two-Bedroom	61	0.8	49
	Three-Bedroom	5	0.88	4
Visitor		136	0.1	14
	Total Expected Parking Demand			**109**

5.0 TRANSPORTATION DEMAND MANAGEMENT

Transportation demand management (TDM) is the application of strategies and policies to influence individual travel choice, most commonly to reduce single-occupant vehicle travel. TDM measures typically aim to encourage sustainable travel, enhance travel options and decrease parking demand. The following sections present a number of TDM measures that the applicant could pursue to reduce the amount of vehicle parking required for the development. For all of the TDM measures, an approximate reduction in parking demand is provided.

5.1 Carsharing Memberships

5.1.1 Overview

As indicated in **Section 1.2**, there are two Modo vehicles within walking distance of the subject site, one at Esquimalt Road and Dominion Road and the other at Esquimalt Road and Carlton Terrace. Further, according to the 2017 CRD Regional Household Travel Survey, Esquimalt has one of the highest shares of households in the region with one vehicle (54%), which can make carsharing an even more viable option for families who may require a vehicle for only select trips.[14]

Part of the reason why carsharing is expanding locally and being supported by municipalities is because of its ability to reduce household vehicle ownership and parking demand. A recent 2018 study from Metro Vancouver analyzed 3,405 survey respondents from carsharing users in the region and found that users of Car2go and Modo reported reduced vehicle ownership after joining a carsharing service. The impact was larger for Modo users; households joining Modo reduced their ownership from an average of 0.68 to 0.36 vehicles. Further, Modo members were close to five times more likely to reduce car ownership compared to Car2go users. Additional research includes:

[14] Capital Regional District. (2017). CRD Origin-Destination 2017 Household Travel Survey, pg. 105. Available online at: https://www.crd.bc.ca/docs/default-source/regional-planning-pdf/transportation/crd-2017-od-survey-report-20180622-sm.pdf?sfvrsn=4fcbe7ca_2

- A 2016 study in San Francisco reported that the potential for carsharing to reduce vehicle ownership is strongly tied to the built environment, housing density, transit accessibility, and the availability of parking.
- A 2013 study from the City of Toronto looked at the relationship between the presence of carsharing in a residential building and its impact on vehicle ownership. The study surveyed residents of buildings with and without dedicated carshare vehicles. The study found that the presence of dedicated carshare vehicles had a statistically significant impact on reduced vehicle ownership and parking demand. Specifically, 29% of carshare users gave up a vehicle after becoming a member and 55% of carshare users forwent purchasing a car as a result of carsharing participation.[15]

While a study has not yet been completed in Greater Victoria to understand the impacts of carsharing on vehicle ownership, the results would likely be similar especially for households living in more urban areas such as Esquimalt and Victoria where there is greater access to multiple transportation options.

5.1.2 Recommendation

Based on the research above, the applicant should consider providing Modo Plus memberships to units within the proposed development. The memberships should be tied to the unit—not the tenant—to ensure that carsharing remains a viable option throughout the life of the building. This would cost the applicant approximately $500/membership or $68,000 to provide memberships to each unit. Residents would be able to use their memberships to access Modo vehicles throughout the region, including the two vehicles within a 1-minute and 7-minute walk of the site.

A parking demand reduction of 6% for residents is supported for the proposed development if Modo memberships are provided to each unit. Additional reductions could be achieved with the provision of a Modo vehicle.

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[15] Engel-Yan, D., & D. Passmore. (2013). Carsharing and Car Ownership at the Building Scale. Journal of the American Planning Association, 79(1), 82-91.

5.2 Shared Electric Bicycle Program

5.2.1 Overview

Electric bicycles (e-bikes) are an emerging transportation mode that is gaining global popularity. With supportive cycling infrastructure in place, e-bikes have the potential to substitute for, or completely replace, almost all trips traditionally accomplished by a car. This could reduce traffic congestion and mitigate parking challenges within urban areas.

The provision of an e-bike share program is anticipated to have an impact on vehicle ownership at the site; however, as electric bikes are an emerging form of mobility, there is limited research to quantify the full extent of the impact these e-bikes have on vehicle ownership and parking demand.

A 2018 survey of North American electric bike owners reported that e-bikes have the capacity to replace various modes of transportation. E-bikes are commonly used for utilitarian and recreational trips that would previously have been completed by motor vehicles, public transit, and regular bicycles. The study also reported that of these trips previously taken by car, 45.8% were commute trips to work or school, 44.7% were other utilitarian trips (entertainment, personal errands, visiting friends and family, or other), and 9.4% were recreation or exercise trips. The average length of these previous car trips was 15 kilometres. [16]

A recent study found that around 39 kilometres of driving and 14 kilometres of conventional cycling per week is displaced by the average e-bike adopter.[17] Lastly, a 2020 study found that people who purchased an e-bike increased their bicycle use from 2.1 to 9.2 km per day on average.[18]

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[16] MacArthur, J., Harpool, M., & D. Scheppke. (2018). A North American Survey of Electric Bicycle Owners. National Institute for Transportation and Communities, NITC-RR-1041.

[17] Bigazzi, A & E Berjisian. (2019). Electric Bicycles: Can they reduce driving and emissions in Canada. Plan Canada Fall 2019.

[18] Fyhri, A & H.B. Sundfor. (2020). Do people who buy e-bikes cycle more? Transportation Research Part D, 86, 1-7.

5.2.2 Recommendation

It is recommended that the applicant consider a shared e-bike program for the site and consider the following parameters:

- The provision of 20 shared e-bikes could be provided (15% of units). It is recommended that the applicant secure urban / commuter style e-bikes, which are more economical than cargo bikes. However, the applicant should consider—if funding allows—the provision of cargo e-bikes, which would provide residents with the ability to use the bikes for grocery shopping, dropping off / picking up children from school, etc.
- If the applicant pursued this strategy, they would need to find place to store the bikes. One option could be providing additional spaces in the long-term bicycle parking area.
- The e-bikes should be owned and maintained by the property manager and be provided in perpetuity.
- The process to reserve an e-bike will most likely be on a first come first serve basis, but would ultimately need to be determined by the property manager.
- Overall e-bike utilization should be carefully monitored in the first year. If demand is consistently high (above 75%), consideration should be given to adding more e-bikes to the fleet.

With the provision of 20 shared e-bikes, a <u>10% reduction</u> in resident parking demand is supported.

5.3 Non-Standard Bicycle Parking

5.3.1 Overview

Non-standard bicycles are longer, wider, and heavier than a typical bicycle, which makes them more challenging to park than a regular bike. Non-standard bikes include tricycles, electric cargo bikes, or a bike with a trailer, for example. Because of their size, they require different parking configurations. As electric bicycles and other non-standard bikes become more commonplace, it will be important that new developments provide the right parking to allow users to securely and conveniently park their bicycles.

There is the opportunity to design the long-term bicycle parking to accommodate non-standard bicycles. This could further reduce vehicle parking demand at the site. According to research completed in Greater Victoria, one of the top barriers facing prospective e-bike users is the fear that their bicycle might be stolen.[19] Further, this research showed that users would feel more comfortable if they could park their bicycle in a locked or supervised area.

Example of a non-standard bike parking space at Royal Jubilee Hospital.

The Capital Region Local Government Electric Vehicle + Electric Bike Infrastructure Planning Guide[20] includes e-bike parking design guidelines to help address the concerns of current and prospective e-bike owners as well as to increase overall e-bike ownership in the Capital Region. The e-bike parking design guidelines include three key recommendations: (1) that all e-bike parking spaces be in a secure location (2) that 50% of the long-term bike parking spaces have access to an 110V wall outlet and (3) 10% of the spaces be designed for non-standard bicycles.

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[19] WATT Consulting Group. (2018). Capital Region Local Government Electric Vehicle + Electric Bike Infrastructure Backgrounder. Available online at: https://www.crd.bc.ca/docs/default-source/climate-action-pdf/reports/electric-vehicle-and-e-bike-infrastructure-backgrounder-sept-2018.pdf?sfvrsn=a067c5ca_2

[20] WATT Consulting Group. (2018). Capital Region Local Government Electric Vehicle + Electric Bike Infrastructure Planning Guide. Available online at: https://www.crd.bc.ca/docs/default-source/climate-action-pdf/reports/infrastructure-planning-guide_capital-region-ev-ebike-infrastructure-project-nov-2018.pdf?sfvrsn=d767c5ca_2

5.3.2 Recommendation

It is recommended that the applicant commit to the following:

- At least 10% of the required long-term bicycle parking spaces should be designed for non-standard bike spaces.
  - Note, if the applicant purses the shared e-bike program, it will need to ensure that there are enough long-term spaces to accommodate the shared electric cargo bikes.
- Non-standard bike parking spaces should have a minimum distance of 3.0m in length and 0.9m in width.
- All non-standard bike parking spaces should be provided as ground anchored racks. Non-standard bicycles, especially electric cargo bikes, are heavy, long, and challenging to park in a vertical bike rack.
- At least 50% of the required long-term non-standard bike parking spaces should have access to a 110V wall receptable for charging

With the provision of non-standard bike parking, a 3% reduction in resident parking demand is supported.

5.4 Bicycle Maintenance Facility

5.4.1 Overview

Residential developments can provide dedicated on-site bicycle maintenance facilities, such as bicycle repair tools, pumps, wash stations, etc., to support ongoing bicycle use among building users.[21] This is particularly beneficial for residents living in smaller dwelling units where space is at a premium and/or access to a bicycle repair service may be inaccessible or present a financial barrier. The following amenities should be included:

[21] Victoria Transport Policy Institute. (2015). *Parking Management: Strategies for More Efficient Use of Parking Resources*. Retrieved from: www.vtpi.org/tdm/tdm28.htm#_Toc128220491

- **Repair Tools:** Bicycle repair tools including: two identical tire levers; two screwdrivers (one flat head and one Phillips); double sized wrenches at the following sizes 8, 9, 10, 11, 15, 32 mm; Allen wrenches at the following sizes 2.5, 3, 5, 6, 8 mm; and a tire pump that works with Schrader and Presta valves.
- **Bike Repair Stand**
- **Bike Wash Station**: A station with a hose, drain, and supplies which can assist a resident in cleaning their bicycle.
- **Lighting and surveillance**: The facility should be well-it (inside and out), with consideration for surveillance systems to address possible personal security issues.
- **Information:** Cycling network maps, information on bicycle shops, and an advertising space for scheduled events.

The addition of these elements to the development could result in a parking demand reduction as they would promote cycling for residents by providing accessible and functional facilities.

5.4.2 Recommendation

A 2% reduction in resident parking demand would be supported for the provision of a bicycle maintenance facility.

5.5 TDM Summary

Table 8 is a summary of the recommended TDM measures and their potential impact on parking demand.

Assuming condominium tenure, the maximum parking demand reduction that can be achieved is 21% (25 spaces) if the applicant implements all TDM measures. This could bring the demand from 120 resident parking spaces to 95, for a total demand of 109 spaces.

If the applicant provides market rental apartments and commits to all the TDM measures, the demand could be reduced from 95 resident parking spaces to 75, for a total demand of 89 spaces.

Table 8. Summary of Parking Demand Reductions

Reduction Options	Approximate Parking Reduction, Condo Tenure	Approximate Parking Reduction, Market Rental Tenure
7.1 Carsharing Memberships	6%	6%
7.2 Shared E-bike Program	10%	10%
7.3 Non-Standard Bicycle Parking	3%	3%
7.4 End-of-Trip Bicycle Facilities	2%	2%
Maximum reduction	**21% (25 spaces)**	**21% (20 spaces)**
Baseline Resident Parking Demand	**120 spaces**	**95 spaces**
Estimated Resident Parking Demand with all TDM Measures	**95 spaces**	**75 spaces**
Visitor Parking Demand	**14 spaces**	**14 spaces**
Total Parking Demand with TDM (resident + visitor)	**109 spaces**	**89 spaces**

6.0 CONCLUSIONS

The proposed development at 820 Esquimalt Road / 833 & 837 Old Esquimalt Road is a six-storey multi-family residential building with 136 units. The Township of Esquimalt's parking requirement for medium and high-density apartments is 1.3 spaces per dwelling unit (with one of every four designated as a visitor space); applied to the subject site, this results in 177 parking spaces (133 resident and 44 visitor spaces).

At the time of analysis, the housing tenure was not specified. Expected parking demand for this site was estimated based on a condominium tenure and resulted in 134 stalls (120 resident and 14 visitor).

Should the applicant decide to provide market rental apartments, a 20% reduction in resident parking demand would be supported. This is based on research demonstrating that condominium units generally have a more conservative parking demand compared to rental units. With a 20% reduction applied to the resident parking rates, the development has an expected demand of 109 stalls (95 resident and 14 visitor).

Several TDM measures have been presented for the applicant's consideration. If implemented, the parking demand could be further reduced to 109 stalls (if condo units) or 89 stalls (if market rental units).

7.0 RECOMMENDATIONS

Since the analysis was completed, the applicant has confirmed that they will be pursuing a market rental tenure. Therefore, it is recommended that the site provide vehicle parking at the rates shown in Table 9 below. The proposed number of units and resulting number of recommended vehicle stalls are also shown.

Table 9. Recommended Vehicle Parking Rates – Market Rental Tenure

Land Use		Units	Rate (Stalls per Unit)	Vehicle Parking Stalls
Multi-Family Residential (Rental)	One-Bedroom	70	0.6	42
	Two-Bedroom	61	0.8	49
	Three-Bedroom	5	0.88	4
Visitor		136	0.1	14
			Total Vehicle Stalls	**109**

Additionally, although it is not required, it is recommended that the applicant provide bicycle parking at a rate of one bicycle stall per residential unit, as well as six short-term bicycle stalls for visitors.

Reductions to the above vehicle parking rates could be achieved if one or more TDM measures are implemented as per Section 5.0.

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