



Downtown Parking Study

Plymouth, Michigan

August, 2011



Rich & Associates, Inc.
Parking Consultants - Planners
www.richassoc.com

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Appendix

Appendix A

Introduction

The City of Plymouth and the Plymouth Downtown Development Association (DDA) retained Rich and Associates to update the previous parking analysis completed by the firm in 2004. Rich and Associates was specifically asked to review parking demand projections for the current and future, to review parking layouts of a potential new lots (or public private joint ventures) and to determine if this additional parking was needed in the study area.

This study began with an update of the existing parking supply, building inventory, signage and the completion of a turnover and occupancy analysis to determine the current utilization of parking in the downtown.

Definitions

The following are definitions used for the analysis:

- **Parking Supply** – The number of parking spaces available for use by a specified group or groups of individuals (i.e. shoppers, employees, etc.).
- **Turnover** - Turnover is the number of vehicles that occupied a parking space in a particular period. For example, if a parking lot has 100 spaces and during the course of the day, 250 different vehicles occupied the lot, then the turnover is two and a half times (2.5).
- **Occupancy** - The number of vehicles observed in a specific lot or block face represented as a percentage of spaces occupied.
- **Occupancy Rate** – The percentage of all parking spaces with vehicles parked in them at a given time.
- **Circuit** - A circuit refers to the two-hour period between observances of any one particular parking space. For the turnover and occupancy study, a defined route was developed for each survey vehicle. One circuit of the route took approximately two hours to complete and each space was observed once during that circuit.
- **Block Face** - A number was assigned to each block within the study area. Each block is then referenced by its block number and by a letter (A, B, C or D). The letter refers to the cardinal face of the block; with (A) being the north face, (B) the east face, (C) the south face and (D) the west face. Therefore, a block designated as 1A would refer to the north face of block 1.
- **Modal Split** – Fractional split identifying what percentage of people travel by a certain transportation type (i.e. automobile, mass or public transit, walking, train, etc.).
- **Parking Demand** – The number of parking spaces generated by a single-purpose building, multi-purpose building, group of buildings or outdoor amenity.
- **Parking Need** – Represents the number of parkers who need to be accommodated in a given block after the use of alternative parking facilities is considered. Use is affected by price, location, accessibility and user restriction.

Study Area

The study area, as determined by the City and is illustrated in **Map 1**, located on **page 3**. The study area consists of roughly 12 blocks and was consistent with the study area used in the 2004 study. Areas outside of the study boundaries were examined for parking supply opportunities and potential impacts on parking.



PARKING
STUDY
FOR
THE CITY OF
PLYMOUTH

PLYMOUTH, MICHIGAN



LEGEND:

- # BLOCK NUMBER
- STUDY AREA

Sheet Title:

STUDY
AREA

File No.	1122
Scale	NTS
Date	07-21-2011
Checked By	AN



MAP Number:

MAP 1

Parking Supply

Field work for this study entailed a review of the parking supply within the study area. **Table A** summarizes the existing public and private parking supply. There are approximately 2,350 parking spaces in the study area. Of these spaces, approximately 294 (13 percent) are on-street and 656 (28 percent) are off-street public spaces. There are approximately 1,400 (60 percent) private off-street spaces. The majority of the parking (taking into account both on and off-street parking) in the downtown is privately owned parking. Public parking in this study refers to parking that is not restricted (either by signage or by inference) to any particular business or businesses.

Table B on **page 5** is a detailed parking supply listing types and time durations of parking by block and is followed by **Map 2** on **page 6**, which is a spatial view of the parking supply. In cases where parking spaces were not marked, the number of parking spaces was estimated. This occurred for both on and off-street parking.

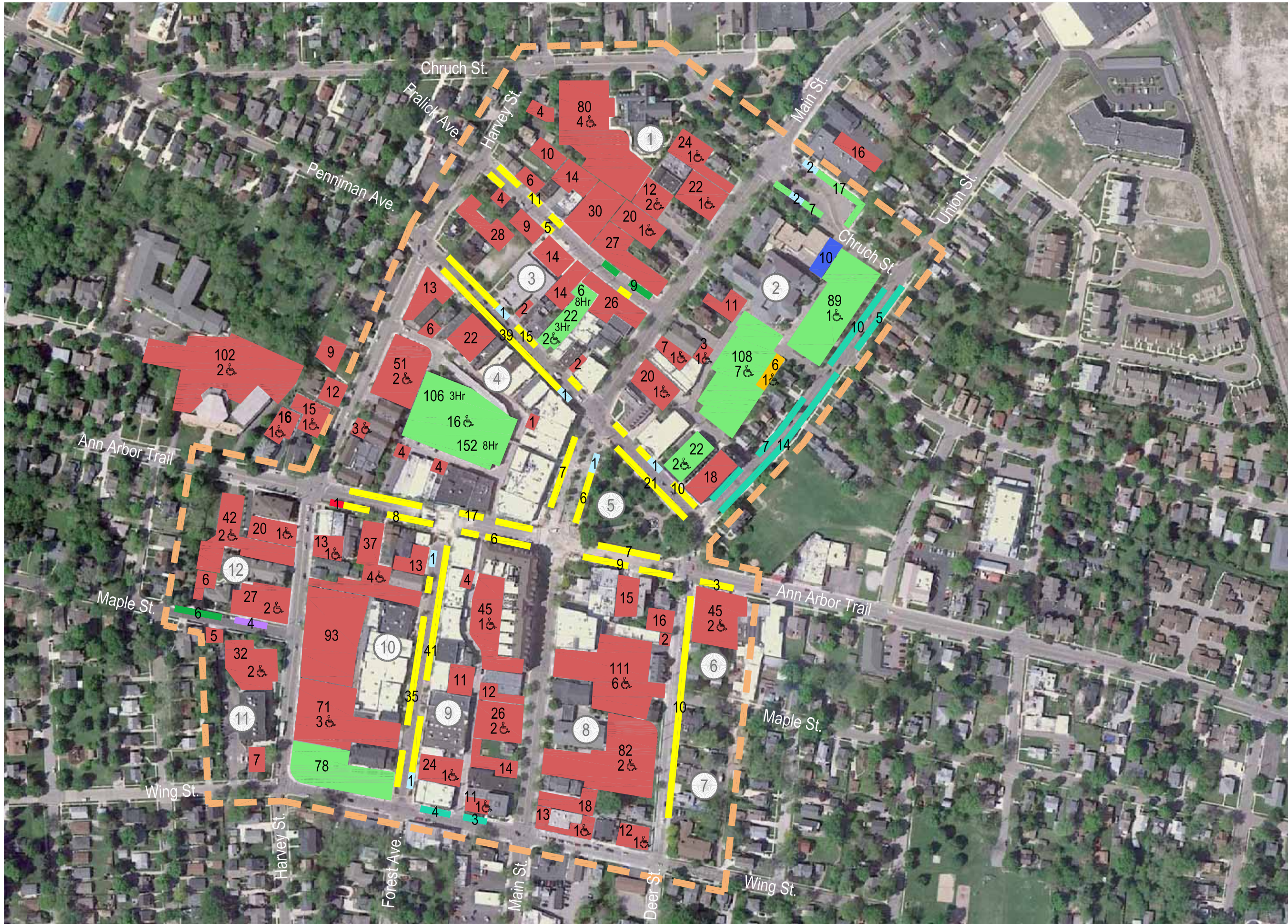
Based on Rich and Associates' experience and best practices, we have found that to successfully manage municipal parking in small downtowns it is especially desirable for the municipality to have control of at least 50 percent of the parking supply. This allows the municipality to effectively manage the parking in terms of allocation, reaction to changing demand, market pricing, and allows the parking to be enforced with greater efficiency. The city of Plymouth does not meet this benchmark with only 40 percent of the parking in the downtown being public.

Table A
Parking Supply Summary

On-Street Parking Totals	294 (13%)
Public Off-Street Parking Totals	<u>656</u> (28%)
Public Parking Totals	950 (40%)
Private Parking Totals	<u>1,400</u> (60%)
Total Parking in Study Area	2,350

Table B
Parking Supply

Block >	1	2	3	4	5	6	7	8	9	10	11	12	Totals
On-Street													
Loading Zone										1			
2 hour on-street	11	10	22	63	34	3	10	9	47	43			
8 hour on-street	9												
Unrestricted on-street		10							7			6	
Reserved on-street												4	
Barrier Free on-street		1	1	1	1				1				
On-Street Totals	20	21	23	64	35	3	10	9	55	44	0	10	294
Off-Street													
Public 3 hour			22	106									
Public 8 hour			6	152									
Public Unrestricted		243								78			
Public Reserved		16											
Public Barrier Free		15	2	16									
Off-Street Public Totals	0	274	30	274	0	0	0	0	0	78	0	0	656
Private/ Reserved	249	75	99	101		45	0	269	147	227	44	95	
Barrier Free	9	3		5		2		10	5	8	2	5	
Off-Street Private Totals	258	78	99	106	0	47	0	279	152	235	46	100	1,400
Summary	278	373	152	444	35	50	10	288	207	357	46	110	2350



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LEGEND:

BLOCK NUMBER

STUDY AREA

ON STREET PARKING

- 8 HR. PUBLIC
- 2 HR. PUBLIC
- BARRIER FREE
- SCHOOL ONLY
- UNMARKED
- LOADING ZONE

OFF STREET PARKING

- PUBLIC
- PRIVATE
- POLICE
- PUBLIC RESERVED
- BARRIER FREE

Sheet Title:

PARKING SUPPLY

File No.	1122
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MAP Number:

MAP 2



Turnover and Occupancy Study

A turnover and occupancy study of the public and private parking supply within the study area was completed on Thursday, July 14, 2011 from 8:00 A.M. to 10:00 P.M. On this day the temperature was in the mid to high 70's with clear skies. A concert was held in the park this evening that began at 7:00 P.M. The turnover and occupancy study was an observation of the majority of on-street and off-street parking within the study area including both the public and private parking. Circuits were completed every two hours and each circuit was approximately two hours in length.

The number of parking spaces occupied was observed during each two-hour circuit for off-street parking and the on-street parking that had no time restrictions. Where there were short term on-street spaces (two hours or less), license plate numbers were recorded.

The study determined the turnover and identified how long specific vehicles remained parked in the same time restricted parking space. The turnover information also yields occupancy results for the parking area and therefore for each circuit a composite occupancy can be derived. Turnover is an indicator of how often a parking stall is being used by different vehicles throughout the course of the day.

Occupancy is an important aspect of parking because it helps us to understand the dynamic of how parking demand fluctuates throughout the day. Likewise, the occupancy can be used to illustrate how parking demand is impacted by events in the study area. Overall, the occupancy data is used by Rich and Associates to calibrate the parking demand model. The results for the occupancy counts are broken down into categories of on-street vs. off-street and public vs. private parking.

Occupancy

A summary of the occupancy results can be found in **Table C**. The full occupancy results are found in **Appendix A**, and the Peak Occupancy is spatially represented on **Map 3** on **page 10**. The night time occupancy results are spatially represented on **Map 3.1** on **page 11**. The three graphs on **page 8** and **9** illustrate the observed occupancy throughout the day with the parking separated by on-street, off-street, public and private.

The observed occupancy and key points are:

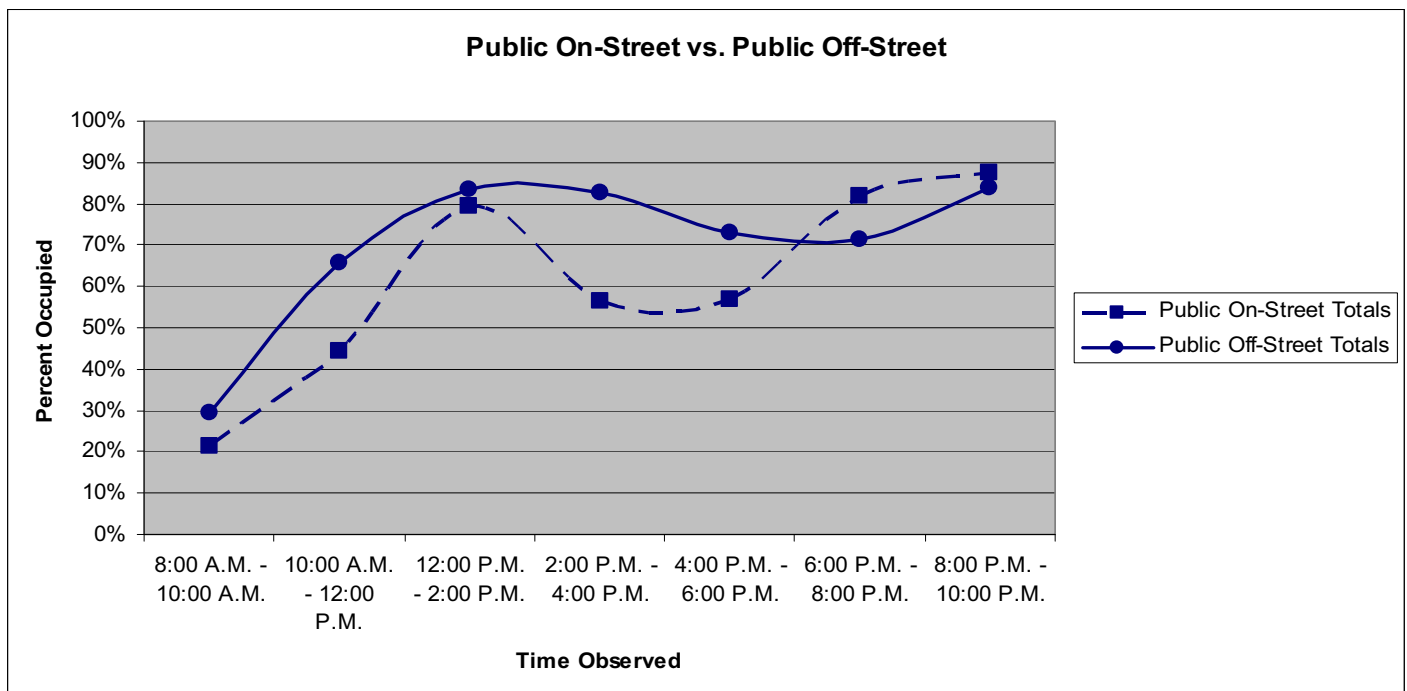
- The daytime peak occurred between 12:00 P.M. and 2:00 P.M. which is a typical peak for a downtown with several restaurants. The parking reached an overall 62 percent occupancy.
- The evening peak occurred between 8:00 P.M. and 10:00 P.M. with an overall occupancy of 63 percent, which was similar to the daytime peak.
- The public parking had a much higher occupancy rate than the private parking.
- The off-street public parking remained close to or above 70 percent occupancy for much of the day. Where as the off-street private parking never reached 50 percent occupancy.
- A point to consider regarding the parking supply and demand for parking is that motorists in general perceive off-street and on-street spaces with occupancies greater than 85 percent to be at capacity, depending on the overall capacity of the parking area. The greater the capacity, the less this perception is valid. When 85 percent occupancy occurs, motorists will begin to re-circulate to seek other parking, adding to downtown traffic congestion and the driver's perception that there is no parking available in the downtown.

Table C
Occupancy Results

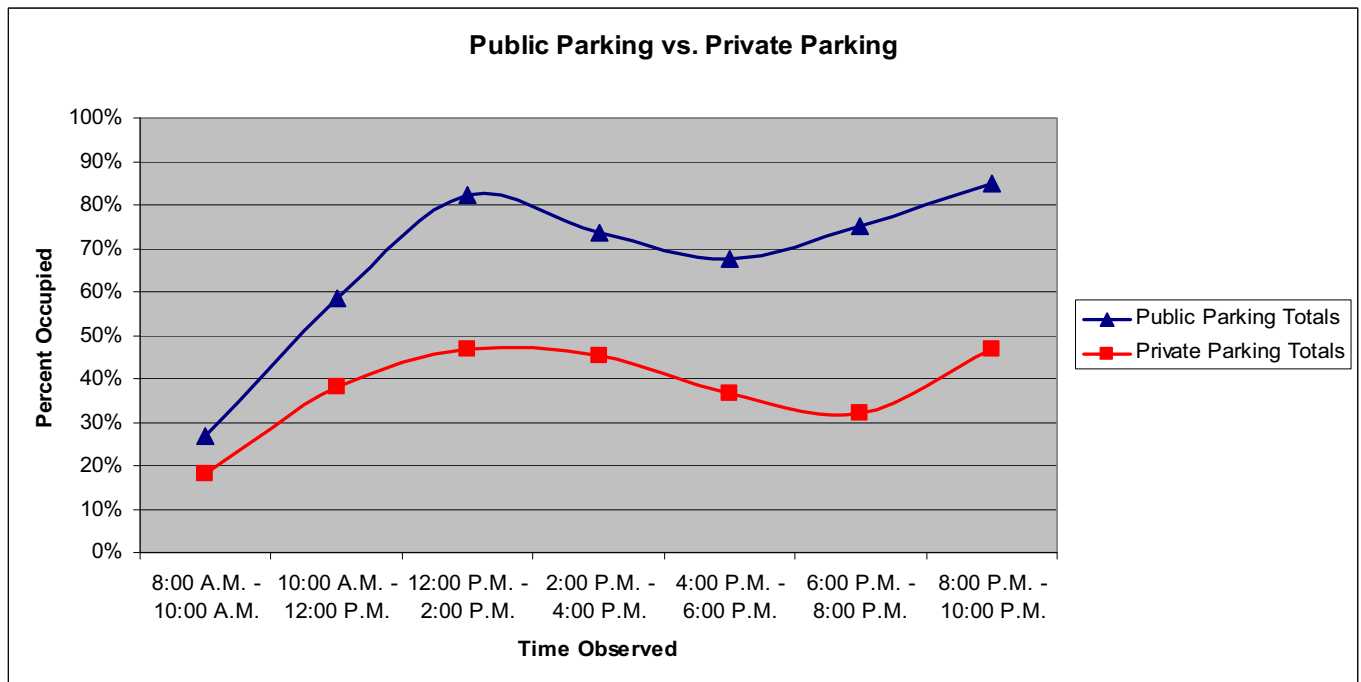
Plymouth, MI
Thursday, July 14, 2011

	# of Spaces observed	8:00am - 10:00am	% Occ.	10:00am - 12:00pm	% Occ.	12:00pm - 2:00pm	% Occ.	2:00pm - 4:00pm	% Occ.	4:00pm - 6:00pm	% Occ.	6:00pm - 8:00pm	% Occ.	8:00pm - 10:00pm	% Occ.
Public On-Street Totals	312	67	21%	138	44%	248	79%	176	56%	178	57%	256	82%	273	88%
Public Off-Street Totals	646	193	30%	428	66%	539	83%	535	83%	467	72%	464	72%	543	84%
Public Combined Totals	958	260	27%	566	59%	787	82%	711	74%	645	67%	720	75%	816	85%
Private Off-Street Totals	1170	208	18%	437	37%	539	46%	523	45%	423	36%	364	31%	535	46%
Overall Totals	2128	468	22%	1003	47%	1326	62%	1234	58%	1068	50%	1084	51%	1351	63%

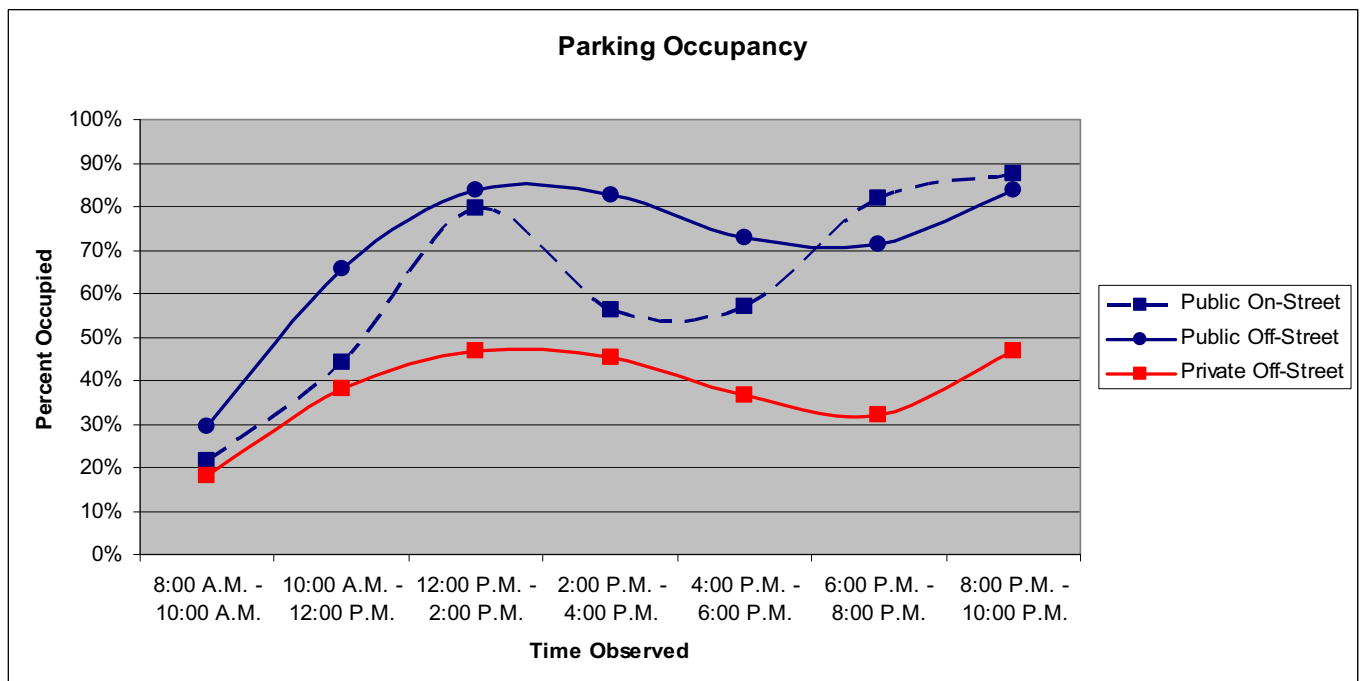
Graph 1



Graph 2



Graph 3





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LEGEND:

BLOCK NUMBER

STUDY AREA

PEAK HOUR % OCCUPANCY

- 85% through 100%
- 75% through 84%
- 50% through 74%
- 0 through 49%

BLOCK FACE KEY PLAN

Sheet Title:

**TURNOVER
OCCUPANCY**
JULY 14, 2011
12:00pm - 2:00pm

File No.	1122	
Scale	NTS	
Date	07-21-2011	
Checked By	AN	

MAP Number:

MAP



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& ASSOCIATES

LEGEND:

BLOCK NUMBER

STUDY AREA

PEAK HOUR % OCCUPANCY

85% through 100%

75% through 84%

50% through 74%

0 through 49%

BLOCK FACE KEY PLAN



Sheet Title:

TURNOVER
OCCUPANCY
JULY 14, 2011
8:00pm - 10:00pm

File No.	1122	
Scale	NTS	
Date	07-21-2011	
Checked By	AN	

MAP Number:
MAP

Turnover

Table D, Parking Turnover Summary below is a summary of the turnover findings for two hour on-street parking spaces and three hour off-street parking spaces. There were 250 vehicles observed parking in the two hour (and less) on-street parking spaces within the study area during the hours of 8:00 A.M. - 8:00 P.M. In the two hour spaces there were 985 (96 percent) vehicles observed remained less than two hours, 35 vehicles parked from two to four hours in the same parking space and 4 vehicles that remained in the same parking space for eight hours or more with an overall on-street violation rate of four percent.

The three hour off-street parking also had a four percent violation rate with 19 vehicles staying beyond the posted time limits. Vehicles that stayed beyond the posted time limits are most likely business owners or employees. The overall violation rate of the two hour and three hour time restricted parking spaces was eight percent. A best practice for an overtime violation rate is five to six percent. Plymouth is near this benchmark.

Table D
Turnover Summary

2 Hour Parking Space Turnover Summary	
Parking Turnover Summary (by type)	2 Hour or less Parking
Vehicles that remained less than 2 hours	985 (96%)
Vehicles that remained between 2 and 4 hours	35 (3%)
Vehicles that remained between 4 and 6 hours	2 (less than 1%)
Vehicles that remained between 6 and 8 hours	2 (less than 1%)
Vehicles that remained between 8 and 10 hours	0
Total number of vehicles analyzed (8:00 A.M. - 8:00 P.M.) in 2 hour stalls	1024
Total number of 2 hour stalls analyzed	250

3 Hour Parking Space Turnover Summary	
Parking Turnover Summary (by type)	3 Hour Parking
Vehicles that remained less than 2 hours	398 (84%)
Vehicles that remained between 2 and 4 hours	55 (12%)
Vehicles that remained between 4 and 6 hours	12 (2%)
Vehicles that remained between 6 and 8 hours	7 (1%)
Vehicles that remained between 8 and 10 hours	1 (less than 1%)
Total number of vehicles analyzed (8:00 A.M. - 8:00 P.M.) in 3 hour stalls	473
Total number of 3 hour stalls analyzed	138

Source: Rich and Associates Field Observations, Thursday, July 14, 2011

Parking Demand

Projections were made to determine the current and future parking demands and the need for parking in the study area. The data collected and compiled by Rich and Associates to calculate the parking demand included:

- An inventory of the study area's on and off-street parking supplies.
- Turnover and occupancy study for public and private on and off-street parking areas.
- The Plymouth DDA provided an updated block-by-block analysis of the square footage and land use of every building in the core study area.

The parking demand analysis is a two step process to determine the number of parking spaces needed. The first step is to run a mathematical model of parking demand based on the buildings gross floor area and land use. The mathematical model multiplies a parking demand generation ratio specific to a certain land use by the floor area of the building to derive the number of spaces needed. While most parking requirements are based on the gross floor area of a particular development and the actual generation ratio is tied to the land use type. There are some land uses that the generation ratio is based on different units such as dwelling units or bedrooms, students, rooms etc.

The second step is to use field observations to calibrate the mathematical model and help to establish projected parking spaces needed. In this case, the turnover and occupancy study results were used to calibrate the model.

Rich and Associates reviewed proposed and potential developments with the DDA, City Staff, and stakeholders. Developments were discussed, though all developments are speculative at this point. Future parking demand was accounted for by the assumption of vacant space being reoccupied at a rate of 40 percent in five years and 80 percent in ten years.

As pointed out previously, motorists generally perceive on and off-street parking areas with occupancies greater than 85 percent to be at capacity, depending on the overall capacity of the parking area. Therefore, the parking supply should generally exceed the parking demand by 10 to 15 percent to account for this.

Table E on the following page demonstrates the parking generation ratios for each land use established for Plymouth versus national averages from the Institute of Transportation Engineers (ITE). ITE parking generation ratios are based on nationally conducted surveys and in some cases the survey sample size is small. In general, the ITE parking generation ratios are assumed to be higher than required in a downtown setting where shared use and linked trips help to address the peak parking needed for various uses at different times of the day and a lower parking generation ratio.

Table E
Parking Generation Ratios

<i>Parking Ratios (Parking stalls per 1,000 gross square feet unless otherwise noted)</i>	Zoning Code, B-2 Central Business District	Institute of Transportation Engineers (ITE)	Established for Plymouth (Day)	Established for Plymouth (Night)
Office	2.00	2.79	2.65	0.09
Medical Office	13.33	3.53	4.11	0.09
Retail	2.00	3.97	2.38	1.28
Mixed Use	N/A	N/A	2.89	1.63
Service	2.00	3.60	2.43	1.81
Restaurant	2.00	10.01	6.00	13.79
Banquet Facility	N/A	N/A	6.00	13.79
Residential – Multi family (per unit)	1.5/unit	1.20-1.50/unit	1.00/unit	1.00/unit
Theatre	1/each 3 seats + 1/each 2 emp.	0.26/seat	0.15/seat	0.38/seat
Hotel	1/unit +1/emp.	1.01/unit	0.81/unit	0.81/unit
Community	N/A	N/A	0.60	2.60
Library	N/A	3.5	1.50	1.50
Museum	6.66	0.75-0.90	0.75	0.09
Church	1/each 2 seats	1.17	1.00	1.00
Government	N/A	3.83	3.25	0.09

Rich and Associates recommends that the city use the ratios Rich and Associates developed for the City of Plymouth study found in **Table E** as a guideline for determining parking needs for various development proposals. These ratios are designed around a peak daytime need. The parking demand that is calculated using these ratios is consistent with the observed parking occupancy from the study completed on Thursday, July 14, 2011.

The assumptions used for the parking demand calculations are:

Assumption 1: The parking demand per block was dependent on the gross floor area (or other units for residential, schools etc.) contained in the block. Parking demand computed for one block was not affected by the amount of gross floor area available on surrounding blocks. Therefore, a block with surplus parking supply is not used to offset shortfalls on adjacent blocks.

Assumption 2: The parking demand calculations were derived under the assumption that currently occupied properties would remain occupied at existing or higher than existing levels into the future.

Assumption 3: Parking demand is not affected by parking availability, use, location and price.

The gross floor area of individual buildings was collected and then sorted by land use categories. The gross floor area is reflected in Table F. In general, the different land uses for each block are multiplied by the appropriate parking generation ratio of parking spaces required per 1,000 square feet except for land uses such as residential and theater. The resulting number of parking

spaces demanded is deducted from the available parking supply on each block and a surplus or deficit in parking for each block is then calculated.

Plymouth has a large number of restaurants that have significant patio seating in the summer which create a larger demand than the rest of the year. Rich and Associates has created a second demand table to show the difference of May through October and November through April. The summaries of the parking demand can be found in **Table F May – October Parking Demand Matrix** and **Table G November – April Parking Demand Matrix**. These tables are represented spatially in the Parking Surplus/Deficit **Maps 4A-4D** pages 18-22.

The following are issues that are taken into consideration when developing the number of parking spaces needed:

- Building size, purpose and special use conditions,
- Socioeconomic characteristics of the downtown populations and visitors of the downtown.
- Alternative modes of transportation, which includes availability, use, attractiveness and policy impacts.
- Proportion of the downtown trips that are multiple-use or linked.
- Vehicle traffic.
- Cost of parking.

The parking generation ratios developed for each land use reflect the peak daytime conditions. In the current daytime situation there is a projected overall surplus within the study area of between 24 spaces in the summer to 100 spaces in the winter. During the turnover and occupancy analysis, there were several blocks where the some of the on and off-street parking was 80 percent occupied during the day. The overall results of the projected demand projections correlate with the overall findings of the occupancy study.

We have projected that the overall surplus becomes a deficit of -29 spaces (summer) to -103 spaces (winter) in five years with the following assumptions. This is shown on **Map 4.1A-4.1D, page 23-25**

- Block 8 includes 15,000 square foot for a potential restaurant development.
- Re-occupancy of 40 percent (27,860 sf.) of vacant space using the mixed use parking generation ratio.
- In the ten year projection the deficit is increased to -67 spaces (summer) to -141 spaces (winter) based on the potential re-occupancy of an additional 40 percent (27,860 sf.) of vacant space using the mixed use parking generation ratio.

The Parking Demand Matrix (**Table F and G**) used in this analysis will be provided to Plymouth to use as a tool in helping to determine the amount of parking needed for each new development. The Excel spreadsheet should be updated with any changes in land use or square footage to keep current with current and future parking needs or to run models for the impacts of possible developments on parking supply.

Table F
May – October Parking Demand Matrix

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	
Block	Office	Medical Office	Retail	Mixed Use	Service	Restaurant	Outdoor Seating	Banquet Facility	Residential	Theatre	Hotel	Community	Library	Museum	Church	Government	Vacant	Demand	Parking	Surplus/ Deficit	Surplus/ Deficit	Surplus/ Deficit	Demand	Surplus/ Deficit	Surplus/ Deficit	Surplus/ Deficit	
									(per unit)	(per seat)	(per unit)							(current)	Supply	Deficit	Deficit	Deficit	(current)	Deficit	Deficit	Deficit	
Daytime	2.65	4.11	2.38	2.98	2.43	6.00	6.00	6.00	1.00	0.15	0.81	0.60	1.50	0.75	1.00	3.25	3.39			(current)	(5 yrs)	(10 yrs)		(current)	(5 yrs)	(10 yrs)	
Night	0.09	0.09	1.28	1.63	1.81	13.79	13.79	13.79	1.00	0.38	0.81	2.60	1.50	0.09	1.00	0.09	3.39	DAY		DAY	DAY	DAY	NIGHT	NIGHT	NIGHT	NIGHT	
1	9,520	2,035	3,026	0	2,822	4,063	1,973	0	1	0	0	0	0	0	11,055	0	0	96	278	182	182	182	105	173	173	173	
2	9,574	12,101	1,288	0	15,039	1,656	125	0	30	405	0	1,500	54,000	13,276	0	25,605	0	391	373	-18	-18	-18	328	45	45	45	
3	1,535	0	11,642	0	18,511	6,120	1,662	0	11	0	0	0	0	0	0	21,588	0	205	152	-53	-53	-53	169	-17	-17	-17	
4	22,031	37,528	31,811	3,291	13,760	38,254	1,895	0	22	0	0	0	0	0	0	0	2,520	594	444	-150	-154	-157	652	-208	-211	-215	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	35	35	35	0	35	35	35	
6	0	0	8,500	0	0	0	1,056	0	0	0	0	0	0	0	0	0	0	27	50	23	23	23	25	25	25	25	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10	10	10	0	10	10	10	
8*	27,211	0	3,167	0	19,001	13,950	1,931	9,000	0	0	16	0	0	0	0	0	0	288	288	0	-90	-90	397	-109	-199	-199	
9	38,300	0	25,797	12,325	10,824	11,090	1,768	0	16	0	0	0	0	0	5,706	0	23,250	325	207	-118	-149	-181	275	-68	-100	-131	
10	5,062	6,612	16,459	23,004	8,673	15,379	1,322	0	1	0	0	0	0	0	0	0	2,090	271	357	86	84	81	307	50	48	45	
11	15,300	0	0	8,400	0	0	0	0	0	0	0	0	0	0	0	0	0	66	46	-20	-20	-20	15	31	31	31	
12	21,000	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	110	46	46	46	2	108	108	108	
TOTALS	149,532	60,276	101,689	47,020	88,629	90,512	11,732	9,000	81	405	16	1,500	54,000	13,276	16,761	47,193	27,860	2,326	2,350	24	-103	-141	2,275	75	-53	-91	
																		(stalls)	(stalls)	(stalls)	(stalls)	(stalls)	(stalls)	(stalls)	(stalls)	(stalls)	
*Block 8 - 5 year scenario includes a potential 15,000 sf restaurant (90 spaces) *Block 8 - Banquet facility is included in the demand though this is not constant																											

Table G
November – April Parking Demand Matrix

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Block	Office	Medical Office	Retail	Mixed Use	Service	Restaurant	Banquet Facility	Residential	Theatre	Hotel	Community	Library	Museum	Church	Government	Vacant	Demand	Parking	Surplus/ Deficit	Surplus/ Deficit	Surplus/ Deficit	Demand	Surplus/ Deficit	Surplus/ Deficit	Surplus/ Deficit
								(per unit)	(per seat)	(per unit)							(current)	Supply	(current)	(5 yrs)	(10 yrs)	(current)	(current)	(5 yrs)	(10 yrs)
Daytime	2.65	4.11	2.38	2.89	2.43	6.00	6.00	1.00	0.15	0.81	0.60	1.50	0.75	1.00	3.25	3.39			(current)	(5 yrs)	(10 yrs)		(current)	(5 yrs)	(10 yrs)
Night	0.09	0.09	1.28	1.63	1.81	13.79	13.79	1.00	0.38	0.81	2.60	1.50	0.09	1.00	0.09	3.39	DAY		DAY	DAY	DAY	NIGHT	NIGHT	NIGHT	NIGHT
1	9,520	2,035	3,026	0	2,822	4,063	0	1	0	0	0	0	0	11,055	0	0	84	278	194	194	194	78	200	200	200
2	9,574	12,101	1,288	0	15,039	1,656	0	30	405	0	1,500	54,000	13,276	0	25,605	0	390	373	-17	-17	-17	326	47	47	47
3	1,535	0	11,642	0	18,511	6,120	0	11	0	0	0	0	0	0	21,588	0	195	152	-43	-43	-43	146	6	6	6
4	22,031	37,528	31,811	3,291	13,760	38,254	0	22	0	0	0	0	0	0	0	2,520	583	444	-139	-142	-146	626	-182	-185	-189
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	35	35	35	0	35	35	35
6	0	0	8,500	0	0	0	0	0	0	0	0	0	0	0	0	0	20	50	30	30	30	11	39	39	39
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10	10	10	0	10	10	10
8*	27,211	0	3,167	0	19,001	13,950	9,000	0	0	16	0	0	0	0	0	0	276	288	12	12	12	370	-82	-82	-82
9	38,300	0	25,797	12,325	10,824	11,090	0	16	0	0	0	0	0	5,706	0	23,250	313	207	-106	-228	-259	251	-44	-165	-197
10	5,062	6,612	16,459	23,004	8,673	15,379	0	1	0	0	0	0	0	0	0	2,090	261	357	96	94	91	288	69	66	63
11	15,300	0	0	8,400	0	0	0	0	0	0	0	0	0	0	0	0	65	46	-19	-19	-19	15	31	31	31
12	21,000	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	110	46	46	46	2	108	108	108
TOTALS	149,532	60,276	101,689	47,020	88,629	90,512	9,000	81	405	16	1,500	54,000	13,276	16,761	47,193	27,860	2,251	2,350	99	-29	-67	2,113	237	109	71
																		(stalls)	(stalls)	(stalls)	(stalls)	(stalls)	(stalls)	(stalls)	(stalls)
*Block 8 - 5 year senario includeds a potential 15,000 sf restaurant (90 spaces) *Block 8 - Banquet facility is included in the demand though this is not constant																									



PARKING
STUDY
FOR
THE CITY OF
PLYMOUTH

PLYMOUTH, MICHIGAN



Parking Consultants
Architects - Engineers
Planners

29877 Northwestern Hwy., Suite 208
Southfield, Michigan 48033
Tel: 248.353.5080
Fax: 248.353.3830
Lutz, Florida
Tel: 813.949.0860
www.RichAssoc.com

LEGEND:

#

BLOCK NUMBER

STUDY AREA

SURPLUS OF PARKING

+100

0 through 99

DEFICIT OF PARKING

-99 through -1

-100 +

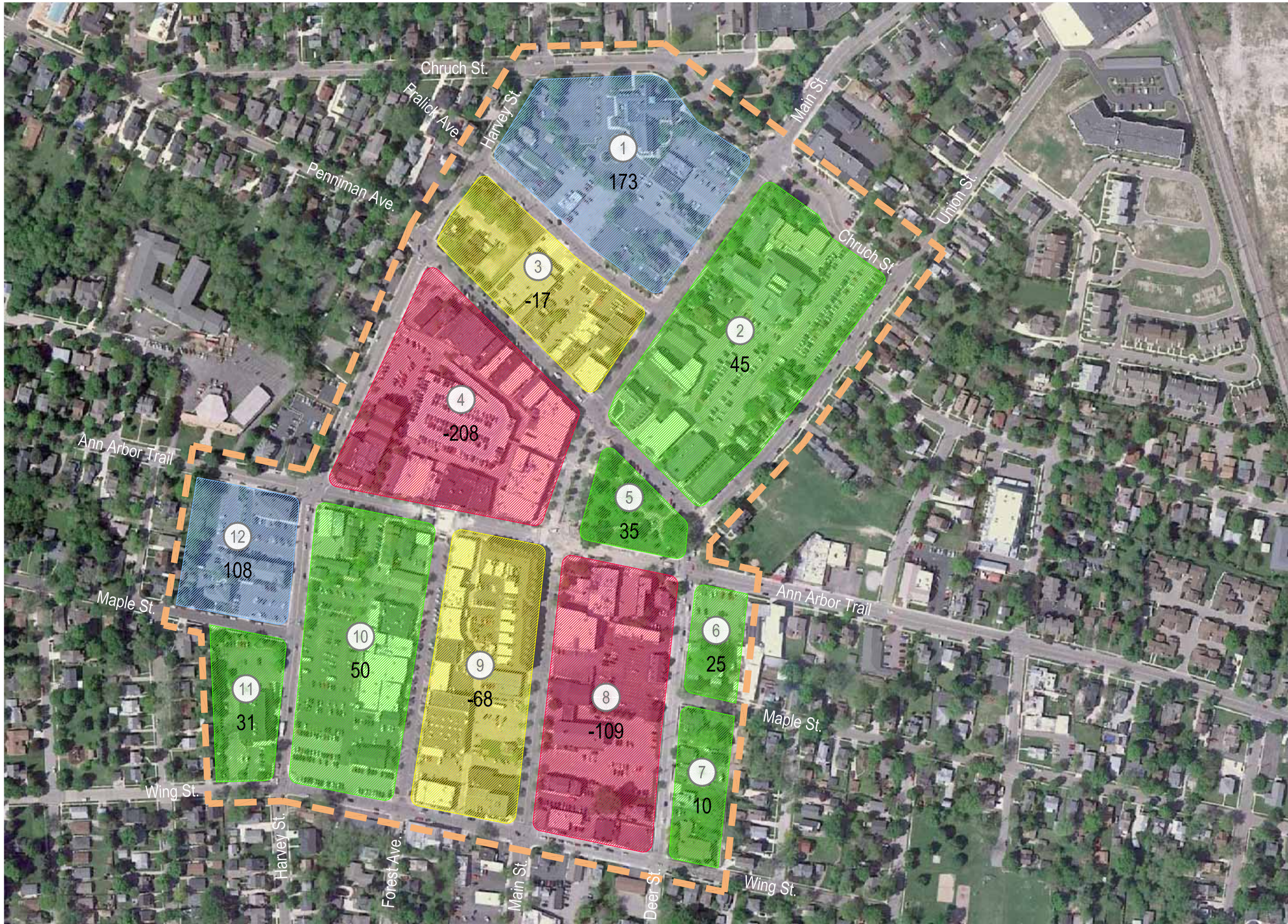
Sheet Title:

PARKING
SURPLUS / DEFICIT
MAY - OCTOBER
(CURRENT) - DAY

File No.	1122
Scale	NTS
Date	07-22-2011
Checked By	AN

MAP Number:
MAP





PARKING STUDY
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PARKING
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PLYMOUTH, MICHIGAN



LEGEND:

BLOCK NUMBER

STUDY AREA

SURPLUS OF PARKING

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DEFICIT OF PARKING

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Sheet Title:

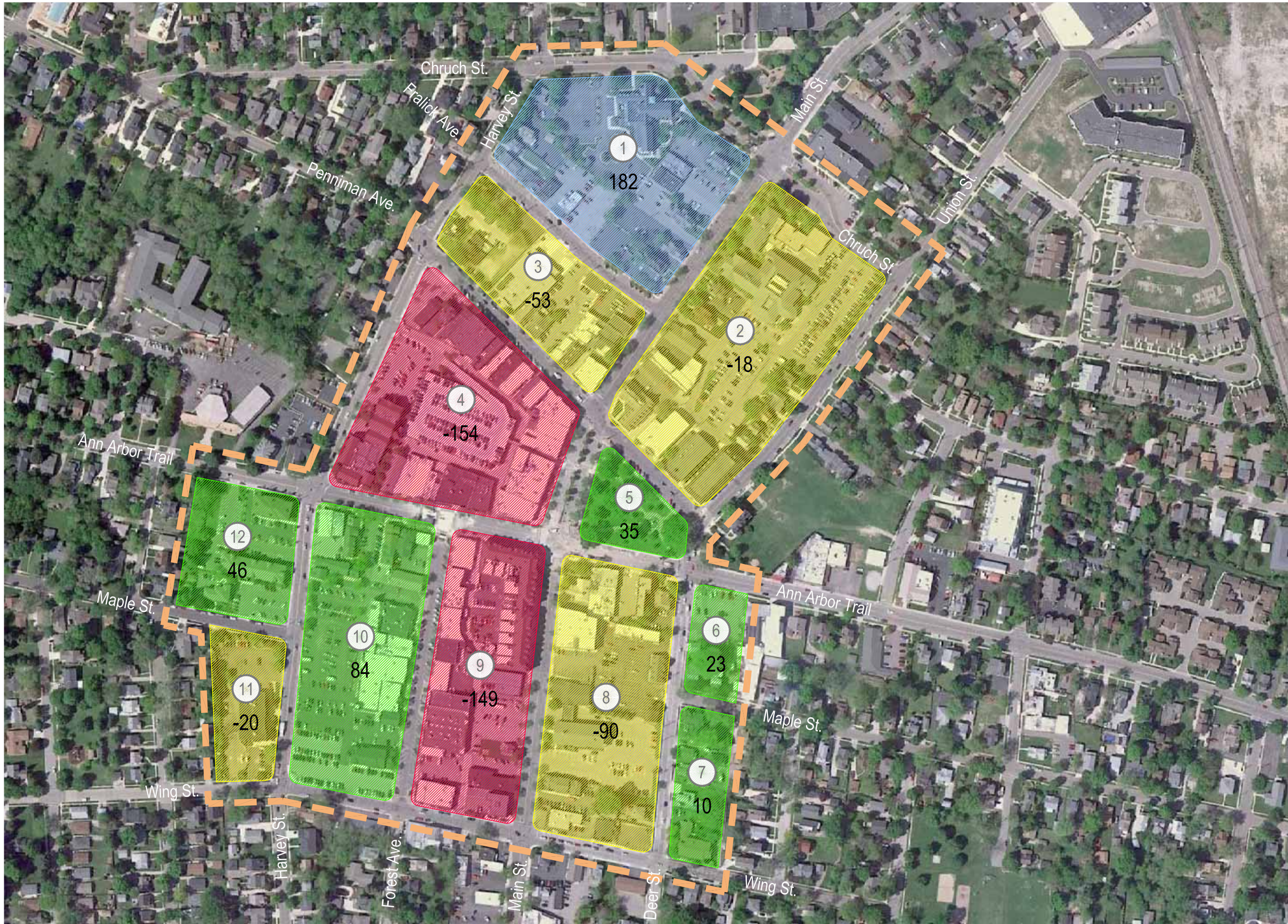
PARKING
SURPLUS / DEFICIT
NOVEMBER - APRIL
(CURRENT) - NIGHT

File No.	1122
Scale	NTS
Date	07-22-2011
Checked By	AN

MAP Number:

MAP





PARKING
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PLYMOUTH, MICHIGAN



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RICH
& ASSOCIATES

LEGEND:

#

BLOCK NUMBER

STUDY AREA

SURPLUS OF PARKING

+100

0 through 99

DEFICIT OF PARKING

-99 through -1

-100 +

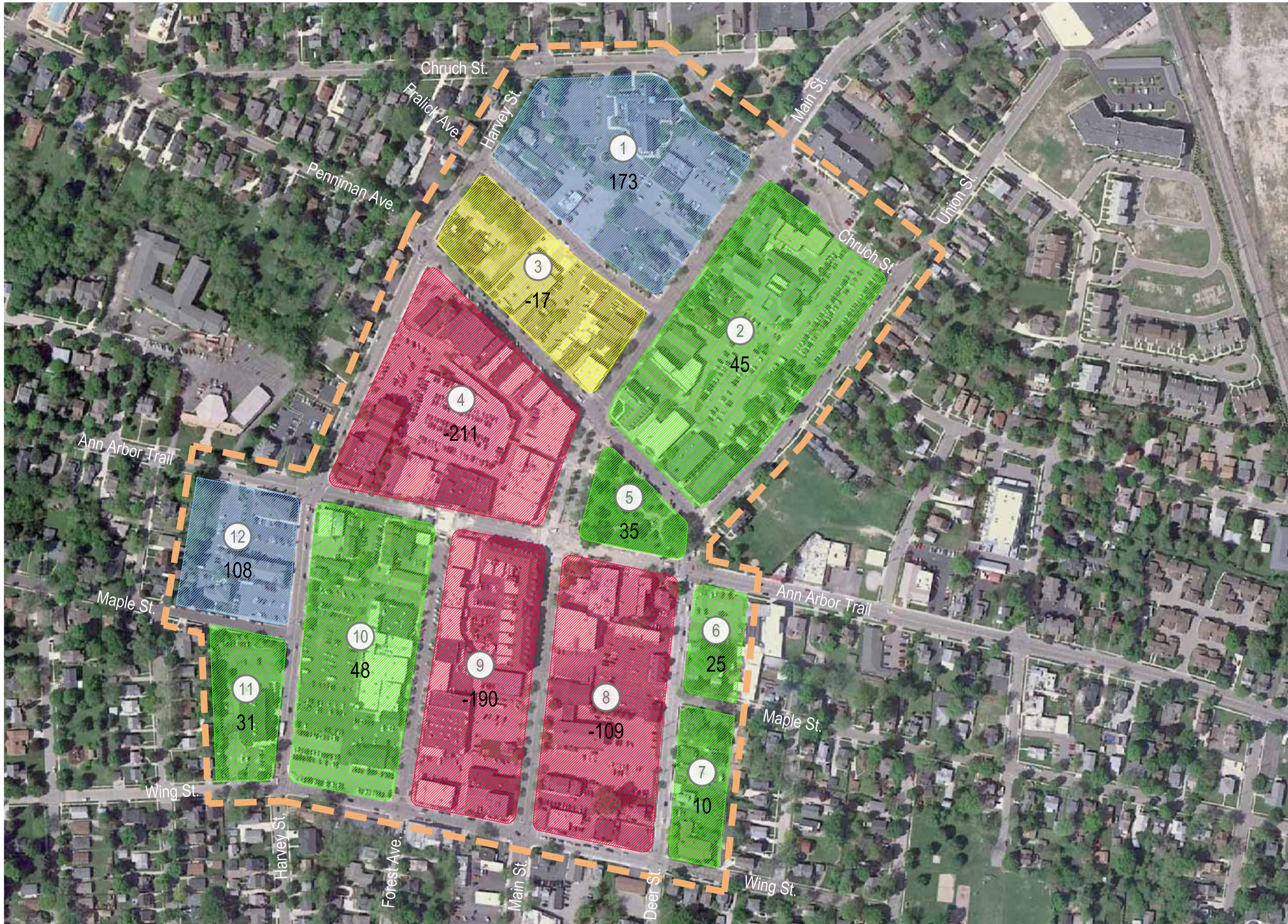
Sheet Title:

PARKING
SURPLUS / DEFICIT
MAY - OCTOBER
(5 YRS) - DAY

File No.	1122
Scale	NTS
Date	07-22-2011
Checked By	AN

MAP Number:
MAP





PARKING
STUDY
FOR
THE CITY OF
PLYMOUTH

PLYMOUTH, MICHIGAN



LEGEND:

BLOCK NUMBER

STUDY AREA

SURPLUS OF PARKING

+100

0 through 99

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-99 through -1

-100 +

Sheet Title:

PARKING
SURPLUS / DEFICIT
MAY - OCTOBER
(5 YRS) - NIGHT

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PARKING
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FOR
THE CITY OF
PLYMOUTH

PLYMOUTH, MICHIGAN



LEGEND:

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SURPLUS OF PARKING

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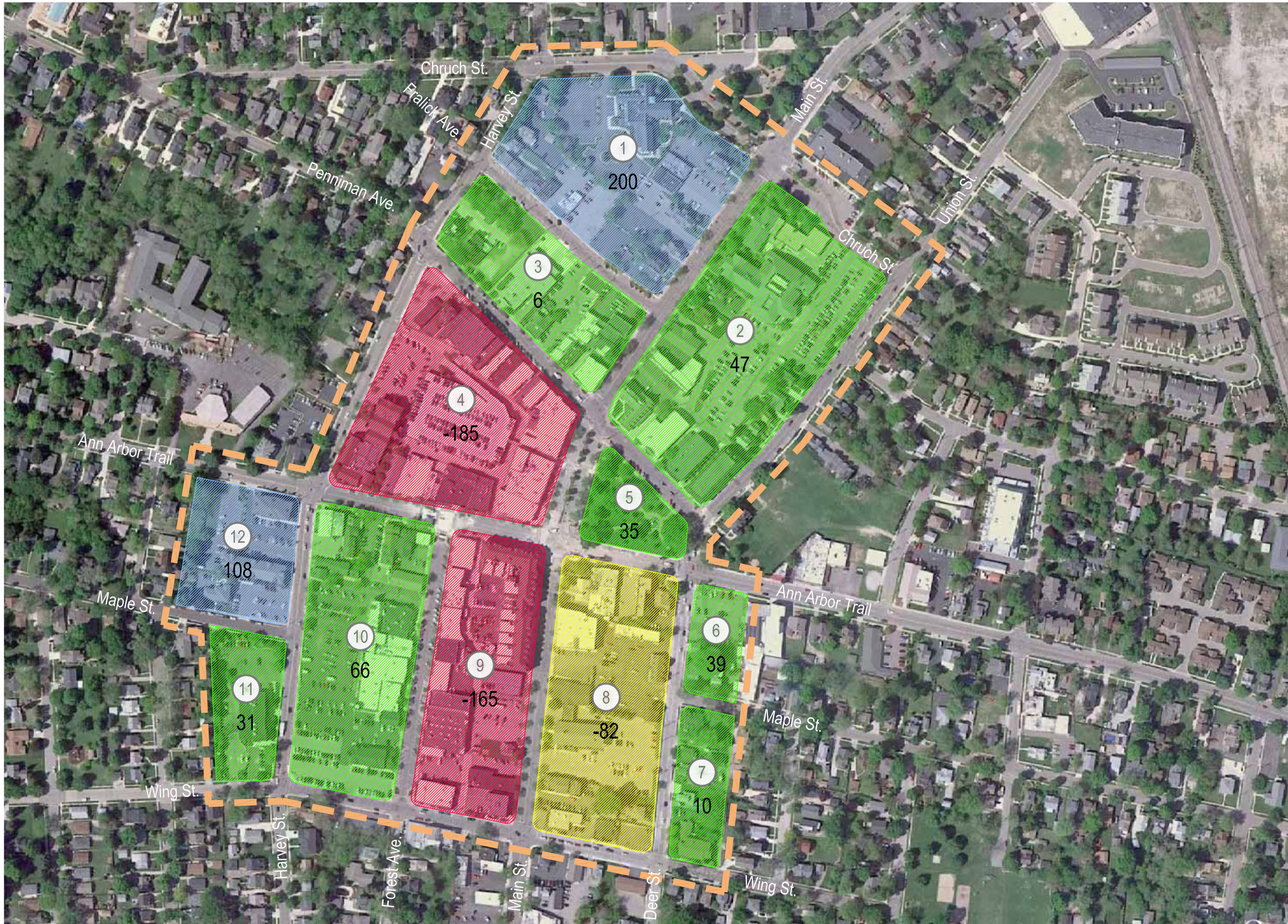
PARKING
SURPLUS / DEFICIT
NOVEMBER - APRIL
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PARKING
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PLYMOUTH

PLYMOUTH, MICHIGAN



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SURPLUS OF PARKING

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PARKING
SURPLUS / DEFICIT
NOVEMBER - APRIL
(5 YRS) - NIGHT

File No.	1122
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MAP Number:

MAP

Parking Demand Summary

While the results of the analysis show that there is an overall parking surplus in the study area, there are blocks with calculated deficits. These blocks are 2,3,4,8 and 11. The larger deficits are centered around blocks 3 and 8. For the most part, these deficits are confirmed by the turnover and occupancy parking study. Block 8 includes the Meeting House and Grand Ballroom which has a demand that will fluctuate due to scheduling and size of events. The date the turnover and occupancy analysis was completed there were not daytime or nighttime events at the Meeting House.

In general, the calculated parking deficits on these blocks are satisfied by parking (both on-street and off-street) in adjacent blocks. Overall, there are a sufficient number of parking spaces to accommodate the current demand for parking. However, the current situation does not allow for shared parking.

Even with the number of private lots in downtown Plymouth it appears that there is not enough parking due to the fact that much of the off-street public parking is near 85 percent occupied, leaving customers/visitors circling throughout the downtown looking for parking. It would benefit the City to work with private lot owners to create more shared use parking throughout the downtown.

Recommendations

Overall, the recommendations are intended to enhance the existing supply of parking through acquiring private parking lots, signage, pedestrian enhancements and marketing changes. A parking system is not just about parking vehicles, it also involves the walkability of a downtown, signage, parking enforcement, lighting and the marketing of parking to owners, employees and customers.

The utilization of lots can depend on any or all of these factors and the overall conditions of the parking areas. Fundamentally, these issues can be a negative or positive impact on a parking system and thus downtown economics in general. The following recommendations will aid Plymouth in creating a more efficient parking system.

At this time Plymouth needs to decide if there will be policy decisions to create parking now as an economic development tool or if the City will wait until there is a shortage of parking to develop new parking. Plymouth is at a point that it is becoming difficult to accommodate the infill of vacant space with existing parking. New development will create a shortfall of parking in the downtown without bringing some of the private parking into the public parking supply and the planning of additional parking can take between one and five years depending on the type of new parking, surface or structured.

Discourage the Development of Any New Private Parking Lots in the Downtown:

A parking system works best when the parking is shared and the Municipality is in control of 50 percent or more of the available parking in the downtown. This is important because it allows shared use parking. The City can then manage, regulate and enforce the parking more efficiently, keeping these costs down and benefiting the downtown economically.

Plymouth falls short of this recommendation owning only 40 percent of the parking. This number includes reserved parking that is owned by the City which is not available for shared use, thus dropping the percentage of available shared use parking even further. When parking spaces are not shared they often go unused for the majority of the day.

While the parking demand analysis showed that there is an overall sufficient parking supply, the availability of shared use parking is an issue. It makes it difficult for a customer/visitor of the downtown to visit more than one location when the parking is reserved for specific uses. It also makes it difficult to provide a sufficient amount of employee parking off-street.

One issue that should be addressed immediately is the potential to add “publically available” parking spaces by entering into agreements with private parking owners whose lots during the day or evenings have available parking spaces. The City or DDA would agree to clean and insure the parking area and then market this parking for customer and visitors if the parking area is within a reasonable walking distance or for employees if the parking area is farther from the core downtown. As part of the marketing program, the City or DDA would include these private/public parking areas in their website as part of the public parking supply and they would also be responsible for signing the parking areas as well.

A good example of this is combining the City Lot on block 10 with the two private lots. As identified in this report, if the parking could be redesigned, there would be a net gain of parking spaces, but more importantly, this would increase the publically available spaces. In the turnover and occupancy study, the City Lot was 96 percent occupied at peak time while the other two lots were 86 and 61 percent occupied. At night these three lots on block 10 were all less than 70 percent occupied. This is but one example.

Recommendations:

- A. In general, Rich and Associates recommends minimizing surface lots and large breaks between buildings to promote walking in the downtown. Surface lots should be located behind buildings or on blocks where the Municipality is not trying to create density. People tend to walk further without complaints if the walk is pleasant, enjoyable and engaging. Landscaping, murals, art and decorated store windows tend to create an experience worth walking. Parking areas are important, though large parking lots without landscaping can be viewed as unsightly, unsafe and discourage pedestrian activity.
- B. The City should work with private parking owners to allow for public shared use of private parking where possible. The City could offer to maintain, light, sign and enforce the lots. These lots would then be taken into the public parking inventory.

An example would be the large private lots along Harvey Street between Ann Arbor Train and Wing Street. There is a potential to gain approximately 10 parking spaces and improve the traffic flow by eliminating two entrances to the lot. This would increase the efficiency and utilization of these lots. **Drawing 1** is a potential layout of the lots combined into one public parking lot.

- C. There is a potential for the City to work with a land owner on an undeveloped parcel on Penniman Avenue next to the Post Office. A parking lot at this site would be a potential of an additional 36 public parking spaces (**Drawing 2**).

Drawing 1



Drawing 2

**Signage:**

Plymouth has both vehicular and pedestrian wayfinding in the downtown. The signs work well and look good in text and color. This recommendation focuses specifically on the parking wayfinding that leads a customer/visitor to the public parking lots. There needs to be more directional location signs leading a driver to the public parking areas.

It is difficult to know if the parking lots are public or private. All public parking lots should have identification parking signs listing who can use the parking, the duration of parking, the hours of operation and the hours of parking enforcement. All lots should be named and signs should identify the name of the parking lots. This lack of identification creates issues with marketing and wayfinding.



Direction/Location sign that is different in color and text



Direction/Location sign



Vehicular Wayfinding sign



Introduction sign



Pedestrian Wayfinding



Pedestrian Wayfinding

Best Practice For Parking Signage

Rich and Associates has established a best practice for vehicle and pedestrian wayfinding parking signage. These best practices have been developed by looking at successful signage in other communities and through signage programs that we have developed. Plymouth has a variation of many of these signs, though all are listed to show how all of the sign types work together.

As a best practice, the following four types of parking signs that increases drivers' wayfinding experience are strongly recommended. Communities often miss the important role that signs play in making visitors comfortable with their surroundings and the effect that signs can have on vehicle travel and parking use efficiency. Additionally, there needs to be pedestrian wayfinding signs to deal with the driver/passenger transition from vehicle to pedestrian modes. It should be noted that sign color, size design and placement may be impacted by local, county or State highway department's regulations.

Directional/Location: Directional-parking signage is distinct in color, size and logo and directs drivers to off-street parking areas. Parking location signage complements the directional parking signage. The signs have arrows pointing to the off-street lots. The signs are mounted on poles at standard heights, on the streets.



Identification: Identification signage is placed at the entry of each parking lot. The name of the parking area is identified and the type of parking available as well as hours of enforcement and the hours of lot operation is listed on the signage. The identification signage is distinctive in color and size, and it is located on a pole at a lower height.



Vehicular Wayfinding: Vehicular wayfinding signs are placed at the points in the downtown to lead to places of interest and parking locations. The sign also points out the various landmarks or attractions that can be found. These types of signs are placed at locations easily found by a driver and are intended to help that driver orient themselves to the downtown area.



Pedestrian Wayfinding: Pedestrian wayfinding signs or kiosks are placed at the points of pedestrian entry/exit to parking lots. Typically a map illustrating the downtown area that points out the various shops or attractions. These types of signs are placed at locations easily found by a pedestrian and are intended to help that person orient themselves to the downtown area to locate their destination and then be able to return to where they parked.



Recommendations:

- A. There should be more directional/location signs in the downtown, especially signs that lead drivers to public parking lots. These signs should clearly identify customer/visitor parking. The current signs are not all consistent in color and shape. The recommendation is for additional signs and that all signs to be the same color and shape.
- B. Use identification signs that let a customer/visitor of the downtown know what lots are public, the allowed parking durations and hours of operation. Each lot should be named and those signs located at the entrances to the lots. Plymouth has some identification signs, though not all public lots have this sign.
- C. The one and two hour on-street parking signs should be spaced at approximately every 100ft – 120ft. There are some block faces where it is difficult to know what the time durations are for on-street parking.
- D. Consider adding a pedestrian wayfinding kiosk on the square.
- E. Rich and Associates recommends signing the walkway to the parking structure from Main Street and the exit of the parking structure from the second level. This will let visitors of the area know that the parking structure is there and lead customers/visitors directly to Main Street. During the turnover and occupancy analysis there were several people walking down the ramp instead of using the pedestrian exit.

Marketing:

Marketing is an important and often overlooked component to a successful parking system. Marketing initiatives should be directed towards downtown employers, employees and customers/visitors. Materials can include direct mailings, brochures, maps, kiosks, on-line web pages or articles in magazines, newspapers, etc.

Information contained in the marketing material should include parking locations, up-coming changes, regulations, fine payment options and any other information relating to the parking system. An individual's perception of Plymouth is greatly enhanced if they know ahead of time where parking is located and what the durations are.

Plymouth currently has some information listed on the city's web page regarding parking. We recommend that parking have a separate tab that lists all things parking. This page should cover all parking information for both customers/visitors and business owners and employees of the downtown.

Information that should be included:

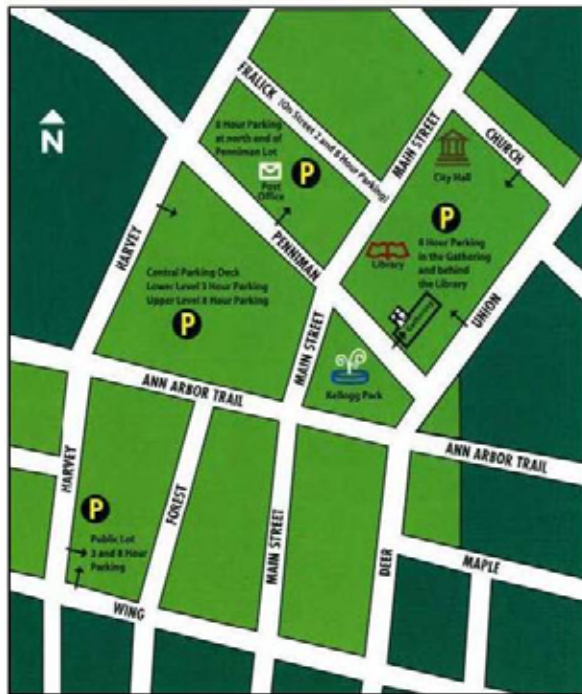
- parking map that shows all public parking locations
- durations both on-street and off-street
- hours of enforcement
- detailed information on tickets
 - fines
 - where to pay
- where employees should be parking
 - importance of on-street parking for success of businesses
- any changes to the parking system
- special event parking instructions and directions

Additionally, the City should actively encourage businesses to include a link to the City's parking page on their own web site.

Recommendations:

- A.** The DDA and City's web site should be modified to have a tab on the main page for Parking.
- B.** A specific parking page(s) needs to be developed.
- C.** The parking web site should include information listing the hours and days of enforcement, parking regulations and where to pay a ticket if one is received. There should also be language about promoting the "park once" concept where if someone is coming downtown for more than one purpose, they should look to off-street parking areas so all errands can be done without moving a vehicle.
- D.** Businesses should be encouraged to have a link to the city's web site and parking page. This allows customers and visitors to click on a link and go directly to the parking page.
- E.** Plymouth has a visitors guide listing the businesses and includes a map detailing both vehicular and bicycle parking in the downtown. This is a good tool to market both the downtown businesses and the parking system. Currently the City and the DDA have two different parking maps located on their web sites which are both different from the visitors guide parking map. The three different maps are shown on the following page. There should be one map that all businesses, DDA and City use to market parking in the downtown. This makes it easier to keep the map current with changes to the parking system.
- F.** Continue to market the free parking in the downtown with the locations of long term parking for customers and visitors who plan to spend an entire day downtown.
- G.** Specific marketing initiatives can be aimed at local employers and employees that inform them of the importance of keeping on-street parking available for customers and visitors. An incentive program could also be used such as a drawing once a month for those employees that are participating in the program and park in the appropriate parking areas.

DDA parking map



Time limited FREE Parking is available in all public parking lots and on streets.

2 hour parking locations

- All striped spaces on streets

3 hour parking lots

- Ground level of the Central Parking Deck and
- Penniman parking lot - next to the Muriel's Doll House

8 hour parking lots Downtown

- Upper level of the Central Parking Deck
- Parking lot at the corner of Wing St. & Harvey St.
- Gathering Pavilion and East Central (Library) Parking Lot

Very nice public restrooms available under the Gathering

Parking time limits are enforced Monday through Saturday from 8 a.m. to 8 p.m., except Holidays.

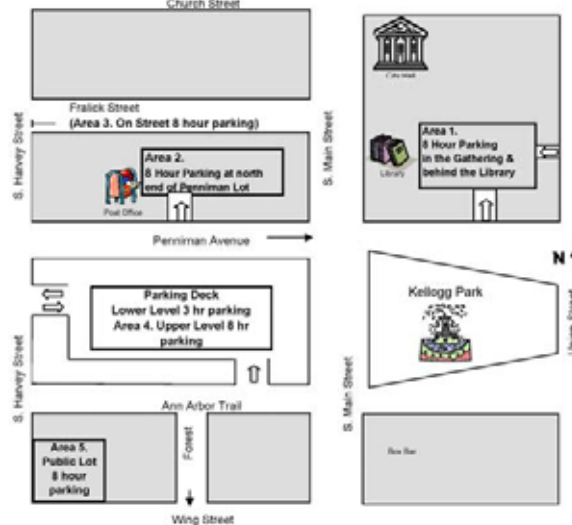
DDA Visitor's Guide parking map



Parking in Downtown Plymouth

On street parking is limited to 2 hours in most areas.

Church Street



City parking
map

Parking is time-limited and enforced in the following areas.

On street Parking is limited to two hours in most areas.

The lower deck of the Parking Structure is limited to three hours.

Parking without time limits is available at the following locations:

- Area 1. In the Gathering and behind the Library
Area 2. In portions of the Penniman Ave. public parking lot
Area 3. On street parking on Fralick street
Area 4. On the upper level of the Parking Deck
Area 5. In the public parking lot at the corner of Wing & Harvey streets

This information is provided courtesy of the City of Plymouth's Downtown Development Authority. If you have additional questions please call us at 734.455.1453 or email dda@ci.plymouth.mi.us

Add Additional Bicycle Racks to the Downtown and Encourage Bicycle Ridership:

Having a safe and secure place to store a bicycle is paramount to successfully promoting the use of bicycles for downtown employees who would otherwise commute using a motor vehicle. Lockers and shelters will also benefit employees of the downtown providing a secure place to store a bicycle out of inclement weather.

Recommendations:

- A. It is recommended that Plymouth use the following guidelines on bicycle racks when choosing new racks for the downtown.

Guidelines on Bicycle Racks (*Bicycle Parking Guidelines, first edition 2002*):

- Racks should allow bike frame to make contact at two points.
- Should allow for more than one bike per rack.
- Needs to allow for popular “U” shape lock.
- Racks should be placed where they will not impede upon pedestrian traffic, though need to be readily identifiable.
- Should be clearly signed with a bicycle parking sign.

- B. Create a marketing program to promote bicycle use as an alternative to driving and consider aiming to achieve the designation as a “Bicycle Friendly Community” recognized League of American Bicyclists to assist in this program.

1. Develop a brochure that markets bicycle ridership in the Plymouth area. Include the bicycle rack locations map as well as a map detailing bicycle routes that connect to the downtown.
2. Host a special event to promote bicycle ridership in a City wide effort to use alternative modes of transportation. This will in turn cut down on the number of parking spaces needed.

Marketing Bicycle Ridership

- Federal law provides tax incentives to bike to work which are explained by The League of American Cyclists, <http://www.bikeleague.org/news/100708faq.php>.
- There are several communities throughout the U.S. that participate in National “Ride Your Bike to Work Day/Month” in May. Information can be found through the League of American Bicyclists www.bikeleague.org.
- Source of possible grant funding through Bikes Belong Coalition, <http://bikesbelong.org>
- Pedestrian and Bicycling Information center is a helpful link that offers advice on funding and marketing bicycling in downtowns. <http://www.bicyclinginfo.org>
“Communities that are bicycle-friendly are seen as places with a high quality of life. This often translates into increased property values, business growth and increased tourism. Bicycle-friendly communities are places where people feel safe and comfortable riding their bikes for fun, fitness, and transportation. With more people bicycling, communities experience reduced traffic demands, improved air quality and greater physical fitness”
www.bicyclefriendlycommunity.org

Parking Enforcement:

Parking enforcement is an important component of a parking system that is designating on-street parking for customers and visitors. By differentiating the time limits of parking between on-street and off-street parking, we are helping to ensure that customers and visitors always have adequate and convenient parking. However, it is necessary to enforce the parking time limits in order for the allocation to work.

In general, we found that the violation rate for on-street to hour parking was lower than best practice which indicates that employees in general are respectful of on-street parking limitations. For the three hour parking however, there were employees parking in these spaces. Enforcement is key to maintaining the availability of customer/visitor spaces and maintaining the perception that there is available parking.

Recommendations:

- A. An enforcement officer should be able to monitor between 600 and 800 parking stalls per shift. Parking enforcement should be carried out by a parking enforcement officer routinely from 9:00 A.M. until 8:00 P.M., five or six days per week.
 - 1. Officers should be dedicated to parking enforcement duties only during their shift in order to ensure that proper routing and timing or stall observation is consistent throughout the day.
 - 2. Routing is the pattern of the officer enforcement walks. Time limited public parking stalls should to be observed once per duration maximum or at least two to three times daily. Specifically, the goal is that a two-hour parking space should to be observed by an officer every two hours from 9:00 A.M. until 8:00 P.M., five to six days per week.
 - 3. Plymouth has 950 parking spaces that need enforcement, though all of these spaces are not two hour parking. This allows the current staffing of two part time parking enforcement officers working opposite days to work efficiently.
 - a. Consistent parking enforcement is important and can be done without checking every space every day as long as the routes of the enforcement officer change each day. The consistency of enforcement will encourage employees to park in the proper places because there is a risk of being ticketed if they do not park properly.

Guidelines on efficient and effective parking enforcement include:

- Routing of officers so that a complete circuit is followed every two hours in the downtown area and every three hours for three hour parking.
- Officers should use handheld parking ticket writers that track license plate numbers. (see following recommendation)
- Every parking space, whether occupied or not, is then entered into the handheld. see following recommendation)
- Staffing should be at a level adequate to assign one officer to monitor up to 600 - 800 parking spaces per shift.
- Parking enforcement officers should be dedicated to parking duties, only being re-assigned during emergencies or special circumstances that may arise.
- Street signs should indicate that parking is enforced from 8:00 A.M. - 5:00 P.M.

Handheld Technology for Enforcement:

Handhelds would allow the use of a courtesy ticket and the use of graduated fines. The software can identify multiple infractions within a given time period and issue a ticket accordingly. The handheld software can assist in tracking fine payment.

Handheld units can also store a “hot list” with information such as stolen vehicles, warrants, previous offenders, and unpaid tickets. When a license plate gets put into the handheld, the plate is run through a database. If it is an offender the handheld responds with the appropriate information. If a vehicle needs to be booted or towed because of multiple unpaid tickets, the information will come up on the screen of the handheld. This helps make the entire parking system more efficient and enforcement more effective.

Recommendations:

- A. Rich and Associates recommend that Plymouth purchase and begin using handheld ticket writers to enforce parking. The handheld units increase efficiency by storing the license plate numbers of vehicles, thus negating the need to physically chalk tires. This will allow enforcement to occur during inclement weather, whereas marking tires with chalk cannot be done in the rain or snow because the chalk gets washed away and does not mark well on a wet tire.
- B. With the purchase of the handheld ticket writers a central computer will become necessary. A home base needs to be set up where the handhelds can be recharged, downloaded and updated daily with pertinent information regarding parking violations and information from the Police Department.
 1. There will be additional software, much of which is available with little to no modification. The software should also be used to process and file tickets.

Parking Tickets/Courtesy Tickets:

Parking tickets or fines need to aid in collection, provide the community with a customer friendly atmosphere and discourage improper parking. Among the best practices ticket strategies are the use of graded fines and courtesy tickets.

Graded fines are fines for improper parking practices where the amount of the fine can be adjusted to penalize repeat offenders with a larger fine than an occasional offender. The goals of the graded fine are to discourage parking infractions and to aid in ticket collection before the tickets ends up going into the court system. Handheld ticket writers are necessary for this recommendation.

Recommendations:

- A. Consider implementing graduated parking fine. This would require the City to establish a fine structure and implement ordinances to allow for graded fines.

A graded fine example for overtime parking:

- 1st ticket – Courtesy ticket, no financial penalty.
- 2nd ticket - \$35.00, reduced to \$15.00 if paid the same day.
- All subsequent increase to \$40.00, reduced to \$20.00 if paid the same day. The fine stays the same for individuals that pay their fines.

- Accumulation of 5 or more unpaid fines. Six or more tickets are set at \$60.00 each with no reductions.
- Illegal parking infractions (such as at a fire hydrant or in a handicap parking stall) remain the same.

The courtesy ticket concept applies to first time parking offenders. The ticket is essentially a written warning or notice that the individual has parked beyond the posted time limit. (Courtesy tickets only apply to overtime parking. Infractions such as illegally parking at fire hydrants and in handicap stalls remain a standard fine.)

The courtesy ticket is usually written to thank the individual for visiting downtown Plymouth, indicate to them that they have parked improperly and then offers potential parking locations that would better suit their needs. Then the courtesy ticket would go on to alert the parker to the fact that they were in violation and then give the parker a map with alternatives to where they can park for longer periods of time. Courtesy tickets are intended to allow leniency for customers and visitors to Plymouth. The tickets also work well with changes to the parking system that may temporarily confuse parkers.

B. Consider implementing a courtesy ticket for first time offenders.

**HERE'S HOW YOU CAN
AVOID
HIGHER
FINES**

Professor Parker
Park Stroller
askParker@focgov.com

If you receive multiple citations within 180 days, the amount of the fine increases

1st Overtime = \$0.00
2nd Overtime = \$10.00
3rd Overtime = \$25.00
4th Overtime = \$50.00

YOU MAY RECEIVE UP TO 3 CITATIONS A DAY

**TWO WAYS OVERTIME
CITATIONS MAY BE ISSUED**

1. You may not park longer than the posted time limit. There is no grace period.
2. When you leave a timed parking space, you may not return and park in the same block-face* or parking lot for at least four hours from the time you left.

**IF YOU HAVE ANY QUESTIONS,
PLEASE CALL 221-6617**

 Parking Services
215 N. Mason Street
Fort Collins, CO 80524
<http://focgov.com/transportation/parking-updates.php>

*Additional information on reverse side

*A BLOCK-FACE is defined as the portion of a street between two intersections, including all on-street parking, both sides and center (where applicable).

LONG-TERM PARKING: If you need to park longer than the posted time limit, try one of the two parking structures or a surface lot, or on-street around the periphery of Downtown where all-day parking is allowed. (See Map).

If you need help with parking
PLEASE CALL 221-6617



■ Long-Term Surface Parking ■ Parking Structure

Thank you for visiting Downtown Fort Collins. Parking regulations help make parking spaces available for everyone. If you would like to provide comments or get more information, please call (970) 221-6617 or ask Professor Parker at askParker@focgov.com

An example of a map and explanation of graduated fines, attached to parking tickets (including courtesy tickets) in Fort Collins.

Barrier Free Parking:

As part of the parking analysis, Rich and Associates reviewed the number of barrier free (handicap) parking stalls in Plymouth. **Table H** is a copy of the Americans with Disabilities Act (ADA) parking guidelines followed by **Table I** listing the public lots and the number of barrier free parking stalls provided. Although the ADA guidelines do not give guidance on the required numbers of on-street barrier free parking spaces, it is important to offer on-street barrier free parking spaces and Plymouth offers several on-street barrier free parking spaces.

Along with the parking guidelines it is important to make sure that once a person is parked they will be able to access the sidewalk from where they are parked. All intersections should have sidewalks that are barrier free and all lots should have a clear path of access.

**Table H
ADA Parking Guidelines**

Total Parking	Required Minimum Number of Accessible Spaces
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2 percent of total
1001 and over	20, plus 1 for each 100 over 1000

*One in every six assessable spaces, but not less than one, shall be served by an access aisle 96 in (2440 mm) wide minimum and shall be designated "van accessible".
Department of Justice, ADA Standards for Accessible Design, July 26, 2010*

- A. Most public parking lots in Plymouth exceed the number of ADA recommended barrier free spaces. **Table I** is a comparison of the number of barrier free off-street provided to the ADA recommended number of spaces. The only lot that does not meet the recommended number of barrier free spaces is the lot off Wing Street. This lot should have four barrier free spaces according to the guidelines. It is recommended that this lot have four barrier free spaces added to the lot.

**Table I
Comparison of Provided Barrier Free Parking Spaces to
ADA Recommended Barrier Free Parking Spaces**

Lot	Block #	Total Capacity	# of Barrier Free Stalls Required	# of Barrier Free Stalls Provided	Surplus/ Shortfall
Lot behind library	2	203	7	9	+2
Pavilion lot	2	22	1	2	+1
Lot off Penniman Ave.	3	28	2	2	~
Parking Structure	4	258	7	16	+9
Lot off Wing St.	10	78	4	0	-4

Review of Parking Needs:

The results of the parking demand analysis showed that in the current condition there is an overall surplus of parking for both the spring/summer and fall/winter periods. There are however, several blocks with deficits such as blocks 2,3,4,9 and 11. Parking demand from these blocks is currently finding parking on surrounding blocks where there are surpluses in most cases.

In the future condition, there is a projected deficit of -29 to -103 spaces for the overall area. Again, there are blocks with larger deficits which now include block 8. This is the result of re-occupancy and the new project proposed for the corner of Ann Arbor Trail and Main Street.

When we look at the results of the turnover and occupancy study we see that most of the public parking (off and on-street) is at or exceeds 85 percent occupancy while the private parking is in general below the 85 percent occupancy mark. As identified in the study, drivers in general perceive off-street and on-street spaces with occupancies greater than 85 percent to be at capacity, depending on the overall capacity of the parking area. The greater the capacity, the less this perception is valid. When 85 percent occupancy occurs, drivers believe that the parking is full and will begin to re-circulate to seek other parking.

While there is an overall current surplus of parking and the results of the occupancy study shows that at peak time during the day all parking only achieved a 62 percent occupancy, the public available parking was at 82 percent occupancy. This seems to validate the perception that there is insufficient parking in the study area. In the future, our projections show that there will be an overall deficit in parking.

There are several actions that can be undertaken to increase the amount of publicly available parking in the downtown. The primary concern is the parking for the customers and visitors. Their parking choice hierarchy is generally on-street parking first, surface lot second and a parking structure last. Parking duration limits, vehicle and pedestrian wayfinding, and amenities in surface lots and parking structures like lighting and security play a role also in the decision process.

Charging for Parking:

Based on our analysis, there is a need for additional customer/visitor parking in the downtown. This can be accomplished by reallocating parking, but this should also occur in conjunction with a discussion of paid parking since one way to change parkers behavior is to charge for parking.

Generally, cities with parking systems that are self sufficient and build a parking structure rely upon revenue from several sources. This includes revenue from the actual parking structure being built, revenue from existing parking structures and surface lots in the downtown, and revenue from on-street meters and fines.

It is difficult if not impossible to build a parking structure in a downtown and have it fully amortize without significant equity contributions such as grants, or reserve funds. This is why pooling other parking revenue sources such as other decks, lots and on-street parking is so important. Without parking meters, it is critical that on-street enforcement is consistent so that people who are staying longer are parking in off-street locations and that employees are not parking on-street.

Based on parking Best Practices it is generally agreed that on-street parking should be reserved for customers and visitors. In areas that have little commercial activity, the on-street spaces can have longer durations of stay allowed. There is a body of information that has been prepared by

Donald Shoop from UCLA that suggests that all on-street parking should be metered. The rationale simply put is that on-street parking is the most sought after parking and therefore the most valuable parking. Therefore there should be a charge for parking that places a premium on this type of parking.

Further, it is suggested by Shoop that revenue from parking meters should be used to cover parking operating expenses and any net revenue go back into the downtown assessment area for things such as sidewalk cleaning, signs, lighting, banners etc. Parking revenue is then helping to pay for the upkeep of the downtown.

Parking meters or other technology encourage turnover in a downtown, though enforcement can also work to keep parking spaces turning over. While parking meters or some other type of system to pay for use of an on-street space in downtown Plymouth makes sense from a Best Practices standpoint and would provide a revenue stream to improve, maintain and expand the parking in the downtown, paid parking on-street may put the downtown at a competitive disadvantage. There are no downtowns in the area that have paid on-street parking including downtown Northville. Our experience has been that unless the property owners and business owners are behind paid on-street parking, the implementation of the system will be difficult at best.

With respect to off-street parking, there may be the possibility of charging for parking in the parking structure (both for the three hour and employee parking) and in other off-street lots with the use of a multi space meter or similar technology. We believe there may still be resistance to charging for customers and visitors.

The following is a review of potential ways to charge for parking.

Multi Space Meter:

The multi space meter was designed to handle both on-street and off-street parking. The simplest multi space meters are simply a meter head that can cover multiple spaces. This type of machine does not allow the use of currency and may or may not accommodate credit card. The more complex multi space meter can handle any number of spaces and can accommodate someone paying for parking by coin, bills, credit or value card. The parker simply inputs their stall number into the machine and then either selects the amount of time they want to stay (up to a maximum if applicable) and then pays the amount on the screen. A receipt is issued and the parker leaves.

This system allows a parker to add time to their space but ideally would not tell them how much available time was on the space to dissuade someone from driving up and using someone else's unused time. The enforcement officer either wirelessly downloads a report or gets a printout from the machine that indicates spaces that have time paid for. The enforcement officer then goes down and tickets vehicles where the space has no time paid for.

The issues with the Multi Space Meter are;

- Depending on the length of the block, there may need to be multiple machines.
- There is a learning curve to using the machine (though this technology is currently being used in Ithaca downtown.
- In general, the machines need a power source though solar is possible.

- The Multi Space Meter allows the potential to use coins, paper currency, credit card, and value cards.
- Each parking space must be numbered and the parker must notice and remember their stall number.

Pay and Display Machine:

The pay and display machine is similar to the pay by space machine except that the parking spaces do not need to be numbered. The parker pays for the amount of time they want to park and then a receipt is given stating that they must go back to their vehicle and put the receipt on their dashboard. The receipt shows the date, the block face that the machine is on and the time the space is paid for.

The enforcement officer would walk down the parked vehicles on-street and read the receipt on the dashboard and read the time the space is paid for and issue a ticket accordingly.

The issues with the Pay and Display Meter are;

- Depending on the length of the block, there may need to be multiple machines.
- There is a learning curve to using the machine
- In general, the machines need a power source though solar is possible.
- The Pay and Display Machine allows the potential to use coins, paper currency, credit card, and value cards.
- Each parking space is not numbered, but the parker must go back to their vehicle after they pay and place the receipt so that it can be read by the enforcement officer.
- The receipt must be placed on the dash so that the enforcement officer can read the receipt.

Pay by Phone and Meter/Machineless:

With either option there is the potential to use a pay by phone system. In the case of the Pay by Space Machine, the parker would have to establish an account with the company in advance. Once they park their vehicle they would dial a phone number and enter in their stall number and the amount of time they want to stay. This information would be incorporated in the overall data system and when the enforcement officer pulled a report from the machine, the pay by phone payment and valid time would also be reported.

For the Pay and Display, the parker would pay and the information would be entered into a wireless system that would report to the enforcement officer that a specific vehicle license plate has paid for time and what time that space expires.

Based on our analysis, we offer the following recommendations for reallocation parking and any possibility of charging for parking.

- A. The eight hour spaces on the ground floor of the parking structure should be considered prime parking and a premium charged for a monthly permit to park in these spaces.

- B. The roof of the parking structure should be designated three hour parking but allow the sale of a limited number of permits at a premium. This will open up more visitor customer parking if the three hour parking on the roof is adequately marketed including signage. The DDA must check if this violates any previous agreements (oral or written) with the medical office building.
- C. Assuming that the City/DDA can provide additional parking either by acquiring existing sites or doing a lease with a private parking lot owner, the other existing City lots should be permitted. We noted that there appear to be employees from business along Harvey Street that park either on-street or in the City parking lots that in fact have parking at their business. The permit would have a small cost associated with it to keep employees that already have parking at their place of employment from parking in a City lot.
- D. The City/DDA should look at increasing the spaces they lease at the Christian Science Church with the goal of establishing an employee parking area at this location. In the future, acquisition of this property and construction of a parking lot that is sensitive to the site location near a residential area should be a priority. This will provide a place for employees who do not want to pay for a permit to park for a lesser monthly cost or even free. It will be important to provide a walkway from the lot to Harvey Street to allow parkers to move from the parking lot to the east more efficiently.

Payment In Lieu of Parking:

The City is currently considering a payment in lieu of parking program. The premise of the system is that some or all of a projects parking requirements based on the code are eliminated with a payment, generally calculated on a per space basis. In Plymouth the cost per space is \$10,000. The assumption is that the requirement for the project to provide parking is waived and that the City (or DDA) will provide parking in part through the collection of in lieu fees.

The City will then provide all parking (except for residential) within the set business district. Payment in lieu of parking fees allows dense development due to the fact that parking does not need to be included within the property footprint. This in turn creates a more walkable downtown without the multiple entrances and exits of parking lots throughout the downtown. The City then has a better handle of the allocation of parking since they will be in control of the majority of parking in the downtown. This will also cut down on towing due to the availability of more public parking in the downtown creating a more welcoming image of Plymouth and taking away the confusion of what parking is private verses public.

The issue that we have with the payment in lieu of parking in the City of Plymouth at this time is that the City may collect the in lieu fee, but they are unable to provide the additional parking, or at least provide the additional parking in a reasonable distance from the project (depending on location). If the City were to collect the fee in lieu and waive a projects parking requirement, it is unclear where the new additional parking demand would park since our occupancy studies have shown that much of the City's parking supply is at or near 85 percent occupied.

Additionally, parking will need to follow the zoning code and be provided within 300 feet of the business. Currently Plymouth does not have many land options in which they can easily create parking lots. This means that the City must be prepared to build a structure at some point in the near future.

A special City Commission Meeting was held Monday, March 28, 2011 to discuss the positive and negative effects of "payment in lieu of parking". Several issues were discussed and three options were presented:

1. Accept all applications for payment in lieu of parking
2. Deny all applications for payment in lieu of parking
3. Accept some and deny other based on some criteria

Currently Rich and Associates believes that this issue needs to be discussed further. First Plymouth needs to decide on how and where the parking will be provided and second a detailed ordinance will need to be written up to make the program fair and encourage development in the downtown.

Appendix

**Plymouth, MI
Occupancy July 14, 2011**

Appendix A

Block/ Face	Description	# of Spaces observed	8:00am - 10:00am	% Occ.	10:00am - 12:00pm	% Occ.	12:00pm - 2:00pm	% Occ.	2:00pm - 4:00pm	% Occ.	4:00pm - 6:00pm	% Occ.	6:00pm - 8:00pm	% Occ.	8:00pm - 10:00pm	% Occ.
1	Citizens Bank	25	0	0%	3	12%	3	12%	4	16%	3	12%	1	4%	3	12%
1	Private (Thai &)	23	4	17%	6	26%	16	70%	3	13%	3	13%	5	22%	15	65%
1	AMD	14	1	7%	2	14%	2	14%	2	14%	0	0%	3	21%	9	64%
1	Dari King	21	0	0%	1	5%	4	19%	7	33%	9	43%	7	33%	18	86%
1	Funeral Home	27	0	0%	4	15%	2	7%	3	11%	2	7%	2	7%	15	56%
1	Doyle's Tavern/Funeral Home	30	0	0%	1	3%	9	30%	9	30%	6	20%	20	67%	26	87%
1	Behind Doyle's Tavern	14	3	21%	10	71%	11	79%	13	93%	9	64%	8	57%	13	93%
1C	8 hr on-street	9	1	11%	5	56%	9	100%	8	89%	7	78%	8	89%	10	111%
1C	2 hr on-street	11	0	0%	0	0%	5	45%	3	27%	4	36%	11	100%	11	100%
2	Municipal parking around museum	19	6	32%	10	53%	14	74%	9	47%	7	37%	5	26%	17	89%
2	Municipal parking next to City Hall	9	4	44%	6	67%	9	100%	5	56%	5	56%	1	11%	2	22%
2	Library lot	89	10	11%	59	66%	60	67%	86	97%	65	73%	60	67%	79	89%
2	Library lot HC	8	0	0%	3	38%	2	25%	4	50%	5	63%	2	25%	6	75%
2	Library lot	108	7	6%	48	44%	73	68%	79	73%	57	53%	69	64%	108	100%
2	YMCA parking	7	1	14%	3	43%	4	57%	6	86%	4	57%	2	29%	7	100%
2	Private lot	11	1	9%	3	27%	1	9%	2	18%	4	36%	2	18%	2	18%
2	Pavilion	24	9	38%	19	79%	19	79%	18	75%	14	58%	20	83%	22	92%
2	Medical Office lot	4	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	5	125%
2	Charter One lot	21	0	0%	3	14%	6	29%	7	33%	8	38%	9	43%	21	100%
2B	unmarked on-street	17	3	18%	4	24%	8	47%	7	41%	8	47%	7	41%	17	100%
2BB	unmarked on-street	14	2	14%	6	43%	9	64%	4	29%	3	21%	9	64%	14	100%
2BB	unmarked on-street	5	2	40%	1	20%	2	40%	2	40%	2	40%	0	0%	4	80%
2C	2 hr on-street	11	0	0%	0	0%	2	18%	2	18%	1	9%	5	45%	8	73%
3	Laphau Maxwell	6	0	0%	2	33%	3	50%	2	33%	2	33%	0	0%	0	0%
3	Private next to PO	14	4	29%	4	29%	4	29%	4	29%	6	43%	10	71%	13	93%
3	Josephs	9	0	0%	2	22%	8	89%	6	67%	7	78%	9	100%	6	67%
3	Private lot	4	0	0%	0	0%	0	0%	1	25%	0	0%	0	0%	0	0%
3	Post office	2	0	0%	1	50%	1	50%	1	50%	1	50%	0	0%	1	50%
3	3 hr Municipal lot	24	1	4%	2	8%	18	75%	5	21%	14	58%	21	88%	23	96%
3	8 hr Municipal lot	6	5	83%	6	100%	4	67%	5	83%	6	100%	5	83%	5	83%
3	Alley	2	0	0%	1	50%	1	50%	0	0%	0	0%	1	50%	1	50%
3A	Funeral Home	26	1	4%	5	19%	4	15%	1	4%	10	38%	15	58%	22	85%
3A	2 hr on-street	5	0	0%	4	80%	3	60%	1	20%	0	0%	3	60%	5	100%
3C	2 hr on-street	16	2	13%	4	25%	14	88%	9	56%	13	81%	15	94%	12	75%
3D	Lot behind coffee shop	28	5	18%	8	29%	4	14%	8	29%	5	18%	10	36%	12	43%
4	St. Joseph Mercy Hospital	56	13	23%	28	50%	23	41%	44	79%	41	73%	20	36%	47	84%
4	private lot	6	2	33%	2	33%	3	50%	3	50%	1	17%	1	17%	2	33%
4	Parking Deck 8 hr lower	13	13	100%	13	100%	13	100%	13	100%	11	85%	12	92%	12	92%
4	Parking Deck 3 hr lower	114	20	18%	49	43%	104	91%	89	78%	82	72%	114	100%	110	96%
4	Parking Deck 8 hr upper	147	51	35%	132	90%	144	98%	136	93%	136	93%	134	91%	125	85%
4A	2 hr on-street	40	1	3%	15	38%	40	100%	37	93%	37	93%	40	100%	39	98%
4B	2 hr on-street	7	5	71%	5	71%	7	100%	7	100%	4	57%	7	100%	7	100%
4C	2 hr on-street	17	5	29%	1	6%	15	88%	16	94%	16	94%	17	100%	17	100%
5A	2 hr on-street (6 closed)	15	3	20%	9	60%	15	100%	9	60%	8	53%	9	60%	15	100%
5C	2 hr on-street	7	3	43%	3	43%	7	100%	2	29%	3	43%	7	100%	7	100%
5D	2 hr on-street	7	3	43%	2	29%	7	100%	4	57%	4	57%	7	100%	6	86%
6	Hardware lot	47	3	6%	5	11%	5	11%	7	15%	6	13%	15	32%	37	79%
6A	2 hr on-street	3	0	0%	0	0%	1	33%	0	0%	1	33%	3	100%	2	67%
7	2 hr on-street	10	0	0%	0	0%	0	0%	0	0%	0	0%	6	60%	11	110%
8	PNC Bank lot	84	22	26%	35	42%	31	37%	28	33%	21	25%	3	4%	21	25%
8	Meeting House Grand Ballroom	117	27	23%	36	31%	37	32%	35	30%	24	21%	27	23%	35	30%
8	Nico & Vail	13	8	62%	1	8%	12	92%	4	31%	6	46%	13	100%	7	54%
8	Smokers Outlet lot	14	2	14%	5	36%	6	43%	6	43%	4	29%	5	36%	1	7%
8A	2 hr on-street	9	4	44%	4	44%	7	78%	3	33%	6	67%	9	100%	9	100%
8A	Private lot	15	4	27%	4	27%	7	47%	7	47%	7	47%	11	73%	11	73%

8B	Private lot	16	5	31%	6	38%	4	25%	7	44%	4	25%	2	13%	8	50%
8D	Law/Real Estate lot	18	9	50%	12	67%	12	67%	12	67%	12	67%	7	39%	2	11%
9	Private lot	25	6	24%	11	44%	15	60%	9	36%	6	24%	3	12%	5	12%
9	Gated lot	28	0	0%	14	50%	14	50%	8	29%	10	36%	7	25%	5	18%
9	Dance lot	12	7	58%	11	92%	10	83%	10	83%	4	33%	2	17%	2	17%
9	Private lot	11	2	18%	8	73%	7	64%	8	73%	8	73%	8	73%	9	82%
9	Mixed Use Building	46	37	80%	38	83%	28	61%	35	76%	21	46%	16	35%	21	46%
9	Alley	4	4	100%	3	75%	3	75%	4	100%	4	100%	2	50%	0	0%
9	Private lot	14	4	29%	9	64%	5	36%	4	29%	5	36%	3	21%	5	36%
9	Penny S. Flury	6	1	17%	2	33%	1	17%	0	0%	1	17%	0	0%	1	17%
9A	2 hr on-street	6	6	100%	6	100%	6	100%	4	67%	5	83%	6	100%	6	100%
9C	on-street unmarked	7	0	0%	4	57%	7	100%	6	86%	7	100%	4	57%	3	43%
9D	2 hr on-street	42	15	36%	28	67%	39	93%	25	60%	19	45%	41	98%	37	88%
10	Municipal lot	78	66	85%	78	100%	75	96%	76	97%	61	78%	19	24%	27	35%
10	Westchester lot	74	8	11%	41	55%	64	86%	61	82%	50	68%	41	55%	31	42%
10	Forest Place lot	93	10	11%	38	41%	57	61%	54	58%	45	48%	50	54%	64	69%
10	Forest Place lot	41	13	32%	12	29%	40	98%	32	78%	26	63%	23	56%	36	88%
10	Lotus Gallery	14	2	14%	2	14%	6	43%	3	21%	7	50%	1	7%	0	0%
10A	2 hr on-street	8	3	38%	6	75%	9	113%	8	100%	7	88%	8	100%	7	88%
10B	2 hr on-street	36	9	25%	23	64%	30	83%	11	31%	17	47%	30	83%	23	64%
11	Community Financial	34		0%	16	47%	19	56%	20	59%	18	53%	2	6%	2	6%
11	Community Financial	7		0%	7	100%	7	100%	7	100%	6	86%	0	0%	0	0%
12	School Board	29		0%	13	45%	18	62%	21	72%	4	14%	0	0%	2	7%
12	On-street reserved	4		0%	2	50%	2	50%	2	50%	2	50%	1	25%	0	0%
12	on-street unmarked	6		0%	6	100%	4	67%	6	100%	4	67%	3	50%	3	50%
12	School Board	44		0%	11	25%	18	41%	15	34%	3	7%	0	0%	1	2%
12	private lot	21		0%	11	52%	8	38%	6	29%	4	19%	0	0%	0	0%
Totals		2128	468	22%	1003	47%	1326	62%	1230	58%	1068	50%	1084	51%	1351	63%