

Date: April 17, 2017
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Project #: P3-2017-006
Regarding: **DRAFT** – Lot 6 Supply / Demand Analysis

Study Purpose and Approach

This **draft** report presents an analysis of parking supply and demand in Downtown Ferndale, Michigan. The analysis has been prepared to determine the number of parking spaces that are needed to accommodate the demand generated by a proposed development on Lot 6 and the existing demand. Future parking demand for the proposed development is estimated using a shared parking model based upon the Urban Land Institute's Shared Parking publication.

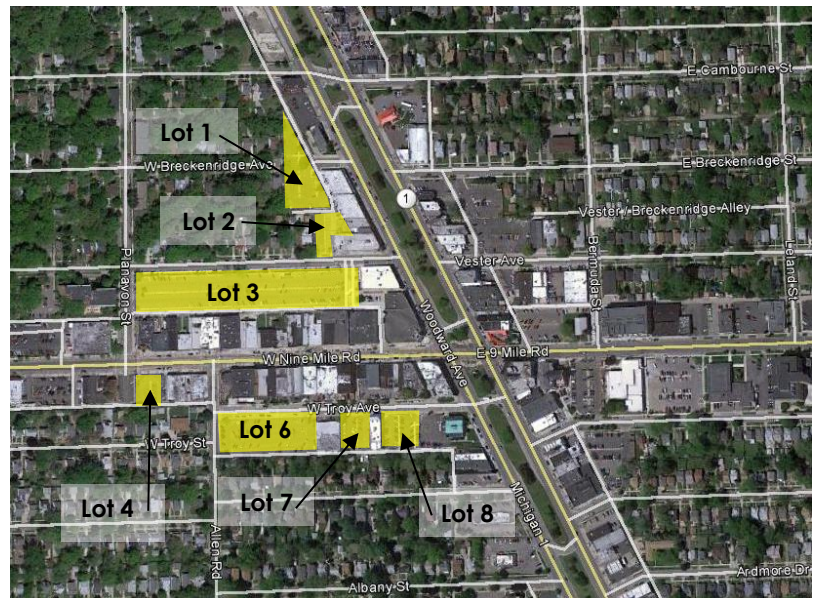
The analysis also uses parking utilization data collected by Republic Parking System, Inc. on the following days:

- Friday March 3, 2017
- Saturday March 4, 2017
- Wednesday March 8, 2017
- Thursday March 9, 2017

During the survey days counts were made every other hour from 9:00 am through 1:00 am that included both metered on-street spaces and municipal off-street spaces.

Existing Off-Street Parking

The adjacent graphic shows the locations of the municipal off-street parking lots in the study area.



Existing Parking Utilization - Summary

Table 1 summarizes the Wednesday / Thursday average recorded parking occupancies in the area West of Woodward Ave. The average occupancy in the seven off-street lots ranged from 11% to 73% occupied. The peak occupancy of the off-street lots ranged from 18% to 100% occupied. Overall the lots had an average occupancy of about 45% occupied. The overall peak occupancy was 78%.

The average occupancy of the on-street spaces was 45% occupied. The peak occupancy of the on-street was 78% occupied. The overall total peaked at 80% occupied occurring in the evening at about 7:00 pm.

Table 1 – Weekday Parking Occupancy

TWO DAY AVERAGE Wednesday - Thursday													
	Off-Street Occupancy							Off-Street	Off-Street	On-Street	On-Street	West of	Total
	Lot 1	Lot 2	Lot 3	Lot 4	Lot 6	Lot 7	Lot 8	West of Woodward	Percent Occupied	West of Woodward	Percent Occupied	Woodward Totals	Percent Occupied
Capacity	87	39	283	40	137	39	39	664		267		931	
9:00 AM	8	10	66	5	36	14	18	156	23%	69	26%	225	24%
11:00 AM	12	16	135	16	72	27	33	309	47%	120	45%	429	46%
1:00 PM	15	19	167	21	103	36	32	391	59%	151	57%	542	58%
3:00 PM	15	11	135	22	84	34	27	327	49%	132	49%	459	49%
5:00 PM	15	9	163	29	122	37	36	409	62%	145	54%	553	59%
7:00 PM	16	23	246	38	138	39	39	537	81%	208	78%	744	80%
9:00 PM	5	21	127	24	110	33	33	351	53%	126	47%	477	51%
11:00 PM	3	7	30	3	71	24	24	161	24%	78	29%	239	26%
1:00 AM	3	3	8	0	39	13	10	75	11%	46	17%	120	13%
Average Occupancy	11%	33%	42%	43%	63%	73%	71%	45%		45%		45%	
Peak Occupancy	18%	59%	87%	94%	100%	99%	99%	81%		78%		80%	

Yellow highlighting indicates occupancies greater than effective supply
 90% Off-Street Lots
 85% On-Street Spaces

Table 2, on the next page, presents the average parking occupancy for Friday / Saturday. The average occupancy of the off-street lots ranged from 32% occupied to 91% occupied. The peak occupancies ranged from 79% to 101% occupied. The peak occupancy in Lot 6 was greater than the striped capacity of the lot. Lots 1 and 2, furthest from Nine Mile Road, were the only lots with peak occupancies of less than 99% full. Overall the off-street lots had an average occupancy of 61%. The overall peak occupancy was 89% occupied. The overall peak exceeded the effective supply which causes parkers to believe that there are not enough spaces.

The on-street spaces had a peak occupancy of 89% occurring at 7:00 pm. The overall parking occupancy averaged 64% occupied with a peak of 94%.

Table 2 – Weekend (Friday/Saturday) Parking Occupancy

TWO DAY AVERAGE Friday - Saturday													
	Capacity	Off-Street Occupancy						Off-Street	Off-Street	On-Street	On-Street	West of	Total
		Lot 1	Lot 2	Lot 3	Lot 4	Lot 6	Lot 7	Lot 8	West of Woodward	Percent Occupied	West of Woodward	Percent Occupied	Totals
9:00 AM	4	17	70	3	37	13	26	169	25%	73	27%	242	26%
11:00 AM	15	29	174	21	89	31	37	394	59%	134	50%	528	57%
1:00 PM	28	29	167	35	133	37	39	466	70%	182	68%	648	70%
3:00 PM	25	26	210	29	125	35	33	482	73%	167	62%	649	70%
5:00 PM	43	21	226	31	135	38	38	530	80%	170	63%	700	75%
7:00 PM	69	33	281	40	139	39	39	639	96%	237	89%	876	94%
9:00 PM	37	29	233	39	136	39	37	549	83%	218	82%	767	82%
11:00 PM	23	28	164	28	124	39	36	439	66%	175	65%	614	66%
1:00 AM	11	15	69	9	87	30	36	256	38%	109	41%	365	39%
Average Occupancy	32%	64%	62%	65%	81%	85%	91%	66%		61%		64%	
Peak Occupancy	79%	85%	99%	100%	101%	100%	100%	96%		89%		94%	

Yellow highlighting indicates occupancies greater than effective supply
 90% Off-Street Lots
 85% On-Street Metered Spaces

Future Parking Demand

The estimate of future parking demand includes the following elements:

- Proposed Lot 6 Development
- Existing vacant commercial space near Lot 6
- Existing demand – using the surveyed occupancy data for Lot 6

Proposed Lot 6 Development

Currently three options are being considered for the proposed development. The land uses included in the current development scenarios are summarized as follows:

Table 3 – Proposed Development Scenarios

	Parking Spaces	Office Space	Retail Space	Residential
Option 1	416	39,000 sf	11,540 sf	24 units
Option 2	401	39,000 sf	11,540 sf	24 units
Option 3	369	0 sf	0 sf	0 units

Existing Vacant Commercial Space

Based on information provided by the Ferndale Downtown Development Authority (DDA) there is about 9,275 square feet of vacant commercial space within reasonable walking distance of Lot 6.

Approximately 2,125 square feet is already leased and will soon be occupied by two new restaurants. The land uses in the remaining 7,150 square feet of space are unknown. This analysis assumes that the uncommitted spaces will be occupied by: 45% restaurants, 45% retail businesses, and 10% will remain vacant. Table 4 estimates the square feet of current vacant space that will be used as part of the estimation of future parking demand.

Table 4 – Current Vacant Space

Committed Restaurant Space sf	Assumed Restaurant Space sf	Total Restaurant Space sf	Assumed Retail Space sf	Total Assumed Occupied sf
2,125	3,218	5,343	3,218	8,560

Shared Parking Demand Estimate

The Urban Land Institute’s shared parking methodology was used to estimate the parking demand for the Lot 6 Development and the current vacant space. The shared parking methodology estimates parking demand and accounts for the fact that parking demand generated by different land uses peaks at different times of the day, different days of the week, and in different seasons. The shared parking demand model also allows for adjustments for local driving ratios that may vary depending on the availability of transit services. In addition, the adjustments can be made to account for captive market and other factors. Standard ULI parking demand base ratios were used as follows:

- Office: Approximately 3.3 to 3.5 spaces per 1,000 s.f. (ratios are based on a sliding scale)
- Apartments: 1.65 spaces per unit (includes .15 spaces per unit for visitors)
- Retail: 4.0 spaces per 1,000 s.f. (3.6 spaces per 1,000 s.f. on weekdays)
- Casual Restaurants: 19.0 spaces per 1,000 s.f. (18.0 spaces per 1,000 s.f. on weekdays)

Several customized drive ratios were used to estimate demand for the development and the vacant commercial space. It is assumed that 75% of retail customers would drive, 90% of retail and office employees would drive, and 93% of residents and residential guests would drive. The drive ratios (except for retail customers) are based on census data for Ferndale. No captive market reductions were applied in the model. The model also assumes that all the parking spaces, including the residential spaces, in the parking structure will be shared and open to all parkers.

Table 5 shows the shared model results for weekdays and weekends by month. The model projects an annual peak demand of 344 spaces occurring at about 1:00 pm on a weekday in December.

Table 5 – Shared Parking Demand Estimates – By Month

Shared Parking Model - Results			
Peak Accumulation	Day/Month	Peak Hour	
321	Weekday - January	2 pm	
270	Weekend - January	7 pm	
321	Weekday - February	2 pm	
271	Weekend - February	7 pm	
328	Weekday - March	1 pm	
280	Weekend - March	7 pm	
326	Weekday - April	1 pm	
278	Weekend - April	7 pm	
329	Weekday - May	1 pm	
282	Weekend - May	8 pm	
329	Weekday - June	1 pm	
281	Weekend - June	7 pm	
325	Weekday - July	1 pm	
282	Weekend - July	7 pm	
326	Weekday - August	1 pm	
284	Weekend - August	8 pm	
327	Weekday - September	2 pm	
277	Weekend - September	7 pm	
329	Weekday - October	1 pm	
282	Weekend - October	8 pm	
331	Weekday - November	2 pm	
282	Weekend - November	8 pm	
344	Weekday - December	1 pm	
294	Weekend - December	7 pm	
312	Weekday - Late December (25-31)	1 pm	
281	Weekend - Late December (25-31)	7 pm	
Peak Month	344	Weekday - December	1 pm

Average Peak Weekdays 327
 Average Peak Weekends 280

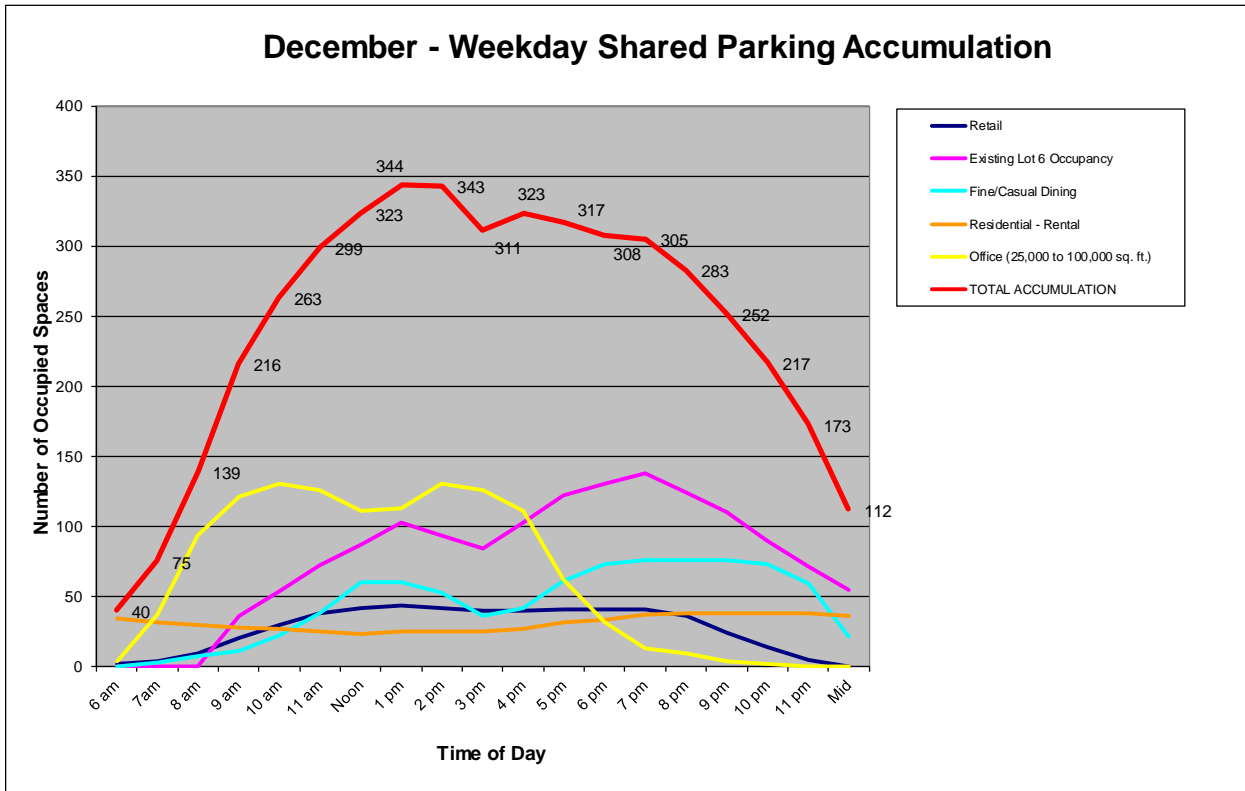
Table 6 presents the shared model results by time of day for a weekday in December. Currently the occupancy of Lot 6 peaks in the evening hours. The peak demand period shifts from the evening hours to the daytime hours because of the demand generated by the 39,000 s.f. of office space. The graph below illustrates the complimentary nature of the demand generated by the office space during daytime hours in the proposed development with the existing Lot 6 occupancy pattern which peaks in the evening.

The shared model results apply only to the proposed Lot 6 mixed use development and the vacant space. The overall existing peak parking occupancy in the area west of Woodward Ave. occurs in the evening hours.

Table 6 – Shared Model Results Weekday in December

Weekday - December

Land Use	6 am	7am	8 am	9 am	10 am	11 am	Noon	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm	Mid
Retail	2	4	9	20	30	38	42	43	42	40	40	41	41	41	36	24	14	5	0
Existing Lot 6 Occupancy	0	0	0	36	54	72	87	103	93	84	103	122	130	138	124	110	90	71	55
Fine/Casual Dining	0	3	7	11	22	38	60	60	53	36	42	61	73	76	76	76	73	59	21
Residential - Rental	34	31	30	28	27	25	23	25	25	25	27	31	33	37	38	38	38	38	36
Office (25,000 to 100,000 sq. ft.)	4	37	93	121	130	126	111	113	130	126	111	62	31	13	9	4	2	0	0
TOTAL ACCUMULATION	40	75	139	216	263	299	323	344	343	311	308	305	283	252	217	173	112		



Parking Adequacy – West of Woodward

When planning for a parking system, the effective supply is typically used to estimate the adequacy of the parking supply. Using the effective supply rather than the actual supply provides an operating cushion. The operating cushion accounts for: spaces lost to minor construction, mis-parked vehicles, the dynamics of vehicles being parked and un-parked, and to reduce the search time needed to locate the last few available spaces, etc. When parking occupancies approach the effective supply threshold parkers start to complain that there are no available spaces when there are some empty spaces. For this analysis, a 90% factor is appropriate for the off-street spaces with an 85% factor for the on-street spaces. The effective supply of the municipal parking areas west of Woodward is calculated in Table 7.

Table 7 – Effective Parking Supply

	Actual Capacity	Effective Factor	Effective Supply
Existing On-Street Supply	267	85%	227
Existing Off-Street Supply	664	90%	598
Existing Total	931		825
Net Added Spaces Option 1	279	90%	251
Net Added Spaces Option 2	264	90%	238
Net Added Spaces Option 3	232	90%	209

The capacity of the proposed Lot 6 parking structure has not been fully defined. There are currently three conceptual options:

- Option 1 mixed use development with 416 spaces
- Option 2 mixed use development with 401 spaces (1 level below grade)
- Option 3 standalone parking structure with 369 spaces

Table 8 presents calculations of the adequacy of the municipal parking areas West of Woodward following the construction, and full occupancy as appropriate, of the proposed Lot 6 development. Parking adequacy is calculated by subtracting the demand from the “effective” supply of spaces. Table 8 calculates the adequacy at 1:00 pm and 7:00 pm for both weekdays and weekends for each of the three options. All the calculations project an overall a surplus of spaces during those time periods. The calculations are purely mathematical; convenience and location are not considered.

Options 1 and 2 result in daytime surpluses of 280 to 301 spaces on both weekdays and weekends. However, the surplus of spaces shrinks to 32 and 45 spaces during evening hours on weekends. The estimated demand for both options remains the same while the supply of spaces is slightly different.

The projected surpluses are larger for Option 3 because there is no additional demand generated by the proposed Lot 6 development. During daytime hours, on weekdays and weekends, surpluses range from 329 to 425 spaces. The weekday evening surplus is estimated at 207 spaces. During weekend evenings, the estimated surplus drops to about 70 spaces.

Table 8 – Parking Adequacy West of Woodward

Option 1 - Lot 6 Development	Weekdays		Weekends	
	1:00 PM	7:00 PM	1:00 PM	7:00 PM
West of Woodard				
Existing Occupancy - Two Day Average	542	744	648	876
Additional Demand (Lot 6 plus vacant)	+ 241	167	128	155
Future Demand	= 783	911	776	1,031
Future Total Effective Supply	1,076	1,076	1,076	1,076
Future Demand	- 783	911	776	1,031
Adequacy (surplus or deficit)	= 293	165	301	45

Option 2 - Lot 6 Development	Weekdays		Weekends	
	1:00 PM	7:00 PM	1:00 PM	7:00 PM
West of Woodard				
Existing Occupancy - Two Day Average	542	744	648	876
Additional Demand (Lot 6 plus vacant)	+ 241	167	128	155
Future Demand	= 783	911	776	1,031
Future Total Effective Supply	1,063	1,063	1,063	1,063
Future Demand	- 783	911	776	1,031
Adequacy (surplus or deficit)	= 280	152	288	32

Option 3 - Stand Alone Parkng Structure	Weekdays		Weekends	
	1:00 PM	7:00 PM	1:00 PM	7:00 PM
West of Woodard				
Existing Occupancy - Two Day Average	542	744	648	876
Additional Demand (Vacant Space)	+ 67	83	58	88 (1)
Future Demand	= 609	827	706	964
Future Total Effective Supply	1,034	1,034	1,034	1,034
Future Demand	- 609	827	706	964
Adequacy (surplus or deficit)	= 425	207	329	70

Notes:

(1) Peak demand period shifts to Weekend in July

Parking Adequacy – Summary

- Each of the three conceptual design options will add between 232 and 279 to the municipal parking supply.
- The peak demand period generated by the conceptual mixed use scenarios (Options 1 and 2) for Lot 6 is projected to occur during daytime weekdays; the office space generates parking demand primarily during daytime hours. As office workers, and visitors, depart for the day parking spaces will become available for evening parkers.
- Overall surpluses of spaces are projected for Options 1 and 2. On weekend evenings the projected surplus ranges from 32 to 45 spaces. On weekday evenings, the overall surplus of spaces is estimated at 152 to 165 spaces. The calculated surpluses are in addition to the effective supply cushion of spaces.
- Option 3 does not generate any additional parking demand so the projected surpluses are greater. During daytime weekdays, the surplus is estimated at 425 spaces. On weekend evenings, the surplus drops to about 70 spaces.