Downtown Courtenay Parking Study

Utilizing Drones and GIS to provide added-value to the gathering of parking data

Matthew Browning, P.Eng

June 12 2024

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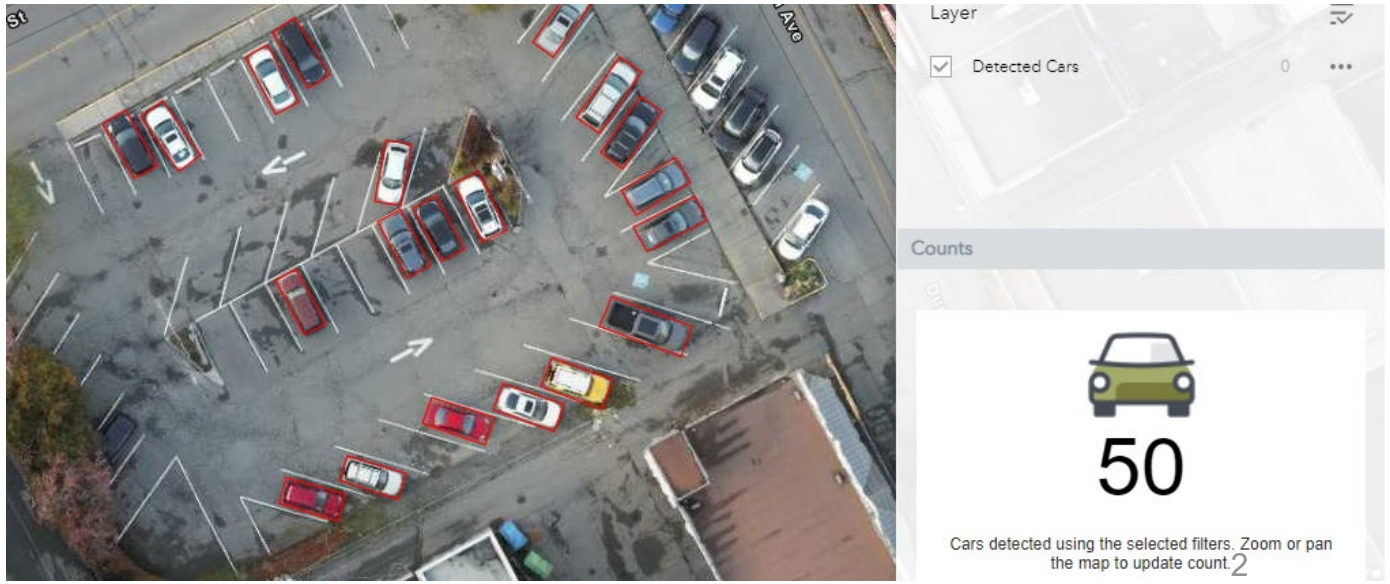
Today's Presentation

- Introduction
- Project Overview
  - Traditional Methodology
  - New Approach
  - Findings and Outcomes
- Benefits and Future Uses



Introduction

Matthew Browning P.Eng

Matthew Browning, P.Eng

19 years in the transportation industry

- Liverpool
- Toronto
- Vancouver Island

Island projects

- Parksville TMP
- Port Alice AT Plan
- Six Mile Mobility Hub
- Hullo Ferry Terminal
- Courtenay Parking Study

Project Overview

Downtown Courtenay Parking Study

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Downtown Courtenay Parking Study

- City of Courtenay staff reached out to us:
  - We previously completed the parking study in 2017
  - We're known to the City for our multi-disciplinary engineering, surveying and planning work
  - Limited work in terms of transportation planning services for the City
- Request to update the parking study with minimal prescriptive language about *how*

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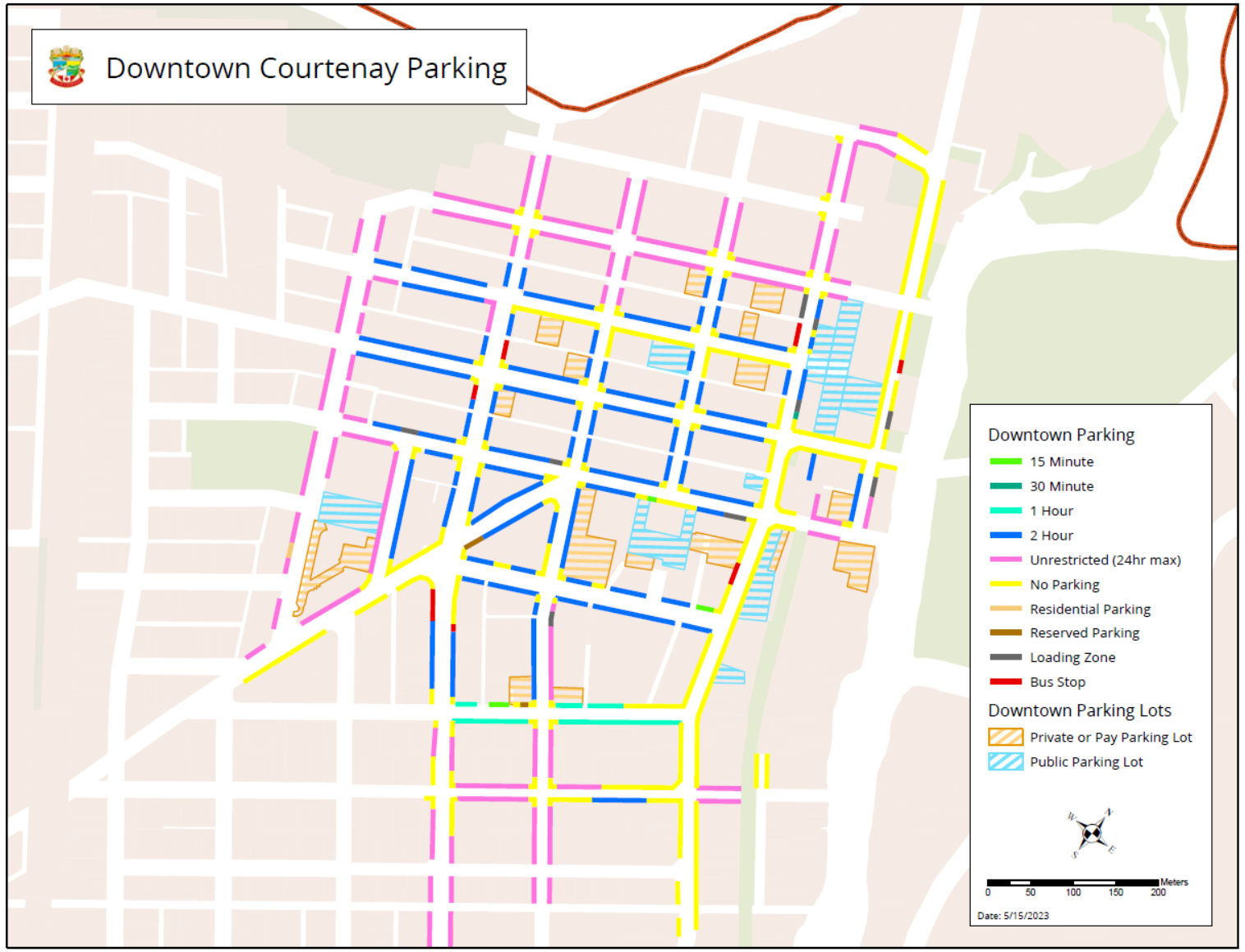
Study Area

- 2023 study extents provided (see right)



Traditional Methodology

Previous Parking Study

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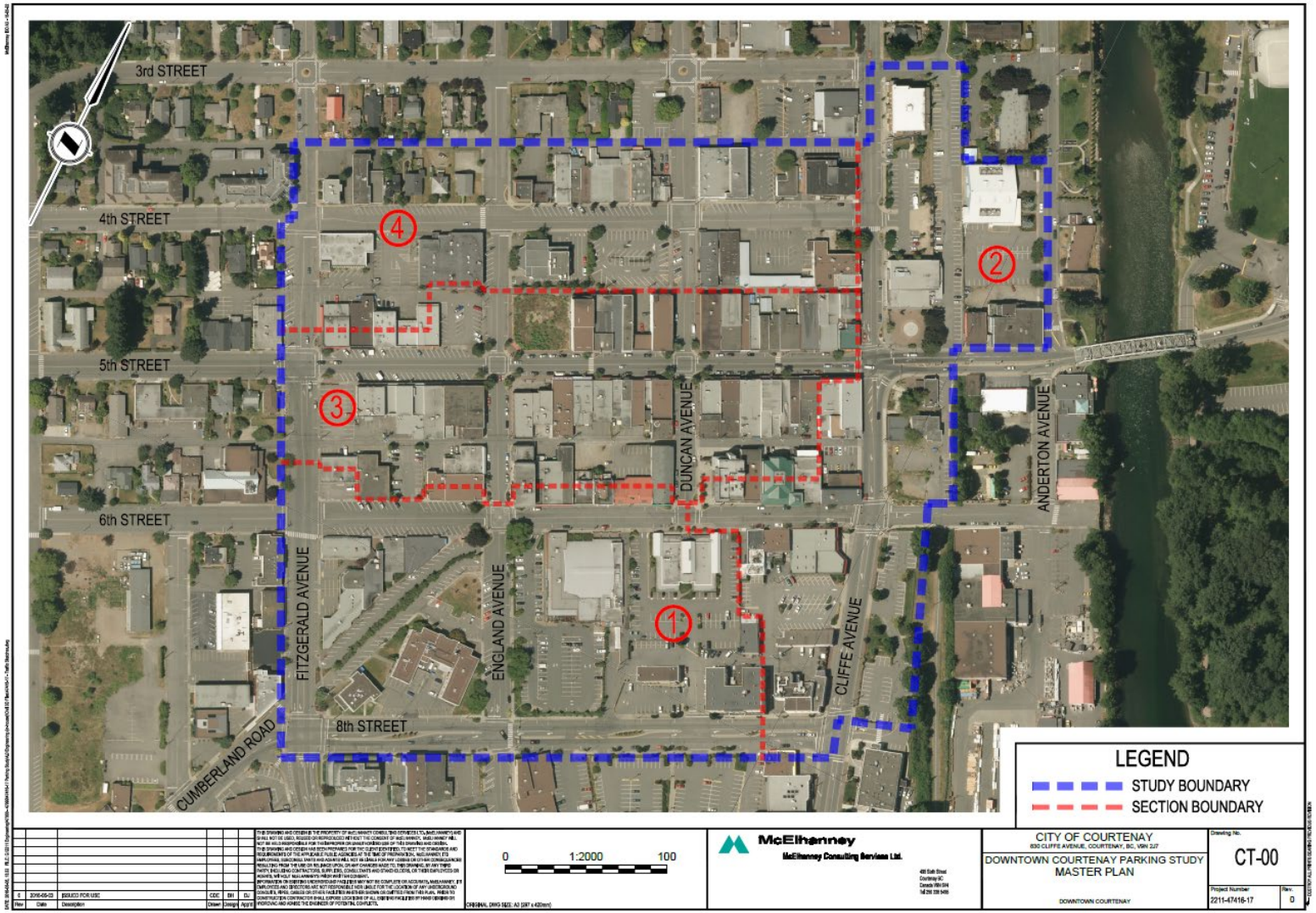
Previous Parking Study

- 2017 study focused on a smaller downtown core and was divided into four sectors;
  - Easier for technicians to walk around and count cars within a 30-minute time-period
  - Counts only differentiated between public and private parking



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Previous Parking Study

- The counts therefore could only be interrogated to the sector-level
  - Number of stalls
  - Private utilization
  - Public utilization
  - Overall utilization
- This provides limited opportunity for meaningful insight

Date: Wednesday, June 8, 2016
Stalls In Use

Area CT-01 (Section #1)

Total No. of Stalls		
Private	Public	
154	300	454

	9:00 AM	9:30 AM	10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 PM	2:30 PM	3:00 PM	3:30 PM	4:00 PM	4:30 PM	5:00 PM	5:30 PM
Number of Private Stalls	80	87	105	99	99	105	102	88	93	86	92	94	90	98	84	80	77	47
Private Parking Utilization	52%	56%	68%	64%	64%	68%	66%	57%	60%	56%	60%	61%	58%	64%	55%	52%	50%	31%
Number of Public Stalls	184	249	247	266	274	253	249	250	228	229	257	234	224	212	200	191	130	102
Public Parking Utilization	61%	83%	82%	89%	91%	84%	83%	83%	76%	76%	86%	78%	75%	71%	67%	64%	43%	34%
Total Number of Stalls	264	336	352	365	373	358	351	338	321	315	349	328	314	310	284	271	207	149
Overall Utilization	58%	74%	78%	80%	82%	79%	77%	74%	71%	69%	77%	72%	69%	68%	63%	60%	46%	33%

Area CT-02 (Section #2)

Total No. of Stalls		
Private	Public	
71	299	370

	9:00 AM	9:30 AM	10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 PM	2:30 PM	3:00 PM	3:30 PM	4:00 PM	4:30 PM	5:00 PM	5:30 PM
Number of Private Stalls	26	24	30	31	34	34	36	35	33	34	30	29	27	25	27	27	19	16
Private Parking Utilization	37%	34%	42%	44%	48%	48%	51%	49%	46%	48%	42%	41%	38%	35%	38%	38%	27%	23%
Number of Public Stalls	129	152	177	178	189	163	184	205	202	183	154	151	134	106	120	117	102	122
Public Parking Utilization	43%	51%	59%	60%	63%	55%	62%	69%	68%	61%	52%	51%	45%	35%	40%	39%	34%	41%
Total Number of Stalls	155	176	207	209	223	197	220	240	235	217	184	180	161	131	147	144	121	138
Overall Utilization	42%	48%	56%	56%	60%	53%	59%	65%	64%	59%	50%	49%	44%	35%	40%	39%	33%	37%

Area CT-03 (Section #3)

Total No. of Stalls		
Private	Public	
45	149	194

	9:00 AM	9:30 AM	10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 PM	2:30 PM	3:00 PM	3:30 PM	4:00 PM	4:30 PM	5:00 PM	5:30 PM
Number of Private Stalls	9	10	12	22	21	23	26	24	19	19	25	20	21	22	21	16	16	11
Private Parking Utilization	20%	22%	27%	49%	47%	51%	58%	53%	42%	42%	56%	44%	47%	49%	47%	36%	36%	24%
Number of Public Stalls	38	46	73	89	109	110	100	125	117	125	108	114	101	100	77	86	79	69
Public Parking Utilization	26%	31%	49%	60%	73%	74%	67%	84%	79%	84%	72%	77%	68%	67%	52%	58%	53%	46%
Total Number of Stalls	47	56	85	111	130	133	126	149	136	144	133	134	122	122	98	102	95	80
Overall Utilization	24%	29%	44%	57%	67%	69%	65%	77%	70%	74%	69%	69%	63%	63%	51%	53%	49%	41%

Area CT-03 (Section #4)

Total No. of Stalls		
Private	Public	
104	141	245

	9:00 AM	9:30 AM	10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 PM	2:30 PM	3:00 PM	3:30 PM	4:00 PM	4:30 PM	5:00 PM	5:30 PM
Number of Private Stalls	38	43	50	44	49	52	52	52	58	64	63	61	50	55	60	52	31	25
Private Parking Utilization	37%	41%	48%	42%	47%	50%	50%	50%	56%	62%	61%	59%	48%	53%	58%	50%	30%	24%
Number of Public Stalls	59	76	87	87	91	102	106	101	104	106	97	90	84	78	68	51	49	32
Public Parking Utilization	42%	54%	62%	62%	65%	72%	75%	72%	74%	75%	69%	64%	60%	55%	48%	36%	35%	23%
Total Number of Stalls	97	119	137	131	140	154	158	153	162	170	160	151	134	133	128	103	80	57
Overall Utilization	40%	49%	56%	53%	57%	63%	64%	62%	66%	69%	65%	62%	55%	54%	52%	42%	33%	23%

COMBINED

Total No. of Stalls		
Private	Public	Total
374	889	1263

	9:00 AM	9:30 AM	10:00 AM	10:30 AM	11:00 AM	11:30 AM	12:00 PM	12:30 PM	1:00 PM	1:30 PM	2:00 PM	2:30 PM	3:00 PM	3:30 PM	4:00 PM	4:30 PM	5:00 PM	5:30 PM
Number of Private Stalls	153	164	197	196	203	214	216	199	203	203	210	204	188	200	192	175	143	99
Private Parking Utilization	41%	44%	53%	52%	54%	57%	58%	53%	54%	54%	56%	55%	50%	53%	51%	47%	38%	26%
Number of Public Stalls	410	523	584	620	663	628	639	681	651	643	616	589	543	496	465	445	360	325
Public Parking Utilization	46%	59%	66%	70%	75%	71%	72%	77%	73%	72%	69%	66%	61%	56%	52%	50%	40%	37%
Total Number of Stalls	563	687	781	816	866	842	855	880	854	846	826	793	731	696	657	620	503	424
Overall Utilization	45%	54%	62%	65%	69%	67%	68%	70%	68%	67%	65%	63%	58%	55%	52%	49%	40%	34%

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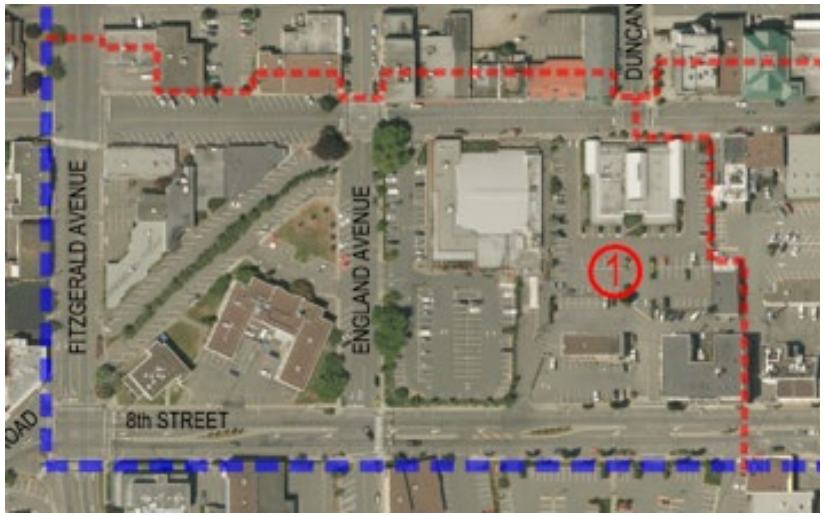
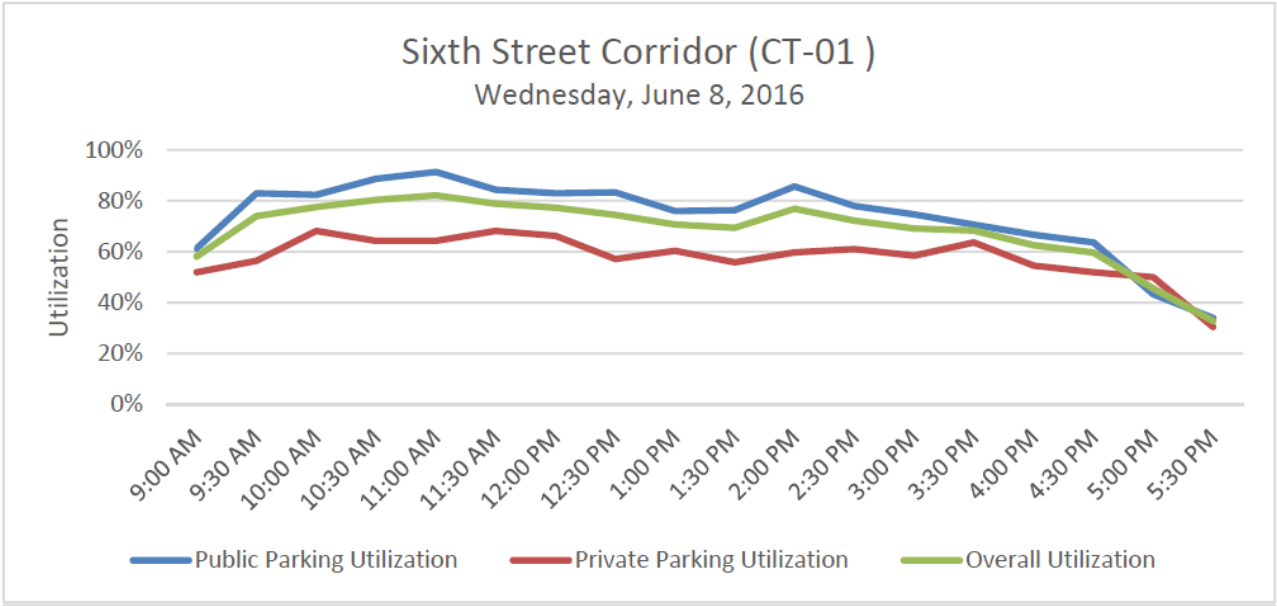
Previous Parking Study

- The utilization chart of the "Sixth Street Corridor", for example, is referring to the *entire* Sector #1 area
  - What does this tell the City?
  - What planning actions can you take based on this?
  - For example; what would happen if they were to transition the angled parking on Sixth Street to parallel?
  - Is there a better way to do this?





A New Approach

Drones and GIS

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Proposal

- McElhanney is at the forefront of Remotely Piloted Aircraft Systems (RPAS) technologies in Canada.
- We have 150+ pilots and over than 60 registered drones tackling a wide array of challenges across western Canada

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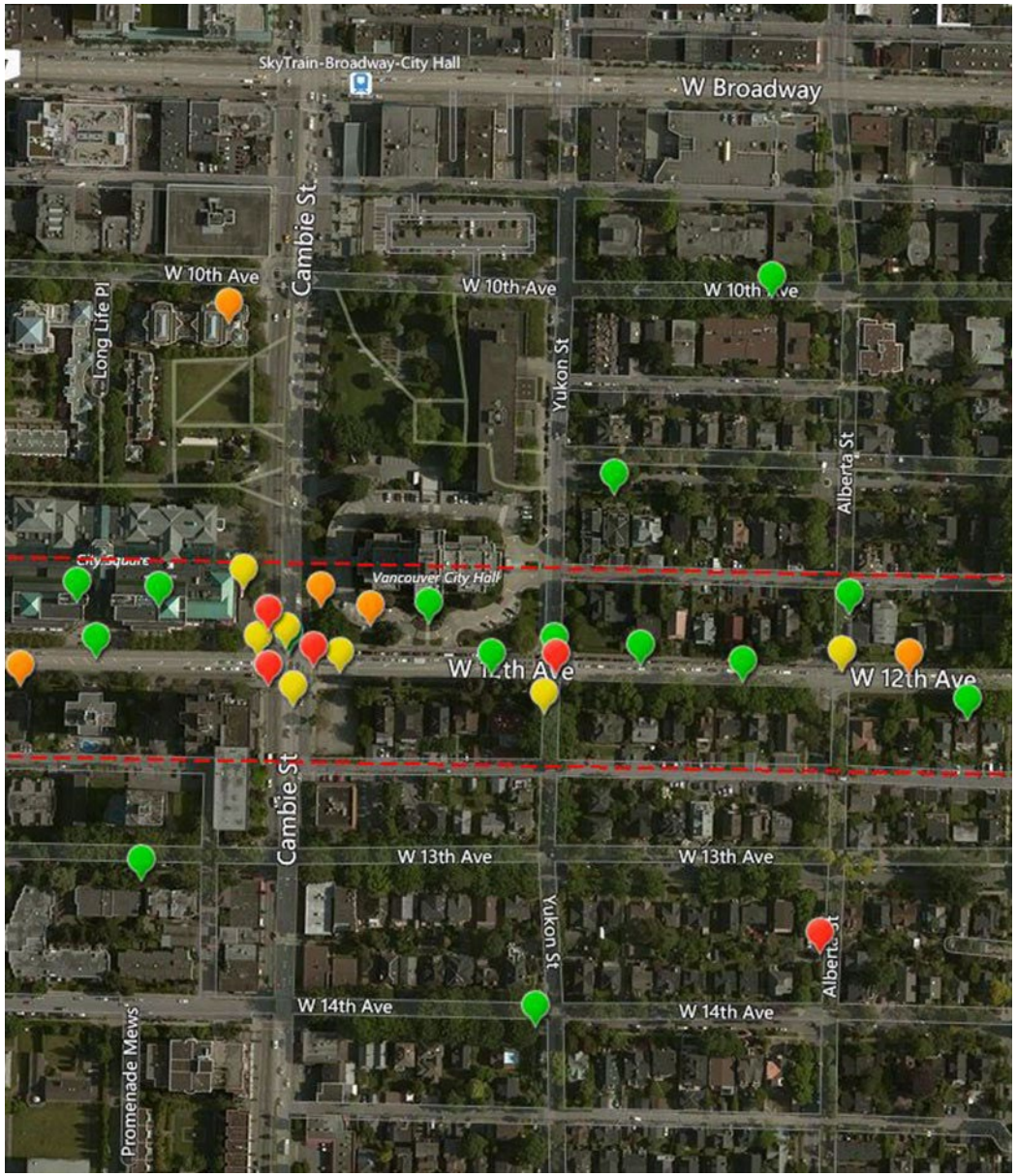
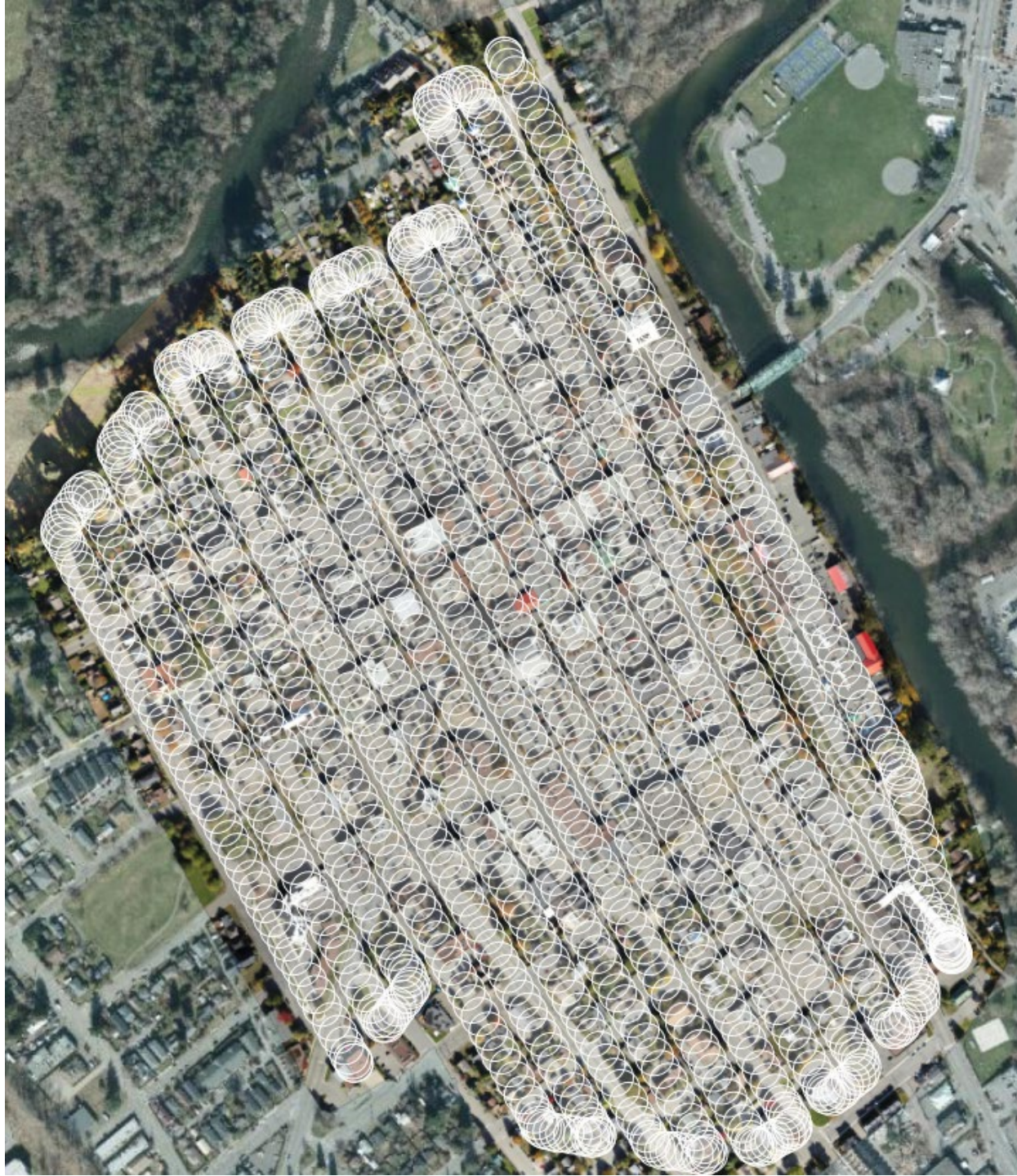
Proposal

- We also have a talented GIS and Spatial Analysis team, working in mapping, spatial analysis, data handling, analysis and visualization.
- The plan was to bring these two disciplines together to find a new approach to conducting parking data collection and analysis



Proposal

- Our workplan proposed to fly a drone mission across the downtown of Courtenay, capturing hundreds of individual images
- These images would then be assembled into an orthomosaic that could be imported into a GIS database
- We would conduct analysis using vehicle recognition software in GIS



The Project

Processing and Rapid analysis

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The Project

- We were able to fly four missions (2 weekdays and 2 Saturdays) using a single drone operator as the human resource
- The process to stitch the images together was seamless and provided an initial tool that had immediate benefits

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The Project

- Two orthomosaics can be compared by dragging across the screen
- The images show September 30th at 11am and 1:30pm along 5th Street
- Any individual location can be compared for two time periods, illustrating parking utilization, duration, informal parking, etc.

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The Project

- The next step was to import the orthomosaics into GIS
- The dashboard created then allows for bespoke interrogation, based on vehicle identification software
  - 717 vehicles parked on-street at 10:00am on Thursday, September 21
  - 47 vehicles parked on-street <u>on Sixth Street specifically</u>
  - Data can be exported to excel for further analysis

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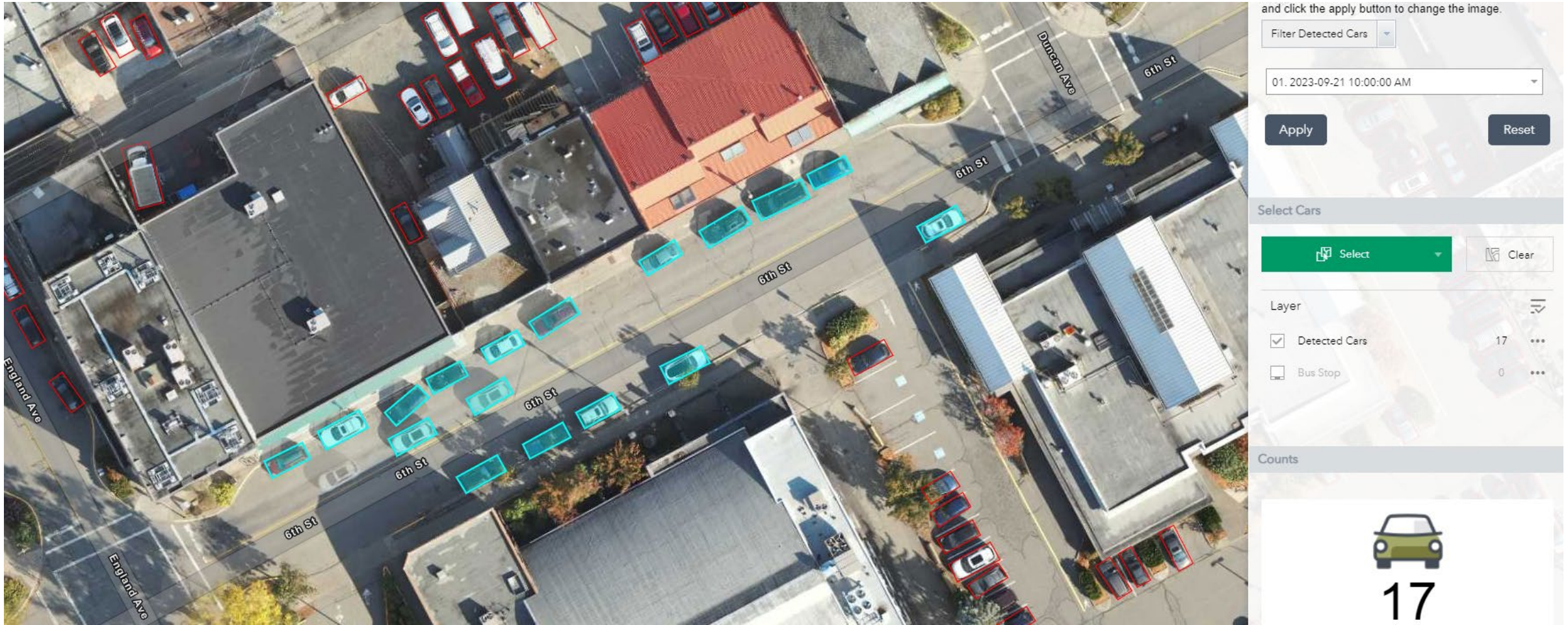
The Project

- Any individual area can be assessed for on/off-street parking and/or driving



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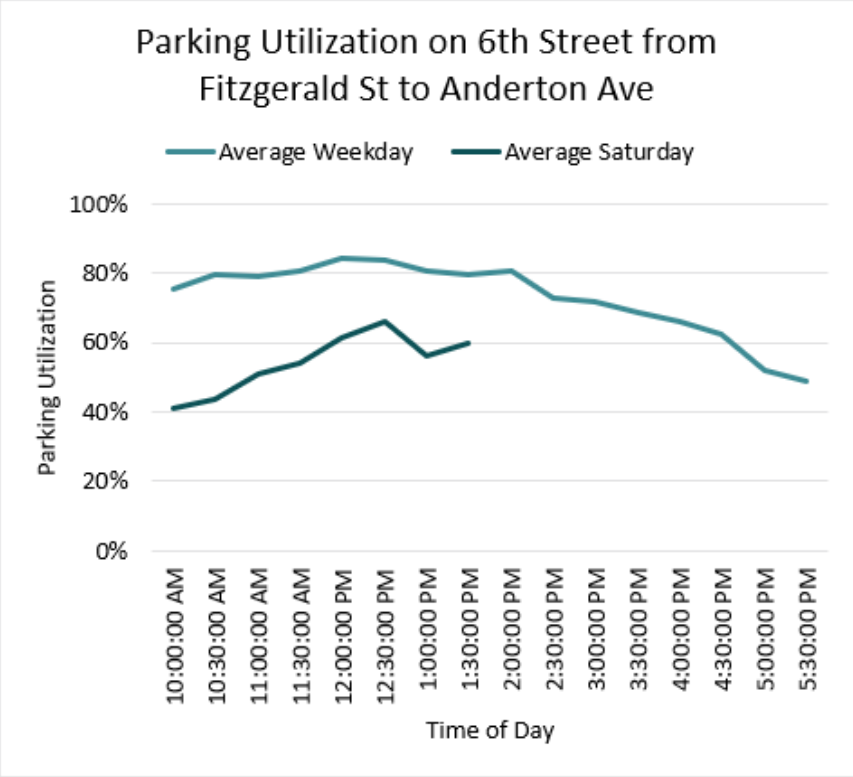
The Project

- Mid-project, staff mentioned the need for data collection in support of 6th Street Active Transportation Options Analysis
- Within the day, we were able to generate usable insights
  - Weekday and weekend utilization
  - Specific - *to the block* - along the corridor

	Occupied		Utilization	
Time of Day	Average Weekday	Average Saturday	Average Weekday	Average Saturday
10:00:00 AM	72	39	75%	41%
10:30:00 AM	76	42	79%	44%
11:00:00 AM	75	49	79%	51%
11:30:00 AM	77	52	81%	54%
12:00:00 PM	80	59	84%	62%
12:30:00 PM	80	63	84%	66%
1:00:00 PM	77	54	81%	56%
1:30:00 PM	76	57	79%	60%
2:00:00 PM	77		81%	
2:30:00 PM	69		73%	
3:00:00 PM	68		72%	
3:30:00 PM	66		69%	
4:00:00 PM	63		66%	
4:30:00 PM	60		63%	
5:00:00 PM	50		52%	
5:30:00 PM	47		49%	

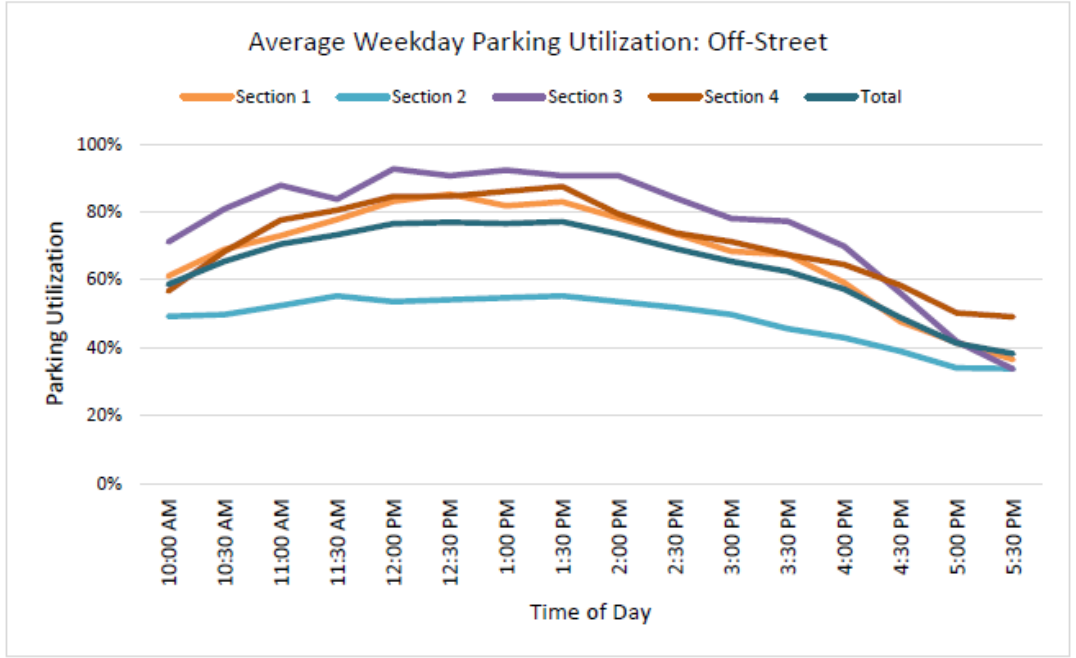


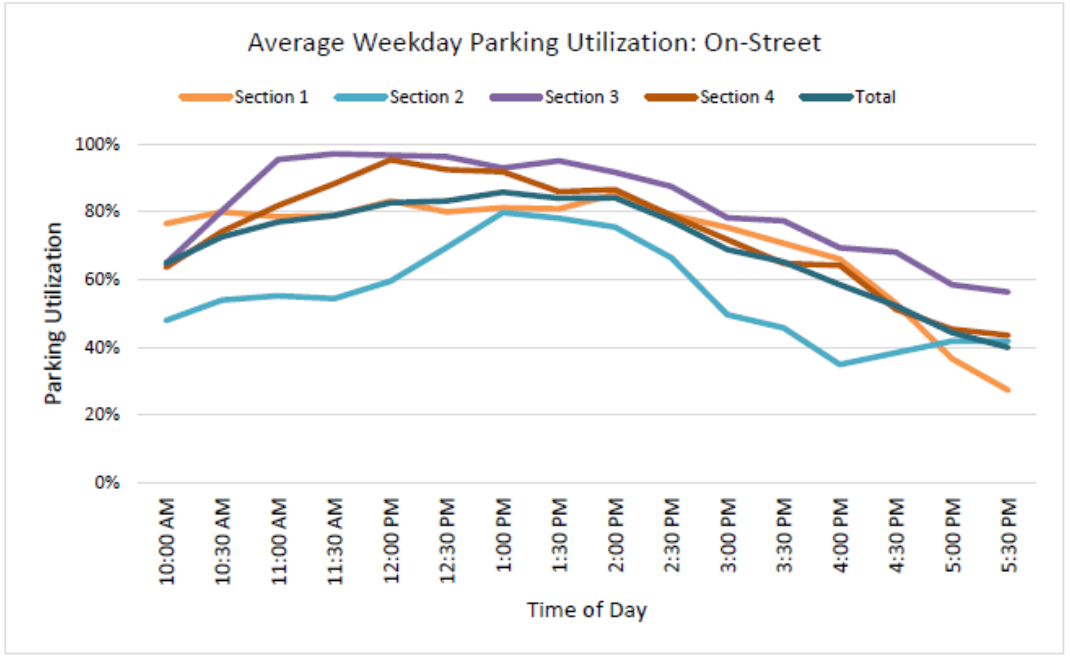
Key Findings

Summary and Site-Specific Observations

Key Findings

- Total utilization for off-street parking never exceeds 80% for the downtown core
- On-street parking tends to be slightly higher, but both drop off dramatically after ~2pm
  - Both graphs are for the average weekday (without farmer's markets or other activities)
  - Weekend utilization is rarely more than 50-60% in total





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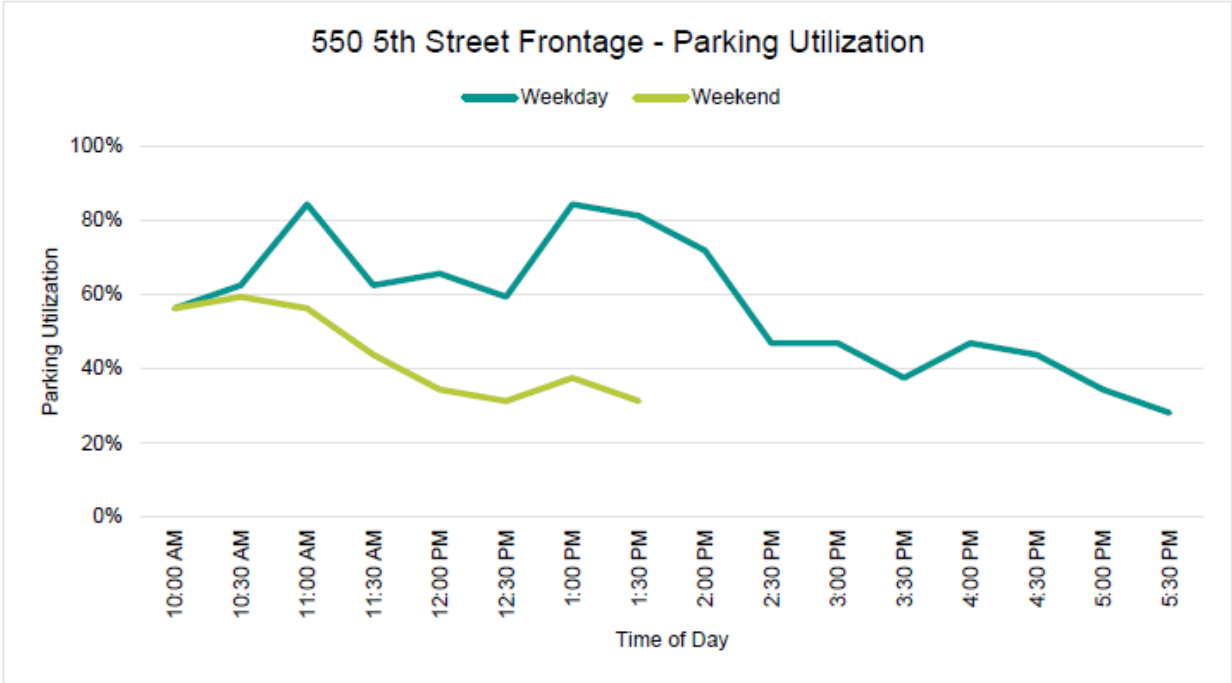
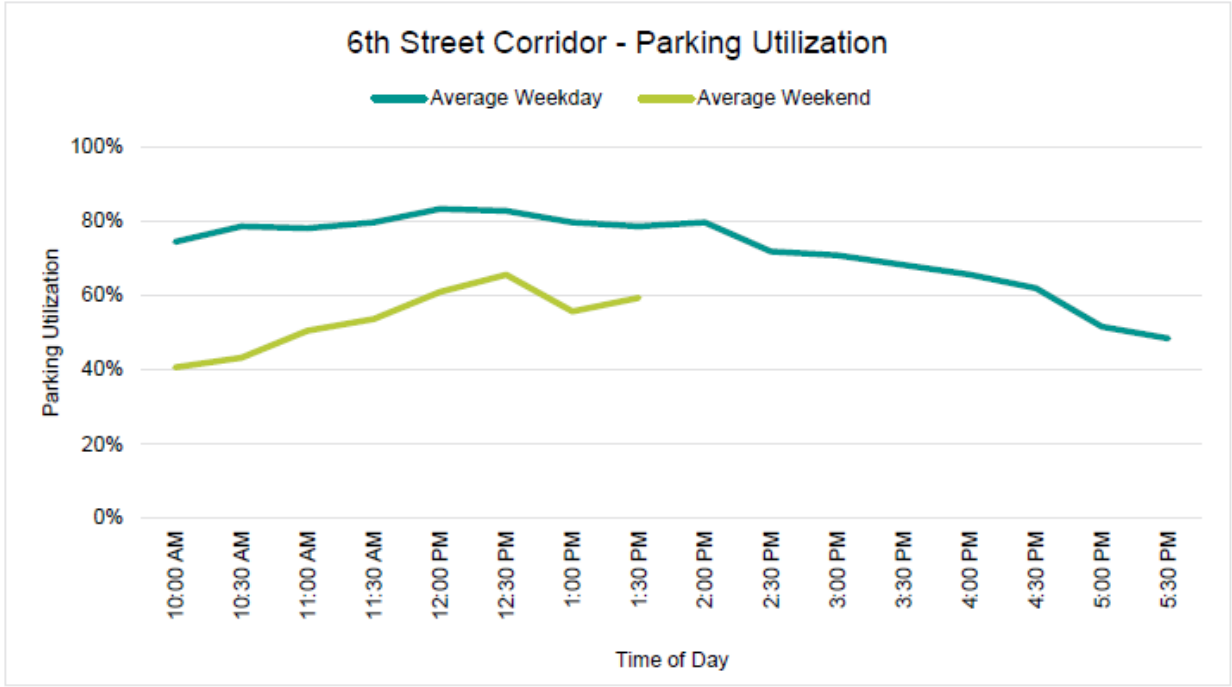
Key Findings

- Staff also asked us to look specifically at the following locations:
  - 550 5th Street frontage
  - 445 10th Street frontage
  - 5th Street corridor between Fitzgerald Ave and England Ave
  - 6th Street corridor
  - Old Orchard Area
  - Multiple off-street parking lots

Key Findings

- Because of the way the GIS is set up, we were able to rapidly complete bespoke analyses of each of these areas and pull meaningful insights that can guide future decision-making





Benefits and Future Uses

Summary

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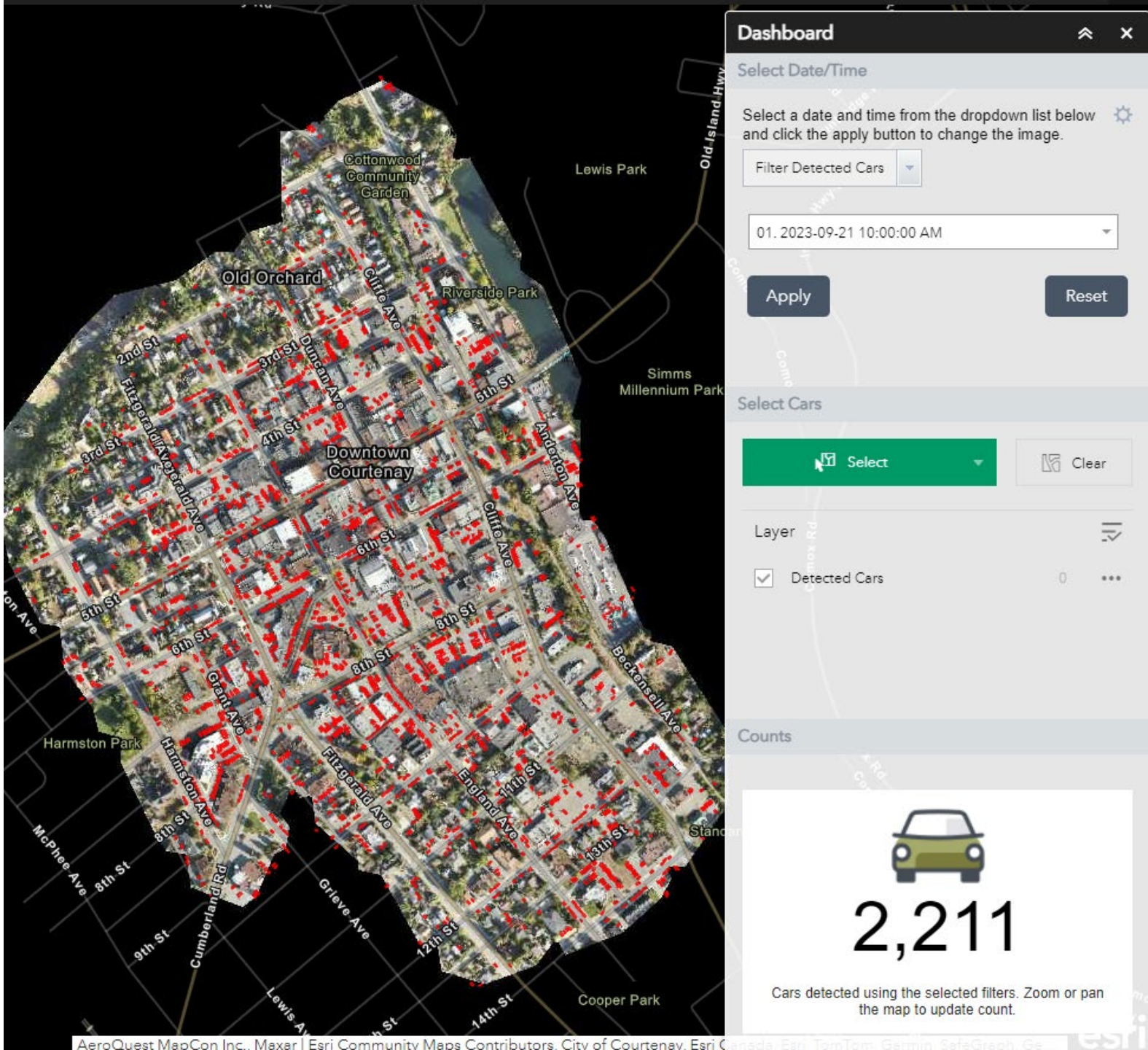
Summary

- Near-elimination of H&S risks associated with manual parking counts
- Granular data that can be interrogated for bespoke purposes, specific to the needs of the City
- Accuracy and validation of results
- Consistent data capture that can be updated at any time
- High-res images can identify a host of additional features:
  - Accessible parking utilization
  - Bike parking utilization
  - Long-term / abandoned parking
- The provides ongoing long-term opportunities for additional uses of the data and the City has access to the GIS portal

Summary

- We recently held a training session so that staff can access and utilize the portal at any time, to conduct whatever analysis is needed for future planning projects



Thank-you

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