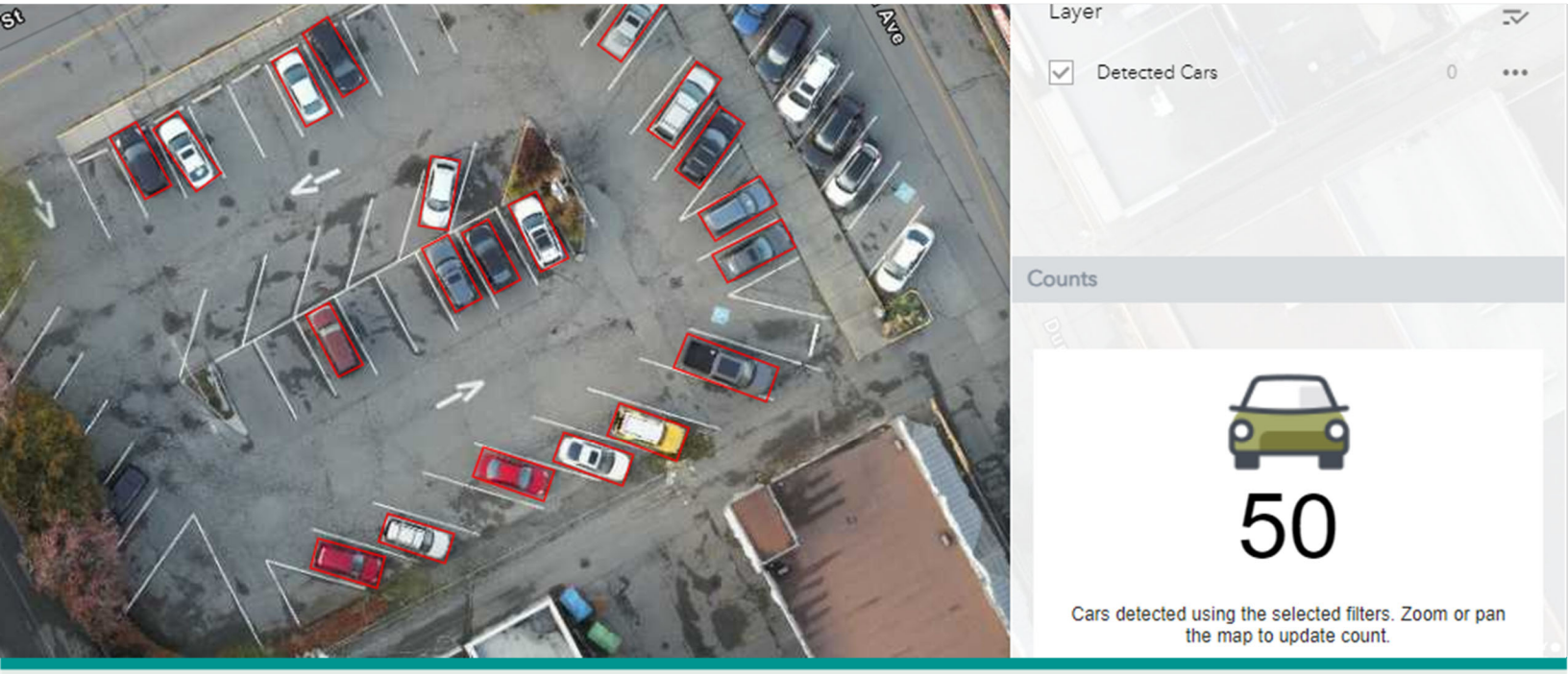
McElhanney

BEST MANAGED COMPANIES
Platinum member



Downtown Courtenay Parking Study

April 4, 2024

Submitted to: City of Courtenay
Prepared by McElhanney

Contact
Matthew Browning P.Eng.,
Project Manager
236-317-3077
mbrowning@mcelhanney.com

Address
1211 Ryan Road,
Courtenay BC Canada
V9N 3R6

Our file: 2121-01086-00

Your Challenge.
Our Passion.

Our File: 2121-01086-00

April 4, 2023

City of Courtenay
1000 Piercy Avenue
Courtenay, BC, V9N 3E6

Attention: Michael Wright, Manager of Public Works Service | Operational Services

Downtown Courtenay Parking Study

As requested by the City of Courtenay, we are pleased to provide this report outlining the purpose, objectives, methodology, analysis and findings of the Downtown Courtenay Parking Study.

We understand that the City wishes to have an updated parking study that provides new insights over and above those delivered as part of the previous iteration of the downtown parking study (2017) and as such we have undertaken this study utilizing an innovative approach that maximizes the value of the analysis for the City.

Through conversations with the City, we have undertaken aerial drone imagery of the downtown core of the City to generate orthomosaic maps of parking behaviours across all-day surveys for weekday and weekend periods. This provides the City with a reliable, insightful and easily-communicable set of data that can be used to support ongoing planning and development efforts throughout the downtown core.

Thank you for your enthusiastic and collaborative support on this cutting-edge approach to transportation planning.

Sincerely,
McElhanney Ltd.

Prepared by:

Gaby Monagan
Transportation Planner
gmonagan@mcelhanney.com
778-357-1335

Reviewed by:

Matthew Browning, P.Eng.,
Senior Transportation Engineer
mbrowning@mcelhanney.com
236-317-3077

Contents

1. Introduction

The City of Courtenay has retained McElhanney to undertake an update of the 2017 Downtown Courtenay Parking Assessment study. The following sections outline the purpose, objectives, methodology and limitations of the previous study, as well as the methodology and outcomes of the current study.

2. Study Purpose and Objectives

The purpose of the study was to collect accurate and reliable parking data for the downtown core area of the City of Courtenay that would allow for future analysis and provide insight into parking behaviours. This allows the City to better understand the relationship between public and private parking utilization, time of peak demand, areas of high (or low) utilization and overall parking behaviours.

The key identified objectives were:

- Focus on the downtown core but provide opportunity to expand the study area to support future planning activities.
- Complete an update to the previous downtown parking study to allow for a comparison of utilization and parking supply trends.
- Capture two weekdays and two weekends to provide a range of data for both periods that reflect different usage patterns and parking behaviours.
- Capture data across the entire day to provide insight into peak periods and utilization changes throughout the day.
- Differentiate between on-street parking and off-street parking lots

Through the study process a series of key questions were determined that the City has an interest in addressing, namely:

- Are the timed parking restrictions at 550 5th Street and 445 10th Street appropriate?
- What is the parking demand along 6th Street?
- Is the overall parking supply sufficient and what is the turnover rate?
- Is it possible to provide insight into the City's current bike parking supply?
- How well-used are the City's accessible parking spots?

3. Previous Study

3.1. SUMMARY OF PREVIOUS STUDY METHODOLOGY AND FINDINGS

The previous downtown parking study was completed in late 2016 and documented in early 2017. The study limits were broadly similar to those applied for this current work although constituting a smaller downtown core, focussed on the commercial centre (see ***Figure 1***).

The 2017 study followed a traditional methodology for capturing parking data with the study area being segmented into four smaller sections to allow field staff to be able to count vehicles within public and private parking lots within a 30-minute increment. Weekday counts were conducted between 9:30am and 5:30pm on a Wednesday and weekend counts between 10:00am and 1:30pm on a Saturday.

The collected data was processed and presented as a series of tables, aggregating the totals for public and private parking across each of the four sections.

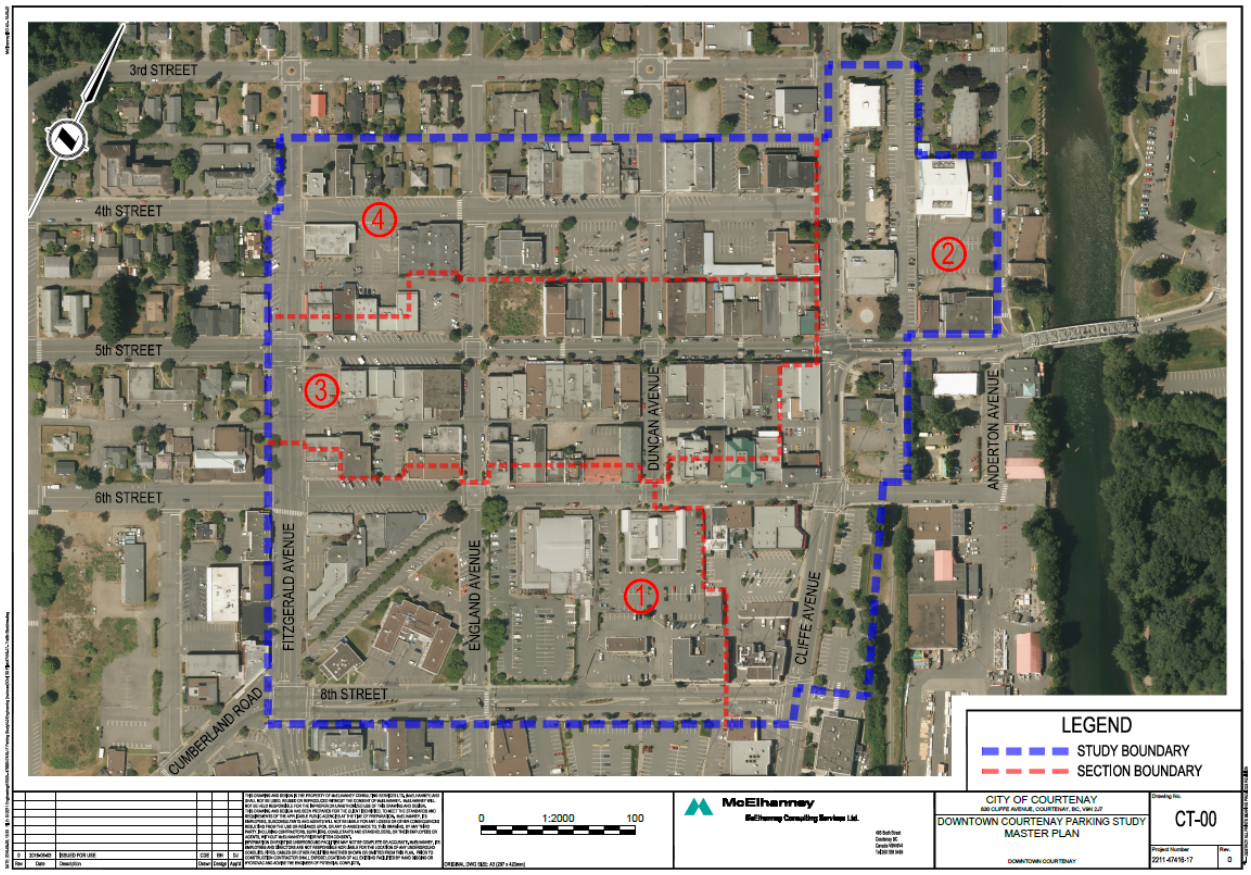


Figure 1 - 2017 Downtown Parking Study Area

Notable from the previous study was that the level of granularity available was minimal, with 'section-level' being the furthest it was possible to drill down spatially into the data. Further, there was no potential to review the fidelity or accuracy of the collected data, leaving some margin for human error at either the

collection, processing, or analysis stage of work. Due diligence was taken, but the methodology did not provide an opportunity for more insightful analysis or investigation.

Broadly, the following observations were noted:

- Total private parking spots = 374
- Total public parking spots = 889
- Private parking was generally more consistently utilized during weekday operations (compared to public facilities)
- Private parking was generally utilized less than 60% during weekday counts
- Weekday private parking counts did not identify a consistent peak of activity
- Weekend private parking counts trended toward higher utilization as the day went on
- Weekday public counts indicated a peak utilization between 10:00am and 2:30pm
- The 5th Street and 6th Street corridors yielded the highest utilization for weekday public parking (84% and 91% respectively)

4. Study Area and Methodology

4.1. AREA MAP AND ZONES

The downtown core area (see ***Figure 2***) for this study was expanded somewhat from the 2017 study, with the inclusion of some adjacent residential areas and the commercial areas to the south of the traditional downtown core.

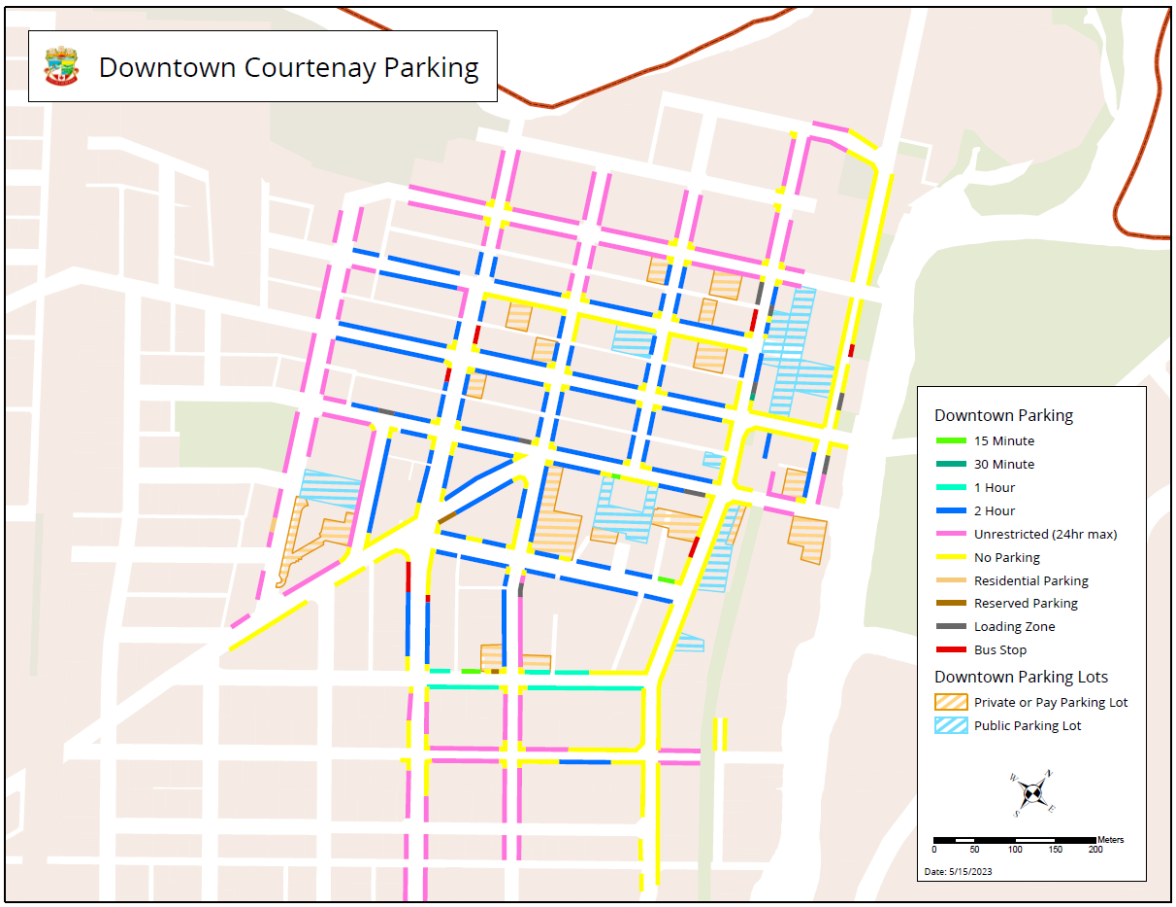


Figure 2 - Initial Extents of Parking Study Area with existing parking restrictions

Through discussion with City staff, the extents of the study area were confirmed as being:

- Northern extent: 1st Street between Anderton Avenue and Cliffe Avenue, 2nd Street between Cliffe Avenue and Fitzgerald Avenue
- Western extent: Harmston Avenue between 3rd Street and Cumberland Road, Fitzgerald Avenue between Cumberland Road and 13th Street
- Southern extent: 13th Street between Fitzgerald Avenue and Beckensell Avenue
- Eastern extent: Anderton Avenue between 1st Street and 6th Street, Beckensell Avenue between 6th Street and 13th Street

4.2. DRONE-BASED DATA CAPTURE METHODOLOGY

In response to the review of the previous study, which found that the parking data was informative, but not as insightful as needed, it was proposed that a new approach to capturing the parking data be pursued.

With the advances in drone technology in recent years and the availability of GIS software that is capable of undertaking vehicle identification processes, the methodology for this study was proposed as follows:

- Two weekday captures (9:30am to 18:00pm) on either Tues/Wed/Thur, avoiding farmer's markets, events, or inclement weather
- Two weekend captures (10:30am to 13:30pm) on Saturdays avoiding events and bad weather
- Each capture event to involve a single drone operator piloting a drone mission to capture orthographic photography of the study area within a 30-minute timeframe
- Orthographic images processed and stitched to form a mosaic representing a snapshot of the study area during that 30-minute time period
- Compilation of all mosaic images into a complete GIS database and build a toolkit to enable parking analysis with the imagery
- Generate a dashboard such that further analysis can be undertaken as the need may arise in the future

Further information on the study methodology, including study dates, timing, data processing and dashboard development are found in ***Appendix A***.

5. Summary of Data Collected

5.1. OVERALL PARKING DATA SUMMARY

A total inventory of the cars that parked in downtown Courtenay bounded by the study area defined in ***Section 4.1*** is summarized in ***Table 1***. The data was collected for 30-minute time intervals. That is, if any vehicle occupied the parking spot within the 30-minute time interval it was recorded as occupied by only one vehicle. Weekday parking data was collected between 10AM – 6PM and weekend parking data between 10:00am – 2:00pm.

The study area includes residential and commercial neighbourhoods with a large number of private parking, off-street parking, and curb-side on-street parking. Loading and delivery parking was omitted from the count, as were private, residential driveway vehicles. It should also be noted that the parking data is an aggregate value and does not provide parking duration of a single vehicle, only if an available space is occupied during the survey period or not.

Table 1: Parking Data Summary

Day Type	Time	Total Occupied Stalls		Off-Street Utilization (based on 1794 available stalls)	On-Street Utilization (based on 1192 available stalls)
		Off-Street	On-Street		
Average Weekday	10:00 AM	1279	717	66%	60%
	10:30 AM	1350	776	70%	65%
	11:00 AM	1401	808	73%	68%
	11:30 AM	1411	800	73%	67%
	12:00 PM	1413	840	73%	70%
	12:30 PM	1402	836	73%	70%

	1:00 PM	1458	852	76%	71%
	1:30 PM	1376	808	71%	68%
	2:00 PM	1311	830	68%	70%
	2:30 PM	1265	762	66%	64%
	3:00 PM	1234	704	64%	59%
	3:30 PM	1179	665	61%	56%
	4:00 PM	1088	613	56%	51%
	4:30 PM	910	513	47%	43%
	5:00 PM	746	430	39%	36%
	5:30 PM	700	386	36%	32%
Average Weekend	10:00 AM	551	364	31%	31%
	10:30 AM	575	400	32%	34%
	11:00 AM	605	430	34%	36%
	11:30 AM	627	438	35%	37%
	12:00 PM	657	456	37%	38%
	12:30 PM	690	459	38%	39%
	1:00 PM	699	438	39%	37%
	1:30 PM	693	432	39%	36%

Overall study area parking observations

At 1pm on a weekday, the busiest time on-average, approximately 76% of off-street parking is occupied. This may appear to be low, based on experiences with finding parking, however the following should be noted:

- 501 4th Street lot – 10/21 (50% occupied)
- 391 4th Street lot – 4/14 (30% occupied)
- 280-232 3rd Street lots – 32/60 (50% occupied)
- Cliffe Ave lots (east side from 10th Street to 12th Street) – 24/90 (25% occupied)
- 1175 Cliffe Ave lot – 14/56 (25% occupied)

There are many smaller, usually-commercial lots that are available throughout the broader downtown area that bring the overall utilization percentage down. The downtown core lots are typically more utilized during the same period.

Similarly, the busiest on-street parking utilization (71%, also at 1pm) may appear low, but there are significant stretches of curb outside the downtown core that are under-utilized, including:

- 2nd Street – 15/50
- 8th Street – 20/38
- 12th Street – 25/44

- Fitzgerald Ave – 39/84
- Harmston Ave – 39/94

Weekend parking utilization was observed to be significantly lower that weekday, with less variability across the time-period surveyed.

Based on the above analysis, it appears that there is sufficient supply within the broader downtown area to accommodate demand, although it may require drivers to walk a modest distance to their destination once parked. Many of the commercial parking lots on the fringe of the downtown do not become busy until later in the afternoon/evening, and so there are opportunities for parking to be supplied there, provided owner-cooperation is received (many businesses are signed 'for customers only').

At this time, there does not appear to be sufficient demand to warrant an additional parking structure within the downtown to provide substantially more parking supply.

5.2. PARKING UTILIZATION

Parking utilization refers to the degree to which parking spaces or facilities are being used or occupied within a given area or over a specific period (or both) as a measure of how effectively parking resources are being utilized by vehicles. Weekday and weekend parking utilization has been calculated and expressed as an occupancy rate; the total number of vehicles parked relative to the parking spaces available.

The utilization rate was calculated for each of the four sections of the downtown core to provide a like-for-like comparison with the 2017 study (extents provided in ***Figure 3*** for reference):

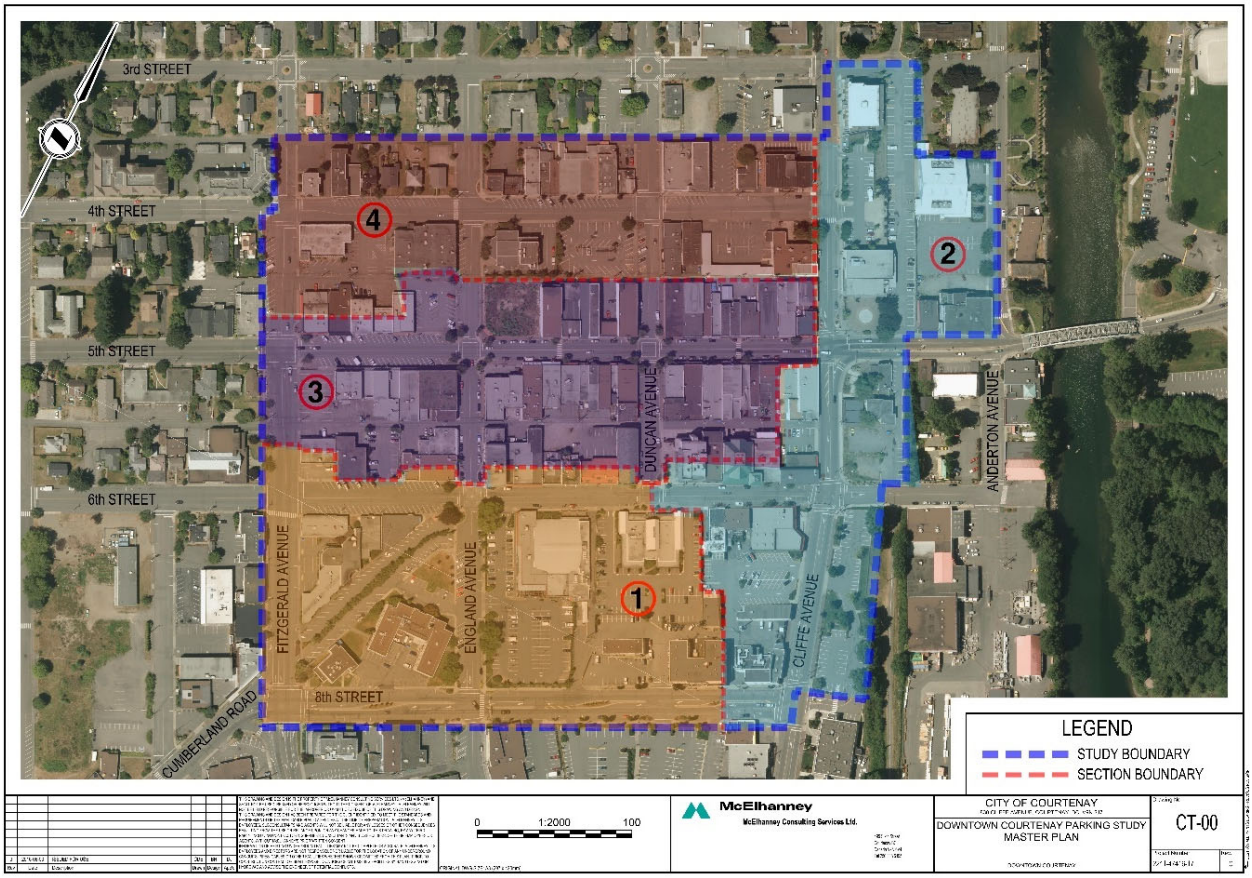


Figure 3: Downtown Parking Section Extents (from 2017 Study)

Figure 4 and ***Figure 5*** show the average weekday on-street and off-street parking utilization, respectively, by time of day and section of the downtown. For both on-street and off-street parking, the utilization peaks at 1:00pm and gradually decreases as the day progresses. On a typical weekday, Section 3 has the highest and Section 2 the lowest off-street and on-street parking utilization.

Sections 1 (85%), 3 (93%), and 4 (88%) have substantially higher utilization than Section 2 (55%) for off-street parking due to lower parking supply while having high demand.

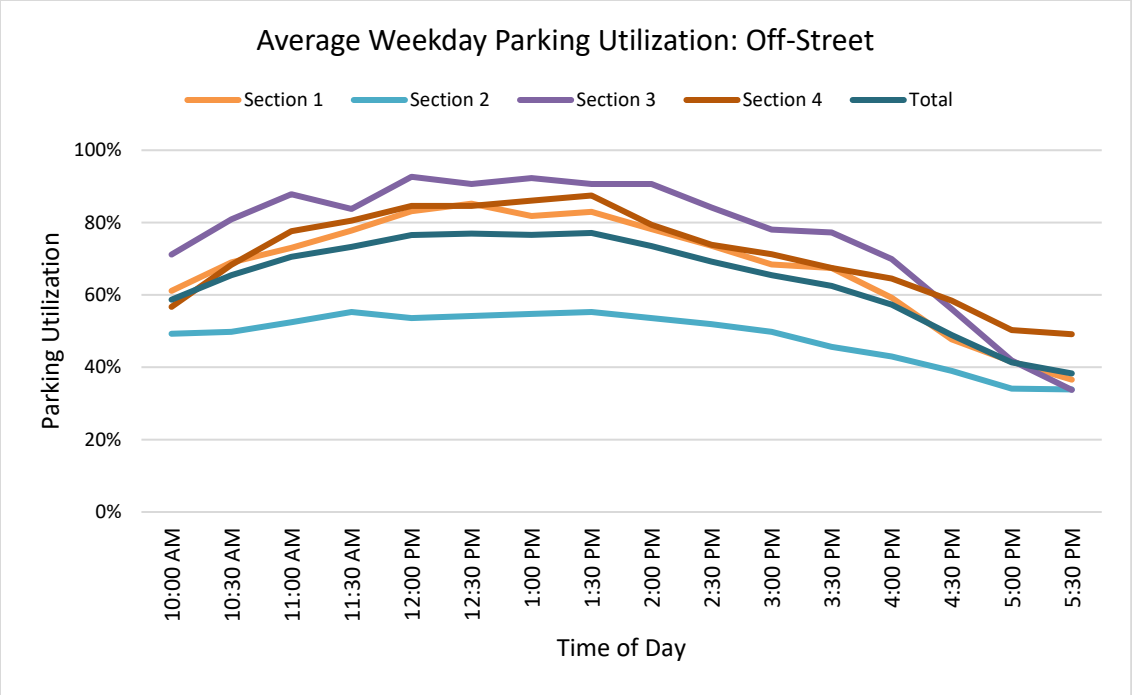


Figure 4: Average Weekday Off-Street Parking Utilization

On-street parking is more variable throughout the day and with an earlier peak that diminishes substantially in the afternoon. This could indicate that the off-street lots are occupied by all-day employees, whereas on-street parking is at least partly driven by discretionary trips (shopping, errands, drop-offs, etc.). Section 3 again has the highest utilization (97%), followed by Section 4 (95%), Section 1 (85%) and Section 2 (80%).

It is notable that the overall parking utilization for off-street parking never exceeds 80% of the available supply, whereas on-street parking is over 80% for around 3hrs during the middle of the day with Section 3 operating at close to 100% from 11am to 12:30pm.

Off-Street Parking Count					
	Off-Street				
	Section 1	Section 2	Section 3	Section 4	Total
Time/Date					
9/21/2023					
10:00 AM	145	125	85	87	446
10:30 AM	176	125	93	104	504

11:00 AM	178	129	99	117	530
11:30 AM	189	146	87	129	560
12:00 PM	219	149	111	131	619
12:30 PM	215	156	108	134	621
1:00 PM	206	154	107	136	610
1:30 PM	214	150	106	130	608
2:00 PM	193	149	109	120	581
2:30 PM	182	147	106	116	559
3:00 PM	176	138	97	114	531
3:30 PM	170	124	95	98	489
4:00 PM	152	118	84	93	448
4:30 PM	119	107	70	89	388
5:00 PM	102	99	55	79	336
5:30 PM	86	94	37	85	307
9/27/2023					
10:00 AM	174	135	90	108	516
10:30 AM	184	138	106	131	569
11:00 AM	203	148	117	150	627
11:30 AM	217	146	119	148	642
12:00 PM	215	134	117	160	636
12:30 PM	230	130	115	157	641
1:00 PM	221	135	120	160	646
1:30 PM	219	142	117	171	657
2:00 PM	215	134	114	153	624
2:30 PM	202	127	101	138	576
3:00 PM	181	125	95	131	542
3:30 PM	182	117	95	134	536
4:00 PM	157	109	88	129	492
4:30 PM	130	99	68	112	414
5:00 PM	115	81	48	94	342
5:30 PM	105	85	46	84	321

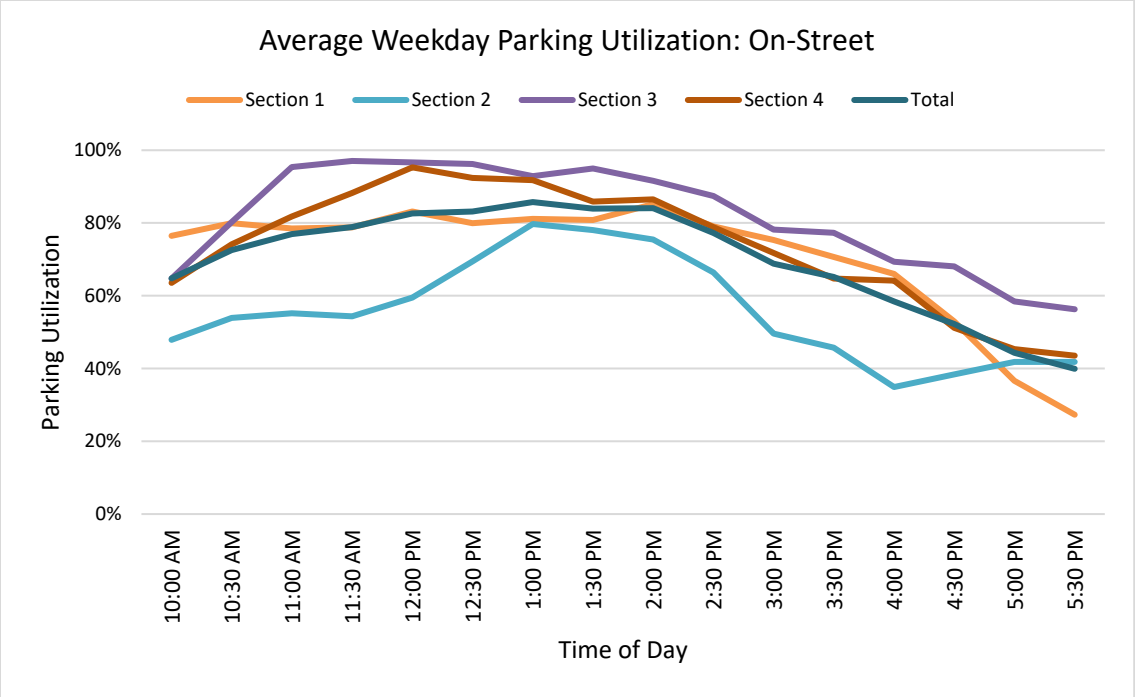


Figure 5: Average Weekday On-Street Parking Utilization

	On-Street Parking Count				
	Section 1	**Section 2**	**Section 3**	**Section 4**	**Total**
Time					
9/21/2023					
10:00 AM	126	43	57	47	274
10:30 AM	124	53	85	51	312
11:00 AM	128	57	108	61	350
11:30 AM	130	61	112	70	372
12:00 PM	140	75	117	79	409
12:30 PM	135	91	113	72	408
1:00 PM	135	95	102	71	400
1:30 PM	139	92	107	61	395
2:00 PM	142	89	102	64	392
2:30 PM	139	82	100	59	375
3:00 PM	126	53	91	55	322
3:30 PM	110	58	93	51	310
4:00 PM	105	42	86	50	279
4:30 PM	79	46	79	49	248
5:00 PM	57	50	63	41	210
5:30 PM	49	51	64	41	202
9/27/2023					
10:00 AM	137	68	97	61	363

10:30 AM	151	72	106	75	402
11:00 AM	142	71	119	78	407
11:30 AM	141	65	120	80	404
12:00 PM	146	63	113	83	404
12:30 PM	140	70	116	87	410
1:00 PM	144	90	120	91	444
1:30 PM	139	89	119	89	431
2:00 PM	151	86	116	83	435
2:30 PM	133	72	108	75	385
3:00 PM	133	62	95	67	355
3:30 PM	133	48	91	59	331
4:00 PM	122	39	79	59	296
4:30 PM	103	43	83	38	266
5:00 PM	69	47	76	36	226
5:30 PM	45	46	70	33	191

Weekend parking utilization by time of day is presented in ***Figure 6*** for off-street parking, and ***Figure 7*** for on-street parking. Similar to weekday utilization, Section 4 has the highest weekend off-street parking utilization (59%) while Section 2 has the lowest (37%). Section 3 has the highest on-street parking utilization (89%) while Section 1 has the lowest (38%). Parking utilization steadily increases from 10:00am – 1:00pm at which it becomes relatively constant. Data was not collected after 2:00pm so it is unknown when utilization decreases.

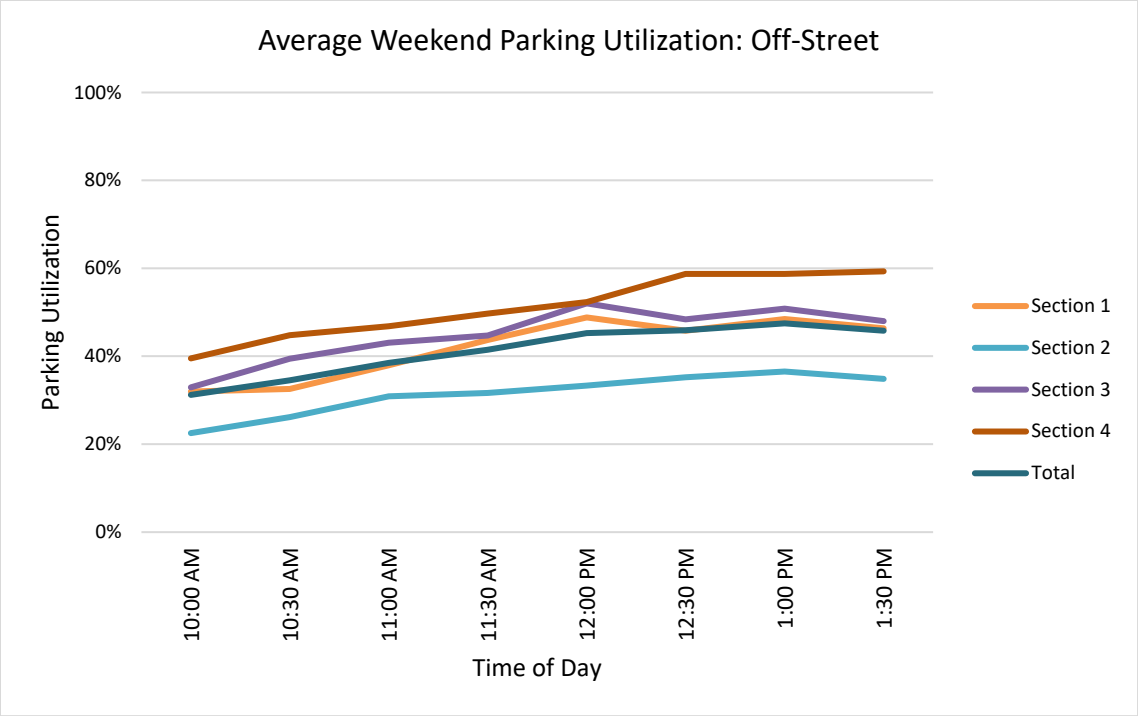


Figure 6: Average Weekend Off-Street Parking Utilization

	Off-Street Parking Count				
	Section 1	**Section 2**	**Section 3**	**Section 4**	**Total**
Time					
9/30/2023					
10:00 AM	71	43	36	49	202
10:30 AM	72	61	44	58	238
11:00 AM	81	73	52	60	266
11:30 AM	95	77	53	64	290
12:00 PM	107	83	63	77	331
12:30 PM	104	86	57	88	337
1:00 PM	108	81	55	96	341
1:30 PM	100	74	56	90	321
10/7/2023					
10:00 AM	96	76	45	87	310
10:30 AM	98	77	53	96	328
11:00 AM	117	90	54	101	365
11:30 AM	133	90	57	107	390
12:00 PM	148	93	65	103	411
12:30 PM	135	100	62	114	416
1:00 PM	145	112	70	106	438
1:30 PM	142	110	62	114	430

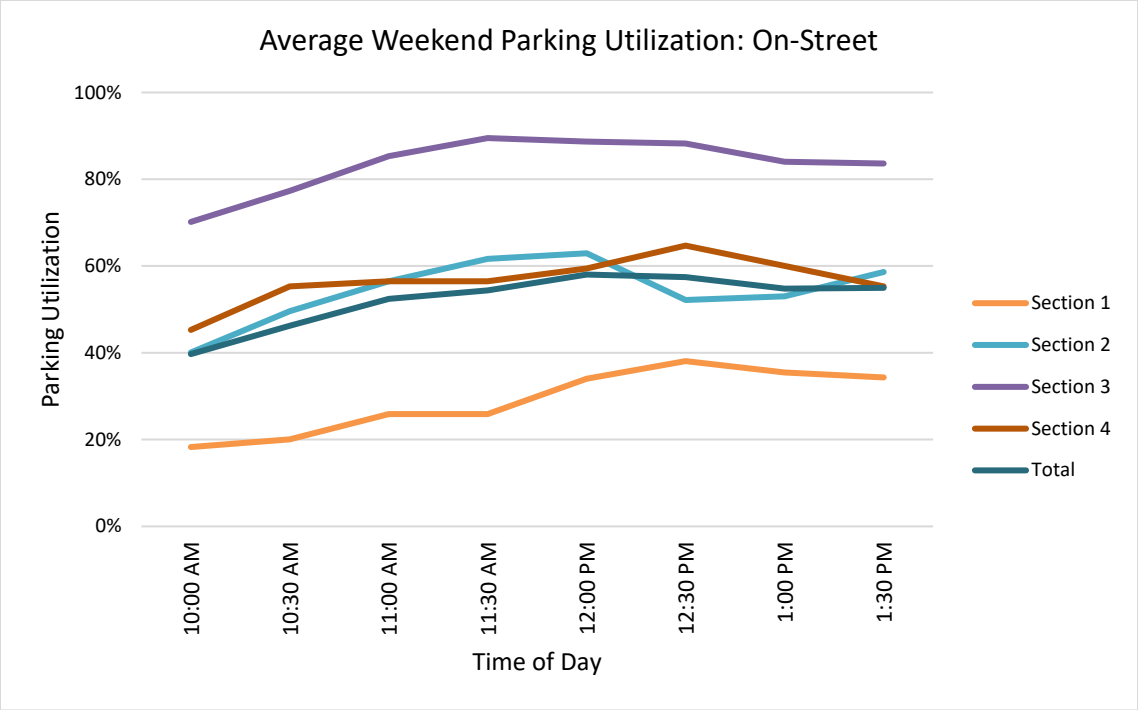


Figure 7: Average weekend On-Street Parking Utilization

	On-Street Parking Count				
	Section 1	Section 2	Section 3	Section 4	Total
Time					
9/30/2023					
10:00 AM	22	33	79	25	154
10:30 AM	24	41	94	32	188
11:00 AM	44	48	101	35	227
11:30 AM	43	53	105	33	231
12:00 PM	47	53	100	37	235
12:30 PM	59	34	106	47	243
1:00 PM	52	37	96	45	226
1:30 PM	49	45	103	43	237
10/7/2023					
10:00 AM	41	60	88	52	237
10:30 AM	45	74	90	62	267
11:00 AM	45	83	102	61	289
11:30 AM	46	90	108	63	304
12:00 PM	70	93	111	64	336
12:30 PM	72	87	104	63	322
1:00 PM	70	86	104	57	313
1:30 PM	69	91	96	51	304

5.3. SITE-SPECIFIC OBSERVATIONS

Analysis of the 550 5th Street Frontage

The 550 5th Street frontage is shown in ***Figure 8*** where vehicle parking is currently permitted without restrictions. The 550 5th Street frontage has a new protected bike lane between the sidewalk and the parking lane. There are approximately 16 parallel parking spaces available on 5th Street between Harmston Avenue to Fitzgerald Avenue.

Figure 8: 550 5th St Frontage

On a weekday, parking utilization peaks between 60 – 80% between 10:00am and 2:00pm. On an average weekend, utilization reaches a maximum of 60% around 10:30am and then drops off for the remainder of the day. ***Figure 9*** provides a time series distribution of the parking utilization along the entire 550 5th Street frontage corridor.

Looking specifically at the immediate frontage that serves 550 5th Street, approximately room for 10 vehicles, there were 33 unique parking movements between 10am and 5:30pm on September 21 (weekday). The average stay was approximately 1.5hrs with the maximum stay of 3.5hrs observed by two vehicles. Most vehicles (9) parked for half an hour or less, eight vehicles parked for an hour, and four vehicles parked for 3hrs or more.

Based on the observed current behaviour, implementing a time restriction on this section of 5th Street would formalize most pre-existing behaviours, and impact only a minority of current users.

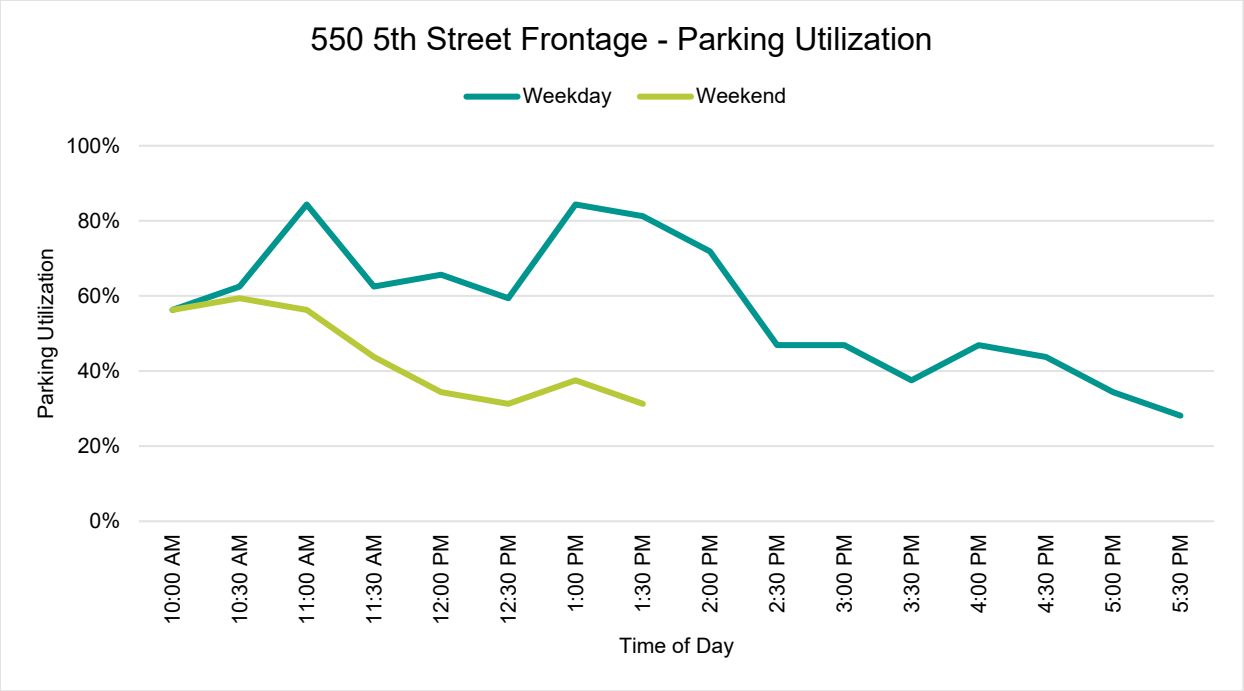


Figure 9: 550 5th St Parking Utilization (between Harmston Avenue and Fitzgerald Ave)

Analysis of the 445 10th Street Frontage

The frontage of 445 10th Street is shown in ***Figure 10*** which currently has four parallel parking spots available.

Figure 10: 445 10th Street frontage

The maximum parking occupancy between the two weekday and weekend days of parking occupancy collection was analyzed by time of day. ***Figure 11*** displays the maximum parking utilization of these four spots. There were only two periods on a weekday when parking utilization was at 100%. On a weekend, parking utilization was at 50% (two cars parked out of the four stalls available) at 10:00am, then decreased as the day progressed.

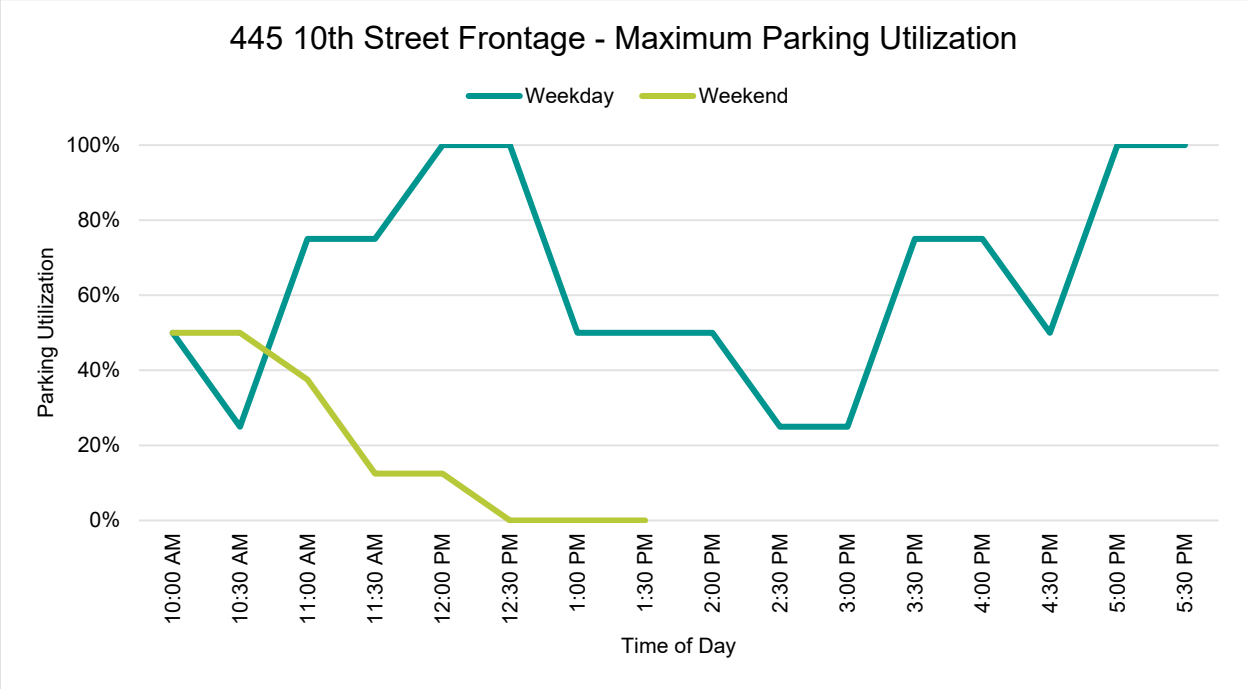


Figure 11: 445 10th St Parking Utilization

Further interrogation of the surveyed data indicates that turnover at the location is relatively high with vehicles stopping, on average for 1.1hrs and not more than 2hrs. In total, an average of 13 individual vehicles utilized the curb between the hours of 10am and 5:30pm, most of which parked for a 1hr duration.

Based on the observed current behaviour, implementing a time restriction on this section of 10th Street would formalize most pre-existing behaviours, and impact only a minority of current users.

Analysis of the 5th Street Corridor

5th Street is spine corridor of downtown Courtenay with a large number of shops and amenities that draw significant activity. The angled parking between Fitzgerald Avenue and England Avenue is known to be an area of high activity and so a specific review of this area was conducted for a typical weekday.

During a typical weekday (10am to 5:30pm) there are an average of 142 individual parking movements across the 24 parking spaces on the north side of 5th Street between Fitzgerald Avenue and England Avenue with an average of 6 different vehicles occupying each space. The average time spent parked is 1 hour and the maximum observed stay was 4.5 hours. The majority of vehicles park for half an hour or

less (89 out of 142 vehicles) with 30 vehicles parking for an hour, 11 parking for 1.5 hours, and very few parking for longer than that. The accessible parking spot at the England Avenue end of the curb was occupied for 1 hour in total, by two different vehicles.

Figure 12: 5th Street Angled Parking

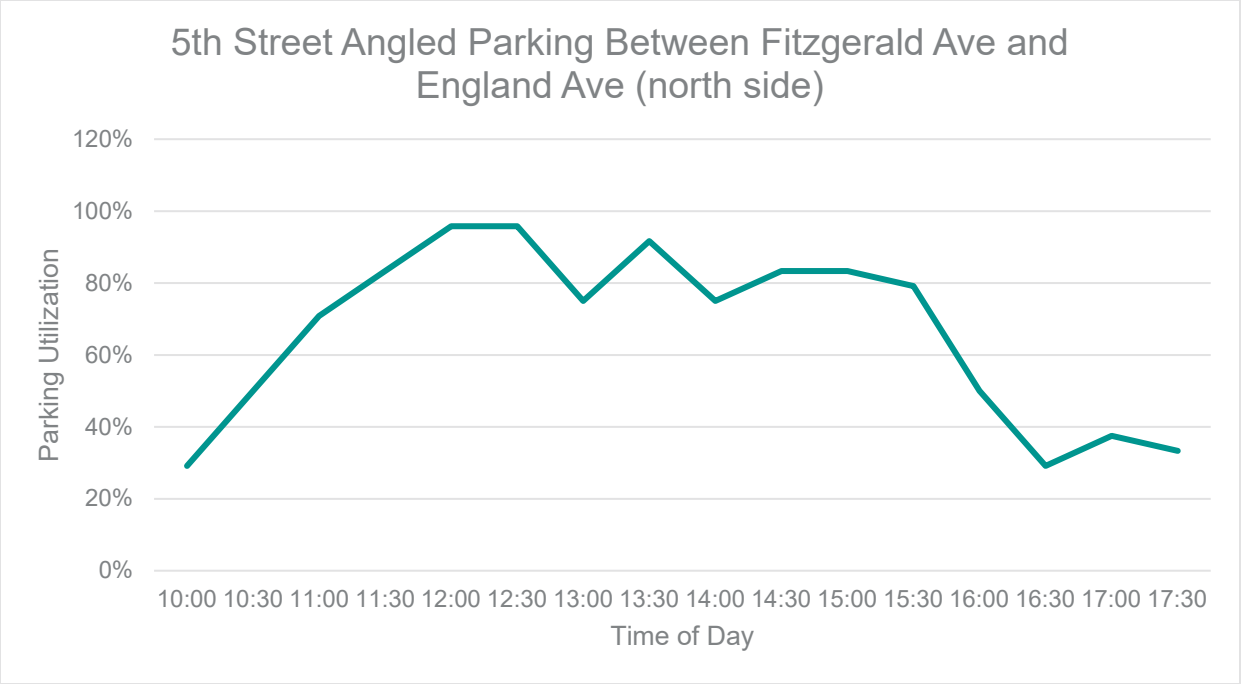


Figure 13: 5th Street Between Fitzgerald Ave and England Ave Parking Utilization

Closer to Cliffe Avenue, 5th Street is served by parallel curb parking, with fewer available parking spots for visitors and customers to park. The 2hr parking restriction is intended to protect this area for short-term stays and provide an opportunity for proximate parking to key retail destinations within the downtown.

An analysis of the weekend parking data indicates that, for the 9 available parking spots on the north side of 5th Street between Duncan Ave and Cliffe Ave, there are an average of 49 individual parking movements within the surveyed tie period (10am to 5:30pm). Utilization is high, with never less than 6 spots occupied (and this includes occasions where large vehicles – or bad parking – remove the availability of one or more spaces), and 8-9 spots occupied between 12:30 and 3pm. On average, vehicles park for around 1.2hrs with most vehicles (22 of 49) staying for 3o minutes or less. 16 vehicles stay for an hour or less and longer stays are infrequent. However, it should be noted that one vehicle was observed parking for 6.5hrs on both survey days, indicating that all-day parking is not uncommon within the downtown core area.

Analysis of the 6th Street Corridor

The 6th Street corridor is a major part of the downtown area with several popular restaurants as well as the Vancouver Island Regional Library, the Old Farm Market, and other key destinations. Parking analysis has been completed for 6th Street between Fitzgerald Avenue and the Anderton Avenue; the analysis area is shown in ***Figure 14***. The block between Fitzgerald Avenue and England Avenue is notable for the angled parking stalls that maximize parking supply in this area. Angled parking currently provides space for 17 stalls on the north side of 6th Street, with a gap for access to the off-street parking lot. This is around double what would be expected with parallel curb parking (approximately eight stalls) in the same

space. On the south side of the street are 23 angled parking spaces along a 75m frontage (this would likely accommodate 12 vehicles with parallel curb parking).

There are currently approximately 96 parking spots available on 6th Street from Fitzgerald Street to the Puntledge River. Parking utilization varies by block along 6th Street, with especially high utilization between Fitzgerald Avenue and England Avenue to access the adjacent businesses. ***Figure 15*** illustrates the parking utilization for the whole corridor by time of day for both a typical weekday and weekend. On a weekday, utilization is at 80% until 2:00pm where it decreases to about 40% by 6:00pm. On a weekend, utilization peaks around 12:30pm at around 60%.

Figure 14 - 6th St Corridor

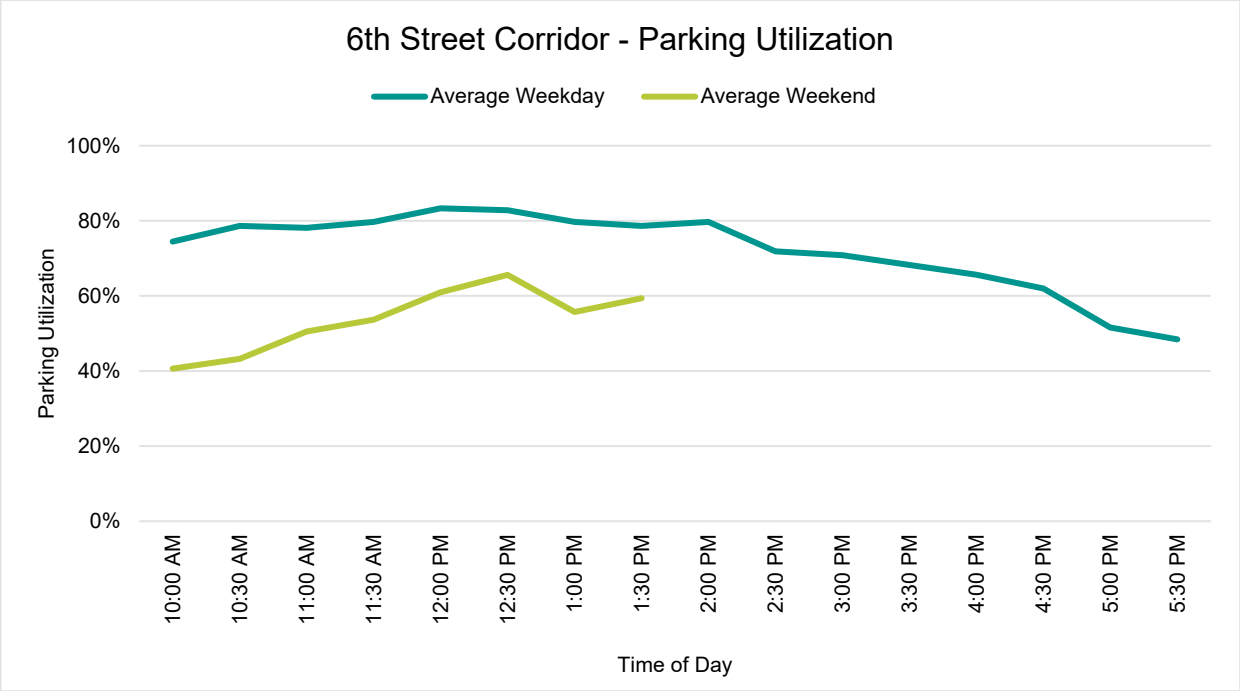


Figure 15: 6th Street Corridor Parking Utilization

Given that parking utilization is never observed to be much more than 80%, the loss of 20 spaces along the corridor (by converting angled parking stalls to parallel) could result in demand exceeding capacity during the busiest times, although the Section 1 utilization more generally is also around 80% and so there would appear to be sufficient capacity in the surrounding area to absorb additional demand when including both on- and off-street parking opportunities. 80% peak period utilization is typically optimal to allow drivers to find a parking spot and minimize parking search behaviour and driver frustration.

Analysis of the Old Orchard Area

Old Orchard is a residential neighbourhood to the north of the downtown area, generally comprised of 1st, 2nd, and 3rd Streets between Harmston Avenue and Cliffe Ave. Community feedback has indicated that there can be some overflow of parking into the residential area which has unrestricted parking access.

Looking specifically at on-street parking within the Old Orchard area, there are approximately 207 parking locations available along 2nd and 3rd Streets and the sections of Harmston Ave, Fitzgerald Ave, England Ave, Duncan Ave, and Cliffe Ave north of 4th Street. Parking utilization is quite consistent from 10am through to around 2pm where it begins to drop off, based on an average of the two weekday survey periods. No more than 137 individual vehicles were observed parking in the neighbourhood during one time period, with an average of around 109 vehicles. Many vehicles appear to stay for the long periods of time, potentially indicating that they have parked prior to the start of the business day by workers within the downtown area. This is somewhat borne out by the fact that weekend parking utilization is far lower with between 47-50 vehicles observed during any time period (less than half of the weekday volume).

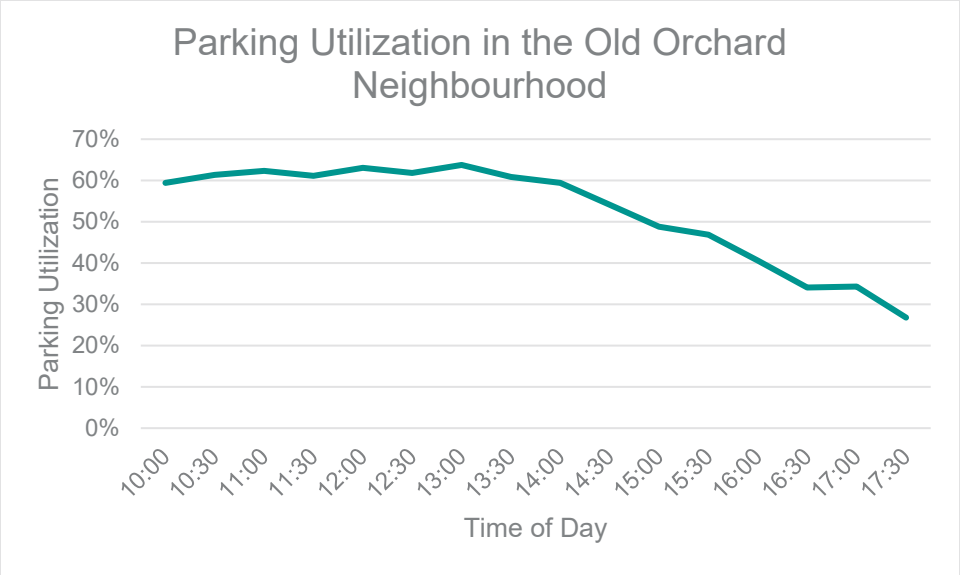


Figure 16: Parking Utilization across the Old Orchard neighbourhood (weekday)

It is interesting to note that the on-street parking north of 4th Street is busy by 10am, whereas the, time-restricted, parking on 4th Street and further into downtown, has significant additional capacity. This would seem to indicate that vehicles are parked early within the Old Orchard neighbourhood for long-stay parking.

Analysis of Off-Street Parking Lots

Shoppers Drug Mart

The Shopper's Drug Mart, located on 8th Street between England Avenue and Cliffe Avenue is a frequently-visited pharmacy, gift shop, grocery, and general goods store which would be assumed to have a relatively high frequency of turnover across parking spaces. The image shown in ***Figure 17*** reports 67 vehicles occupying the lot at 9:30am, out of 107 total available spaces (62% occupancy) while at 1:30pm on the same day, there are 73 vehicles in the lot (68% occupancy), see ***Figure 18***. What is interesting is that by comparing the images we can see that 31 of the vehicles from the 9:30am images are still there at 1:30pm, indicating a stay of at least 4 hours indicating that almost half of vehicles parked in the lot are unlikely to be customers of the store and are more likely to be employees of this, or a neighbouring business. Most of these 31 vehicles are still in their original location by 3:30pm.

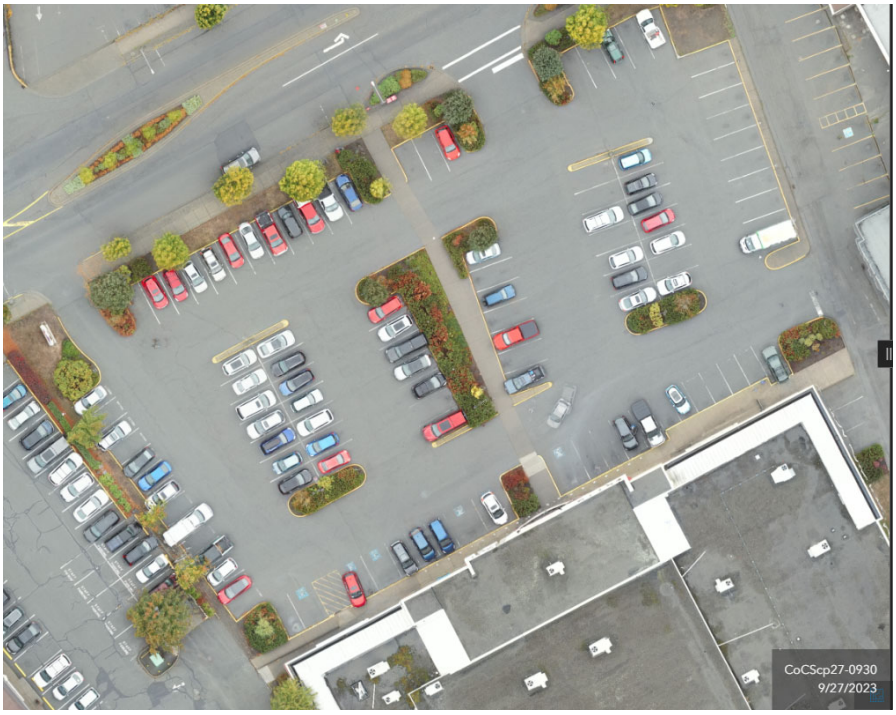


Figure 17 - Shopper's Drug Mart parking lot at 9:30am on Wednesday, September 27 2023

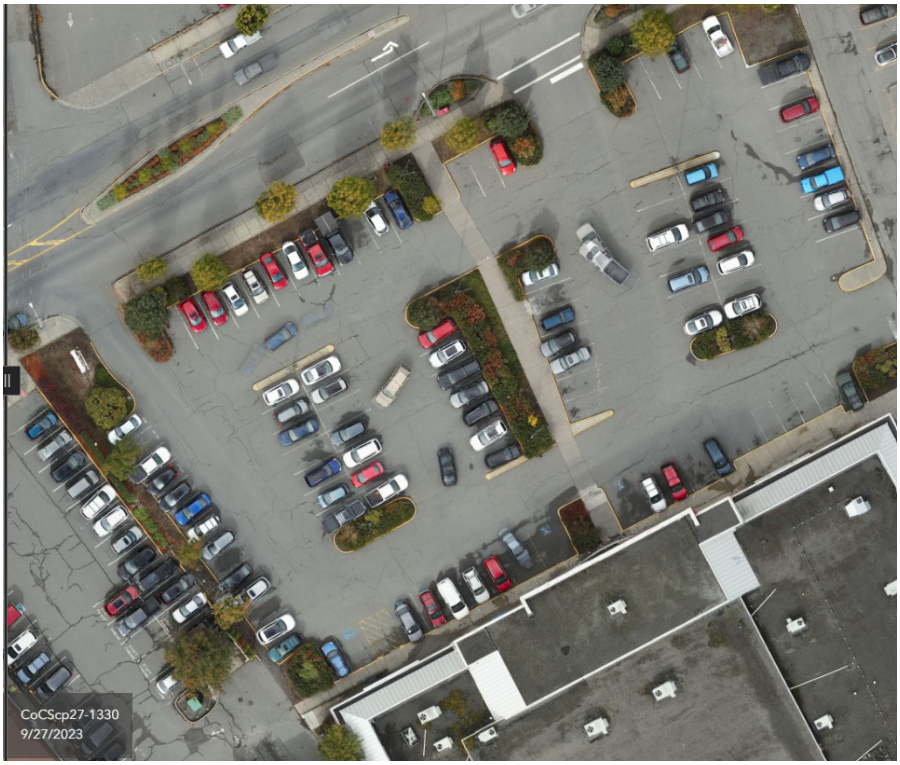


Figure 18 - Shopper's Drug Mart parking lot at 1:30pm on Wednesday, September 27 2023

Vancouver Island Regional Library – Courtenay

The public library has 76 parking spaces, including 4 accessible parking stalls and is accessed by a bi-directional circulation route that also provides through-access from 6th Street through to 8th Street.

On day 1 of the weekday survey there were 42 vehicles parked at 10am on a weekday with only 6 still in place by 2:30pm. However, on the second weekday survey date; of the 71 vehicles parked at 10am, 24 were still in place by 2:30pm, indicating that there may be some variability in how people use the library lot for all-day parking.

Weekend parking utilization is far lower (~25 vehicles parked in the morning peak, on average) but there are still between 6-8 vehicles parked for longer than 3hrs.

Figure 19: Vancouver Island Public Library parking lot

4th Street and Duncan Avenue Surface Parking Lot

The public parking lot at 4th Street and Duncan Avenue contains 47 parking spots. Based on weekday survey data, the utilization of the lot increases rapidly on the approach to midday with utilization at or above 80% between 11:30 and 3pm. Reviewing the individual orthoimages reveals that some vehicles do park for longer than 2 hours (3 vehicles on Sept 21, and 10 on Sept 27).

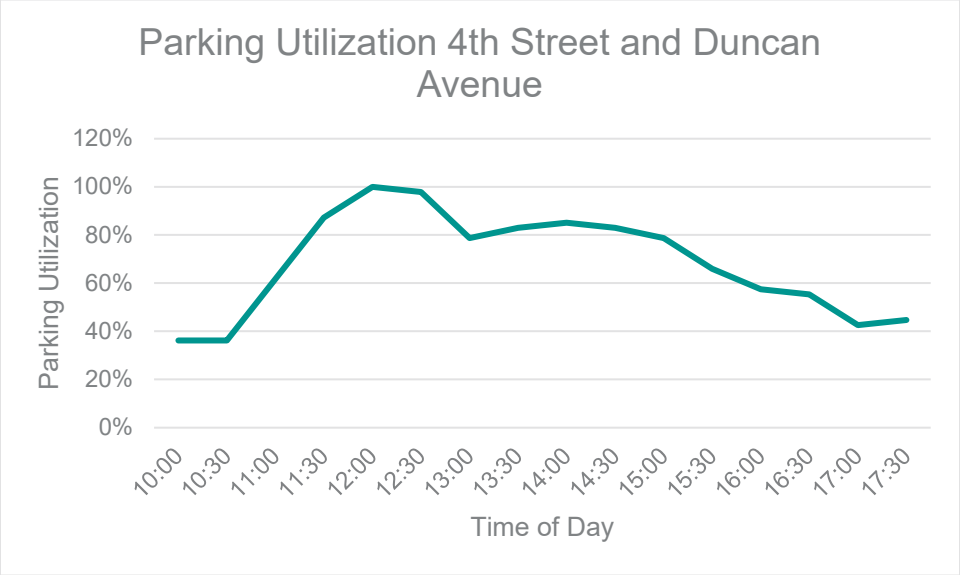


Figure 20: Public Parking Utilization at 4th Street and Duncan Avenue

4th Street and Fitzgerald Avenue Surface Parking Lot

The public parking lot at 4th Street near Fitzgerald Avenue contains 19 parking spots. Based on weekday survey data, the utilization of the lot remains fairly stable at around 60% until the mid-afternoon when it begins to drop to only 2 vehicles by 5:30pm. Reviewing the individual orthoimages reveals that between 6-12 vehicles (out of the maximum of 14 observed parking at one time) park for longer than 4 hours with turnover being low compared to surrounding on-street activities.

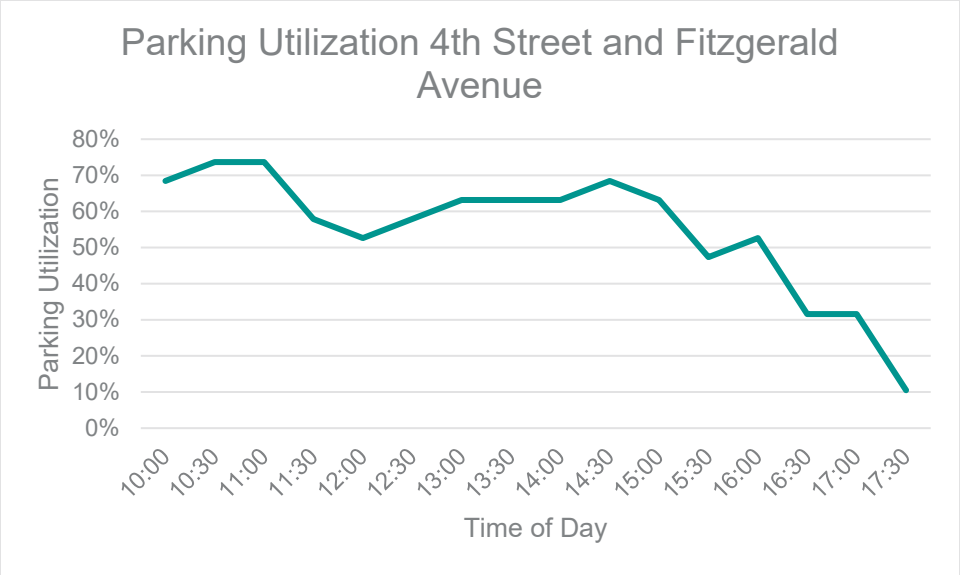


Figure 21: Public Parking Utilization at 4th Street and Fitzgerald Avenue

Upper/Lower Filberg Centre Surface Parking Lot

The lower Filberg parking lot directly serves the Filberg Centre and contains 40 parking stalls. Based on weekday survey data, the utilization of the lot peaks between 11:30am and 2:30pm and reaches maximum capacity around noon, with an average of 26 vehicles present throughout the day. 3-4 vehicles were observed to park for up to 4hrs in duration during weekday operations, however no vehicles parked for longer than this.

There are approximately 80 stalls in the upper parking lot, which also serves the Sid Williams Theatre and other local amenities. The lot is mostly underutilized with less than 50% occupancy until around noon when it increases to around 70% until mid-afternoon (2:30pm). An average of 33 vehicles park in the lot during a typical weekday. Between 10-14 vehicles stay for up to 4hrs on a typical weekday, with only 1 vehicle observed to stay longer than this during the two weekdays surveyed.

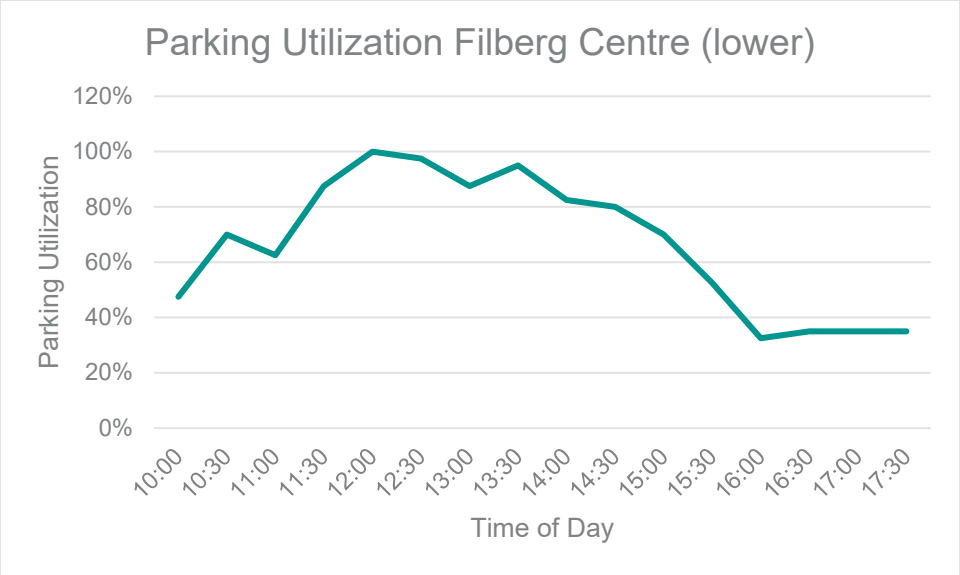


Figure 22: Public Parking at the Filberg Centre (lower)

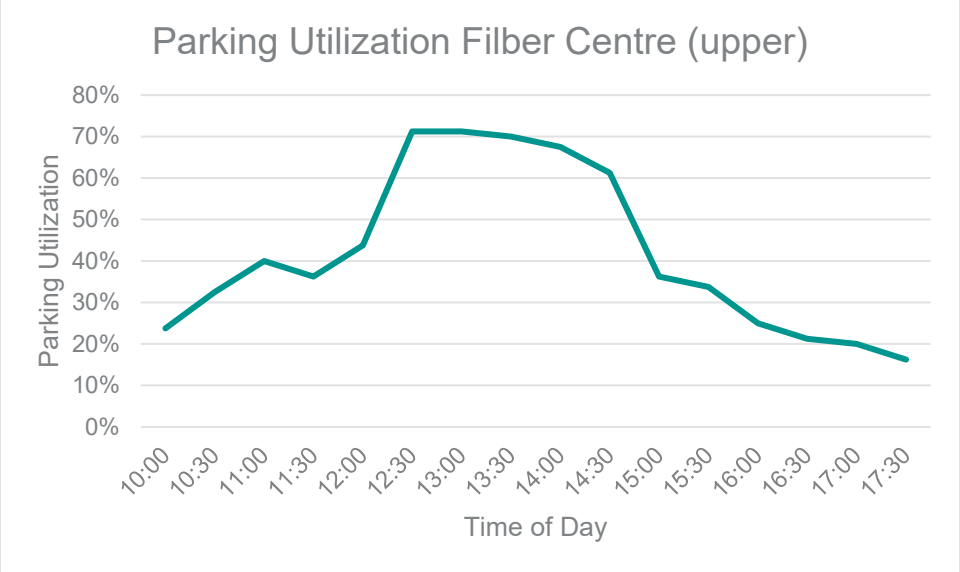


Figure 23: Parking Utilization at Filberg Centre (upper)

Sid Williams Theatre / Native Sons Hall Surface Parking Lot

The surface parking lot at the east end of 4th Street provides adjacent parking for the Sid Williams Theatre, Native Sons Hall, and amenities and commercial activities in the downtown area. There are 33 parking stalls provided. Utilization is quite consistent throughout the day, varying between 60-90% with an average of 24 vehicles parked.

During weekday operations, only 2 vehicles were observed parking for more than 4hrs with most vehicles parking for less than 2hrs, indicating that the lot is being used for relatively short trips/visits. The 2 vehicles identified as parking over 4hrs were there for the entire duration of both survey days, indicating they are regular, likely commuter, parking spots.

Weekend parking appears to be influenced by one-off events, as the first survey day saw 18 vehicles parking from 10am to 1:30pm, whereas the second survey day only saw 1 vehicle park for the whole duration.

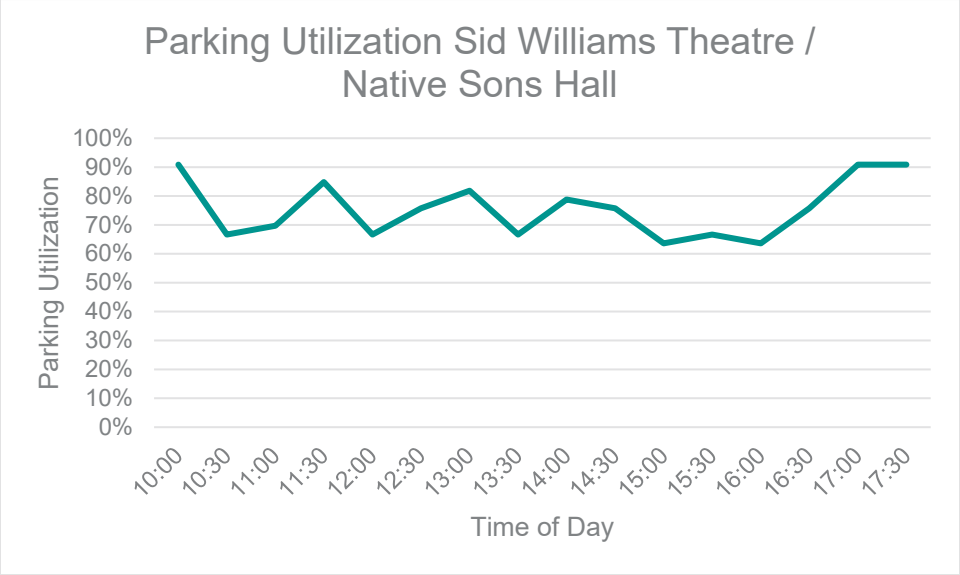


Figure 24: Parking Utilization at Sid Willams Theatre / Native Sons Hall Surface Parking Lot

5.4. GENERAL OBSERVATIONS

Some other general observations to note are:

- Parking utilization peaks mid-day, between 11:00am and 1:30pm.
- Off-street and on-street parking utilization are generally similar.
- Weekday utilization is on average higher than weekend utilization.
- Section 3 and 4 have the highest parking utilization, largely due to lower parking supply than the other sections and a high demand for accessing adjacent businesses.
- Bike parking was not specifically counted, but the data gathered indicates that an average of 7 individual bicycles make use of the 6th Street bike parking facility opposite the library on a typical weekday, with an average duration of stay of approximately 1hr.

6. Tool Development and Future Usage

6.1. WEB-BASED DASHBOARD

The current dashboard is hosted on McElhanney's server and is accessible only by a secure link to maintain security and privacy. Further study and analysis of the data can be undertaken upon request.

Examples of where the data sets collected as part of the drone survey can be interrogated further to provide valuable insights include:

- **Identifying non-conformance with parking restrictions.** Example: 5th Street is designated for 2-hour parking, however on Wednesday, September 27 between 9:30am and 3pm there were at least three vehicles that remained parking on-street for the entire 5.5-hour period.
- **Identifying abandoned vehicles.** Example: 6th Street at Harmston Avenue has 24-hour maximum parking restrictions, however there is an identified vehicle that did not move from the first survey on September 21 to the last on October 7.
- **Identifying the utilization of accessible parking.** Example: the south side accessible parking space at the end of the angled parking on 5th Street by Fitzgerald Avenue was utilized by at least 11 different vehicles across the four surveyed days.
- **Identifying the utilization of bike parking.** Example: the recently-installed bike parking opposite the Comox Valley Regional Library on 6th Street is visible in the drone photography and the utilization of this facility can be determined. Based on the data collected, at least 22 individual bicycles utilized the parking facility across the four survey days.

7. Conclusions and Next Steps

- The available on-street parking supply for the downtown area defined for the study, experiences slightly more than 80% occupancy between 11:30am and 2:30pm on a typical weekday. A generally similar profile is seen for off-street parking, although occupancy never exceeds 80%.
- Weekend parking remains below 50% occupancy for both on- and off-street parking.
- The 5th Street corridor experiences the highest consistent levels of utilization throughout the downtown whereas the areas south of 6th Street and along the Cliffe Avenue corridor are generally under-utilized.
- 5th Street experiences significant turnover, with the area between Fitzgerald Avenue and England Avenue (north side) turning over at an average rate of 0.75 vehicles per hour with 142 unique movements across the 24 spaces in that location.
- Weekday parking demand drops off substantially after 2pm for both on- and off-street parking.

- There are numerous instances across the downtown area where vehicles park in exceedance of the posted parking restriction, resulting in reduced overall supply for short-stay trips.

- Potential bike share solutions: many cities have found space for bike share companies to set up zones for parking and unlocking e-bikes and there are potential locations within the downtown area that would make sense. Typically, parking zones are located in high-activity or destination areas as these are the return-points for bikes in-use, as well as where people expect to be able to find a bike. Given the size and walkability of the downtown area, a single zone location may be sufficient in the downtown, with other zones located in areas such as the Driftwood Mall, Tin Town, North Island College, Vanier Secondary, and/or Comox Exhibition Grounds. Bike share systems have been found to be most effective where either extensive coverage is provided (i.e., dozens of smaller bike parking locations) or else where a limited number of strategic locations are provided. Smaller municipalities with successful bike share systems, such as Whistler, have around 10 locations for parking zones.

- Aside from Cumberland Road, there are a total of 137 angled parking stalls within the downtown area (51 on 4th Street, 46 on 5th Street, and 40 on 6th Street. Angled parking is particularly helpful where demand and turnover are high and there is sufficient right-of-way to allow for the safe reverse-out movement into the roadway. Typically, an angled parking space takes up around 3.2-3.5m of linear curb space (depending on the angle), whereas parallel parking requires around 6.5m of linear curb per space. The current angled parking supply occupies around 480m of curb length, which, if converted to parallel parking would provide around 73 parking spaces (a reduction of some 63 stalls overall). Given the significant loss in parking supply, this conversation should only be considered where:

    - Parking demand and/or turnover is low
    - Sidewalk expansion would yield significant benefits for the community
    - Alternative parking supply is available

  Some challenges associated with angled parking include:

    - Frequent overhanging of vehicles into the sidewalk (typically longer vehicles where the driver is concerned about the rear of the car obstructing the roadway)
    - Poor visibility for reversing movement – low speeds on streets with angled parking is helpful, and the frequent stop signs within the downtown area achieve this well

- Based on the analysis, timed parking restrictions at the 550 5th Street and 445 10th Street frontages would be appropriate measures to continue to manage parking supply and demand throughout the downtown area

- Enforcement of compliance with parking restrictions should be focused in problem areas

Appendix A

Study Methodology

Study Dates, Timing, and Conditions

The drone captures were conducted on the following dates:

- Thursday, September 21 – 9:30am – 18:00pm [weather conditions: sunny]
- Wednesday, September 27 – 9:30am – 18:00pm [weather conditions: cloudy with patches of rain]
- Saturday, September 30 – 10:30am – 13:30pm [weather conditions: mainly sunny]
- Saturday, October 10 – 10:30am – 13:30pm [weather conditions: mainly sunny]

On each date there were no observed special events or other disruptions outside of normal City operations and the weather was a mix of scattered clouds with some light precipitation. Based on the conditions, there is ample reason to assume that these dates and times reflect typical operations for the downtown area, particularly because the capture dates were after the summer holidays and reflect “back to school” and more typical commuting conditions.

Figure 25: DJI M300 Drone

The study gathered data utilizing the DJI M300 RPAS (Remotely Piloted Aircraft System), equipped with a Zemmuse P1 camera featuring a 35mm focal length lens. As a safety precaution, an AVSS parachute system was affixed to the drone in case of emergencies. The use of this drone requires an Advanced Pilot’s Licence, regulated by Transport Canada. The advanced licence allows the operator to fly a drone over bystanders at a specific altitude in an urban / semi-urban setting. Proper communication between Transport Canada, the City, and local RCMP was required prior to starting the flight missions to allow for clear response to members of the public who may report the drone activities. For each capture mission, the drone operator was located at 6th Street and Harmston Avenue, away from active vehicular movements. No issues were reported with the drone missions on any of the capture days, and all flights were completed as planned; this included the capture on the rainy day (September 27) where clear images were still captured due to the protective housing around the camera lens.

Data Processing

Each data capture mission constituted approximately 1,175 individual images (see ***Figure 26)*** which were then stitched together to form a composite mosaic of the study area for that 30-minute period utilizing the Site Scan application within the ArcGIS software platform.

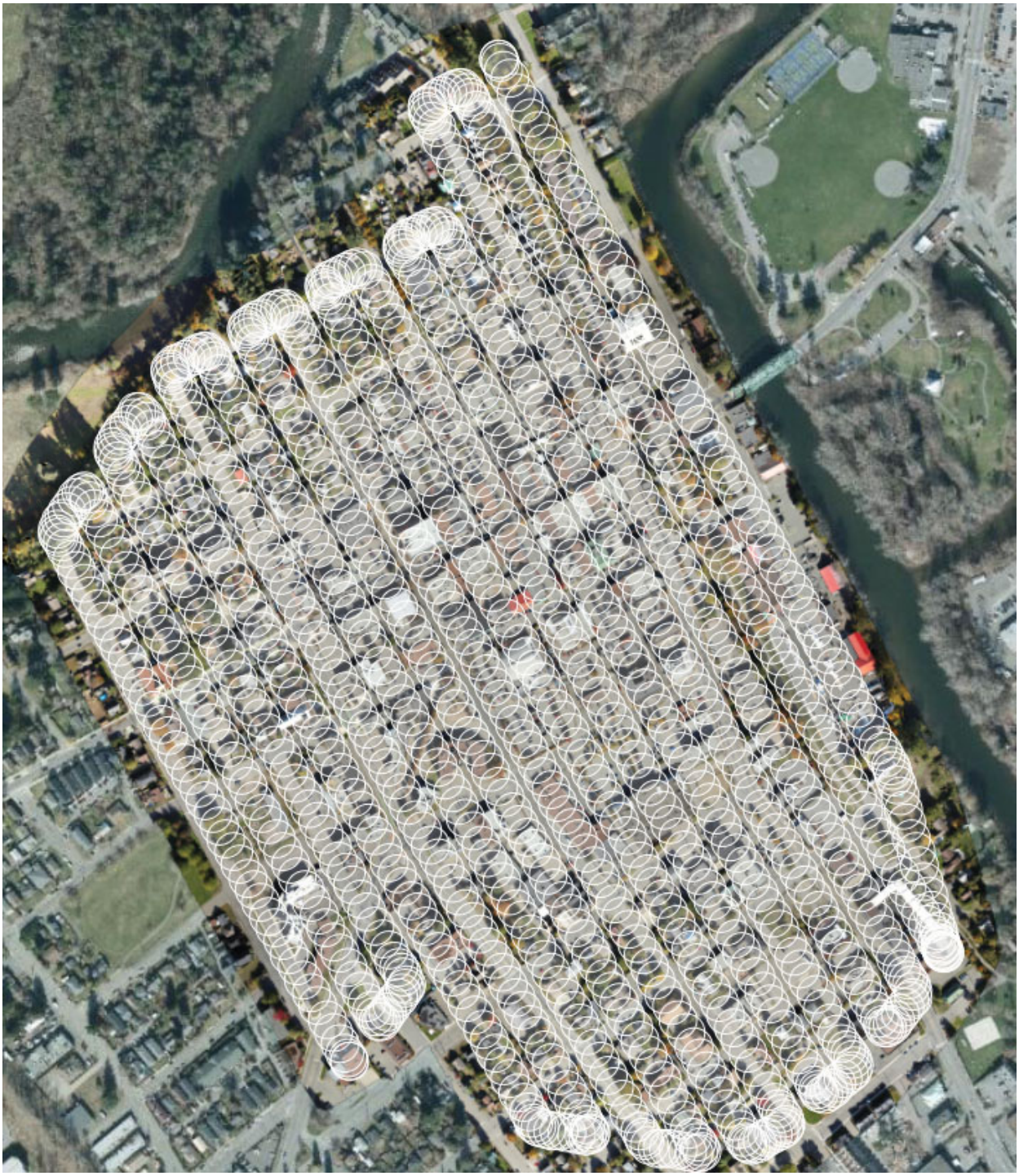


Figure 26 - Drone Mission Image Capture

An example of the imagery composite is provided in ***Figure 27*** below, with the boundaries of the study area clearly visible via the higher quality imagery covering the downtown area.

Figure 27 - Composite image of the 12:00pm drone flight for October 7, 2023

The high-resolution images provided through the drone photography allow for close-up inspection of parking occupancy and other street-level details for the study period under investigation in a way that was previously very difficult, if not impossible to derive. An example is provided in ***Figure 28*** for the parking lot at the intersection at 4th Street and Duncan Avenue where the lot occupancy at 12:00pm on Saturday, October 7 is observed to be full with 45 out of 46 spaces occupied and one (facing 4th Street, third from the left) either recently occupied or about to be occupied. Also notable is that one vehicle (a silver-grey truck) is occupying an area in the lower left of the image that is not technically a parking space.

Additionally, as the drone photographs include the on-street conditions, the use of the roadway is also visible, indicating the busy operations on the westbound lane of 4th Street west of Duncan Avenue.

Figure 28 - Parking lot at 4th Street and Duncan Avenue on Saturday, October 7 2023

With the data set available from the drone survey of the downtown core, it is possible to investigate period-by-period changes in parking space occupancy to gain insights on frequency of turnover and other operational metrics.

Data Dashboard

Following the processing of the individual images into the usable mosaics that allow for the initial scan and review summarized in Section 4.5, the data files were imported into McElhanney's GIS Portal for further analysis.

Following the import to the GIS portal, a series of analytical tools were developed to provide users with the ability to interrogate and export findings. Primarily, the main feature of the GIS software is the ability to run vehicle identification software that locates vehicles within the image and automatically counts them. Along with this core functionality, the following tools were also developed:

- **Layers** - This allows the user to show or hide ‘detected cars’, ‘roads’, ‘building footprints’, and drone imagery’ depending on what the user would like to see.
- **Parking filter** - This allows the user to differentiate between vehicles that are being driven on the road and vehicles parked in either on-street or off-street parking lots.
- **Date filter** - This allows the user to select the date and time period to review, based on the surveyed data (which can be added to over time).
- **Select** - This function allows the user to create a shape within the image and only count cars within this area. An example would be to draw a polygon around an off-street parking lot to automatically count the number of cars within the lot.
- **Export** - This allows the user to select a time period, location and/or filter and export the results across a range of times or dates to a .csv file which can then be opened in Microsoft Excel for further analysis and reporting.

An example screenshot of the dashboard is provided in ***Figure 29*** where the number of on-street vehicles at 10:00am on Thursday, September 21, 2023 is derived (717 across the entire study area). A toggle of the Parking Filter button indicates that 1,420 vehicles are parked off-street at the same time, showing the relative parking utilization for both forms of parking.

The value of this dashboard is that it allows for bespoke, detailed analysis of specific areas that are of interest to the City. For example, ***Figure 30*** shows the on street parking demand on 6th Street between Fitzgerald Avenue and Cliffe Avenue for Wednesday, September 27, 2023 (47 vehicles), and this can be extracted for all time periods on this date to assess the fluctuation in demand over time for this corridor.

Figure 29 - Example Screenshot of the GIS Dashboard

Figure 30 - Example of Isolating On-Street Parking on 6th Street Only

Statement of Limitations

Use of this Report. This report was prepared by McElhanney Ltd. ("**McElhanney**") for the particular site, design objective, development and purpose (the "**Project**") described in this report and for the exclusive use of the client identified in this report (the "**Client**"). The data, interpretations and recommendations pertain to the Project and are not applicable to any other project or site location and this report may not be reproduced, used or relied upon, in whole or in part, by a party other than the Client, without the prior written consent of McElhanney. The Client may provide copies of this report to its affiliates, contractors, subcontractors and regulatory authorities for use in relation to and in connection with the Project provided that any reliance, unauthorized use, and/or decisions made based on the information contained within this report are at the sole risk of such parties. McElhanney will not be responsible for the use of this report on projects other than the Project, where this report or the contents hereof have been modified without McElhanney's consent, to the extent that the content is in the nature of an opinion, and if the report is preliminary or draft. This is a technical report and is not a legal representation or interpretation of laws, rules, regulations, or policies of governmental agencies.

Standard of Care and Disclaimer of Warranties. This report was prepared with the degree of care, skill, and diligence as would reasonably be expected from a qualified member of the same profession, providing a similar report for similar projects, and under similar circumstances, and in accordance with generally accepted engineering/planning/etc and scientific judgments, principles and practices. McElhanney expressly disclaims any and all warranties in connection with this report.

Information from Client and Third Parties. McElhanney has relied in good faith on information provided by the Client and third parties noted in this report and has assumed such information to be accurate, complete, reliable, non-fringing, and fit for the intended purpose without independent verification. McElhanney accepts no responsibility for any deficiency, misstatements or inaccuracy contained in this report as a result of omissions or errors in information provided by third parties or for omissions, misstatements or fraudulent acts of persons interviewed.

Effect of Changes. All evaluations and conclusions stated in this report are based on facts, observations, site-specific details, legislation and regulations as they existed at the time of the site assessment/report preparation. Some conditions are subject to change over time and the Client recognizes that the passage of time, natural occurrences, and direct or indirect human intervention at or near the site may substantially alter such evaluations and conclusions.

Independent Judgments. McElhanney will not be responsible for the independent conclusions, interpretations, interpolations and/or decisions of the Client, or others, who may come into possession of this report, or any part thereof. This restriction of liability includes decisions made to purchase, finance or sell land or with respect to public offerings for the sale of securities.

Contact
Matthew Browning, P.Eng
236-317-3077
mbrowning@mcelhanney.com

McElhanney

CANADA BEST MANAGED COMPANIES
Platinum member