MEMORANDUM

TO:	Heather Richards, City of McMinnville
FROM:	Rick Williams, Owen Ronchelli, and Pete Collins, RWC
DATE:	September 5, 2017
Project:	**Downtown McMinnville Parking Study**
Subject:	**Task 2: Technical Memorandum 2 – Data Collection Methodology**

This memorandum presents the methodology for collecting and assessing on- and off-street parking utilization data within the downtown McMinnville parking study area. It describes the processes for developing the inventory, collecting data, entering the data, conducting the analysis, as well as the type of information that will be generated, and how it will be used to evaluate existing and projected parking conditions in the study area.

I. INVENTORY

The parking inventory will serve as a baseline for evaluating existing and projected parking conditions in the study area, cataloging the total number of off-street and on-street parking stalls by location and type. The study area map provided by City of McMinnville staff (**Attachment A**) was used to establish the boundaries for the inventory and data collection effort.

Methodology for On-Street Inventory

1. Use of aerial map(s) to identify all on-street parking stalls in the study area.
2. Assign a unique number to each city block within the area (see **Figure 1**).
3. Format the inventory template to include each block face, with the appropriate number of stalls designated by time restriction (see example, **Attachment B**). The template will include columns that identify:

   a. Block # (see **Figure 2**, next page)
   b. Space # (see **Figure 2**)
   c. Time of day (presented in one-hour increments over the period the city elects to conduct its survey, e.g. 7:00 AM – 7:00 PM).
   d. Type of space by time restriction.

Figure 1 : Assigning Block Numbers
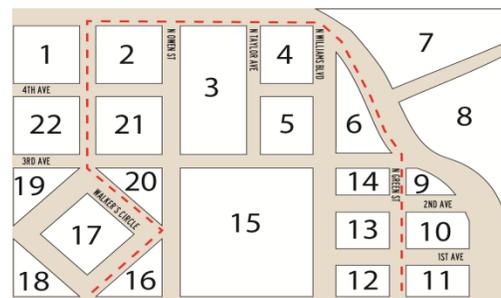
4. Conduct field verification to catalog all on-street spaces in the study area. Use a measuring wheel to estimate the number of stalls on block faces that lack striping.
5. Incorporate initial and field-verified counts into the final inventory template.

Figure 2: Parking Inventory Diagram

Methodology for Off-Street Inventory

1. Use of aerial map to identify all parking sites in the study area.
2. Correlate the map to GIS shape files of tax lots to determine the relationship of buildings to parking areas (see example, **Figure 3**).
3. Assign unique descriptors to each building/parking site.
4. Create an inventory template that includes information on each site–descriptor, building name, address, type of use, number of parking stalls, etc. The template will be created in Excel.
5. Use aerial maps to count stalls by site.
6. Incorporate these initial counts into the inventory template (see example, **Attachment C**).
7. Record issues related to specific sites (e.g., tree cover, shade, etc.,) that limit a full count of stalls on site. These issues will be resolved through field verification.
8. Conduct field verification to catalog all off-street spaces in the study area.

Figure 3: Example Mapping of Off-street Inventory
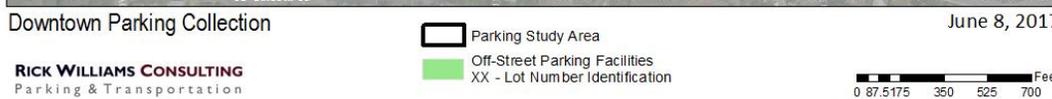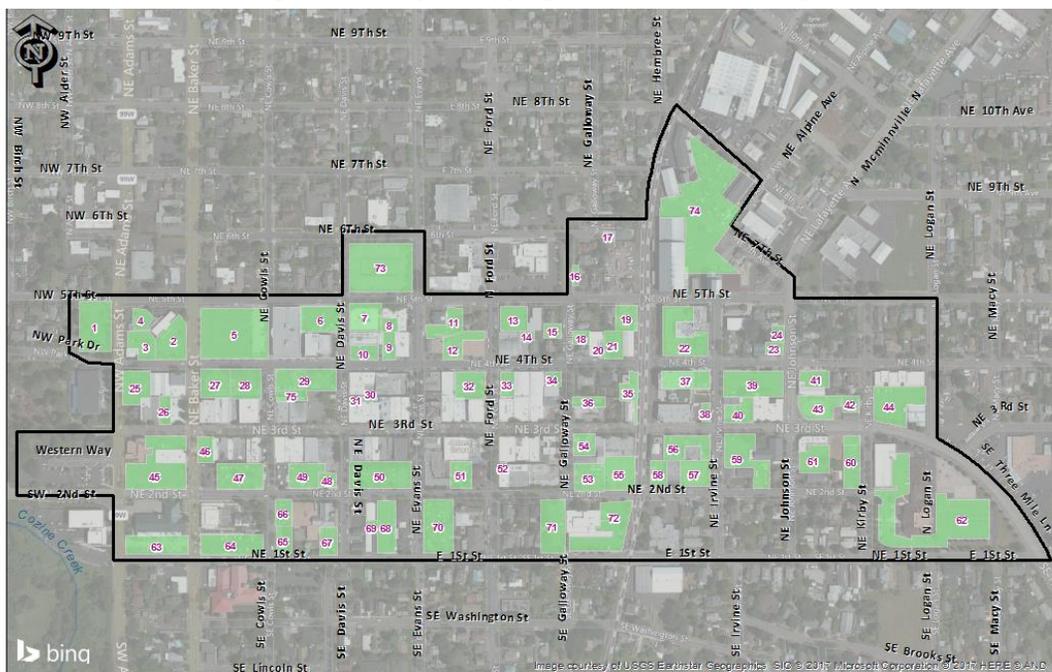
II. DATA COLLECTION

Data collection will provide the information necessary to evaluate existing and projected parking conditions in the study area. Data will include the total number of vehicles parked in the study area over the course of the selected data collection day(s), with stalls denoted by location and type.

Methodology for On-Street Data Collection

1. Field-verify all information from the inventory related to on-street stalls.
2. Finalize an on-street inventory/data collection template (see example, **Attachment B**).
3. Develop route maps based on the most efficient format for collecting data (see example, **Attachment D)**.
4. Collaborate with the City and SAC to determine data collection survey dates and hours.
5. Train and schedule surveyors.
6. Surveyors will survey each on-street stall in the study area on days representing a "typical weekday" and a "typical weekend day".
7. Surveyors will record the license plate number of each vehicle occupying a parking stall.
8. Data will be collected each hour on the hour for a period of 10 hours.

Methodology for Off-Street Data Collection

1. Collaborate with all advisory groups to determine an appropriate process for notifying affected private property sites of the data collection effort.
2. Field-verify all information related to parking sites.

   a. Field verification will address issues raised in the inventory phase and identify sites with unique characteristics to be surveyed during data collection (e.g., time-limited visitor stalls, ADA stalls, etc.).

3. Finalize an off-street inventory template.
4. Develop route maps based on the most efficient format for collecting data at off-street parking sites.
5. Develop templates to collect occupancy information over a 10-hour study period (see **Attachment B)**.

   a. At sites where stalls are time-limited, data collection templates will be modified to allow for the collection of license plate data (to assess average length of stay and turnover).

6. Collaborate with City/SAC to determine data collection survey sites, dates and hours (to coincide with the on-street data collection).
7. Train and schedule surveyors.
8. Surveyors will collect occupancy data at all sites on days representing a "typical weekday" and a "typical weekend day," to be determined with City/SAC.

a. Data will be collected each hour on the hour for a period of 10 hours.
b. In facilities with time-limited parking stalls, both occupancy and license plate data will be recorded.

9. Surveyors will record all data in templates developed for each unique site.

III. DATA ENTRY

1. All data from on- and off-street templates will be entered into a database for analysis.

IV. DATA ANALYSIS

Data will be analyzed and evaluated to derive findings for the following metrics.

Parking Inventory

Parking supply data for on- and off-street facilities will be organized by location, type, and accessory use.

Parking Utilization

Parking utilization data will be analyzed to determine the total number of vehicles parked in the study area, cataloged by location, type, and accessory use and described in terms of occupancy, duration of stay, and turnover, as applicable. These factors, described below, can be quantified for the entire study area and/or sub-areas to provide more specificity regarding use in unique nodes of the downtown.

a. **Occupancy**
   Occupancy is the total number of occupied parking stalls in the study area and is most commonly shown as a percentage of overall system capacity. Occupancy can be calculated for the combined study area, for sub-areas, and/or for individual lots or garages. Where time-restricted and other stall types exist, additional information on occupancy of these stalls is provided.

   A parking system is generally considered to be full or at its effective capacity when occupancies reach or exceed 85% in the peak hour. Where more than 85% of stalls are occupied, users may be discouraged from parking, or may add to congestion by circling the area in search of available spaces.

b. **Duration of Stay**
   Duration of stay is the average length of time a vehicle remains in a parking stall. For this study, duration of stay is sampled in one-hour increments. Duration of stay information can be used to calibrate posted time stays to accommodate priority users (e.g., retail customers). It can also be used to identify the total number of vehicles, or percentage of vehicles, that violate posted time restrictions when enforcement hours are in effect, and the rate of vehicle turnover (see below).

Duration of stay is calculated by dividing the total number of vehicle hours parked by the total number of unique vehicles captured in the data.

c. **Turnover**

Turnover reflects the total number of vehicles using a parking stall over the course of a day, and is typically measured over a 10-hour period. Parking managers use turnover as a measuring stick for the efficiency of a parking system. For instance, if a stall has a 2-hour time restriction, its intended minimum rate of turnover is 5 (10-hour day divided by 2-hour stall). If turnover were demonstrated to be less than 5, the system would be deemed inefficient. A rate greater than 5 would indicate a system operating very efficiently.

d. **Unique Vehicles**

The number of Unique Vehicles is a measure of how many customers, visitors, and employees are accessing the parking district, and can be used as a baseline for commercial growth—more customers and visitors correlates to a more vibrant district. A "unique vehicle" is captured in license plate numbers recorded each hour of the survey.

e. **Stays of Five Hours or More**

Stays of Five Hours or More can be used to estimate the number of employees using on-street stalls, which is helpful when designing and implementing a district-specific parking management plan and/or calibrating enforcement.

f. **Violation Rate**

Data will be analyzed to determine the percentage of vehicles that exceed posted time stays. This information can be correlated to actual enforcement data for the survey days, comparing the observed number of violations to actual citations issued. The parking industry targets violation rates of 5% - 7% as a measure of efficiency. When violation rates are below 5%, enforcement may be over-provided and customers may perceive the area as not customer-friendly. When rates exceed 7%, the system is considered inefficient and enforcement may need to be increased.

g. **Moving to Evade**

Moving to Evade is measured by capturing unique license plates that move throughout the study area over the course of a survey day. Such vehicles often belong to employees who move them every few hours to avoid parking off-street or in areas where pricing is in place.

V. SUMMARY

The methodologies outlined in this memorandum represent best practices in data collection for parking and will be used in the Downtown McMinnville parking study. Data entry, analysis and initial strategy development will be reviewed with the City and the SAC in September and October 2017.
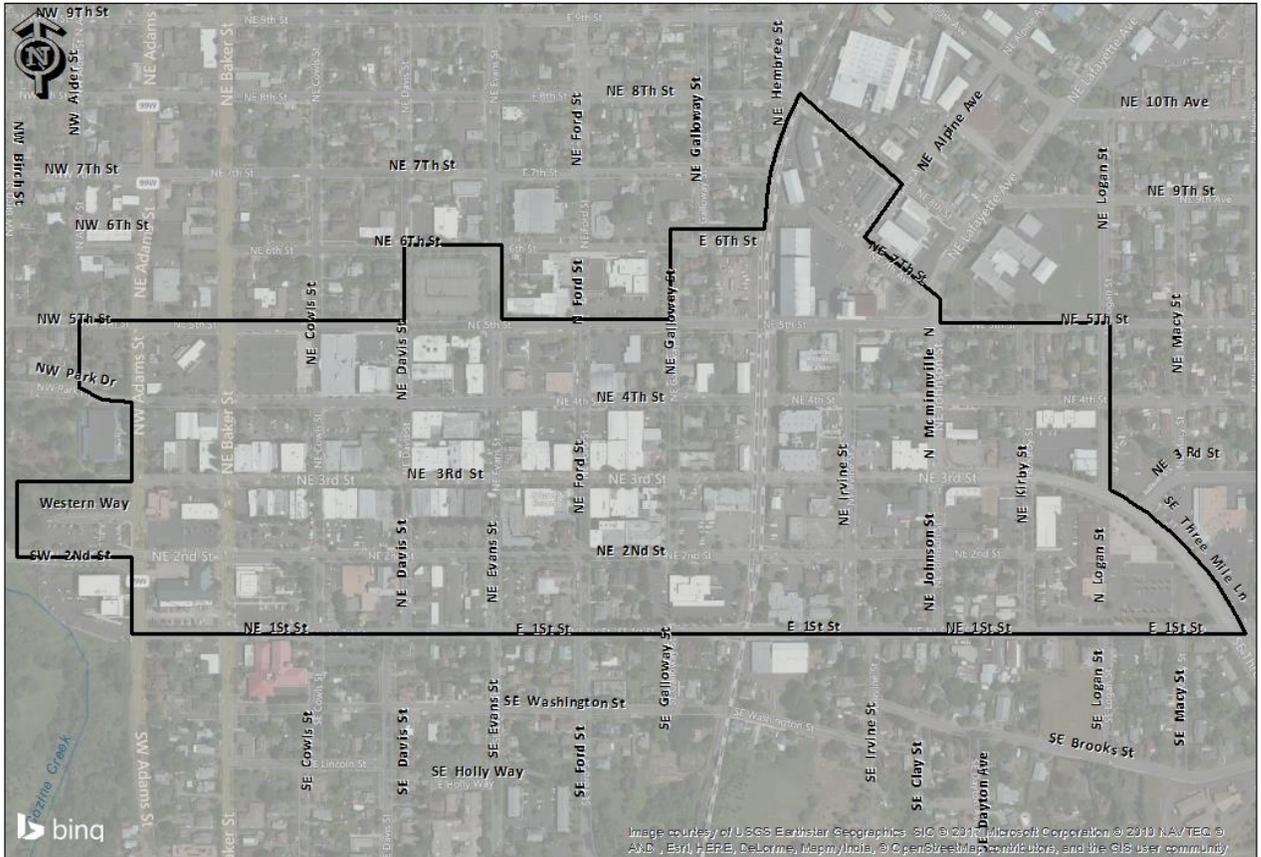
City of McMinnville

ATTACHMENT B

Sample Data Collection Templates – On-Street Template

Block #	Space #	Time	8am-9am	9am-10am	10am-11am	11am-12pm	12pm-1pm	1pm-2pm	2pm-3pm	3pm-4pm	4pm-5pm	5pm-6pm
ROUTE 1												
26A	NP											
25A	NP											
25B	1	NL		941D							22V7	
25B	2	NL		DXMM				797E	797E	797E	168D	
25B	3	NL			723C	373D		394E				
25B	4	NL		ADU4	ZSA9						712F	
25B	5	NL										
25B	6	NL		909D	909D	909D	909D	909D	909D	909D	909D	909D
25B	7	NL										
25B	8	NL			630F	630F	630F	716F				
25B	9	NL										
25B	10	NL							3139	WGC2		
25B	11	NL	129B						3139		007E	007E
25B	12	NL										
27B	1	NL										
27B	2	NL		DNMU	DNMU							
27B	3	NL										
27B	4	NL										
27B	5	NL		VVX7				QZJ7		200D		
27B	6	NL										
27B	7	NL										
27B	8	NL	925B	925B	925B	925B	925B	925B	925B	925B	925B	925B
41B	1	NL					XEU6	315F				
41B	2	NL										
41B	3	NL	589D						MRX5	MRX5		
41B	4	NL	2VT9				514C	514C	514C			
41B	5	NL	353B									

Sample Data Collection Templates – Off-Street Template

Lot ID	Facility Identification	# of Stalls	9:30 AM	10:30 AM	11:30 AM	12:30 PM	1:30 PM	2:30 PM	3:30 PM	4:30 PM	5:30 PM	6:30 PM
114_1	North Lot	79	41	56	56	55	54	55	57	73	79	75
114_2	South Lot	97	31	42	52	63	59	55	62	77	92	97
126_1	Wells Fargo	24	16	16	23	21	16	14	16	14	20	24
129_1	Bank of Cascades	14	11	11	10	11	13	13	13	12	7	12
130_1	Chase Bank	35	7	15	13	6	9	14	18	13	8	6
137_1	Old St. Francis Mcmenamins Guests Only	25	21	22	20	16	20	25	24	20	22	25
137_2	Reserved Stalls	32	6	10	12	14	12	11	11	10	11	7
138_1	City Hall	20	8	7	0	1	3	6	5	0	1	0
138_4	Customer 2hr Free Parking	13	3	7	4	6	6	7	7	6	5	4
139_3	City Employee Vehicles Only	39	24	33	29	29	29	29	32	18	16	12
146_1	2 hr parking/ Permit Parking	68	65	68	65	65	66	68	66	52	22	20
146_2	School District Permit Parking Only	45	44	43	44	42	41	41	44	31	12	9
146_5	Boys and Girls Clubs of Bend	33	33	33	31	31	30	28	27	23	5	4
147_1	2 hr parking/ Permit Parking	41	39	40	39	40	38	35	39	33	30	11
147_2	Hawthorn Healing Arts Center	17	9	10	10	8	8	6	7	6	2	1
164_1	First United Methodist Church	35	5	6	26	28	15	8	13	29	14	9
167_1	Deschutes Historical Museum	41	11	26	24	35	30	22	27	20	10	10
171_1	Deschutes Library Parking Only	64	27	51	50	54	57	61	56	35	20	7
118_2	Permit Parking Only	24	20	17	15	13	13	17	16	20	20	17
118_3	Alpine Mortgage/Deschutes Land Trust	14	12	11	10	8	10	12	7	5	3	4
119_2	Gateway Plaza - Permit Only	57	28	27	30	33	35	37	33	21	8	11
119_3	First American Title	28	26	29	29	29	30	34	29	17	9	10
124_1	Building 18	8	8	5	5	5	4	7	5	4	1	1

Example (Tigard, OR): Inventory of Off-street Stalls

Lot Number	Lot Descriptor	Stall Total by Lot	% of Total Area Stalls
23/24	2 HR Public Parking (Burnham Lot)	20	11.6%
39	Stevens Marine	8	4.7%
40	Ferguson	12	7.0%
41	B & B Print Source	9	5.2%
42	Mannings Auto	14	8.1%
43	Henderson Auto	41	23.8%
44	Wyatt Fire Protection	9	5.2%
45	Tigard Vision Center (Visitor/Front Lot)	22	12.8%
46	Tigard Vision Center (Employee/Back Lot)	27	15.7%
47	Scott Hookland LLP	10	5.8%
	Total Off-Street Parking Stalls (10 sites)	172	100.0%

ATTACHMENT D

Example (Everett, WA): Data Collection Route Map (All Routes)
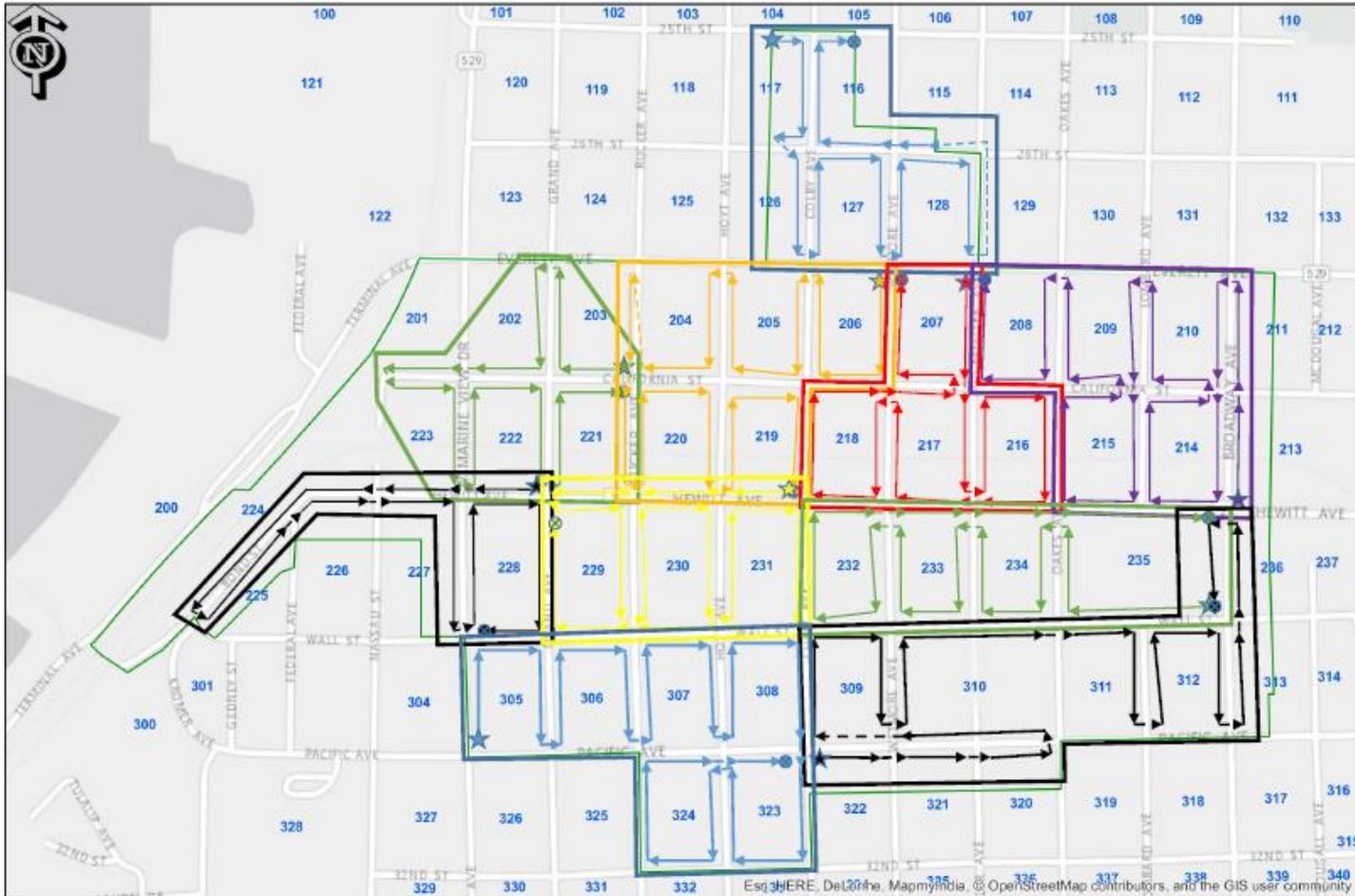
Downtown Everett Parking Study

September 2015

RICK WILLIAMS CONSULTING
Parking & Transportation

Downtown Everett Study Boundary

Feet
0   170 340   680   1,020   1,360

Example:

Data Collection Route Map (Single Route)
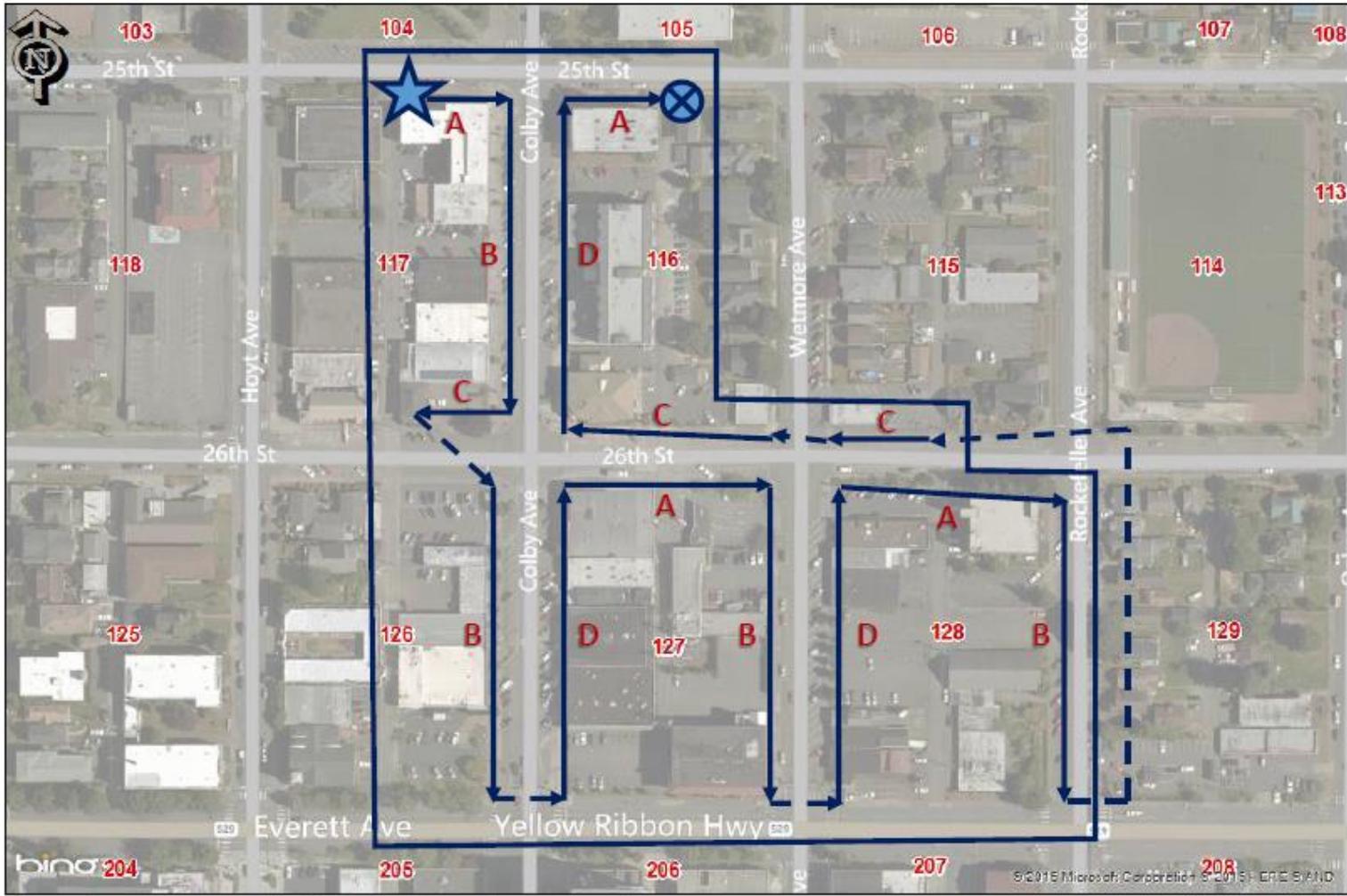
Downtown Everett Parking Study

ROUTE 1

RICK WILLIAMS CONSULTING
Parking & Transportation
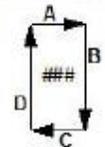
October 2015

Route Study Boundary Area
Block Number Identification
A Blockface Identification
→ Walking Direction

★ Beginning of Route
⊗ End of Route

Feet
0   50 100   200   300   400