Flint Downtown Traffic and Parking Study

Prepared for:

Genesee County Metropolitan Planning Commission

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1.0 PROJECT SUMMARY

1.1 Introduction

Like many downtown areas in the industrial Midwest, Flint has seen a decades-long cycle of disinvestment from their downtown area, resulting in vacant storefronts and buildings and declining land values. However, long-buoyed by a large municipal and governmental presence, Downtown Flint is poised for resurgence, with new business activity, residential development, and an expanding nearby university campus. This activity has put pressure on the downtown parking supply, and raised questions as to the efficiency of traffic circulation within the downtown area, and the impact that may have on drawing new residents and business patrons to downtown.

In order to address these deficiencies, a task force of local and state agencies and the business community initiated the Flint Downtown Traffic and Parking Study. The purpose of this study is to evaluate a variety of alternatives for improving transportation and parking opportunities in the immediate downtown area.

1.2 Study Area

The study area for the Flint Downtown Traffic and Parking Study is generally bounded by I-475 to the east, I-69 to the south, Chevrolet Avenue to the west, and Robert T. Longway Drive to the north, as illustrated in Figure 1-1.

1.3 Planning Process

Preparation of this study involved a multi-faceted process incorporating extensive coordination with local agencies, consultation with the downtown business community, and community outreach. Documentation of the external outreach process can be found in Appendix A.

<u>Project Task Force</u>

The foundation and direction of the Flint Downtown Traffic and Parking Study were established by the Project Task Force, made up of representatives of all local agencies and major downtown stakeholders that play a role in or are directly affected by transportation issues in the downtown area. This group led the development of the plan, as they will play an integral role in seeing to the implementation of the plan recommendations. The Project Task Force was comprised of:

- C. S. Mott Foundation
- Ellis Parking
- City of Flint, Department of Public Works
- City of Flint, Planning Commission
- Flint Downtown Development Authority (DDA)
- Genesee County Metropolitan Planning Commission (GCMPC)
- Michigan Department of Transportation (MDOT)
- Metropolitan Transit Authority (MTA)
- University of Michigan Flint
- Uptown 6

<u>Public Outreach</u>

In order to interface with other downtown stakeholders and the general public, two public meetings were held as part of the study. The first, on September 19, 2006, was an informal open house aimed at educating the public on the goals and objectives of the study, and the alternatives to be evaluated for improving both parking opportunities and

Figure 1-1: Project Study Area

Flint Downtown
Traffic and Parking Study

traffic operations. A second public meeting, held on October 30, 2006, combined open house format with a formal presentation, detailing the findings and recommendations of the study. Written comments were collected at each of the meetings for consideration in the study process. Meeting summaries are included in Appendix A.

1.4 Study Goals and Objectives

Major goals and objectives for the study, as identified at the initial task force meeting, are as follows:

- Increase on-street parking downtown, specifically along the Saginaw corridor
- Eliminate some of the one-way streets to help with the navigation through downtown
- Improve on street parking management and enforcement
- Better connect the cultural center to downtown
- Improve utilization of existing off-street parking
- Improve traffic flow through downtown
- Improve aesthetics in the public right of way
- Increase the emphasis on non-motorized transportation
- Improve "walkability" and ADA accessibility
- Improve transit mobility with minimal disruption to vehicular traffic

1.5 Document Organization

The Flint Downtown Traffic and Parking Study report is organized into the following chapters:

Chapter 2.0 presents a discussion of the existing roadway network conditions, including roadway network and direction of travel, existing truck and bus routes, and traffic operational performance along study corridors.

Chapter 3.0 presents the existing parking conditions within downtown, including on- and off-street parking facilities and utilization.

Chapter 4.0 details projections of future traffic and parking demand, including the forecasting methodology.

Chapter 5.0 discusses the alternatives analysis process, including the process for developing alternatives, a comparison of traffic operation, physical feasibility, on-street parking supply, and implementation costs.

Chapter 6.0 presents the study recommendations, including roadway network and parking improvements, potential enhancements, implementation and phasing, and funding opportunities.

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2.0 EXISTING TRANSPORTATION NETWORK

The following sections present the existing transportation infrastructure and services within the study area, along with an assessment of their current operational performance.

2.1 Transportation Network Characteristics

2.1.1 Study Area Street Network

The study area roadway network, depicted in Figure 2-1, includes a well-established system of one-way streets within the downtown core area, surrounding Saginaw Street, the primary two-way north-south traffic artery traversing the study area. Court and 5th Streets, together designated as M-21, form a one-way couplet, and are the primary east-west arterials within the study area, along with Robert T. Longway Blvd north of the U of M Flint campus.

The study area includes three freeway interchanges: I-475/Longway Drive, I-475/Downtown, and I-69/Downtown. Each of the “Downtown” interchanges offers direct access to multiple downtown streets via continuous service drives.

2.1.2 Truck and Bus Routes

Because of Flint’s industrial history and the current and former presence of major plants and industrial facilities in and around the downtown area, many of the streets in the study area are designated truck routes, as shown in Figure 2-2. East/west truck routes through the study area include Kearsley Street, Second Street, Court Street, Fifth Street and Robert T. Longway Blvd. In the north/south direction, Grand Traverse Street, Church Street, Beach Street, Saginaw Street and Cezar Chavez Drive (I-475 Service Drive) are designated truck routes.

There are a total of 12 fixed bus routes that traverse the study area, as depicted in Figure 2-3. There is a downtown transit center located in the block between Harrison, Clifford, Second, and Third Streets. All bus routes operate within general traffic lanes, and offer traditional curb-side stops within the study area.

2.1.3 Non-Motorized Transportation

The majority of the downtown area includes sidewalks, along with pedestrian signalization at most intersections. Few additional non-motorized amenities are currently in place, with the exception of some street furnishings installed along Saginaw Street. The University of Michigan – Flint campus includes a more extensive pedestrian network within the campus confines, including pedestrian crossings of the Flint River. There are no bike lanes or other bicycling amenities outside of the campus area.

2.2 Data Collection

In order to conduct a detailed evaluation of intersection operations, peak hour turning-movement volumes were collected at 48 study area intersections.

24-hour volumes at intersections throughout the study area were obtained by the GCMPC for the purpose of determining the peak hour within each group of adjacent signal locations for data to be collected. In addition, peak hour turning movement counts collected in March and April, 2002 along Saginaw, Court and 5th Streets for a previous study were obtained from the GCMPC. 24-hour volume data was used to verify that the 2002 counts are valid and consistent with 2006 conditions

Counts were conducted at all other study intersections during the month of August, 2006, for the 8:00-9:00AM and 4:00-5:00PM time periods. Turning-movement volumes are summarized in Appendix B.

Figure 2-1: Study Area Roadway Network

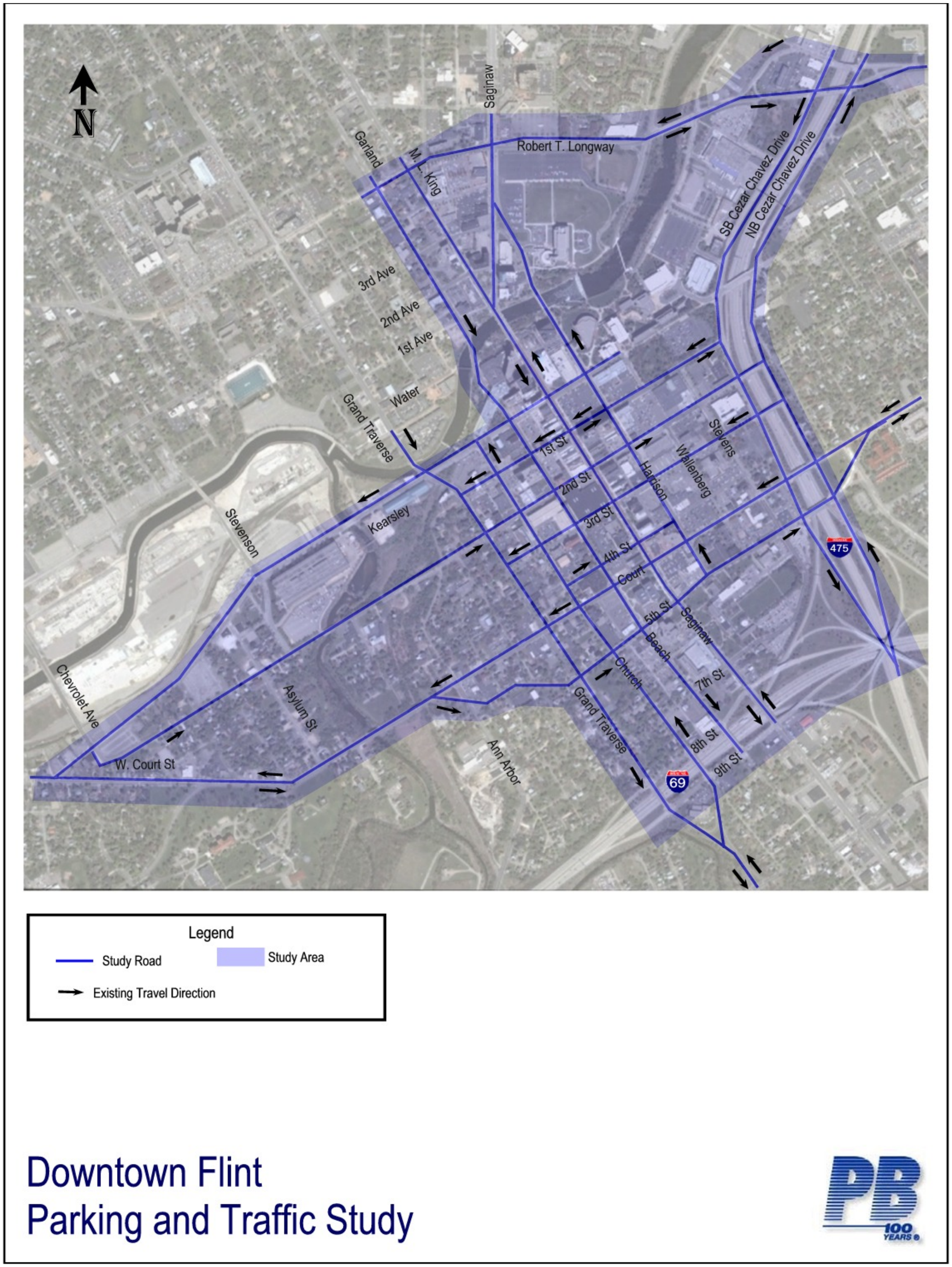

Figure 2-2: Designated Truck Routes

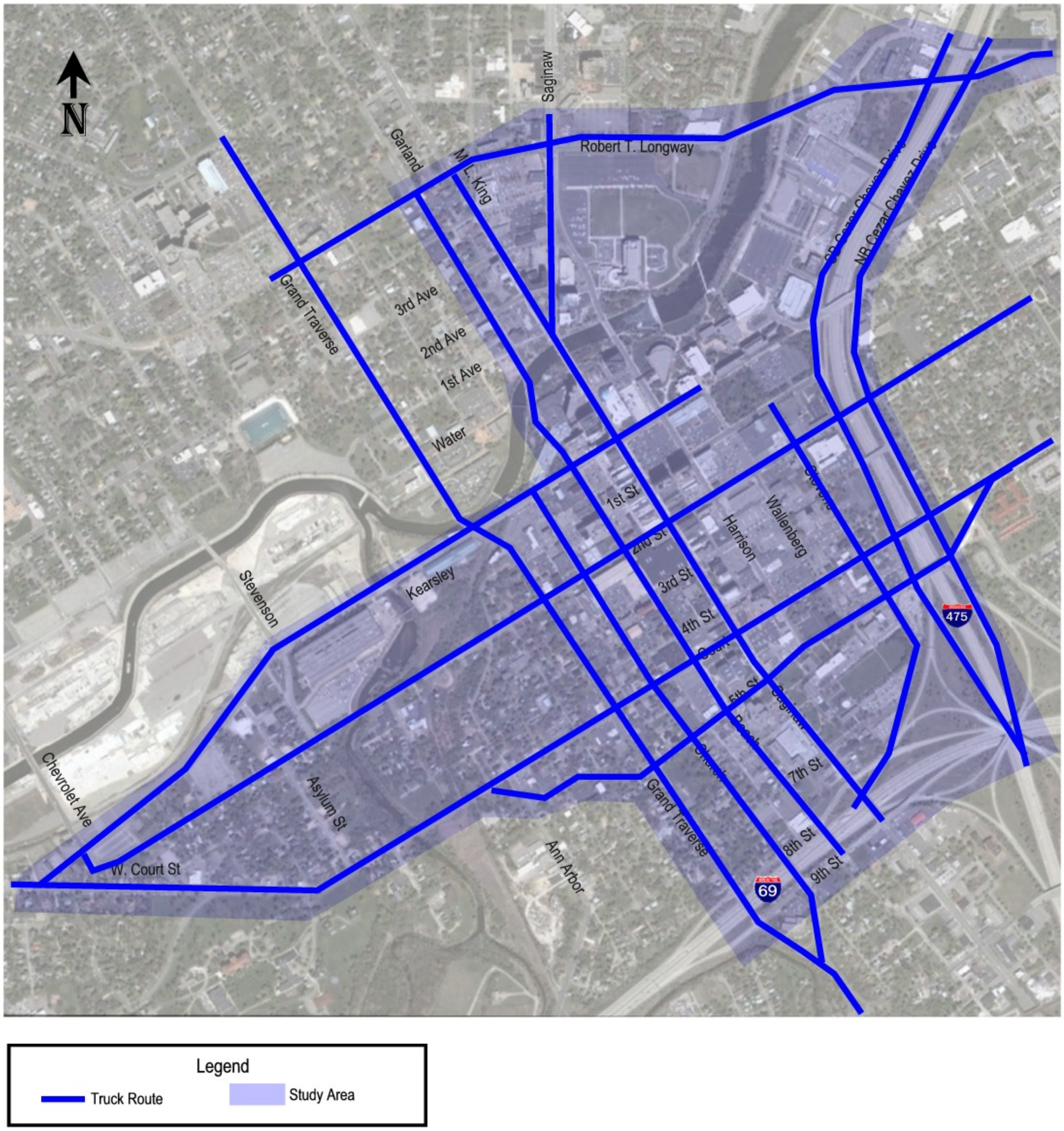

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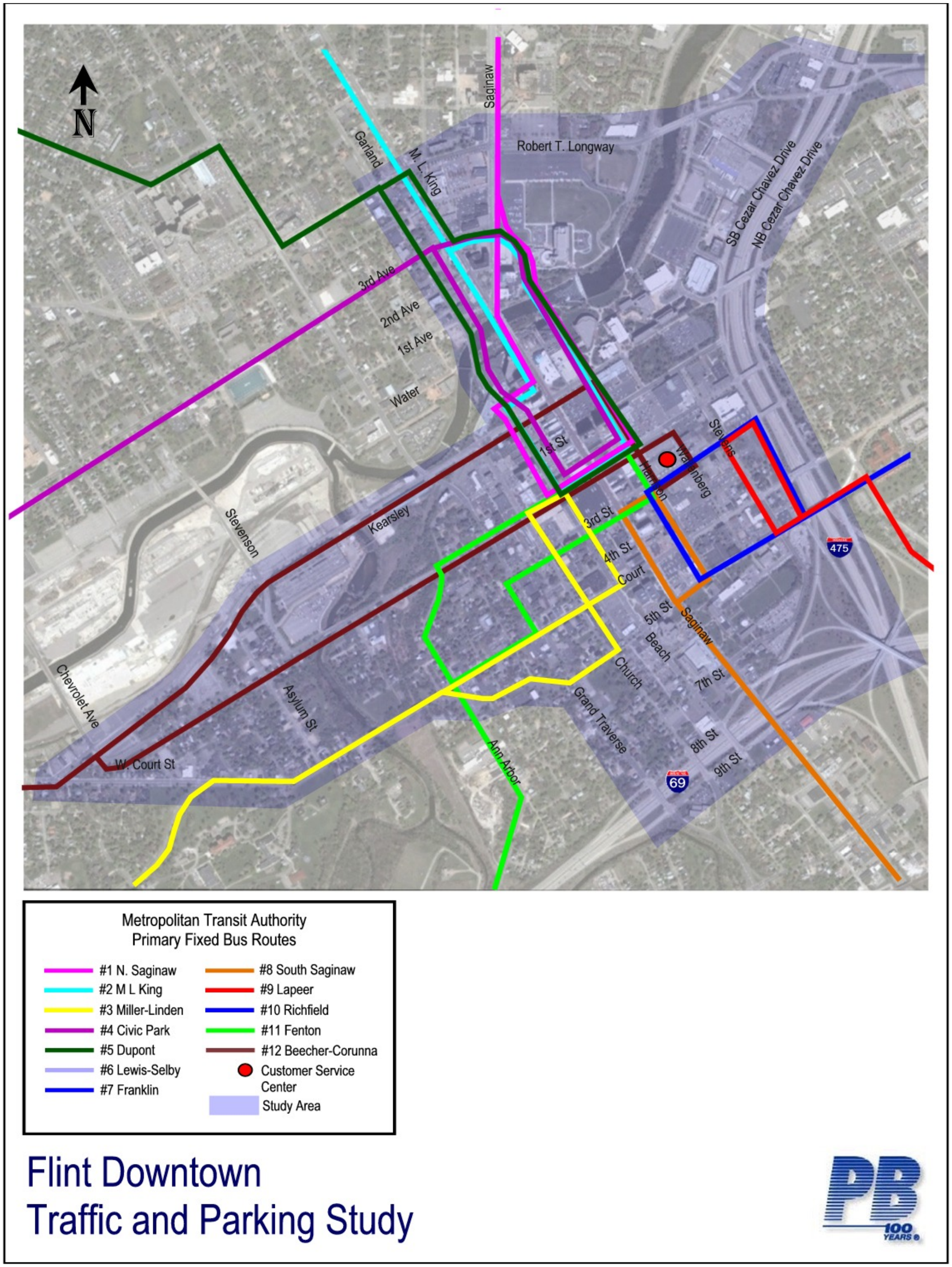
Figure 2-3: MTA Fixed-Route Bus Service



2.3 Analysis Methodology

The performance of a roadway facility is most often described in terms of Level of Service (LOS). LOS provides a common letter grade rating system, understandable to a broad range of stakeholders, which is based on quantitative measures of congestion and delay that are not always meaningful in and of themselves. An evaluation of existing traffic operations at signalized and unsignalized intersections was conducted using Synchro v6.0, a network-based traffic analysis and signal optimization model. Synchro evaluates intersection delay and level of service using the methodology outlined in the *2000 Highway Capacity Manual* (HCM2000) developed by the Transportation Research Board (TRB) National Research Council. This method defines level of service in terms of delay, or more specifically average control delay per vehicle. Delay is a measure of driver and/or passenger discomfort, frustration, fuel consumption and lost travel time. Tables 2.1 and 2.2 present the LOS criteria for unsignalized and signalized intersections, respectively. Level of Service D or better during the peak hours of the day is a commonly used standard for acceptable Level of Service in urbanized areas.

Table 2.1: Level of Service Criteria for Unsignalized Intersections

Level of Service	Description	Average Control Delay Per Vehicle (seconds)
A	Little or no delay.	≤ 10.0
B	Short traffic delays.	> 10.0 and ≤ 15.0
C	Average traffic delays.	> 15.0 and ≤ 25.0
D	Long traffic delays.	> 25.0 and ≤ 35.0
E	Very long traffic delays.	> 35.0 and ≤ 50.0
F	Demand exceeds capacity resulting in extreme delays and queuing.	> 50.0

Source: 2000 Highway Capacity Manual, Special Report 209

Table 2.2: Level of Service Criteria for Signalized Intersections

Level of Service	Description	Average Control Delay Per Vehicle (seconds)
A	Operations with very low control delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low control delay occurring with good progression and/or short cycle lengths.	> 10.0 and ≤ 20.0
C	Operations with average control delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 and ≤ 35.0
D	Operations with longer control delays due to a combination of unfavorable progression, long cycle lengths, or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 and ≤ 55.0
E	Operations with high control delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55.0 and ≤ 80.0
F	Operation with control delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80.0

Source: 2000 Highway Capacity Manual, Special Report 209

2.4 Intersection and Roadway Operations

Table 2.3 and Figure 2-4 present the existing peak hour performance of study area intersections. Analysis reports can be found in Appendix C.

Table 2.3: Existing Peak Hour Intersection Performance

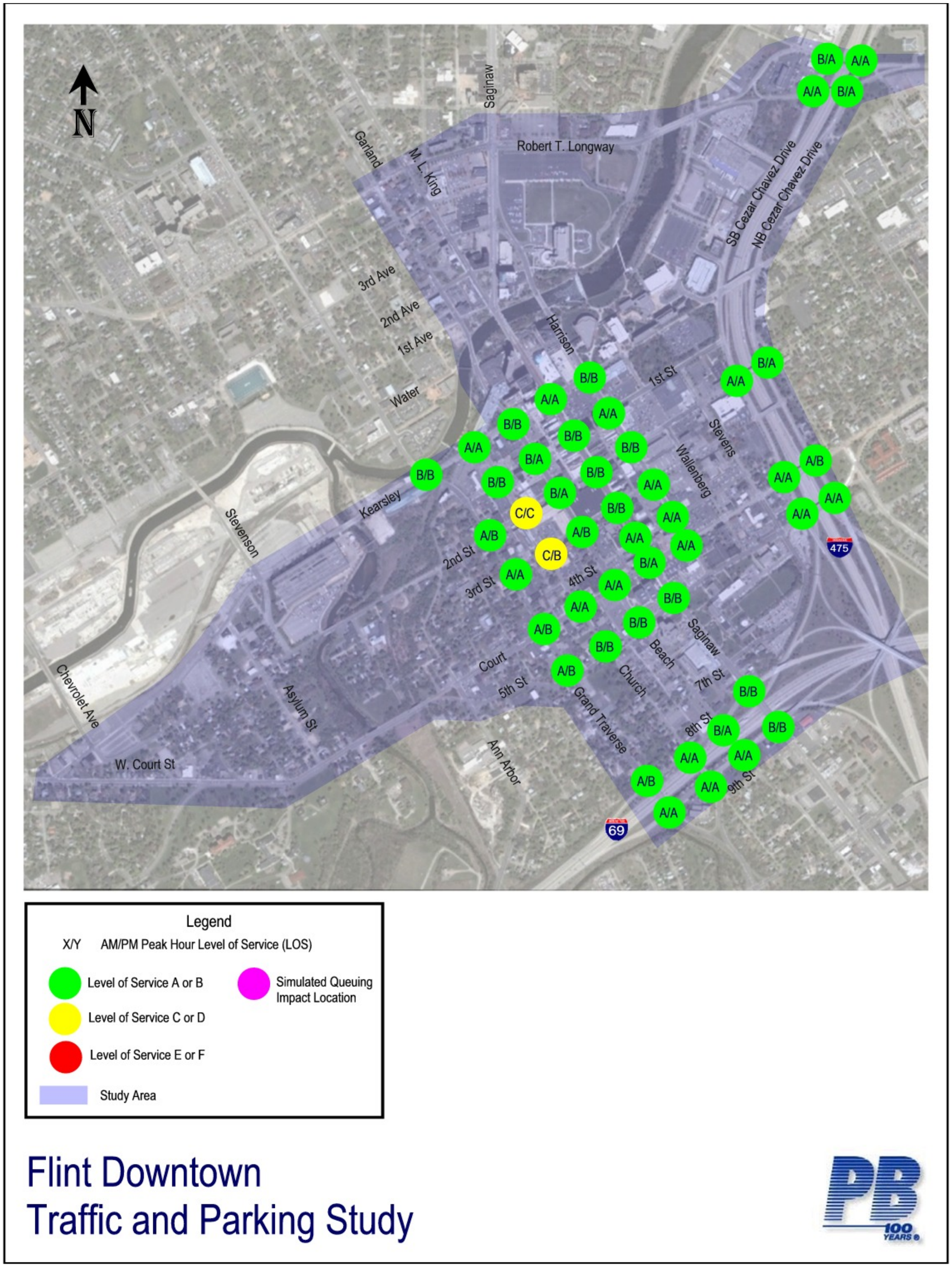
Intersection	Control	AM Peak		PM Peak	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
Grand Traverse Street at Kearsley Street	Signalized	18.8	B	14.6	B
Grand Traverse Street at First Street	Two-Way-Stop*	9.3	A	11.8	B
Grand Traverse Street at Second Street	Signalized	9.5	A	7.3	A
Grand Traverse Street at Third Street	Signalized	4.1	A	6.2	A
Grand Traverse Street at Court Street	Signalized	7.9	A	10.4	A
Grand Traverse Street at Fifth Street	Signalized	8.0	A	10.0	B
Grand Traverse Street at Eighth Street	Signalized	9.5	A	10.0	B
Grand Traverse Street at Ninth Street	Signalized	9.6	A	6.5	A
Church Street at Kearsley Street	Signalized	5.6	A	6.6	A
Church Street at First Street	Two-Way-Stop*	11.9	B	11.0	B
Church Street at Second Street	Signalized	30.1	C	29.1	C
Church Street at Third Street	Signalized	23.1	C	17.9	B
Church Street at Court Street	Signalized	7.9	A	8.0	A
Church Street at Fifth Street	Signalized	12.2	B	10.3	B
Church Street at Eighth Street	Signalized	9.9	A	8.5	A
Church Street at Ninth Street	Signalized	6.1	A	8.8	A
Beach Street at Kearsley Street	Signalized	19.0	B	13.2	B
Beach Street at First Street	Signalized	11.6	B	8.3	A
Beach Street at Second Street	Signalized	14.8	B	7.4	A
Beach Street at Third Street	Signalized	7.3	A	10.6	B
Beach Street at Court Street	Signalized	7.5	A	7.1	A
Beach Street at Fifth Street	Signalized	12.0	B	12.2	B
Beach Street at Eighth Street	Signalized	11.4	B	8.8	A
Beach Street at Ninth Street	Signalized	8.5	A	7.9	A
Saginaw Street at Kearsley Street	Signalized	6.8	A	8.9	A
Saginaw Street at First Street	Signalized	11.8	B	11.6	B
Saginaw Street at Second Street	Signalized	15.7	B	15.6	B
Saginaw Street at Third Street	Signalized	12.5	B	11.5	B
Saginaw Street at Fourth Street	Signalized	7.5	A	9.5	A
Saginaw Street at Court Street	Signalized	10.4	B	10.0	A
Saginaw Street at Fifth Street	Signalized	14.7	B	13.5	B
Saginaw Street at Eighth Street	Signalized	10.3	B	13.4	B
Saginaw Street at Ninth Street	Signalized	11.0	B	12.0	B
Harrison Street at Kearsley Street	Signalized	14.5	B	12.7	B
Harrison Street at First Street	Signalized	9.9	A	10.0	B
Harrison Street at Second Street	Signalized	16.8	B	16.2	B
Harrison Street at Third Street	Signalized	8.5	A	9.2	A
Harrison Street at Court Street	Signalized	6.7	A	6.7	A
SB Chavez Drive at Second Street	Signalized	9.3	A	9.0	A
SB Chavez Drive at Court Street	Signalized	7.4	A	7.8	A
SB Chavez Drive at Fifth Street	Signalized	8.2	A	7.5	A

Intersection	Control	AM Peak		PM Peak	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
NB Chavez Drive at Second Street	Signalized	11.7	B	15.7	A
NB Chavez Drive at Court Street	Signalized	8.3	A	10.6	B
NB Chavez Drive at Fifth Street	Signalized	8.2	A	5.6	A
SB Chavez Drive at WB Robert T. Longway Blvd	Signalized	10.1	B	8.6	A
SB Chavez Drive at EB Robert T. Longway Blvd	Signalized	9.5	A	10.5	A
NB Chavez Drive at WB Robert T. Longway Blvd	Signalized	4.3	A	6.1	A
NB Chavez Drive at EB Robert T. Longway Blvd	Signalized	10.1	B	9.6	A

LOS = Level of Service; (sec/veh) = Seconds per vehicle
*Note: Delay and LOS at stop-controlled intersections is based on the stop-controlled approaches only

As shown in the table, all study area intersections currently operate at LOS C or better during both peak hours, with the vast majority of intersections operating at LOS A or B, indicative of minimal congestion throughout the study area under existing conditions.

Figure 2-4: Existing Peak Hour Intersection Level of Service



2.5 Identified Deficiencies

Based on traditional operations analysis, as shown in Section 2.4, all study area intersections currently operate at acceptable levels of service, with most operating with minimal levels of congestion during the peak periods. However, while this analysis indicates that congestion levels are low throughout the study area, it is not able to measure potential inefficiencies in the transportation network that may otherwise impede mobility, or the lack of effectively balancing use the transportation network for all modes and users. The following are identified deficiencies relating to overall multimodal mobility, as observed through both study evaluation and stakeholder input:

One-way Streets

One-way streets are typically used to increase roadway capacity in downtown areas by reducing the number of conflict points at each intersection and simplifying traffic signal operations. However, one-way streets can have the negative effects of increasing travel distances to reach destinations and, if not properly designed, can create driver confusion for unfamiliar motorists.

Typically, one-way streets are laid out in couplets - two parallel streets operating in opposite directions with right turn circulation to allow for easy travel around blocks. Within the study area, portions of the one-way street system are fragmented and do not follow this convention. For example, in the east/west direction Kearsley Street and Second Street together form a one-way couplet connecting Chevrolet Avenue through downtown to I-475, but within the downtown core First Street, which is a one-way street, lies in between them. This causes a breakdown in the right turn circulation. In addition, while Third and Fourth Streets are a paired couplet, Fourth Street terminates at Church Street, and changes characteristics East of Saginaw Street from a city street to a smaller service drive with only a 24 foot width, thereby reducing the effectiveness of the couplet. Finally, First and Third Streets are both two-way streets on either side of downtown, creating a discontinuity in operation and causing opposing traffic to meet head on at intersections.

In the north/south direction, Harrison Street and Clifford Street are paired. However, Clifford Street only runs from Second Street to Fifth Street, providing little service to southbound traffic. In addition, Beach and Church Streets are set up as a couplet with right turn circulation. However, because northbound traffic that intends to cross the river must use the Grand Traverse Street bridge, Church and Grand Traverse are functionally being used as a reverse couplet. In summary, these inconsistencies require drivers to take circuitous routes to reach their destinations. This, in turn, adds to travel time, and the lack of a logical pattern may cause confusion for unfamiliar drivers.

Signal System

Although the level of service at the study intersections is acceptable for the existing conditions, this analysis does not take into account the number of times a motorist must stop while traversing the study area. While signal timings along a number of study corridors are established to properly progress traffic, a comprehensive optimization of the downtown area has not been conducted in recent memory. Furthermore, the ability to maintain coordination between signals is impaired by the age and condition of the signal system. The current signal system in downtown Flint is antiquated to the point where it may not be possible to update the programs in the signal controllers or maintain offsets that would improve progression.

Non-motorized Travel

Currently, there are no bike lanes on any of the streets in the downtown Flint network. Given the proximity of the University of Michigan – Flint campus and the plans for student residential growth, adequate facilities for bike use within downtown is rapidly increasing in importance.

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3.0 EXISTING PARKING CONDITIONS

A parking turnover and occupancy study was undertaken in 1999 for the Flint DDA. In order to update the data and findings of the 1999 study, a visual survey of the various parking areas was undertaken in order to complete an anecdotal comparison with the 1999 data.

The following definitions apply to the discussion of downtown parking conditions:

- *Turnover* - Turnover is the number of cars 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 length of time a parking space is occupied by a vehicle.

- *Circuit* - A circuit refers to the two-hour time 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 2 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.

3.1 Existing Parking Supply

The downtown core of Flint incorporates a variety of on- and off-street parking, but public and privately operated. Figure 3-1 illustrates the off-street parking locations and on-street parking allowances and restrictions.

As shown in the figure, the majority of downtown curb space is signed to allow two-hour maximum parking, while numerous blocks do not allow parking. Some curb space is dedicated to public safety parking or drop-off. There are approximately 420 on-street parking spaces within the downtown core area.

Off-street parking accounts for a much more significant portion of the downtown parking supply. There are currently six publicly-operated parking facilities, the most significant of which are the McCree ramp (865 spaces) and the DDA lot along Saginaw between First and Kearsley (290 spaces). A multitude of privately-owned and operated off-street parking facilities are located throughout the area, many of which are open for public parking. There are approximately 1350 off-street parking spaces within the downtown core area.

3.2 On-Street Turnover and Occupancy

The intent of this analysis was to determine the number of times on-street spaces were “turning over”, or being used by different vehicles, and the occupancy of on and off-street spaces by time of day. The turnover and occupancy count was undertaken from 10:00 a.m. to 6:00 p.m. on August 31, 1999. Table 3.1 summarizes the on-street turnover and occupancy findings.

Observations conducted in 2006 concluded that occupancy was slightly higher than the 1999 study as would be expected with increases in activity levels. Additionally, it would be preferable to undertake a full turnover and occupancy study after the planned and proposed adaptive re-uses of the existing downtown buildings have been completed and parking variations associated with use changes have equalized.

Figure 3-1: Existing Parking Supply

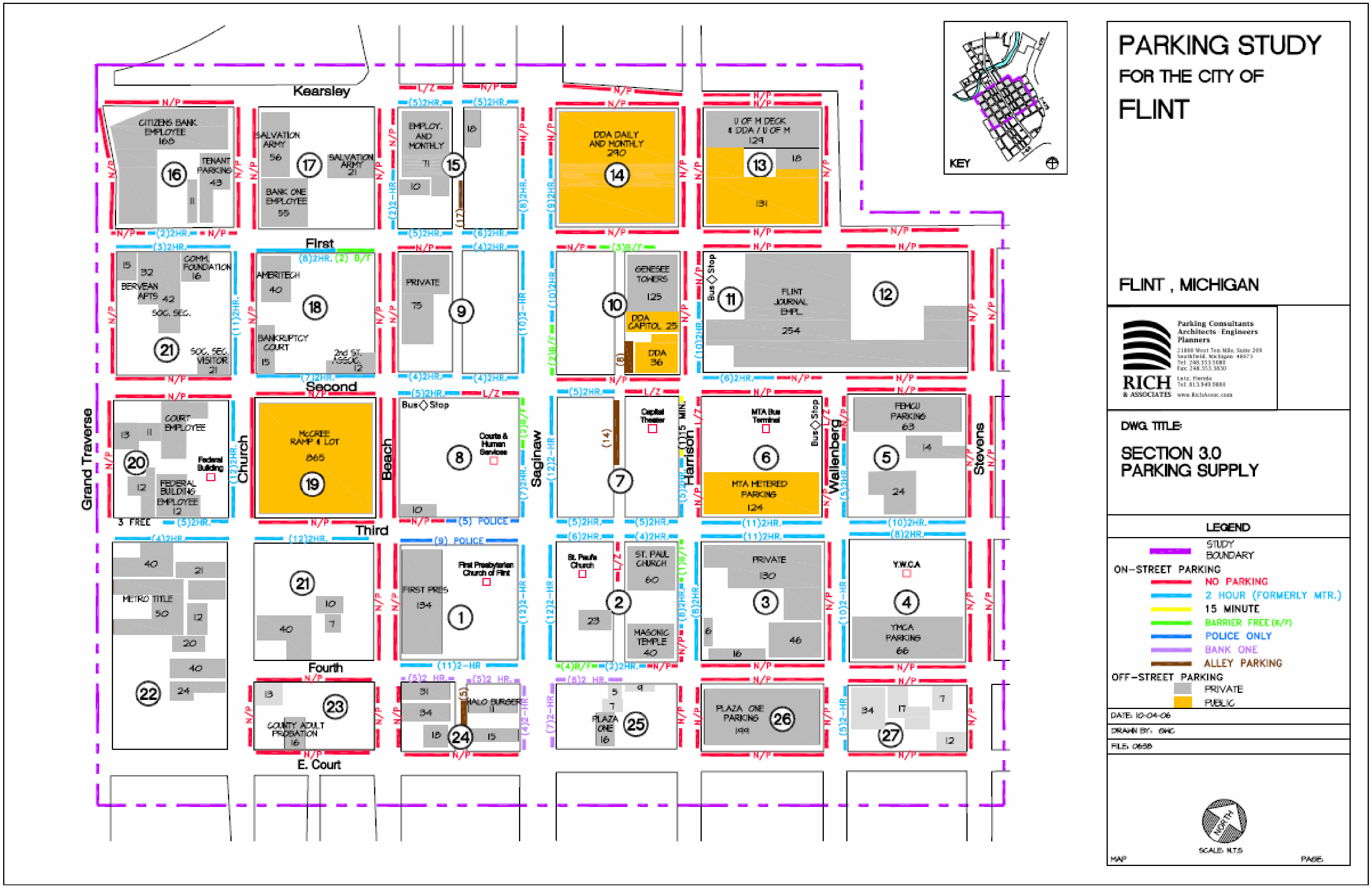


Table 3.1: 1999 On-Street Turnover and Occupancy Data

On-Street T&O			Est.	Circuit 1 10:00 - 12:00		Circuit 2 12:00 - 2:00		Circuit 3 2:00 - 4:00		Circuit 4 4:00 - 6:00		Average Turnover	Average		Peak	
Block	Face	Description	Cap.	Occ.	%	Occ.	%	Occ.	%	Occ.	%		Occ.	%	Occ.	%
18	D	On-Street	9	9	100%	9	100%	9	100%	8	89%	0.92	9	97%	9	100%
20	D	On-Street	11	2	18%	1	9%	0	0%	0	0%	0.92	1	7%	2	18%
26	A	On-Street	10	5	50%	7	70%	7	70%	9	90%	0.92	7	70%	9	90%
26	B	On-Street	8	8	100%	8	100%	7	88%	7	88%	0.92	8	94%	8	100%
26	D	On-Street	2	1	50%	1	50%	1	50%	1	50%	0.92	1	50%	1	50%
27	D	On-Street	12	11	92%	12	100%	12	100%	8	67%	0.92	11	90%	12	100%
28	C	On-Street	6	5	83%	4	67%	4	67%	3	50%	0.92	4	67%	5	83%
28	D	On-Street	10	3	30%	2	20%	4	40%	3	30%	0.92	3	30%	4	40%
29	D	On-Street	5	2	40%	2	40%	2	40%	2	40%	0.23	2	40%	2	40%
33	B	On-Street	10	0	0%	8	80%	8	80%	9	90%	0.92	6	63%	9	90%
33	C	On-Street	8	7	88%	6	75%	6	75%	5	63%	0.92	6	75%	7	88%
34	B	On-Street	5	5	100%	3	60%	4	80%	5	100%	1.27	4	85%	5	100%
34	C	On-Street	10	9	90%	9	90%	10	100%	10	100%	2.60	10	95%	10	100%
34	D	On-Street	12	10	83%	8	67%	10	83%	9	75%	2.60	9	77%	10	83%
35	C	On-Street	11	1	9%	1	9%	1	9%	0	0%	1.00	1	7%	1	9%
36	D	On-Street	10	0	0%	0	0%	0	0%	0	0%	0.00	0	0%	0	0%
40	B	On-Street	7	8	114%	4	57%	7	100%	7	100%	2.75	7	93%	8	114%
41	B	On-Street	8	0	0%	0	0%	1	13%	0	0%	0.13	0	3%	1	13%
41	D	On-Street	16	16	100%	12	75%	16	100%	11	69%	3.67	14	86%	16	100%
42	A	On-Street	11	0	0%	0	0%	0	0%	0	0%	0.00	0	0%	0	0%
42	D	On-Street	8	0	0%	0	0%	0	0%	0	0%	0.00	0	0%	0	0%
46	B	On-Street	11	10	91%	7	64%	7	64%	4	36%	0.92	7	64%	10	91%
46	C	On-Street	11	3	27%	3	27%	4	36%	1	9%	0.92	3	25%	4	36%
On-Street Summary			211	115	55%	107	51%	120	57%	102	48%	1.10	111	53%	133	63%

Source: Rich & Associates, 1999

The following are observations and conclusions from the on-street turnover and occupancy study:

- The daytime activity in the study area was relatively constant between the hours of 10:00 a.m. to 6:00 p.m. The level of activity along some of the block faces varied tremendously, however overall occupancy was high within the CBD.

- A few vehicles were parked at expired meters (since removed); however there were very few vehicles parked illegally without a ticket in the parking enforcement area (enforcement activity has changed since the previous study work).

- The analysis revealed that 30 of the 543 vehicles analyzed were being moved every two-hours. This practice, known as the "two hour shuffle", is intended to avoid a fine for overtime parking. Some parkers (8) were simply parking in a single stall for the entire day. 2006 observations indicate that most individuals now park on-street in a single parking stall for the entire day due to lack of parking enforcement, which is a fundamental issue that requires addressing.

- Based on the 1999 study, turnover was low within Flint's CBD, averaging just 1.10. This indicates that those vehicles parked on street within the study area were generally remaining for the full two hours or longer. 2006 observations indicate that the turnover is now even lower. The important aspect of low turnover is that fewer vehicles have access to prime parking stalls, directly impacting the availability of customer and visitor parking. Retail activity cannot thrive without adequate on-street turnover.

Table 3.2: 1999 Observed On-Street Violations Summary

1999 - Violation Summary: *(Summarizes how long a random sample of vehicles stayed beyond the posted time limit at on-street meters)*	Maximum Posted Duration (2 hour)
Number of parking spaces in sample	263 meters
Vehicles that remained 2 to 4 hours	13.3% (35)
Vehicles that remained 4 to 6 hours	7.2% (19)
Vehicles that remained 6 hours or more	3.0% (8)
Total number of vehicles analyzed	543

Source: Rich & Associates, 1999

3.3 Off-Street Turnover and Occupancy

Table 3.3 presents the 1999 turnover and occupancy data for off-street parking facilities within the downtown core area.

Table 3.3: 1999 Off-Street Turnover and Occupancy

Off-Street Occupancy			Est. Cap.	Circuit 1 10:00 - 12:00		Circuit 2 12:00 - 2:00		Circuit 3 2:00 - 4:00		Circuit 4 4:00 - 6:00		Average Turnover	Average		Peak	
Description				Occ.	%	Occ.	%	Occ.	%	Occ.	%		Occ.	%	Occ.	%
18		Off-Street	300	239	80%	231	77%	226	75%	198	66%	n/a	224	75%	239	80%
20		Off-Street	148	117	79%	96	65%	52	35%	79	53%	n/a	86	58%	117	79%
26		Off-Street	130	130	100%	130	100%	110	85%	90	69%	n/a	115	88%	130	100%
27		Off-Street	255	108	42%	84	33%	98	38%	97	38%	n/a	97	38%	108	42%
28		Off-Street	97	10	10%	46	47%	92	95%	89	92%	n/a	59	61%	92	95%
33		Off-Street	80	80	100%	80	100%	80	100%	80	100%	n/a	80	100%	80	100%
35		Off-Street	123	119	97%	102	83%	115	93%	113	92%	n/a	112	91%	119	97%
36		Off-Street	68	49	72%	50	74%	33	49%	33	49%	n/a	41	61%	50	74%
42		Off-Street	154	40	26%	30	19%	34	22%	29	19%	n/a	33	22%	40	26%
Off-Street Summary			1355	892	66%	849	63%	840	62%	808	60%	n/a	847	63%	975	72%

Source: Rich & Associates, 1999

The turnover and occupancy table identifies the parking areas according to block and face references. The parking supply structures and surface lots are identified on Figure 3-1. The tables include estimated capacities (number of parking spaces) per lot and the number of on-street spaces examined during the study circuits completed August 31, 1999. The study included the public parking areas, as well as a number of private lots and structures.

Parking demand was highest along Saginaw Street and on blocks 6,9,11 and 15. This high occupancy corresponded with the predicted parking demand deficit calculated from the original 1999 building use and occupancy data. Since the original 1999 work included an inventory of vacant space, the model was also applicable to 2006 by updating the vacant space per actual developments that have taken place.

The daytime activity in the study area was constant throughout the day. The peak time was between 10:00 am and 12:00 noon. This peak time corresponds with the peak demand time for office parking (as identified by the Urban Land Institute). Overall, the occupancies varied greatly by area, with many parking lots achieving 100% occupancy.

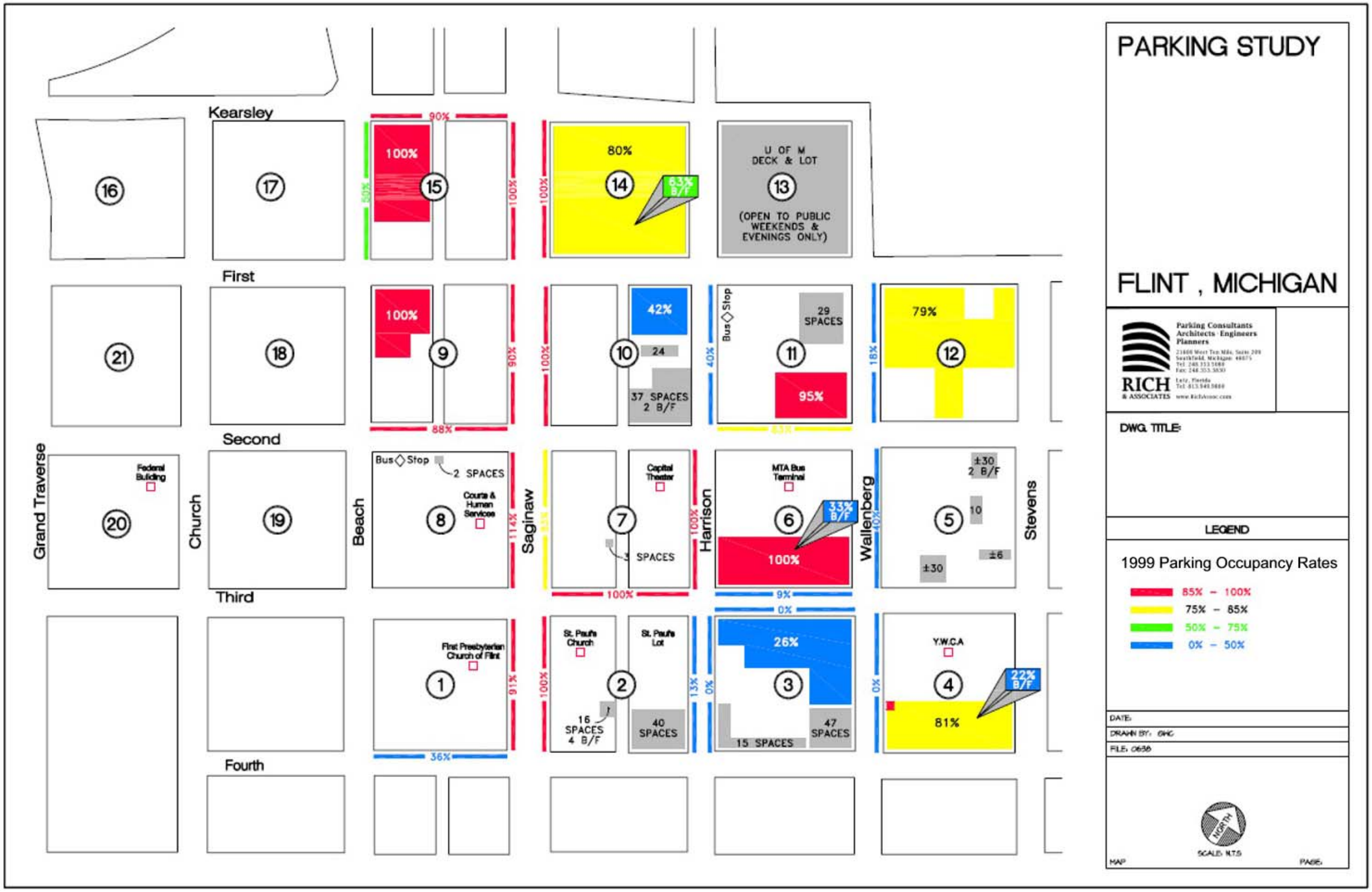
The 2006 observations revealed that occupancies are now higher, particularly for downtown surface lots such as the DDA lot at Saginaw and Kearsley.

3.4 Identified Deficiencies

Figure 3-2 illustrates occupancy rates and the identified deficiencies in downtown Flint based on the 1999 turnover and occupancy study. The areas indicated in red are occupancies above 85%. These areas are considered to be deficient in terms of parking supply. Although the data is older, the deficiency locations are still relevant in 2006 and define the groupings of blocks or the core area where new parking or additional parking opportunities should be considered.

It was noted that some outlying lots did have additionally capacity and that a combination of parking enforcement and signs could aid greatly in re-distributing parking demand and help to alleviate core downtown shortages. It should be noted however that plans for re-occupancy of downtown buildings that are currently vacant will add to the shortage of parking.

Figure 3-2: 1999 Parking Occupancy and Deficiencies



4.0 FORECASTED TRAFFIC AND PARKING DEMANDS

4.1 Forecasted Traffic Demand

Forecasts for study area travel demand at the 2030 planning horizon year were developed using Genesee County Metropolitan Planning Commission's Urban Travel Demand Model. Regional travel demand models provide a *macroscopic* tool to forecast future travel demands on the region's roadway network based on land use and socio-economic projections. While the model is an invaluable tool for understanding high-level travel demands throughout the region, it is limited in its sensitivity to detailed traffic operations, such as intersection controls.

In order to determine an aggregate forecast for travel demand specific to within the study area, a cordon was established within the GCMPC model along the study area boundaries. Within the cordon boundary, the model forecasts growth in travel demand of 15% between the base year (2002) model and the horizon year (2030) model. Because 2006 is the base year for the purpose of this study, this growth rate was prorated to 13% over the shorter 24 year horizon. This growth rate was applied as a universal factor to the entire study area. Forecasted volumes are presented in Section 5.0

4.2 Forecasted Parking Demand

This parking demand forecast serves as an update to the 1999 parking study. The study involved field observations and discussions with stakeholders to identify developments and re-developments that have taken place over the past six years. This data was then incorporated into a parking demand generation model that mathematically calculated the amount of parking needed for each block in the study area. This forecast draws on standards developed by the Institute of Transportation Engineers (ITE) and the Urban Land Institute (ULI), which were modified in accordance with past experience with the City of Flint.

4.2.1 Methodology

The methodology for forecasting future parking demand involves computer modeling of parking demand based on existing and future land-uses. Specifically, an inventory of buildings and their uses is compiled and a demand factor is assigned to each use category.

The demand factors are based on research by the Institute of Transportation Engineers and the Urban Land Institute. Modifications to the demand factors are based on experience with past projects for the Flint DDA and experience with similar projects in other Cities.

Once the block-by-block demand has been calculated, for both current and future circumstances, a comparison with the existing supply of parking is made. The resultant figures are parking surplus and demand estimates for each block. The methodologies applied by the firm include an analysis and examination of the previously mentioned parking space and land use inventories, as well as a parking utilization analysis. The data used for the analysis was originally collected in 1999 and updated in September of 2006.

Sample Calculation:

- 2,500 square feet of retail space at a ratio of 2.61 parking stalls per 1,000 square feet.
- 2,500 x 2.61 = 6,525
- 6,525/1,000 = 6.53 or 7 parking stalls to service the employee and customer need of this particular retail store.

4.2.2 Parking Forecast

Table 4.1 presents the forecasted parking demand for the central business district. The table contains the square footages of the various buildings on each block and then categorizes them according to use. As previously explained the table multiplies the gross floor area by a parking generation ratio to determine the parking demanded. The available parking on each block is then netted form the demand to determine whether there is a surplus or shortfall of parking on each block.

The table continues by defining a current (2006) scenario, a five-year (2011) scenario and finally a ten-year (2016) scenario. The future scenarios are based on expected infill of vacant building space. No new parking is assumed at this point since proposed new parking in the City is only in the planning stages.

The chart demonstrates that currently there is a modest shortfall of parking in the study area of 273 parking stalls. More importantly, it also demonstrates that the parking shortfall will increase to 503 parking stalls in five years and 733 parking stalls in ten years, based on current development forecasts. The growth of future parking demand is particularly impacted by anticipated redevelopment and re-occupancy of buildings located on Saginaw Street.

In summary:

- Current parking shortfall is a relatively modest at 273 parking stalls.
- Future parking shortfalls increase to 503 parking stalls in five-years and 733 parking stalls in ten-years.
- Most of the parking shortfall is centered on the blocks at Saginaw and Second Streets. This quadrant area is under serviced for parking and future re-occupancy of vacant building space will exacerbate the problem.
- The projected shortfalls based on the building space correlates with the areas of observed shortfall from the 1999 parking study for the Flint DDA.
- The parking model assumes that no parking is removed for the system.

Figures 4-1 and 4-2 illustrate the parking surpluses and deficits for the current (2006) and ten-year (2016) future scenarios. An examination of the red blocks indicated on these drawings clearly exhibits the shortage of parking in the core downtown. In particular the quadrant centered on the Saginaw and Second Street intersection has the greatest shortfall of parking. By examining the spatial drawing of parking shortages, it is possible to best estimate where new parking will be most effective and how much new parking is demanded at various locations.

Table 4.1: Parking Demand Analysis Worksheet

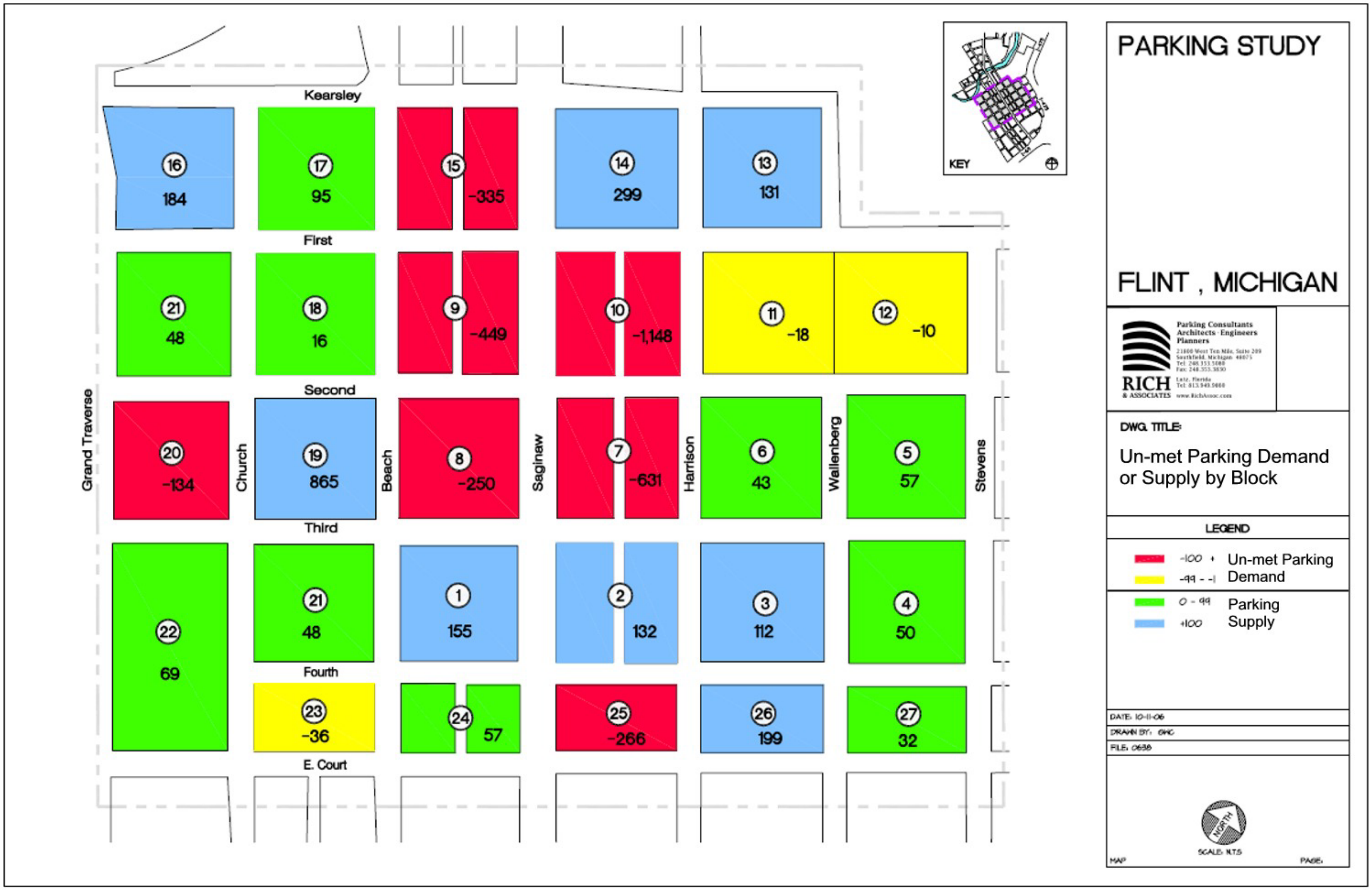
Block	Office &	Retail	Service	Medical	Restaurant	Residential	Special #1	Vacant	Demand	5 yr.	10 yr.	Supply	Surplus/	Surplus/	Surplus/
	Gov.			Service		(per unit)	(Institutional)		(current)	Peak	Peak	Total	Deficit	Deficit	Deficit
Factors	2.64	2.61	3.51	4.11	6.87	0.88	0.45	3.44		Demand	Demand		(current)	(5 years)	(10 years)
1							24,000		11	11	11	166	155	155	155
2	4,000						39,000		28	28	28	160	132	132	132
3			5,200	21,000					105	105	105	217	112	112	112
4							76,573		34	34	34	84	50	50	50
5	8,800			3,125		24	3,850		59	59	59	116	57	57	57
6			26,200						92	92	92	135	43	43	43
7	82,838	6,683					20,550	91,613	560	619	678	47	-513	-572	-631
8	95,952	9,859							279	279	279	29	-250	-250	-250
9	12,600				910		2,775	107,105	409	478	546	97	-312	-381	-449
10	291,560	2,200						123,159	1,199	1,278	1,357	209	-990	-1,069	-1,148
11	100,000							900	267	268	268	250	-17	-18	-18
12							66,129		30	30	30	20	-10	-10	-10
13									0	0	0	131	131	131	131
14									0	0	0	299	299	299	299
15	74,050	33,851			5,000	16	7,546	30,964	442	462	482	147	-295	-315	-335
16	15,160								40	40	40	224	184	184	184
17	3,852						60,000		37	37	37	132	95	95	95
18	21,983						21,700		68	68	68	84	16	16	16
19									0	0	0	865	865	865	865
20	72,957					11			202	202	202	68	-134	-134	-134
21	34,716								92	92	92	140	48	48	48
22	45,734							4,416	136	139	142	211	75	72	69
23	24,752								65	65	65	29	-36	-36	-36
24	6,000				7,600		7,200		71	71	71	128	57	57	57
25	119,625								316	316	316	50	-266	-266	-266
26									0	0	0	199	199	199	199
27	9,998			4,000					43	43	43	75	32	32	32
Sq. Ft.	1,024,577	52,593	31,400	28,125	13,510	51	329,323	358,157	4,585	4,815	5,045	4,312	-273	-503	-733
						(units)			(stalls)	(stalls)	(stalls)	(stalls)	(stalls)	(stalls)	(stalls)

Source: Rich and Associates, Inc., September 2006

Notes:
Demands presented in this chart represent the peak daytime demand that will occur during the workweek (typically Wednesday at 11:00 am).
Special #1 contains the square footages of buildings such as civic, community use buildings or certain light industrial uses.
Future Demand is calculated by assuming 20% re-occupancy of vacant space within 5 years and 40% within 10 years.
Re-occupancy is also assumed to be of a mixed nature (offices, apartments or retail) for Flint.

Figure 4-1: 2006 Parking Over-Demand/Over-Supply by Block

Figure 4-2: 2016 Forecasted Parking Over-Demand/Over-Supply by Block



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5.0 ALTERNATIVE ANALYSIS

5.1 Alternative Development

Based on input from the task force and the community and a preliminary geometric and operations review, three alternatives were identified for formal analysis. Each alternative was evaluated against the following major criteria:

- Traffic operational performance
- Required physical improvements;
- Impact on on-street parking, and;
- Implementation costs.

A number of elements were evaluated on a preliminary basis, but not included in the final analysis. First, the conversion of Court and 5th Streets from one-way to two-way was considered. However, it was determined that these streets already form a well functioning one-way couplet, and serve as the primary east-west arterials for through traffic within the study area. Furthermore, there would be significant expense, and potentially right-of-way impacts, to reconstruct the convergence points on either end of the core downtown area to allow two-way travel. Because these two streets carry an approximately equal volume of east and westbound thru traffic, converting both to two-way would likely put the majority of the traffic load on one of the streets.

Reversing the direction of Beach and Harrison Streets was also considered. However, both streets are one-way north of the core downtown area, and this change would lead to opposing traffic meeting head on at the intersections where the conversion took place. In addition, this change would break the existing one-way couplets of Harrison and Clifford Streets and Beach and Church Streets, respectively.

Finally, angle parking was originally proposed to be evaluated on both sides of Saginaw Street, but geometric review found that it would not fit while still allowing one travel lane in each direction. For this analysis angle parking was considered only on the northbound side of Saginaw Street, with parallel parking retained along the southbound side.

Several common elements were reviewed as part of all alternatives:

- Pedestrian circulation and "walkability"
- Connectivity between the Cultural Center and Downtown
- Opportunities for increased on-street parking
- Feasibility of creating a "parking mall" on 3rd Street between Beach and Harrison

These items are addressed throughout this section, and further in Section 6.0: Recommendations.

The following sections present each of the three alternatives carried forward for analysis.

5.1.1 Alternative 1

Alternative 1 is a "Transportation System Management" (TSM) option to improve mobility and on-street parking management with low capital cost.

<u>Circulation</u>

Under this alternative, the study area traffic signal system would be optimized – traditionally one of the highest benefit-to-cost ratio improvements, providing sometimes substantial circulation improvements at minimal cost. However, due to the age of the traffic signal system, it is not certain whether optimized timings could be installed or progression maintained without major overhaul or replacement of the traffic signal equipment. For the purposes of this study, it is assumed that new timings could be installed and maintained without equipment replacement.

This alternative also includes provision of bike lanes along Kearsley, Beach and Harrison Streets, in order to improve non-motorized mobility throughout the study area.

The proposed roadway network for Alternative 1 is depicted in Figure 5-1.

Parking

Under Alternative 1, on-street parallel parking would be added at locations throughout the study area within the existing roadway, with particular emphasis on the roadways in the vicinity of Saginaw Street where curb space is not currently maximized. Signage and enforcement would be improved in order to generate appropriate parking turnover, particularly along Saginaw Street.

5.1.2 Alternative 2

Alternative 2 proposes numerous modifications to the roadway network aimed at addressing circulatory and parking deficiencies throughout the study area.

Circulation

Under Alternative 2, Grand Traverse Street would be converted to two-way operation in the north/south direction between Church and Kearsley Streets. This conversion would address the issue of northbound thru traffic, which currently turns off Grand Traverse Street onto Church Street and then back onto Grand Traverse again to cross the Flint River. This circuitous route increases travel time for many motorist. The two-way roadway is proposed as a three-lane cross-section (one lane in each direction, with a continuous center left-turn lane), with a parking lane along the southbound side of the roadway. This configuration would better fit the context of the surrounding residential neighborhood, and provide on-street parking both as an amenity, and as a buffer between pedestrian traffic and the adjacent roadway.

In the east-west direction, Alternative 2 would include conversion of Kearsley, 1st, 2nd, 3rd and 4th Streets to two-way traffic. This would provide more direct routing to destinations within downtown, reducing circuitous driving patterns and motorist confusion. First and Third Streets are both two-way streets on either side of downtown, so converting the streets to two-way in the core downtown area would resolve this discontinuity. For Kearsley, First, and Second Streets, conversion to two-way operation would greatly reduce travel distances, particularly within the western portion of the study area, where each street has long block distances. The ineffectiveness of the Third and Fourth Street couplet is also addressed in this alternative.

Alternative 2 would also include signal system optimization and the addition of bike lanes, as proposed in Alternative 1.

The proposed roadway modifications for Alternative 2 are depicted in Figure 5-2.

Parking

Similar to Alternative 1, Alternative 2 would include provision of additional on-street parking along study area roadways wherever possible. However, Alternative 2 would also include the addition of angle parking along one side of Saginaw Street, resulting in Saginaw being reduced to one lane in each direction. This improvement is aimed at maximizing available on-street parking along the key activity corridor within downtown.

Figure 5-1: Alternative 1 Roadway Network Improvements

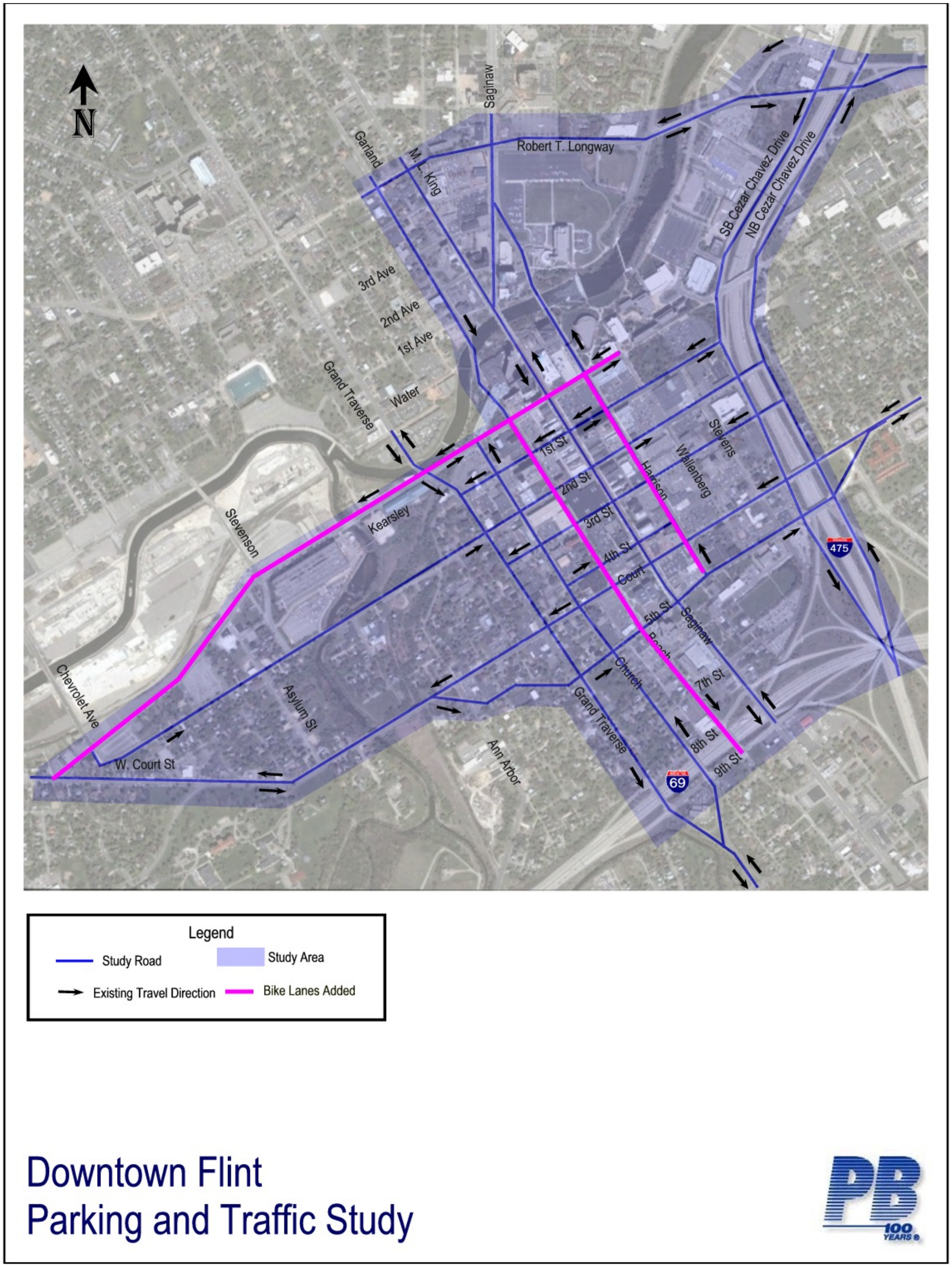
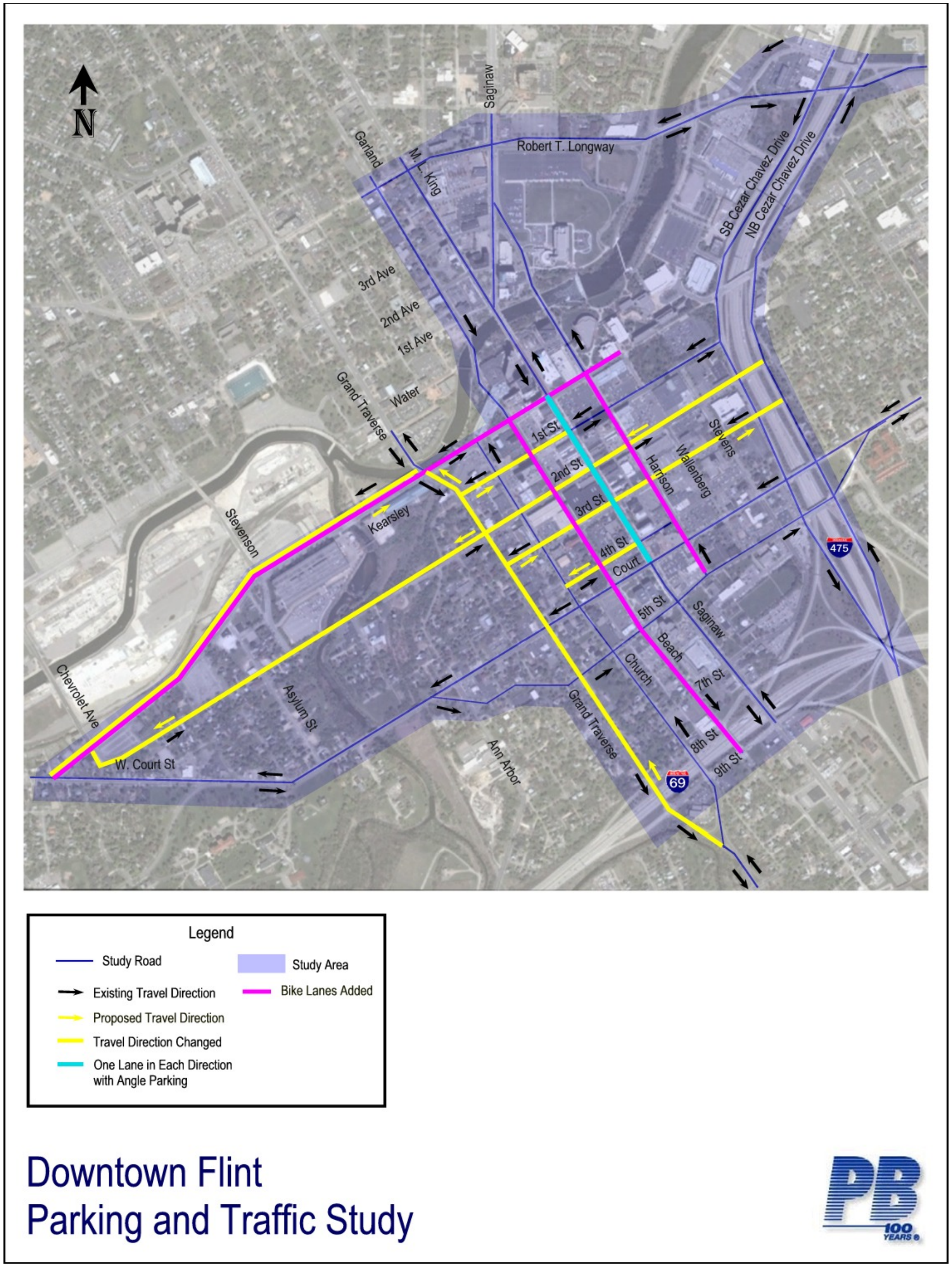


Figure 5-2: Alternative 2 Roadway Network Improvements



5.1.3 Alternative 3

Circulation

Alternative 3 builds upon Alternative 2 in addressing inefficiencies of the current one-way street system. In addition to the improvements proposed in Alternative 2, Alternative 3 would include conversion of the remaining north-south one-way streets to two-way operation, including Church, Beach, Harrison and Clifford Streets. Bike lanes would be provided along Beach Street in both directions. The proposed roadway network improvements are depicted in Figure 5-3.

Parking

Alternative 3 would maximize on-street parallel parking, similar to Alternative 1. This alternative, however, would not include angle parking along Saginaw Street, which would remain a four-lane arterial with parallel parking on both sides.

5.2 Alternative Analysis

5.2.1 Traffic Operations

Traffic Volume Forecasting

As indicated in Section 4.1, a universal growth factor of 13% was applied to the study area as an approximation of 2030 traffic volumes, based on the GCMPC regional travel demand forecasting model. However, the roadway operational changes proposed under Alternatives 2 and 3 required substantial redistribution of traffic volumes to account for the new directions of travel. Traffic redistribution to account for changes in traffic patters was conducted based on an assessment of probable re-routing, given observed destinations, proportion of through traffic and continuity of parallel routes, connectivity to the regional freeway system and major arterials, and roadway character. 2030 peak hour turning-movement volumes for each of the three alternatives can be found in Appendix B.

It should be noted that conversion of one-way street networks to two-way operation is commonly known to reduce trip lengths, and consequently reduce the amount of traffic on the street network because of direct access to destinations. While this fact has been conveyed anecdotally throughout numerous professional publications, there is little if any published quantitative research on the effects of converting one-way streets to two-way on traffic volumes. Due to the lack of quantitative data, for the purposes of this study a conservative approach was adopted, assuming no reduction in traffic volumes due to this conversion, in order to test the sensitivity of the roadway network to the proposed changes.

Traffic Operations Analysis

The impact of each alternative on traffic operations in the study area was evaluated for the AM and PM peak hours using Synchro 6.0 for future year (2030) conditions. In addition to the use of Synchro, which is an empirical analysis and optimization tool, SimTraffic was used to assess potential queuing and spillback issues associated with the short block spacing indicative of downtown Flint. SimTraffic is a microsimulation program that takes into account the dynamics of a roadway network and simulates actual vehicle flows, thereby allowing the user to better predict potential issues within a complex roadway network of closely spaced intersections.

Tables 5.1 and 5.2 provide a comparison of the intersection delay and levels of service for each alternative during the AM and PM peak hours, respectively. The resulting levels of service for study area intersections are shown in Figures 5-4, 5-5, and 5-6. Analysis reports can be found in Appendix D.

Figure 5-3: Alternative 3 Roadway Network Improvements

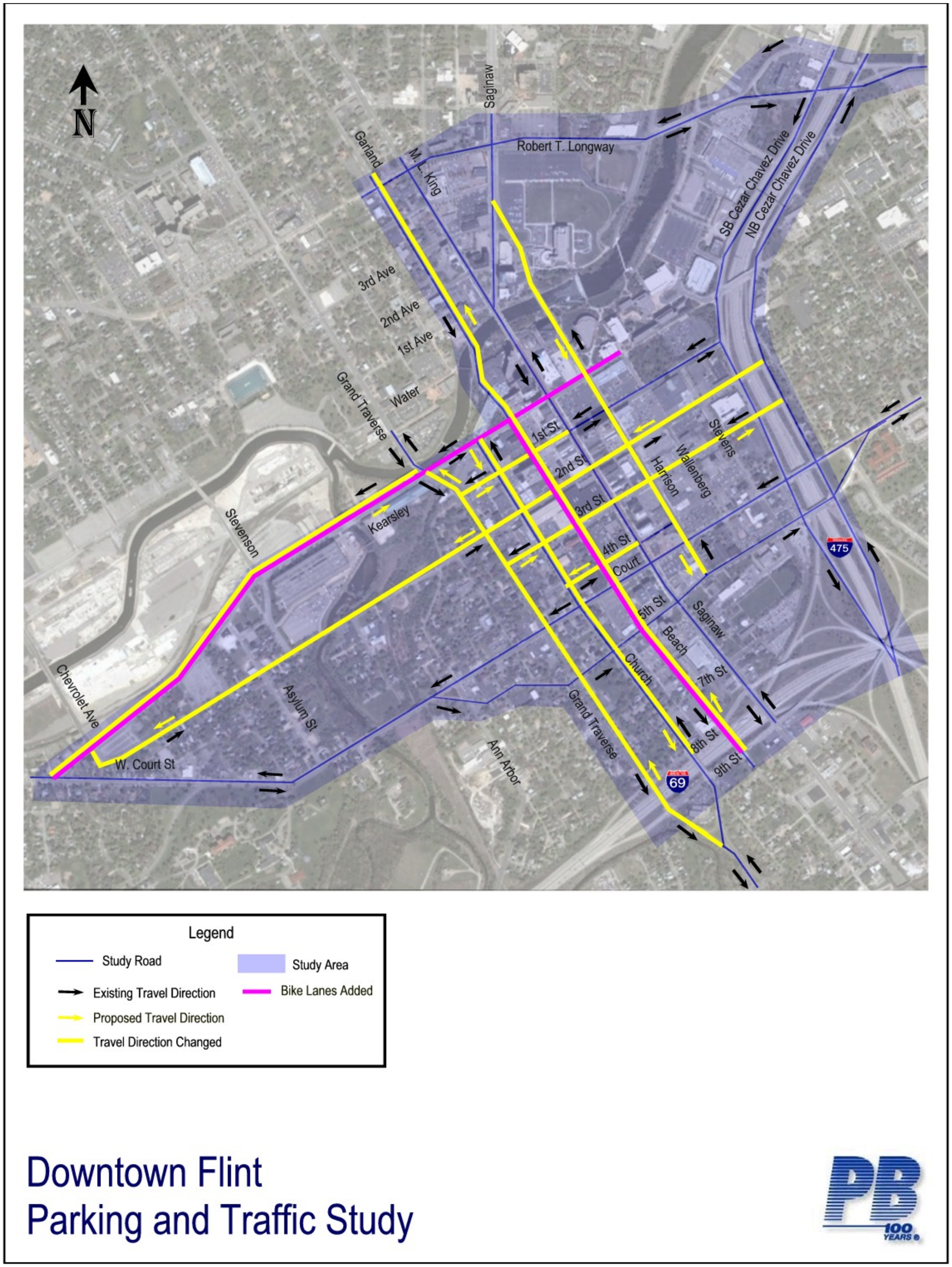


Table 5.1: 2030 AM Peak Hour Intersection Performance

Intersection	Control	Alternative 1		Alternative 2		Alternative 3	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
Grand Traverse Street at Kearsley Street	Signalized	5.6	A	9.4	A	8.6	A
Grand Traverse Street at First Street	Two-Way-Stop*	9.5	A	17.3	B	15.9	B
Grand Traverse Street at Second Street	Signalized	3.7	A	7.9	A	7.8	A
Grand Traverse Street at Third Street	Signalized	5.8	A	4.8	A	6.3	A
Grand Traverse Street at Court Street	Signalized	3.5	A	6.5	A	6.4	A
Grand Traverse Street at Fifth Street	Signalized	8.3	A	12.5	B	11.7	B
Grand Traverse Street at Eighth Street	Signalized	6.4	A	9.6	A	7.6	A
Grand Traverse Street at Ninth Street	Signalized	9.0	A	9.9	A	9.7	A
Church Street at Kearsley Street	Signalized	2.8	A	6.4	A	7.1	A
Church Street at First Street	Two-Way-Stop*	7.3	A	10.2	B	10.6	B
Church Street at Second Street	Signalized	2.5	A	5.1	A	7.6	A
Church Street at Third Street	Signalized	7.9	A	11.0	B	9.8	A
Church Street at Court Street	Signalized	4.4	A	10.1	B	8.0	A
Church Street at Fifth Street	Signalized	7.1	A	7.7	A	5.4	A
Church Street at Eighth Street	Signalized	9.8	A	14.3	B	8.3	A
Church Street at Ninth Street	Signalized	4.2	A	4.9	A	6.1	A
Beach Street at Kearsley Street	Signalized	8.2	A	7.6	A	10.1	B
Beach Street at First Street	Signalized	7.0	A	5.8	A	6.3	A
Beach Street at Second Street	Signalized	11.1	B	9.7	A	10.1	B
Beach Street at Third Street	Signalized	9.4	A	11.3	B	7.2	A
Beach Street at Court Street	Signalized	6.2	A	5.0	A	8.3	A
Beach Street at Fifth Street	Signalized	11.0	B	6.0	A	10.2	B
Beach Street at Eighth Street	Signalized	7.9	A	8.6	A	11.7	B
Beach Street at Ninth Street	Signalized	5.1	A	17.5	B	4.0	A
Saginaw Street at Kearsley Street	Signalized	7.6	A	18.4	B	10.1	B
Saginaw Street at First Street	Signalized	6.7	A	11.5	B	11.1	B
Saginaw Street at Second Street	Signalized	4.5	A	6.8	A	6.6	A
Saginaw Street at Third Street	Signalized	4.7	A	7.6	A	9.0	A
Saginaw Street at Fourth Street	Signalized	7.7	A	7.6	A	4.9	A
Saginaw Street at Court Street	Signalized	6.2	A	7.0	A	6.2	A
Saginaw Street at Fifth Street	Signalized	8.7	A	8.7	A	7.8	A
Saginaw Street at Eighth Street	Signalized	9.0	A	9.5	A	9.2	A
Saginaw Street at Ninth Street	Signalized	9.7	A	17.9	B	11.5	B
Harrison Street at Kearsley Street	Signalized	10.2	B	8.4	A	9.2	A
Harrison Street at First Street	Signalized	7.7	A	9.1	A	10.9	B
Harrison Street at Second Street	Signalized	5.9	A	9.2	A	7.5	A
Harrison Street at Third Street	Signalized	7.6	A	8.0	A	11.7	B
Harrison Street at Court Street	Signalized	8.8	A	8.0	A	9.9	A
SB Chavez Drive at Second Street	Signalized	9.3	A	11.2	B	11.1	B
SB Chavez Drive at Court Street	Signalized	5.8	A	6.3	A	7.3	A

Intersection	Control	Alternative 1		Alternative 2		Alternative 3	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
SB Chavez Drive at Fifth Street	Signalized	5.1	A	5.4	A	6.6	A
NB Chavez Drive at Second Street	Signalized	19.3	B	7.5	A	7.1	A
NB Chavez Drive at Court Street	Signalized	8.6	A	8.6	A	8.6	A
NB Chavez Drive at Fifth Street	Signalized	8.9	A	8.8	A	8.8	A
SB Chavez Drive at WB Robert T. Longway Blvd	Signalized	9.1	A	9.0	A	9.0	A
SB Chavez Drive at EB Robert T. Longway Blvd	Signalized	8.9	A	9.0	A	9.0	A
NB Chavez Drive at WB Robert T. Longway Blvd	Signalized	6.5	A	6.4	A	6.4	A
NB Chavez Drive at EB Robert T. Longway Blvd	Signalized	7.5	A	7.6	A	7.6	A

LOS = Level of Service; (sec/veh) = Seconds per vehicle; N/A = Delay exceeds maximum calculated delay based on HCM method.
*Note: Delay and LOS at stop-controlled intersections is based on the stop-controlled approaches only

Table 5.2: 2030 PM Peak Hour Intersection Performance

Intersection	Control	Alternative 1		Alternative 2		Alternative 3	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
Grand Traverse Street at Kearsley Street	Signalized	10.2	B	18.0	B	12.0	B
Grand Traverse Street at First Street	Two-Way-Stop*	9.5	A	427.2**	F	49.6**	F
Grand Traverse Street at Second Street	Signalized	8.0	A	10.2	B	11.0	B
Grand Traverse Street at Third Street	Signalized	3.8	A	9.4	B	5.6	A
Grand Traverse Street at Court Street	Signalized	3.9	A	19.1	B	15.7	B
Grand Traverse Street at Fifth Street	Signalized	10.7	A	10.9	B	12.3	B
Grand Traverse Street at Eighth Street	Signalized	6.9	A	5.4	A	9.1	A
Grand Traverse Street at Ninth Street	Signalized	6.1	A	7.6	A	8.5	A
Church Street at Kearsley Street	Signalized	4.1	A	10.0	B	9.5	A
Church Street at First Street	Two-Way-Stop*	11.4	B	9.7	A	11.3	B
Church Street at Second Street	Signalized	2.9	A	11.1	B	9.0	A
Church Street at Third Street	Signalized	9.1	A	9.9	A	8.3	A
Church Street at Court Street	Signalized	7.1	A	5.9	A	4.4	A
Church Street at Fifth Street	Signalized	8.6	A	4.8	A	8.6	A
Church Street at Eighth Street	Signalized	8.0	A	8.6	A	11.7	B
Church Street at Ninth Street	Signalized	8.4	A	7.9	A	15.0	B
Beach Street at Kearsley Street	Signalized	8.0	A	8.0	A	11.3	B
Beach Street at First Street	Signalized	7.1	A	5.5	A	9.0	A
Beach Street at Second Street	Signalized	6.1	A	10.7	B	11.8	B
Beach Street at Third Street	Signalized	10.0	A	9.8	A	11.7	B
Beach Street at Court Street	Signalized	6.9	A	6.7	A	14.1	B
Beach Street at Fifth Street	Signalized	7.9	A	12.5	B	15.1	B
Beach Street at Eighth Street	Signalized	3.0	A	3.2	A	6.1	A
Beach Street at Ninth Street	Signalized	6.2	A	7.7	A	3.6	A
Saginaw Street at Kearsley Street	Signalized	12.6	B	16.0	B	11.9	B
Saginaw Street at First Street	Signalized	8.0	A	11.4	B	6.9	A
Saginaw Street at Second Street	Signalized	7.8	A	11.8	B	12.5	B
Saginaw Street at Third Street	Signalized	4.1	A	8.7	A	5.3	A
Saginaw Street at Fourth Street	Signalized	7.0	A	8.9	A	6.7	A
Saginaw Street at Court Street	Signalized	9.9	A	11.2	B	8.1	A
Saginaw Street at Fifth Street	Signalized	14.1	B	12.1	B	12.0	B
Saginaw Street at Eighth Street	Signalized	7.2	A	8.6	A	8.3	A
Saginaw Street at Ninth Street	Signalized	13.0	B	11.2	B	12.3	B
Harrison Street at Kearsley Street	Signalized	9.2	A	9.2	A	9.8	A
Harrison Street at First Street	Signalized	7.3	A	8.6	A	10.2	B
Harrison Street at Second Street	Signalized	7.2	A	12.3	B	9.7	A
Harrison Street at Third Street	Signalized	9.8	A	8.3	A	9.1	A
Harrison Street at Court Street	Signalized	6.5	A	6.4	A	10.0	B
SB Chavez Drive at Second Street	Signalized	8.5	A	23.6	C	8.6	A

Intersection	Control	Alternative 1		Alternative 2		Alternative 3	
		Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS	Delay (Sec/Veh)	LOS
SB Chavez Drive at Court Street	Signalized	9.3	A	8.8	A	7.4	A
SB Chavez Drive at Fifth Street	Signalized	8.5	A	6.6	A	7.5	A
NB Chavez Drive at Second Street	Signalized	5.9	A	11.2	B	9.4	A
NB Chavez Drive at Court Street	Signalized	10.8	B	10.5	B	10.7	B
NB Chavez Drive at Fifth Street	Signalized	6.3	A	6.8	A	5.9	A
SB Chavez Drive at WB Robert T. Longway Blvd	Signalized	9.4	A	9.4	A	9.5	A
SB Chavez Drive at EB Robert T. Longway Blvd	Signalized	10.4	B	10.4	B	10.4	B
NB Chavez Drive at WB Robert T. Longway Blvd	Signalized	8.4	A	8.4	A	8.5	A
NB Chavez Drive at EB Robert T. Longway Blvd	Signalized	8.2	A	8.2	A	8.2	A

LOS = Level of Service; (sec/veh) = Seconds per vehicle; N/A = Delay exceeds maximum calculated delay based on HCM method.
*Note: Delay and LOS at stop-controlled intersections is based on the stop-controlled approaches only
**Note: High values of delay for stop-controlled approaches may be overstated, as adjacent signals likely create traffic gaps.

Figure 5-4: Alternative 1 - 2030 Intersection Performance

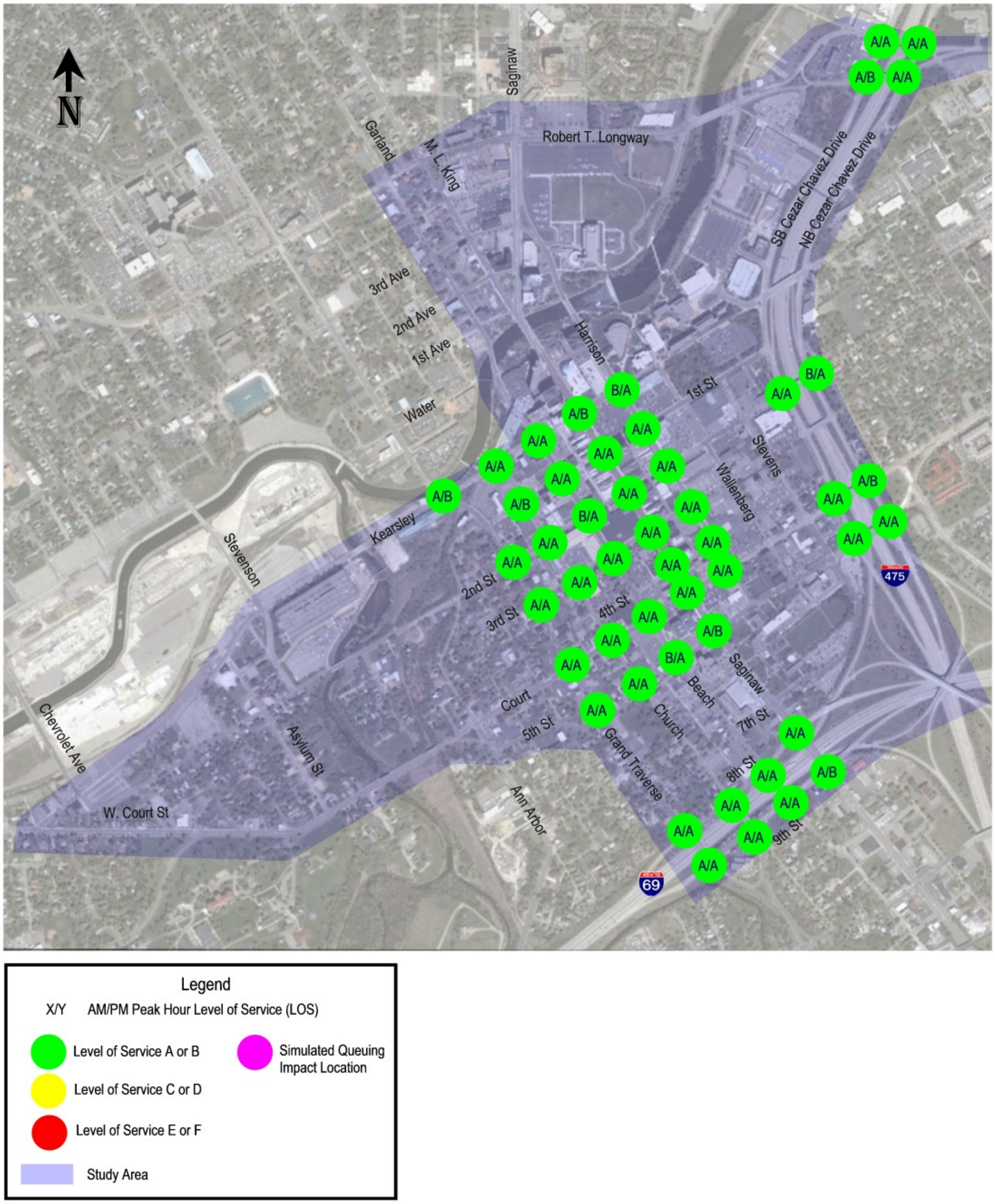


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Figure 5-5: Alternative 2 - 2030 Intersection Performance

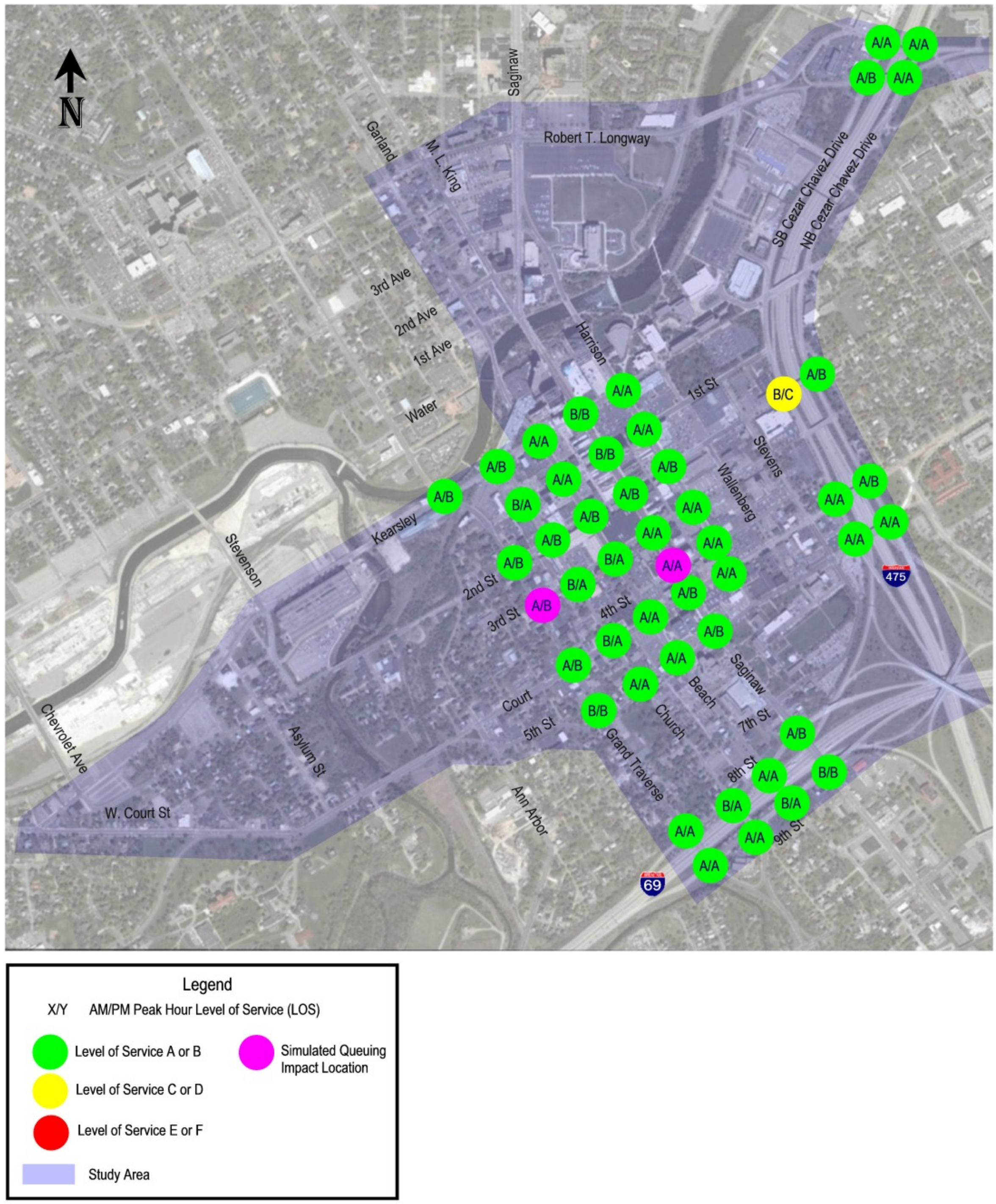

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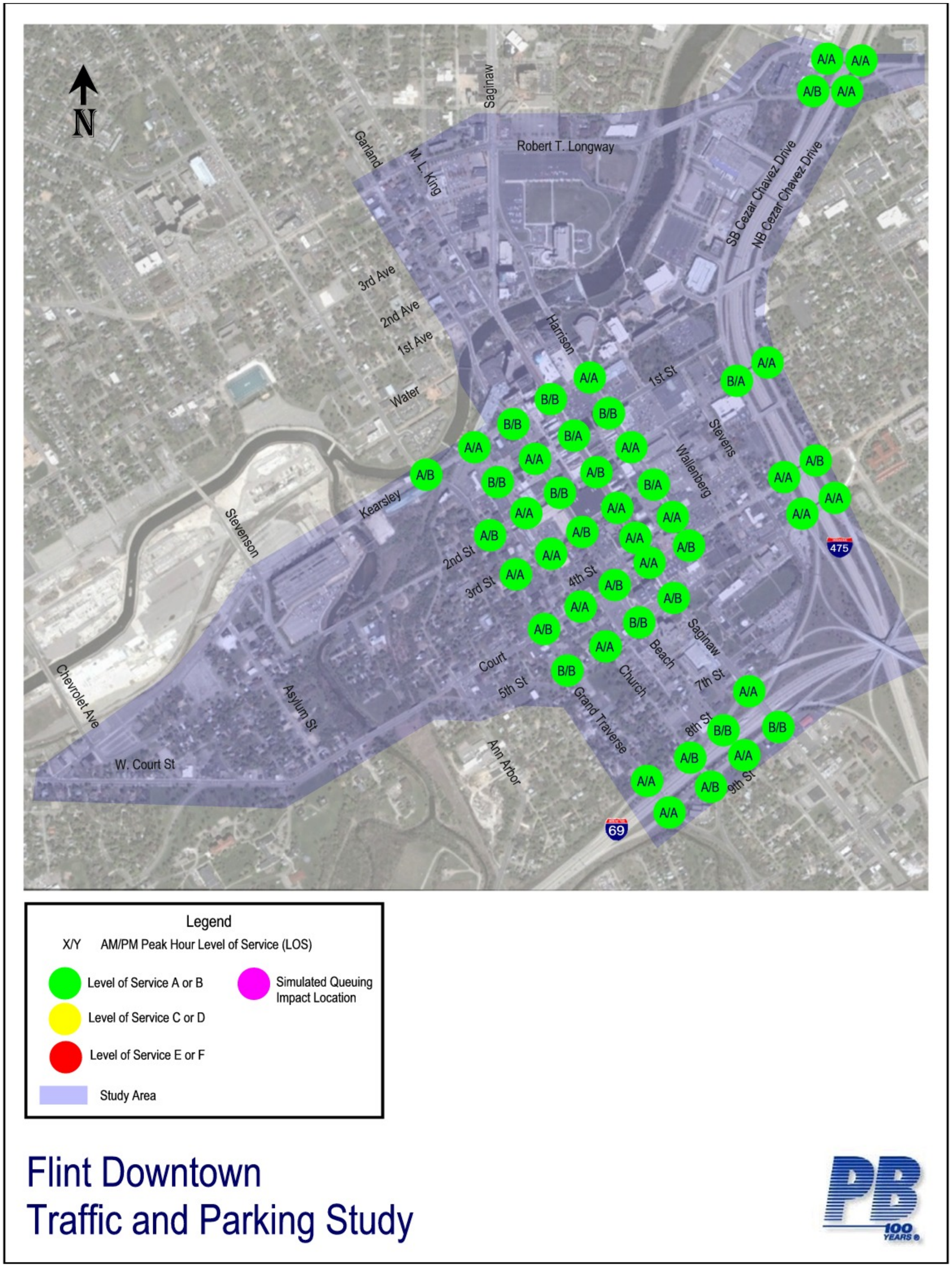
Figure 5-6: Alternative 3 - 2030 Intersection Performance



As shown in the tables and figures above, all study area intersections are forecast to operate at acceptable Level of Service (LOS) C or better during both peak hours, indicating minimal congestion throughout the roadway network at the 2030 study horizon. The following presents a discussion of the performance of each of the three alternatives:

Alternative 1

Under Alternative 1, although some travel lanes would be lost to accommodate additional on-street parking and bike lanes, signal optimization is expected to offset any loss in capacity, resulting in LOS B or better during both peak hours at all intersections. However, this alternative does not address inefficiencies of the one-way street system or driver navigation issues.

Alternative 2

While all intersections are anticipated to operate at acceptable LOS C or better under Alternative 2, delay at some locations is forecast to increase slightly over Alternative 1. This is largely due to the increase in conflicting movements inherent as part of a two-way street system, which increase delay time for turning vehicles yielding to opposing traffic. However, it is expected that any marginal increase in delay would be offset by reduced travel distances due to the introduction of two-way east-west streets.

In some locations, however, queue spillback was observed in the SimTraffic simulation that was not reflected in the Synchro analysis for this alternative. Simulation analysis indicated that spillback (traffic queuing back from one intersection and blocking the next upstream intersection) is likely along Grand Traverse Street between Court and 3rd Streets, and on Saginaw Street between Court and 4th Streets during the PM peak period, as shown in Figure 5-5. Both of these conditions are due to the reduction in travel lanes along these corridors. In addition, the simulation analysis does fully not take into account the affect of parking maneuvers on the flow of traffic. In Alternative 2, the change from parallel to angle parking on one side of Saginaw Street reduces the travel lanes from two lanes to one in each direction. With only one travel lane, drivers will be required to stop and wait for every parking maneuver.

Alternative 3

Under Alternative 3, all intersections are anticipated to perform at LOS B or better, largely due to effective signal timing and improved balance of traffic on the expanded two-way street system, both of which are expected to offset increased conflicting movements at each location.

The queue spillback conditions observed in Alternative 2 are expected to be mitigated under Alternative 3. Under this alternative, Saginaw Street is proposed to remain as a four-lane arterial, thereby reducing the potential for intersection congestion with one lane in each direction. Along Grand Traverse Street, the conversion of Church Street to two-way operation is anticipated to result in a shift of some southbound traffic, thereby reducing the critical southbound movement during the PM peak hour and reducing intersection delay.

5.2.2 Physical Characteristics and Feasibility

A key measure of the effectiveness of an alternative is the engineering feasibility of the proposed changes, and how well the modifications fit within the context of the surrounding street system.

In order to determine the required physical improvements associated with each alternative, a conceptual design process was undertaken to determine preliminary cross-sections and lane assignments of each roadway. In cases where the roadway cross-section or direction of travel is proposed to be altered, turning profiles were evaluated depending on the nature of each route in order to identify potential turning impacts:

- Truck Routes: Right-turn maneuvers were evaluated at all locations where two truck routes intersect within the study area. The WB-40 design vehicle was used to assess turn feasibility, assuming a reasonable amount of driver over-correction where appropriate and physically feasible.
- Bus Routes: Right-turn maneuvers along all current fixed bus routes within the study area were evaluating using a standard transit bus design vehicle template.

The following is a summary of the physical impacts of each of the three alternatives.

Alternative 1

Alternative 1 involves two primary modifications to the roadway network: addition of bike lanes along three key corridors, and optimization of the traffic signal system to allow for more efficient traffic flow. The bike lanes would result in removal of parking in some locations, but would otherwise not impact traffic movements throughout the roadway network, and would require only striping and minor signage improvements. Parking losses would be offset with additional on-street parking at other locations throughout the study area.

Optimization of the traffic signal system is a low-cost means of improving the efficiency of the transportation system. In the case of Downtown Flint, however, many of the signals are considerably aged, and making modifications to the signal timing, and in particular maintaining coordination with adjacent signals, may no longer be feasible without full replacement or major signal improvements.

Alternative 2

Under Alternative 2, the conversion of Grand Traverse, Kearsley, 1st, 2nd, 3rd, and 4th Streets to two-way operation would require four intersection radius improvements in order to maintain all truck and bus movements along existing posted truck routes and fixed bus routes. In addition, minor reconfiguration of the intersection of Grand Traverse and Church Streets would be required to accommodate flow of northbound traffic onto Grand Traverse Street. Modification or replacement of 28 traffic signals would also be required. Physical improvements required to accommodate Alternative 2 are depicted in Figure 5-7.

While two of the identified intersection radius improvements appear to be feasible within existing right-of-way and without significant impacts, adjustment of the radii at two locations to accommodate truck turning movements may result in right-of-way and building impacts:

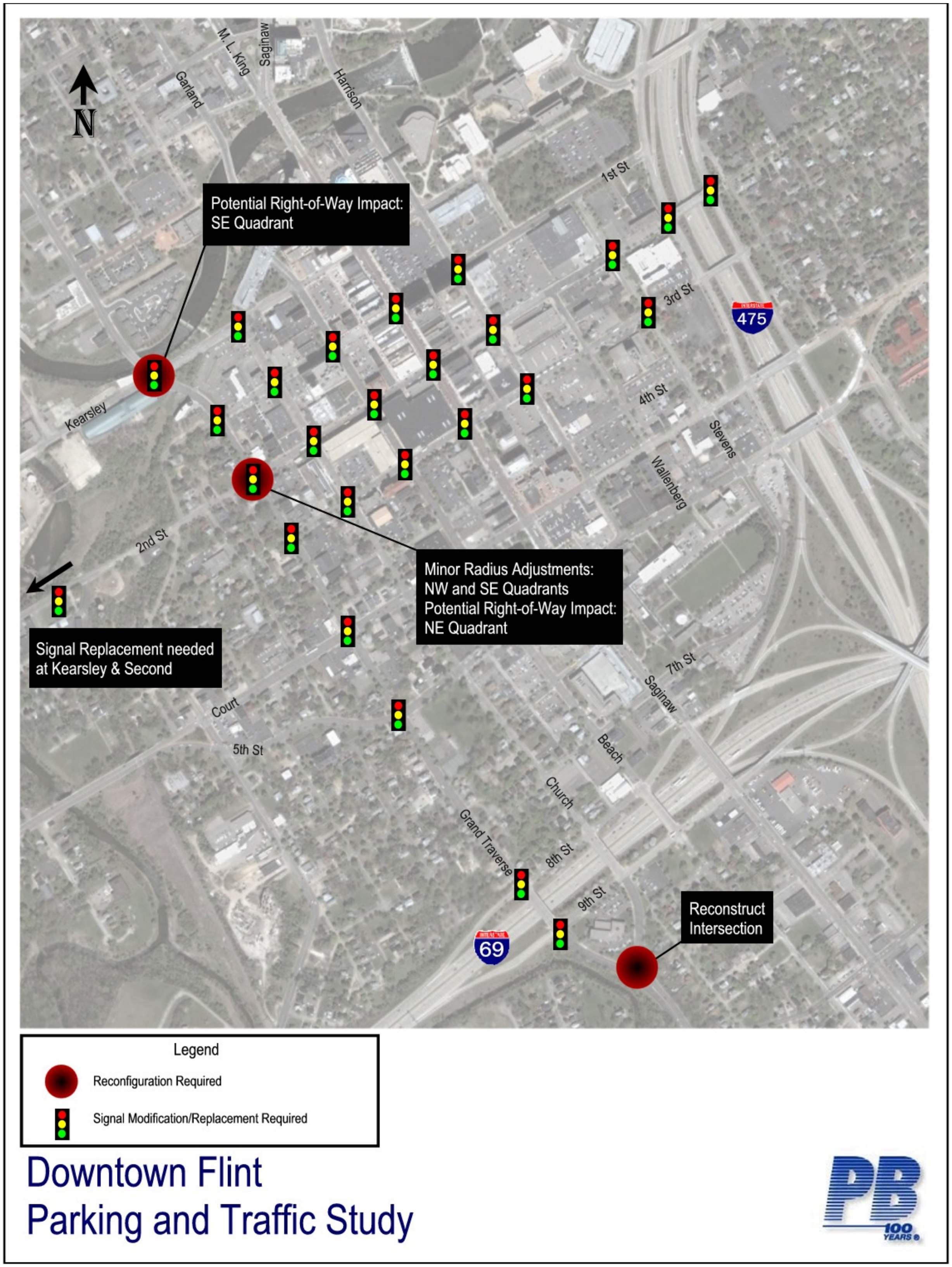
- Grand Traverse/2nd Street (Northeast Quadrant)
- Grand Traverse/Kearsley (Southeast Quadrant)

At Grand Traverse/Kearsley, it is unclear as to the need to acquire right-of-way for this improvement, but the land required for the radius adjustment is undeveloped. At Grand Traverse/2nd Street, however, conceptual engineering illustrates a potential building impact in the northeast quadrant to accommodate truck turning movements. Depending on the importance of this movement to the truck route system, this location may be a candidate to be posted for no right turns by trucks.

Alternative 3

Under Alternative 3, the conversion of most downtown one-way roadways to two-way operation, including Grand Traverse, Kearsley, 1st, 2nd, 3rd, 4th, Church, Beach and Harrison Streets, would require 18 intersection radius improvements in order to maintain all truck and bus movements along existing posted truck routes and fixed bus routes. In addition, minor reconfiguration of the intersection of Grand Traverse and Church Streets would be required to accommodate flow of northbound traffic onto Grand Traverse Street. Slightly more significant improvements would be necessary at the intersection of Harrison/Saginaw to accommodate the conversion of Harrison Street to two-way

Figure 5-7: Required Physical Improvements - Alternative 2



traffic. Modification or replacement of 40 traffic signals would also be required. Physical improvements required to accommodate Alternative 3 are depicted in Figure 5-8.

While the majority of identified intersection radius improvements appear to be feasible within existing right-of-way and without significant impacts, adjustment of the radii at three locations to accommodate truck turning movements may result in right-of-way and building impacts:

- Grand Traverse/2nd Street (Northeast Quadrant)
- Grand Traverse/Kearsley (Southeast Quadrant)
- Harrison/3rd Street (Southwest Quadrant)

At Grand Traverse/Kearsley, it is unclear as to the need to acquire right-of-way for this improvement, but the land required for the radius adjustment is undeveloped. At Grand Traverse/2nd Street and Harrison/3rd Street however, conceptual engineering illustrates potential building impacts in the northeast and southwest quadrants, respectively, to accommodate truck turning movements. Depending on the importance of these movement to the truck route system, this location may be a candidate to be posted for no right turns by trucks.

The conversion of Beach Street under this alternative to two-way traffic is made challenging by the extent of the one-way operation of Beach both north and south of the study area. At the north end of the study area, there is no clear location to transition from the one-way to two-way operation. In addition, all roadways that require a transition from one-way to two-way will at one point have traffic meeting head-on at the transition point. Such a condition could pose safety concerns that must be monitored to assure that visibility is sufficient.

5.2.3 On-Street Parking

Overall on-street parking availability would improve under each alternative, as it is proposed to maximize the use of curb space for on-street parking where possible. However, the three alternatives will differ slightly in the number and locations of parking spaces that can be provided based on the direction of travel on the roadway, proposed number and use of lanes, and the required setback to accommodate operational needs or oversize vehicle turning.

Table 5.3 presents approximate on-street parking space counts for the existing condition, as well as Alternatives 2 and 3. Figures 5-9 and 5-10 illustrate the block-by-block change in on-street parking spaces under Alternatives 2 and 3, respectively, as compared to the existing condition. An exact on-street parking yield for Alternative 1 was not determined through engineering review, but would be similar in quantity to Alternative 3.

As shown in Table 5.3, the on-street parking space count is anticipated to significantly increase under either Alternative 2 or 3. Within the area bounded by Grand Traverse Street to the west, I-475 to the east, Kearsley Street to the north, and I-69 to the south, the existing total of approximately 415 on-street parking spaces is anticipated to be increased to over 1000 spaces under Alternative 2, and over 900 spaces under Alternative 3.

For the critical Saginaw Street corridor, two changes are proposed to increase on-street parking opportunities. Under both Alternatives 2 and 3, parallel parking is proposed to be added along Saginaw between Kearsley Street and the Flint River, with a total yield of 35 additional spaces. This change would result in the removal of the center left turn lane along this segment of roadway, which is shown to have little operational effect at the intersection of Saginaw/Kearsley.

In addition, angle parking along one side of Saginaw Street between Court Street and Kearsley Street is proposed under Alternative 2. Angle parking differs significantly from parallel parking not only in the yield of parking spaces within the same curb length, but also in operations and safety.

Figure 5-8: Required Physical Improvements - Alternative 3

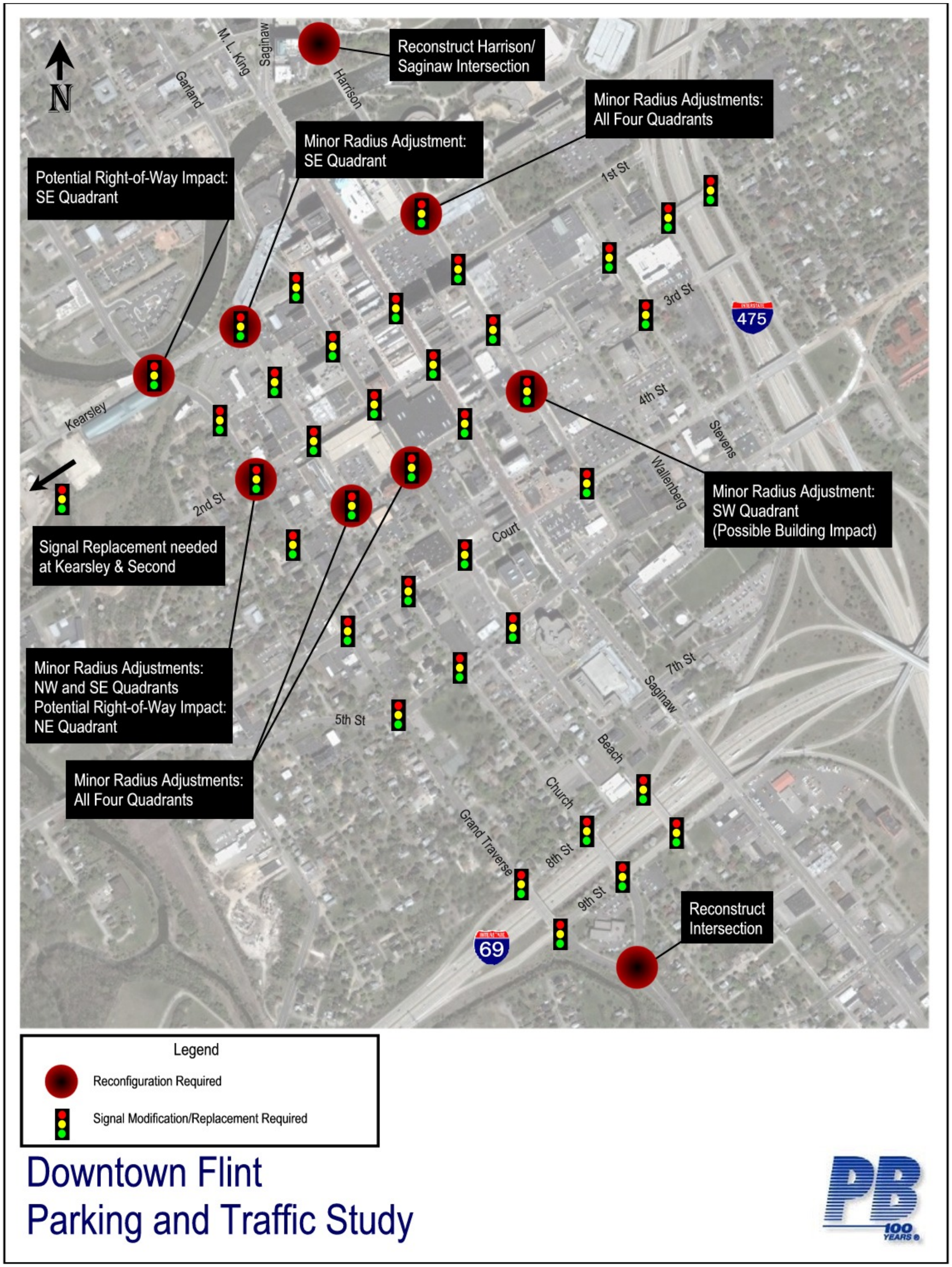


Table 5.3: On-Street Parking Space Comparison

Street	Between:	Existing Spaces*	Alternative 2 Spaces*	Alternative 3 Spaces*
Kearsley St.	Grand Traverse and Church	0	0	0
	Church and Beach	10	10	10
	Beach and Saginaw	17	0	0
	Saginaw and Harrison	0	0	0
	East of Harrison	0	0	0
1st Street	Grand Traverse and Church	0	8	8
	Church and Beach	8	15	15
	Beach and Saginaw	8	23	23
	Saginaw and Harrison	0	14	14
	East of Harrison	0	55	55
2nd Street	Grand Traverse and Church	0	11	11
	Church and Beach	9	19	15
	Beach and Saginaw	18	14	14
	Saginaw and Harrison	11	10	10
	East of Harrison	7	45	45
3rd Street	Grand Traverse and Church	4	7	6
	Church and Beach	12	24	24
	Beach and Saginaw	0	0	0
	Saginaw and Harrison	20	15	14
	East of Harrison	8	31	31
4th Street	Grand Traverse and Church	0	0	0
	Church and Beach	7	0	0
	Beach and Saginaw	24	24	24
	Saginaw and Harrison	8	7	7
	East of Harrison	0	0	0
Grand Traverse	Kearsley and 1st	0	8	8
	1st and 2nd	0	14	14
	2nd and 3rd	0	8	8
	3rd and 4th	0	12	12
	4th and Court	0	10	10
	Court and 5th	0	34	34
	South of 5th	0	0	0
Church	Kearsley and 1st	0	16	16
	1st and 2nd	11	26	22
	2nd and 3rd	11	23	21
	3rd and 4th	0	17	16
	4th and Court	0	10	10
	Court and 5th	6	24	22
	South of 5th	24	70	70
Beach	North of Kearsley	0	0	0
	Kearsley and 1st	2	7	0
	1st and 2nd	0	12	0
	2nd and 3rd	0	11	0
	3rd and 4th	0	9	0
	4th and Court	0	0	0
	Court and 5th	0	11	0
	South of 5th	0	32	0
Saginaw	North of Kearsley	0	35	35
	Kearsley and 1st	22	31	21
	1st and 2nd	20	31	25
	2nd and 3rd	22	27	21
	3rd and 4th	27	31	25
	4th and Court	13	15	14
	Court and 5th	24	26	26
	South of 5th	40	54	53
Harrison	North of Kearsley	0	41	41
	Kearsley and 1st	0	11	21
	1st and 2nd	11	12	22
	2nd and 3rd	14	13	16
	3rd and 4th	11	13	23
	4th and Court	0	0	0
	Court and 5th	0	0	0
	South of 5th	0	0	0
	TOTAL:	429	1026	932

*Approximate number of spaces based on aerial photography survey and conceptual parking plans

Figure 5-9: Block-by-Block Changes in On-Street Parking - Alternative 2

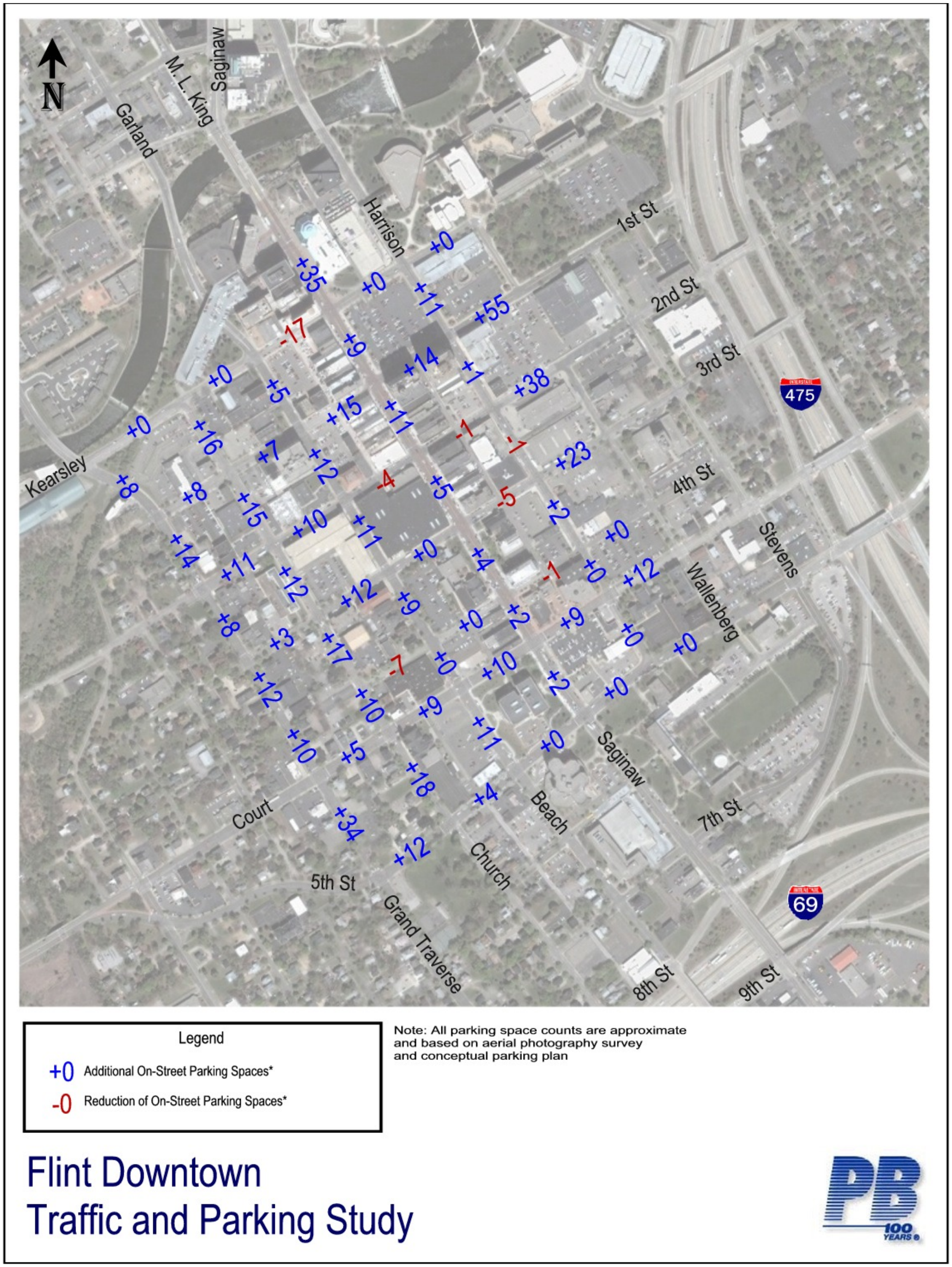
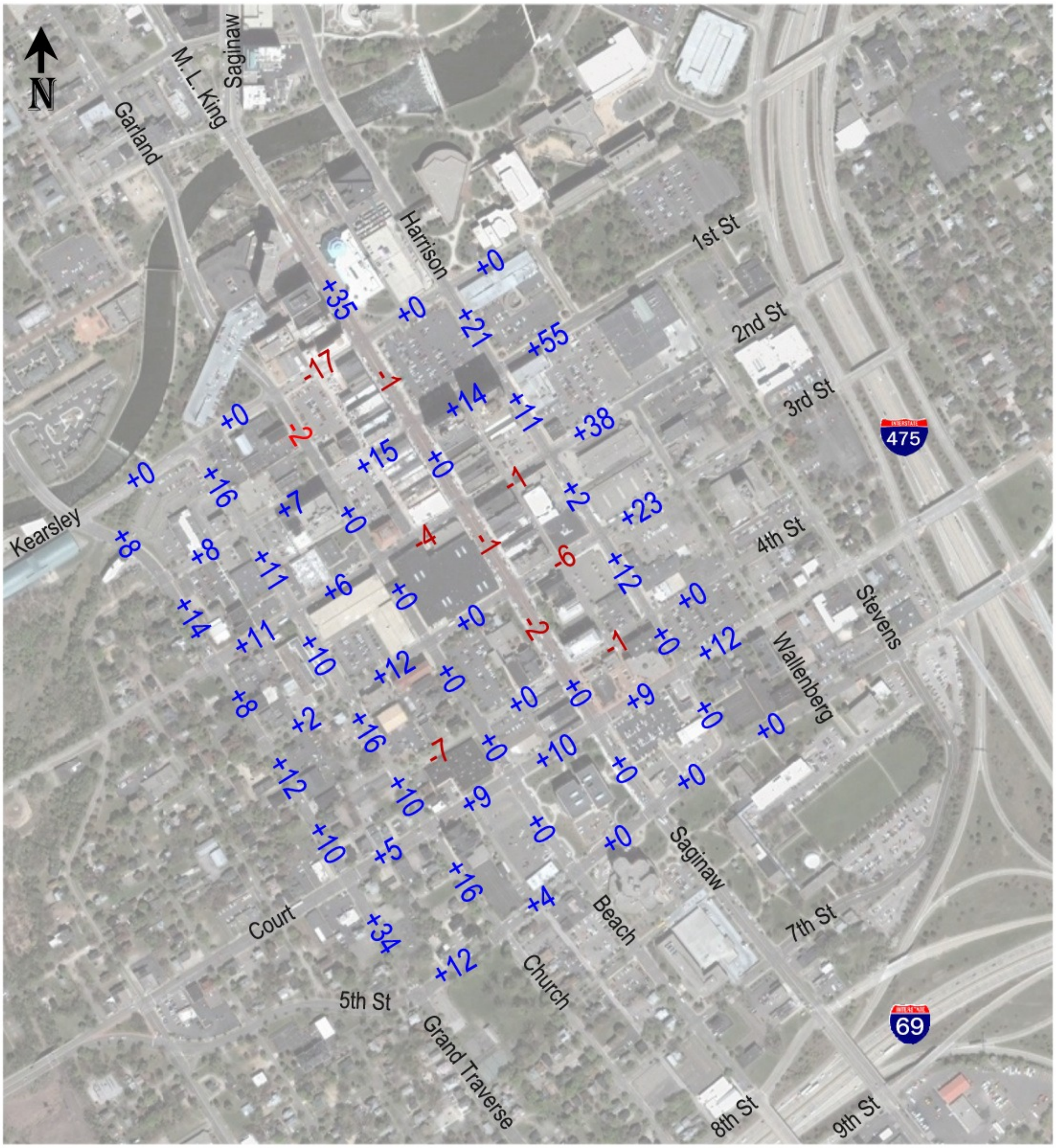


Figure 5-10: Block-by-Block Changes in On-Street Parking - Alternative 3



Legend
+0 Additional On-Street Parking Spaces*
-0 Reduction of On-Street Parking Spaces*

Note: All parking space counts are approximate and based on aerial photography survey and conceptual parking plan

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Conversion from parallel to angled parking typically doubles the on-street parking capacity of a block face. However, in the case of Saginaw Street, angled parking can only be physically accommodated on one side of the street, thereby reducing the additional space yield. Based on the traffic operations analysis, the reduction in Saginaw Street to one lane in each direction would have a negative impact on the southbound movement at the intersection of Court Street, and therefore angled parking would not be feasible between 4th Street and Court Street. In the remaining blocks between 4th Street and Kearsley Street where angle parking feasibility was assessed, the approximate additional space yield as compared to the existing condition is 27 spaces.

In addition to increasing total on-street parking spaces, angled parking also assist in traffic calming and an overall narrowing of the active portion of the street that pedestrians have to cross. Generally, angled parking can create a more pedestrian friendly atmosphere and add valuable parking into the downtown. However, several fundamental considerations need to be addressed when examining the prospect of angled parking, including:

- Traffic Flow Impediments[1]: The ingress and egress time for a vehicle to park needs to be taken into consideration. Parallel parking takes on average 21 seconds for a vehicle to complete a parking maneuver. Conversely, angle parking takes 11 to 12 seconds, helping to reduce the impediment time to other traffic.

- Accident Incidences: Angled parking is considered by some experts to increase the opportunity for accidents along a roadway. However, what is misunderstood is that the angled parking also acts as a traffic-calming device, reducing travel speed. Statistically, accident rates attributed to angled parking are only higher on high speed, high traffic volume roadways. While angled parking may increase the number of accidents, the severity of the accidents is reduced by slower travel speeds, if the traffic flow is low and the speeds posted are correspondingly low.

- Pedestrian Safety: Angled parking increases the distance between the vehicle travel lane and pedestrian activity on the sidewalks. Also, angled parking allows the driver of a vehicle to enter and exit in relative safety being away from the travel lane. Parallel parking on the other hand forces drivers to enter and exit vehicles adjacent to a travel lane. Angled parking, lane reduction to two travel lanes, traffic calming (slower vehicle travel rates) and the use of bump-outs at intersections all add to enhance pedestrian safety by reducing the potential for vehicle/pedestrian conflict.

- Economic Activity: Additional on-street parking, slower travel and greater pedestrian activity are the key elements of the most successful urban areas. This is particularly important in areas with contiguous commercial and retail space.

The benefits of angled parking have been found in most instances to outweigh the potential problems and this is most clearly defined by recent position changes being expressed by the Institute of Transportation Engineers (ITE). This authoritative body comprised of traffic engineering and planning professionals has identified the benefits and misconceptions about angled parking over the past several years.

The 'rule of thumb' (1) is that if there are more than 10,000 vehicles using a given roadway per day, then parallel parking is recommended. However, for roadways with less than 10,000 vehicles per day, conditions are suitable for angled parking to be considered. Average daily traffic volumes on this segment of Saginaw Street recorded during October, 2005 were over 12,700 vehicles per day at 2nd Street and over 13,200 vehicles per day at 3rd Street.

[1] The information and statistics provided are adopted directly from "Changing On-Street Parallel Parking to Angle Parking" by John Edwards PE, ITE Journal, February 2002.

5.2.4 Implementation Costs

The costs of implementation vary significantly by alternative. While Alternative 1 is a relatively low-cost means of improving the transportation system, Alternatives 2 and 3 would require significant reconstruction of the signal system infrastructure within the study area in order to support conversion of streets to two-way traffic. Table 5.4 presents a summary of implementation costs by alternative.

Table 5.4: Estimated Implementation Costs by Alternative

			Alternative 1		Alternative 2		Alternative 3	
Item	Units	Unit Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
Signal Replacement	Each	$ 75,000.00	0	$ -	26	$ 1,950,000.00	38	$ 2,850,000.00
Intersection Radius Adjustment*	Each	$ 10,000.00	0	$ -	4	$ 40,000.00	18	$ 180,000.00
Pavement Markings	Per Block	$ 2,000.00	32	$ 64,000.00	81	$ 162,000.00	90	$ 180,000.00
Traffic Signage Updates	Per Block	$ 400.00	32	$ 12,800.00	81	$ 32,400.00	90	$ 36,000.00
Grand Traverse/Church Intersection Improvements	Lump Sum	$ 90,000.00	0	$ -	1	$ 90,000.00	1	$ 90,000.00
Harrison/Saginaw Intersection Improvements	Lump Sum	$ 75,000.00	0	$ -	0	$ -	1	$ 75,000.00
Engineering (10%)				$ 7,680.00		$ 227,440.00		$ 341,100.00
Contingency (20%)				$ 15,360.00		$ 454,880.00		$ 682,200.00
TOTAL ALTERNATIVE COSTS:				$ 99,840.00		$ 2,274,400.00		$ 3,411,000.00

*Does not include potential right-of-way cost

5.3 Other Study Elements

5.3.1 Connectivity to Cultural Center

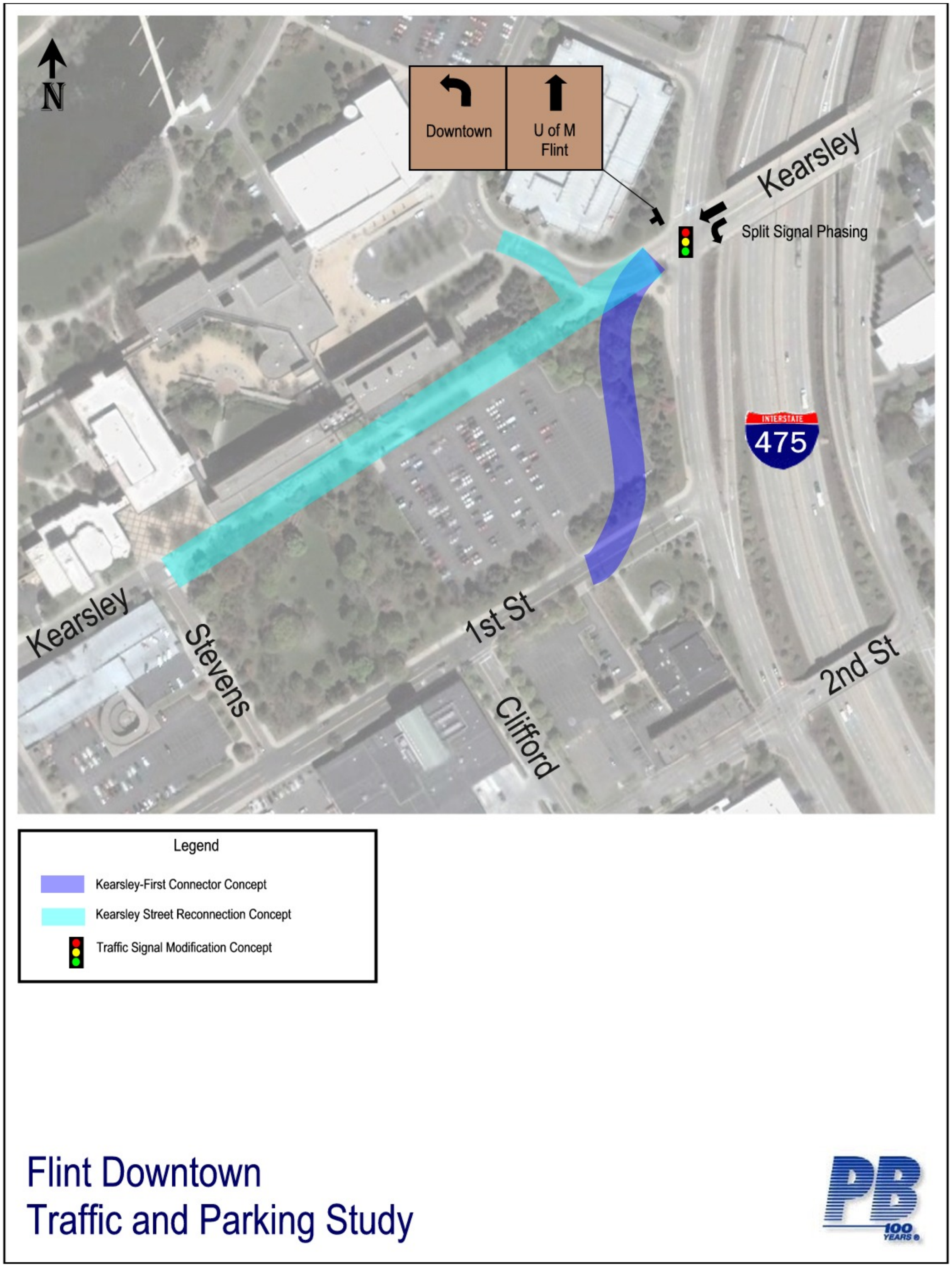
Connectivity between downtown and the Cultural Center was identified as a key stakeholder issue, and has been the focus of both the recent Cultural Center and University of Michigan Flint Master Plans. Conversion of Kearsley Street between Chavez Drive and Harrison Street to a pedestrian mall by the university years ago has severed the logical connection between these two areas, forcing traffic to travel circuitous routes to make this connection.

The recent master plans prepared for the Cultural Center and the University of Michigan Flint have proposed a new Kearsley-to-First connector roadway, as depicted in Figure 5-11, to improve this connection. This new roadway would require reconfiguration of an existing university parking lot. While this proposed connector roadway would improve connectivity between downtown and the Cultural Center, a preliminary engineering review has found the alignment necessary to connect the Kearsley Street over I-475 bridge to First Street, along with the necessary connection into the university, would not likely meet geometric requirements for intersection spacing, sight distance, and other design criteria. Furthermore, 1st Street would not provide good connectivity further to the west along the Flint River corridor towards Kettering University.

It is recommended that reconnection of Kearsley Street be considered in order to address the desired connection between the Cultural Center and Saginaw Street. The nature of this roadway should be low-speed and pedestrian-oriented, consistent with the context of the adjacent university facilities and proposed redevelopment south of Kearsley Street, including focus on developing a walkable environment with a narrow-width vehicular travelway, to discourage use of this route as a primary traffic throughway east-to-west across downtown. This recommendation would require close discussion and coordination with the University of Michigan Flint to see how this modification could be accommodated within the university's recommended vision for the south campus area.

An interim solution, depicted in Figure 5-11, could incorporate the use of enhanced signal phasing and signage to emphasize the connection to 1st Street and the downtown area. This would require modifications to the existing traffic signal to enable split-phase operation.

Figure 5-11: Connectivity Options Between Downtown and Cultural Center



5.3.2 3rd Street Parking Mall

The constrained parking conditions within downtown, and in particular along the central Saginaw Street corridor, precipitated investigation of innovative opportunities to increase on-street parking. One such concept was the conversion of portions of 3rd Street (between Beach and Harrison Streets) into a "parking mall", where parking is maximized within the public right-of-way, with the minimum necessary circulation to access the parking areas. These blocks of 3rd Street would be physically closed to through traffic, with entering access only from Saginaw Street, and traffic exiting only to the adjacent north-south streets.

The two blocks of 3rd Street under study have a curb-to-curb width of 33', with 10' sidewalks on either side. Options for enhance parking within these blocks were studied utilizing design standards as documented in the AASHTO Guidelines for the Design of Highways and Streets (the "Green Book") and the Institute of Transportation Engineers (ITE) Traffic Engineering Handbook. The following are the key findings of this investigation:

- 45^0 angle parking is only feasible on one side of the roadway in order to provide sufficient aisle width for vehicular circulation. This configuration would result in no net parking gain as compared with parallel parking on both sides of the roadway.
- 90^o angle parking is not feasible within the roadway footprint.
- Expanding the curb-to-curb width of the roadway is not feasible, as it would encroach in the minimum desirable sidewalk widths to accommodate pedestrian circulation through the area.

Based on these findings, it was therefore determined that it is not feasible to utilize 3rd Street to expand the on-street parking supply along the Saginaw Street corridor.

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6.0 RECOMMENDATIONS

6.1 Roadway Network Improvements

Based on the findings in the alternatives analysis, a Recommended Alternative is proposed based largely on the roadway network of Alternative 2, as shown in Figure 6-1. The roadway network improvements would result in two-way traffic on all east-west roadways north of Court Street, thereby eliminating the partially functional one-way couplet system, reducing confusion and travel distances, particularly along Kearsley and Second Streets. In addition, the alternative would result in the conversion of Grand Traverse Street to two-way traffic, while maintaining the largely effective north-south one-way couplet system of Church/Beach and Harrison/Clifford.

Unlike Alternative 2, it is recommended that parallel parking be retained along Saginaw Street. Based on observed traffic volume levels, potential for operational issues, and the utility of the roadway as the primary north-south artery through the study area, installation of angled parking, and the resulting loss of two travel lanes, could have a negative impact on mobility and safety along the corridor. However, it should be noted that parking turnover and time limit enforcement is noted as the most significant challenge to the effective use of parking along Saginaw. It is strongly recommended that parking time limits be strictly enforced along Saginaw Street, where high turnover parking is critical to the existing and proposed businesses along the corridor. Further discussion on parking enforcement can be found in Section 6.2.

In addition, the proposed three-lane cross-section for Grand Traverse Street between Kearsley and I-69 under Alternative 2 was found to result in potential queuing issues during the PM peak hour. As a result, it is recommended that Grand Traverse Street be configured as a three-lane cross-section with a fourth lane that would be used for parking during the majority of the day, but would have parking restrictions during the PM peak period, allowing use as a second southbound traffic lane. This configuration would provide sufficient capacity to maintain acceptable operations, while providing a more scaled roadway cross-section during non-peak hours. Proposed typical cross-sections for Grand Traverse Street and other recommended street modifications are shown in Figure 6-2.

6.2 Parking Recommendations

Addressing long-term downtown parking needs will require a combination of initiatives aimed at increasing parking system efficiency through enforcement, and re-allocation of long and short-term parking. These changes to the parking system will improve the use of some outlying parking areas and paid parking that have additional capacity. Similarly, the parking regulations, enforcement and potential restoration of paid parking typically has the effect of reducing the single passenger-parked vehicle mode of transportation by encouraging more individuals to utilize car-pooling, ride sharing and public transportation. These changes to the modal split or method of travel can help to reduce the actual parking demand in an urban area.

Increased parking enforcement will have the effect of displacing employees who are currently parking on street. However, since Flint has practiced parking enforcement in the past, it is practical to assume that employees will return to their previous parking locations, ideally off-street. The intended result is to increase the available supply of customer and visitor parking in the short-term. On-street customer/visitor parking is very important to the success of the Flint’s retail sector.

Long-term parking demand is expected to grow beyond the capacity of the existing parking system, even with the efficiency related improvements outlined in the recommendations. Plans to address these long-term parking needs should include the currently proposed Uptown Corporation parking structures. These three potential parking structures are all located adjacent to blocks that need the most parking. While each individual parking facility is too small to address the overall parking demand for the downtown area, the combined projects will aid addressing most of the expected ten-year parking demand scenario.

Figure 6-1: Recommended Alternative Roadway Network

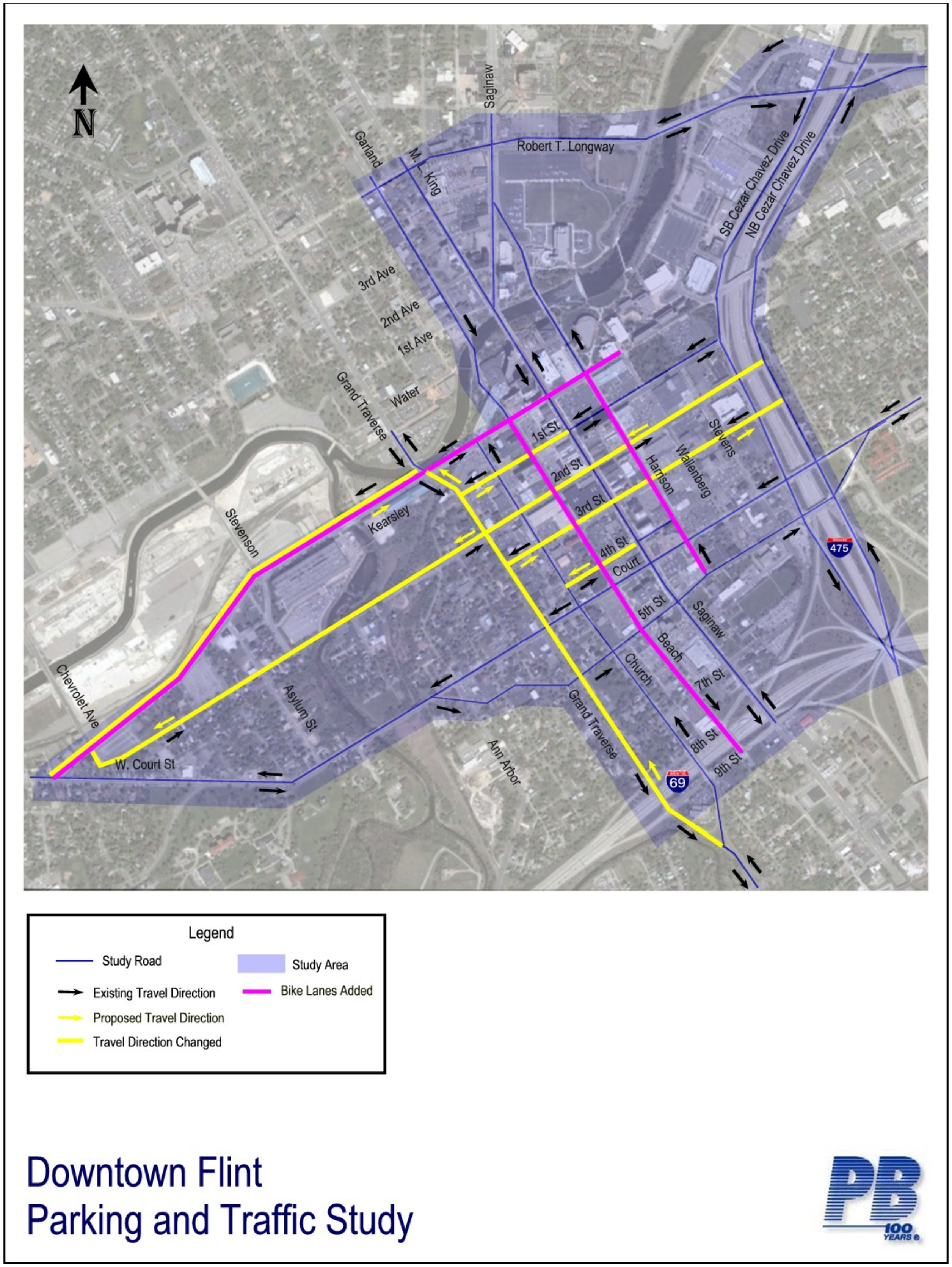


Figure 6-2: Recommended Typical Cross-Sections

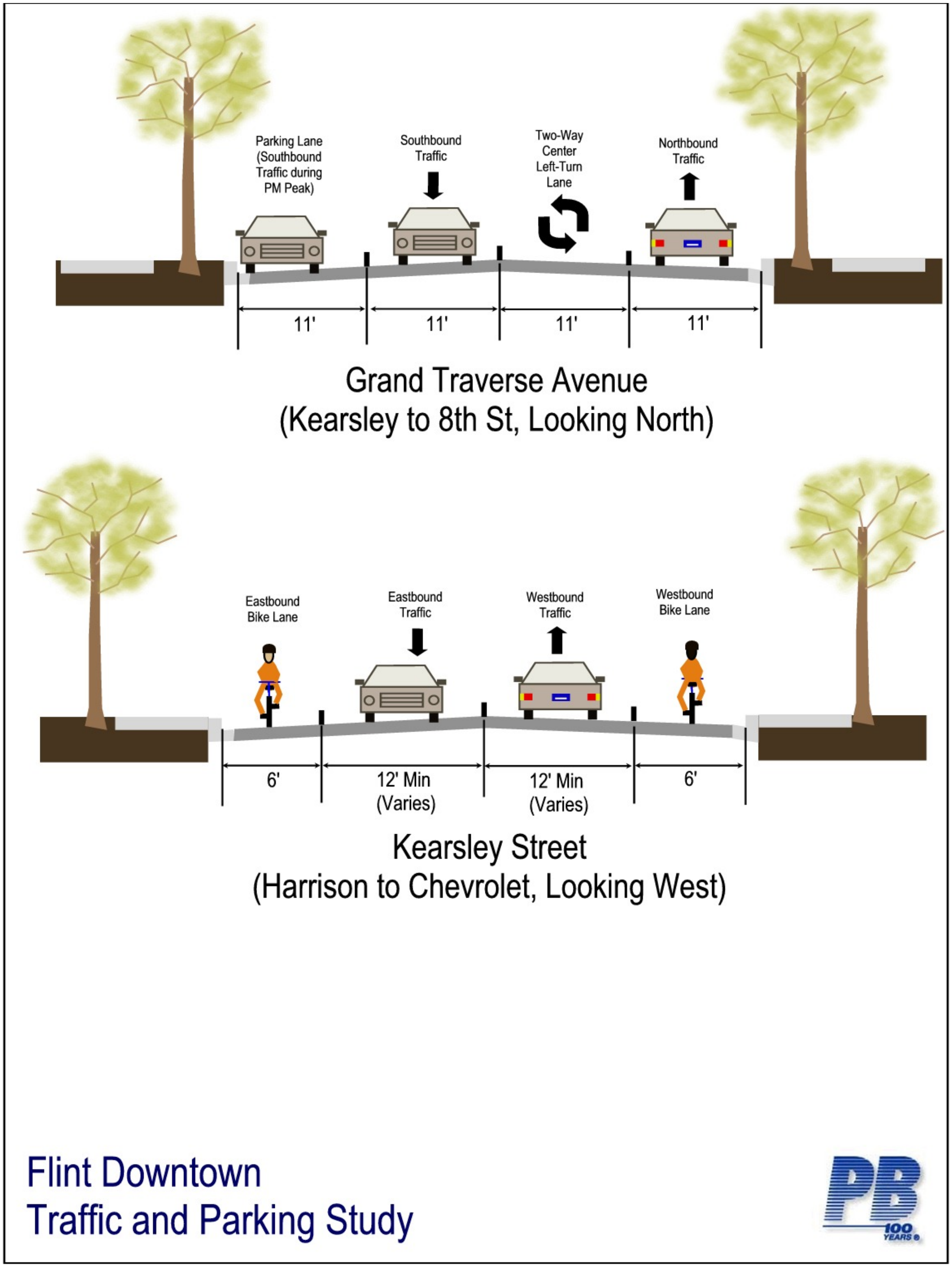
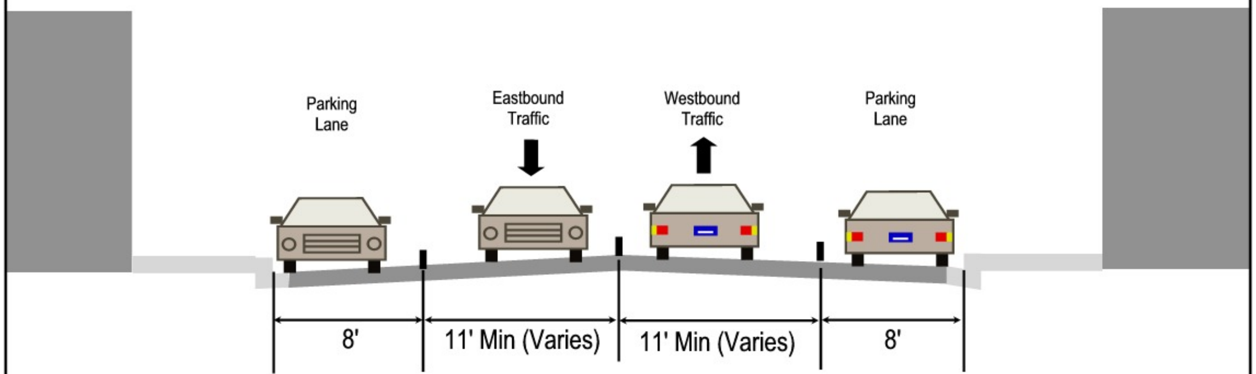
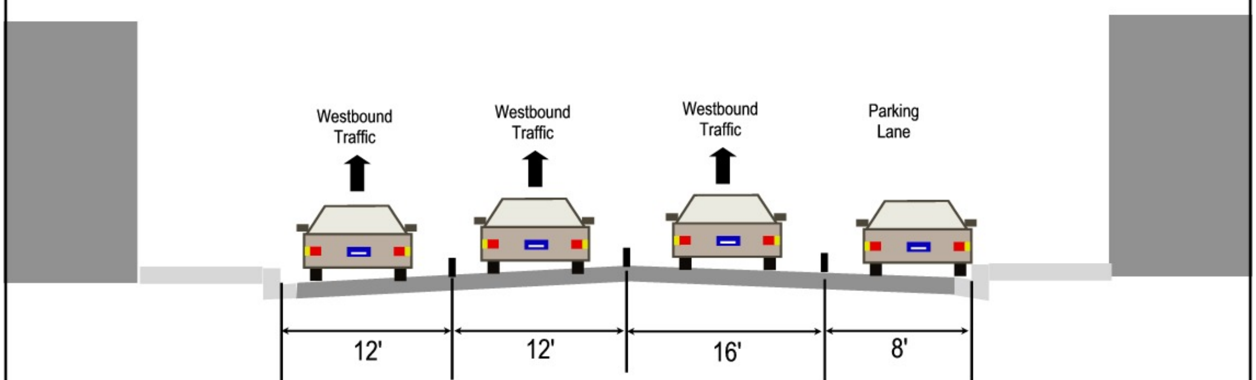


Figure 6-2 (Cont.): Recommended Typical Cross-Sections



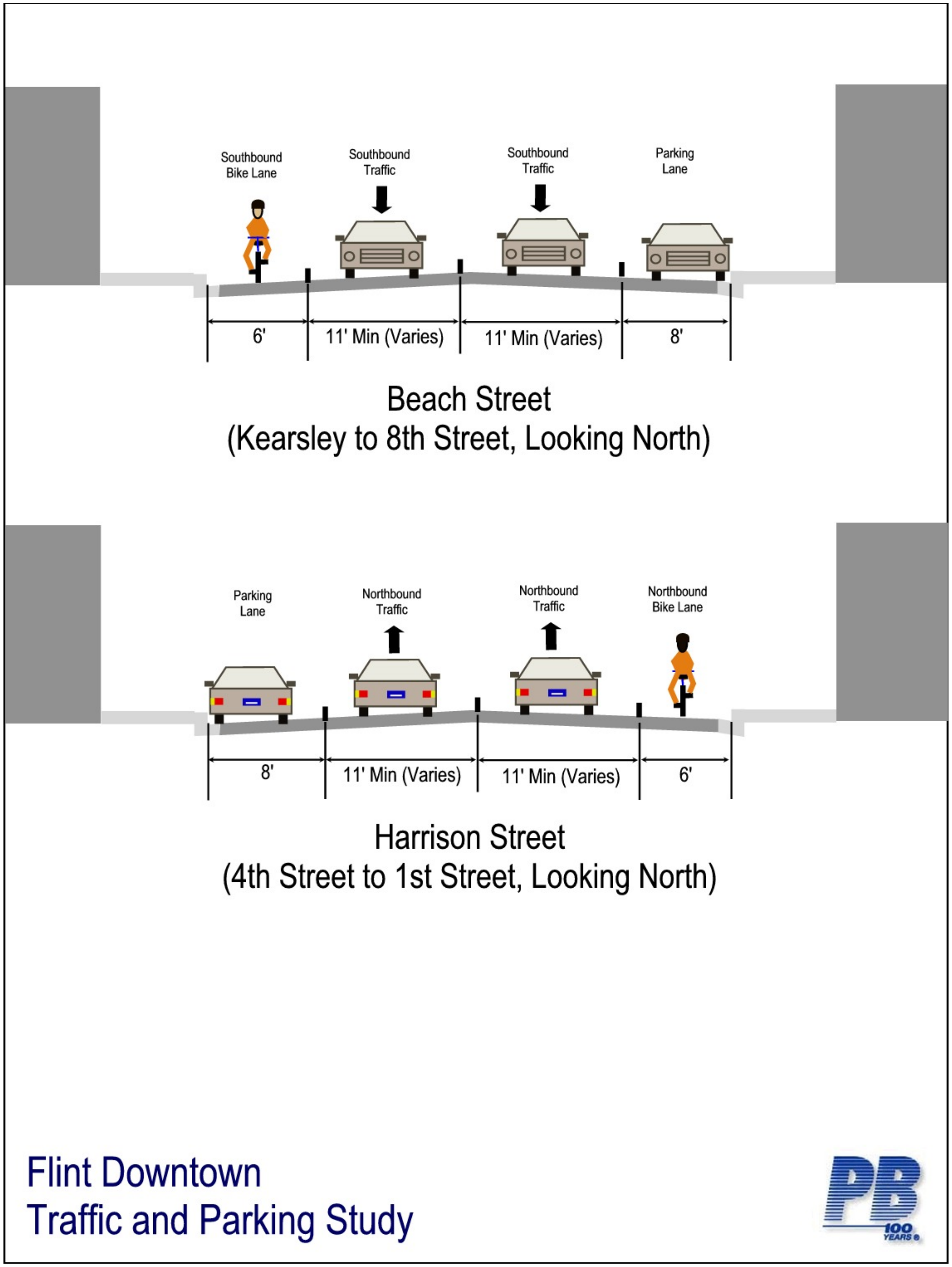
1st, 2nd and 3rd Streets
(Grand Traverse to Clifford, Looking West)



Court Street
(Stevens to Grand Traverse, Looking West)

Flint Downtown
Traffic and Parking Study

Figure 6-2 (Cont.): Recommended Typical Cross-Sections



Further consideration should be given to other alternatives for new parking provision. The McCree parking ramp owned by the County would offer another potential source of new parking if this aging facility were to be re-built. A larger new facility, possibly covering the entire block, should be considered to increase the available public parking in the downtown core. Likewise, it is recommended that private parking areas in the downtown core be obtained, either through ownership or operating agreement, to be used as public parking. As public parking, these parking areas could service a greater number of users and adjacent land uses through shared use.

Finally, it is recommended that existing public parking in the downtown be land-banked, as provision of this parking is crucial to the overall public parking needs in downtown Flint. This is particularly true for the DDA lot located at Saginaw, Kearsley, Harrison and First Streets. This central parking lot services virtually all of the adjacent land uses and is very important to the economics of the downtown area. Should potential future public/private joint venture projects for this parking area be proposed, the opportunity to build additional public parking capacity in a structure should be sought.

New Parking Opportunities Summary:

- Increase efficiency of existing system through enforcement and paid parking.
- Possibility of additional on-street capacity (pending design review).
- Need to see through with proposed Uptown corporation new parking schemes.
- Expanded new McCree parking structure.
- Acquisition of private parking to use as public parking.
- Land bank existing central DDA lot as a joint public/private venture if opportunity arises.

6.2.1 Near-Term Parking Recommendations

Parking Enforcement

Parking enforcement is more crucial than ever in Flint since most of the parking meters have been removed due to vandalism. Enforcement ensures that the parking system continues to function efficiently by keeping long-term parking activity in designated areas and preserving on-street parking for downtown customers and visitors. The absence of enforcement will lead to employee parking and other long-term parking activity to take place on street, which will result in reduced availability of customer and visitor parking

<u>Description</u>: 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 from 9:00 am until 5:00 pm, six days per week. Actual staffing will depend on whether full or part-time enforcement officers are utilized. Some communities choose part-time officers to help reduce staffing costs.

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. Routing is the pattern of the officer enforcement beat or walk. Time limited public parking stalls need to be observed once per duration maximum. Specifically, a two-hour parking needs to be observed by an officer every two hours from 9:00 am until 5:00 pm., six days per week.

Handheld ticket writers should be used in order to track ticket issuance, repeat offenders, shuffling activity and revenue. The handheld technology allows for varying fine amounts to help discourage repeat offenders. By increasing the fine for individuals that accumulate unpaid parking fines, the rate of collection should also be increased. Additionally, improper parking activity is reduced due to a consistency in monitoring parking and issuing tickets. Handhelds also allow for the issuance of a courtesy ticket to first time offenders. These tickets inform someone that they have parked improperly, and directs them to alternate parking locations and thanks them for visiting Flint.

Responsibility: Parking enforcement needs to be undertaken comprehensively under a single management structure for the entire downtown area. Many communities assign this function to a DDA or undertake enforcement as a City department function. In most cases, police department supervision of parking enforcement results in an individual being assigned to a multitude of duties. The result is that enforcement is undertaken inconsistently.

Recommendation: Consider assigning parking enforcement for the entire downtown area to an agency willing to accept responsibility. They in turn will hire and administer parking enforcement, potentially using the enforcement function as a 'downtown ambassador program' helping to promote Flint. The number of officers hired and operating budget should be adequate to ensure comprehensive coverage of all of the public parking system that requires enforcement. Additionally, parking enforcement should also be undertaken using handheld ticket writing technology.

Alternative: As an alternative to assigning parking enforcement to the DDA, consider contracting out the entire parking enforcement function to a private parking operator. Operators typically create proposals that include parking enforcement and management packaged together for a set parking revenue percentage or flat rate to a community. They also undertake ticket collection and remit revenues per the terms of their operating agreement to the involved parties from the City, County and DDA.

Parking Tickets:

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

Graded Fines: 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 occasional offender. The goals of the graded fine are to discourage parking infractions and to aid in ticket collection before the tickets go into the court system.

A graded fine example for overtime parking:

- 1st ticket – Courtesy ticket, no financial penalty.
- 2nd ticket - $20.00, reduced to $5.00 if paid the same day.
- All subsequent tickets the same $20.00, reduced to five 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 $100.00 each with no reductions.
- Illegal parking infractions (such as at a fire hydrant or in a handicap parking stall remain the same).

Courtesy Ticket: 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 Flint, indicating to them that they have parked improperly and then advises them of parking locations that would better suit their needs. A map of the parking system on the reverse of the ticket is also helpful. Courtesy tickets are intended to allow leniency for customers and visitors coming to Flint, as well as informing employees of the downtown where they should be parking. The tickets also work well with changes to the parking system that may temporally confuse parkers.

Anti-Shuffling Ordinance: In order to ensure that employees cannot park in the customer/visitor parking areas, It is important to prevent what is commonly called the two-hour shuffle. Since most of the on-street parking in Flint is two-hour, it is possible for employees to park on street and then move their vehicle at morning break, lunch and then at afternoon break. By moving every two hours to another on street parking stall, they are technically obeying the parking regulations and avoiding a ticket. However this also takes parking away from customers and visitors.

<u>Responsibility</u>: Parking ticket rates and anti-shuffling ordinances need to be established by the City of Flint

<u>Recommendation</u>: Update the fine structure and implement ordinances to allow for graded fines and anti-shuffling parking regulations

Handheld Ticket Writers:

Parking ticket issuance will be complicated with the implementation of courtesy tickets and graded fines. Handheld ticket writers resolve these issues since the devices can keep a database that uses license plate information to track tickets and infractions. The officer follows an established route and inputs information for every parking stall on that route. The information is either the parked vehicle's license plate number or a blank for no vehicle parked. The handheld then recognizes if the vehicle has shuffled, parked overtime and whether there are outstanding tickets by using its internal database.

<u>Responsibility</u>: Agency in charge of parking enforcement. Flint DDA enforcement personal previously used handhelds. Some software upgrades and or new handhelds may be necessary.

<u>Recommendation</u>: Use handhelds to aid parking enforcement. Budget up to $35,000 if new handhelds are necessary.

Parking Fund:

Parking ticket revenue will be needed to aid in paying for the enforcement personnel. In the short-term, parking fine revenue should be placed into a parking fund to offset parking operation costs, or alternatively collected by the City. The City then administers the parking enforcement contract with the agency charged with parking enforcement using fine revenue to help pay for enforcement.

<u>Responsibility</u>: City of Flint.

<u>Recommendation</u>: Deposit fine revenue in a parking fund to help pay for parking enforcement related costs.

One Hour Parking On Saginaw:

Consider changing the on street parking on Saginaw from two to one hour. Parking studies conducted throughout the Country by Rich and Associates has revealed that 85% of customers and visitors use a parking stall for less than one hour. Only a select few businesses truly need more than one-hour of parking for their customers. These businesses will still have access to two-hour parking as only the stalls on Saginaw are affected.

One hour parking along Saginaw would effectively double the number of parking stalls available to a Customer or visitor by creating a higher turnover of vehicles parked. For example, two hour parking permits four different vehicles to use a single stall over the course of an eight-hour day. One hour parking permits eight different vehicles to use a single stall over the course of an eight-hour day. The optimal turnover is dependant of adequate enforcement of the on street parking stalls.

<u>Responsibility</u>: City of Flint.

<u>Recommendation</u>: Reduce the on-street maximum duration for on street parking stalls on Saginaw between Kearsley and Court Streets to one-hour and enforce accordingly.

Parking Signs:

Parking enforcement hinges on the legal ability to issue tickets. In order to ensure that everyone and especially customers and visitors are aware of where they can park and for how long they can park it is imperative that adequate signs be installed.

Previously, each meter had a sticker that indicated the hours of enforcement and the maximum duration for the on street parking in Flint. Since these meters are being removed, signs must be installed to inform parkers of the pertinent information pertaining to the parking regulations. Generally, Rich and Associates recommends that there be one on-street parking sign per block face, two for longer block faces, or as necessary to indicate changes

<u>Responsibility</u>: City of Flint.

<u>Recommendation</u>: Implement new on street parking signs throughout the downtown area. Budget $5,000

6.2.2 Mid Term Parking Recommendations

Parking Signs (con't):

The overall parking system would benefit from a comprehensive way finding system. Parking areas are difficult to find if someone is not familiar with the City. The one-way street system compounds this problem. A comprehensive vehicular and pedestrian way finding program would address these issues and make Flint a more customer and visitor oriented community.

<u>Responsibility</u>: City of Flint.

<u>Recommendation</u>: Implement new on street parking signs throughout the downtown area. Budget $50,000

Marketing:

Marketing is an often-overlooked component of a quality parking system. Review of Internet web pages and other information about Flint, including advertising for special events revealed that parking information is inadequate. All information pertaining to the City should include information on parking. Flint's one-way street system is confusing for individuals who are not familiar with the community and map outlining various destinations and parking areas would be extremely beneficial. The map could be included in printed material and available on-line.

Other marketing initiatives can be aimed at local employers and employees that inform them of changes to the parking system and the importance of keeping on street parking available for customers and visitors. The overall parking system would benefit from a comprehensive way finding system. Parking areas are difficult to find if someone is not familiar with the City. The one-way street system compounds this problem. A comprehensive vehicular and pedestrian way finding program would address these issues and make Flint a more customer and visitor oriented community.

<u>Responsibility</u>: Joint initiative.

Recommendation: Assign/request an agency to oversee a new marketing program. Budget $5,000 annually.

6.2.3 Long Term Recommendations

County Parking Structure:

Consider seeking proposals from private developers to replace and operate the McCree parking structure. This facility is reaching its maximum potential life and will require rehabilitation or replacement in time. As rehabilitation may be cost prohibitive, replacement may be the better alternative for the County.

The actual parking service provided by the McCree facility is important to the operation of the local County and Federal Court facilities. In the interest of maintaining parking service as the primary function for the McCree parking structure, the County should consider inviting replacement proposals from private developers and parking operators. The goal would be to have a private operator construct and operate a new parking facility of adequate capacity on the County site to service local parking needs.

Responsibility: County.

Recommendation: Consider inviting proposals from private developers and parking operators for the replacement of the County parking structure.

Alternative: Begin planning to replace the McCree parking structure with a new County facility. Seek out potential State and Federal grant sources. Initiate a replacement project consulting on design possibilities and project delivery models.

Public/Private Parking Opportunities:

Various development proposals are being considered in the Community that could present joint development opportunities for parking provision. Current parking supplies are close to capacity and in order to accommodate new development and the infill of vacant building space, all possible options to provide new parking should be considered.

Ideally, some communities adopt a policy of seeking out joint ventures for parking provision. Using such a model helps provide parking and encourages development by sharing the cost of parking infrastructure. From the City's perspective, new development brings new tax base opportunity and from the developer's aspect, sharing the cost of provision reduces the overall cost of a development project.

Responsibility: City of Flint/parking agency.

Recommendation: Consider potential proposals from private developers to joint venture on public parking opportunities.

Alternative: Develop a policy framework for joint parking development that describes what the City of Flint would be willing to consider for a joint parking project.

Land-Banking Opportunities:

Currently Flint has a number of private parking lots that are underutilized a various times of the day. In some cases, the lots have barriers to traffic or are signed to keep out non-customer vehicles. These parking areas could be considered for acquisition by the City for public parking.

The City could purchase these parking areas outright to use as public parking or negotiate with the private landowners to allow for the use of these parking areas as public parking. The City would need to assume responsibility for insurance liability, management, cleaning and parking enforcement. The key benefit is an increase in the public supply of parking and the maximization of the shared use potential of the available parking.

Responsibility: City of Flint/parking agency.

Recommendation: Consider acquiring private parking areas to use as public parking. Amalgamate small lots into larger parking areas.

Alternative: Negotiate with private owners for the use of parking as a public parking area.

On Street Parking Meters:

Parking is easiest to enforce and operates the most efficiently when the user also pays a portion of the cost of parking. The introduction of an economic decision making element into the parking process helps to achieve the goals of higher turnover in short-term parking stalls, more parking for customers and visitors and to provide a means of paying for repairs, replacement and upgrades to the parking system.

Consideration should be given to having a long-term goal or replacing the on street parking meters. These meters help to generate revenue and control the parking. A better option for the City then installing individual space meters is to utilize multi-space meters similar to what has recently been implemented in Detroit. These meters are more difficult to vandalize, allow for inexpensive price changes and can handle a variety of payment options.

Responsibility: City of Flint/parking agency.

Recommendation: Consider installing multi-space meters on street. These meters require signs to identify each stall with a numerical reference number, along with a multi-space meter placed on each block face.

Alternative: Replace the individual space meters on street.

Parking, Repair & Replacement Fund:

Parking will require substantial investment over the long-term. Likewise, there is the potential to generate revenue to offset costs from the parking system. Pooling parking revenues or some portion of the parking revenues, would allow for the establishment of a parking repair and replacement fund.

Responsibility: City of Flint/parking agency.

Recommendation: Establish a parking repair and replacement fund.

6.3 Enhancement Opportunities

6.3.1 Wayfinding

Wayfinding is becoming increasingly popular as a means not only to guide vehicular and pedestrian traffic, but to create a sense of place and an enhanced aesthetic environment within the public right-of-way. In addition to the recommended roadway operational changes, wayfinding could plan an important role in better orienting and directing traffic to major destinations and parking facilities. This could aid in not only improving the visitor experience to downtown Flint, but also enhance utilization of major parking facilities by providing more positive guidance for visitors to reach them. Figure 6-3 illustrates an example wayfinding signage concept.

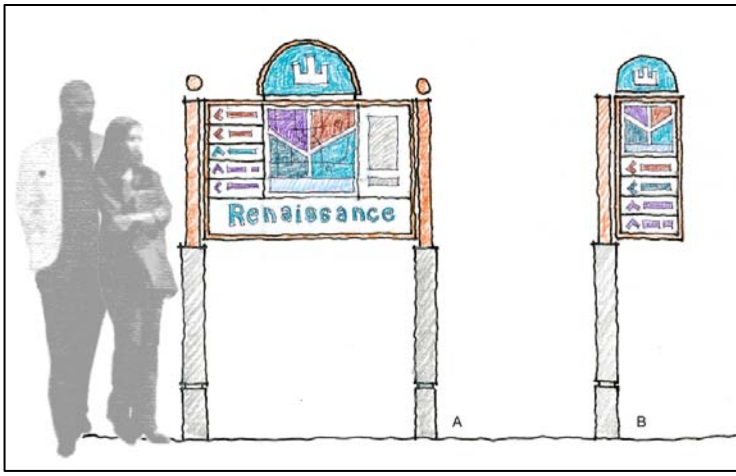


Figure 6-3: Wayfinding Signage Example

While improvements of this nature are typically funded through municipal funds, a public/private partnership may be possible, given the potential benefit to downtown businesses. Programs like the MDOT Logo Signing program or Tourist Oriented Directional Signs (TODS) could be explored. The Logo signing is a program offered by the Michigan Department of Transportation (MDOT) that permits eligible businesses to place their logos on Specific Service Sign panels along designated freeways. The logo signs are erected to provide identification and directional information to the traveling public for key services. TODS is a sign program which provides directional signing for eligible tourist attractions located off the state rural roadway system. These programs are administered by a private entity under the supervision of MDOT. These two programs or some variation of the programs can provide a public/private partnership thus reducing or eliminating public dollars from being spent within this program. Another possible funding mechanism would be the *Surface Transportation Program- Enhancement* (*STPE)* funds do to the street enhancement nature of the signs.

6.3.2 Parking Bump-Outs

Parking bump-outs, as illustrated in Figure 6-4, provide a multitude of benefits for pedestrians in a downtown environment. In locations with on-street parallel parking, parking bump-outs extend the sidewalk into the parking lane area at intersections where parking would not otherwise be allowed. Provision of this extended sidewalk space has the following positive effects:

- By extending the sidewalk into the roadway, the perception of a narrower traveled way can result in traffic calming along the roadway.
- The additional sidewalk space allows for greater pedestrian refuge and amenities, and opportunities for aesthetic improvements.
- The pedestrian crossing distances are shorter, enhancing the pedestrian environment as well as improving traffic signal operations in some cases.

Figure 6-4: Parking Bump-Out Example

Bump-outs have been increasingly employed in downtown areas as a means to enhance both the aesthetic environment and pedestrian experience. While parking bump-outs could be employed at numerous locations throughout downtown given sufficient funding, Saginaw Street would be an ideal location to implement bump-outs, given the pedestrian-oriented environment, parallel parking, and scale of storefronts along the corridor.

6.3.3 Enhanced Crosswalks

Increasing the visibility of crosswalks can have a significant positive effect on pedestrian safety, as well as increasing the prominence of pedestrian movements in the roadway environment.

A number of options existing for increasing crosswalk visibility, including use of paint for high-visibility “zebra stripe” crosswalks (as illustrated in Figure 6-4), or use of pavers or pavement texturing, as shown in Figure 6-5, which raise a driver's awareness through increased noise and vibration. This can be a low-cost method of improving the downtown pedestrian environment and in some cases significantly increase pedestrian safety.

Figure 6-5: Textured Crosswalk Example

6.3.4 Countdown Pedestrian Signals

“Countdown” pedestrian signals provide pedestrians with a numeric countdown to indicate how much longer until the end of the crossing phase. These devices have rapidly gained in popularity in recent years, and are seen as a positive pedestrian amenity, allowing people crossing the roadway to better understand the available time to complete the crossing. The result is a reduced rate of pedestrian-vehicle crashes, and increased emphasis on the non-motorized environment. These signals are most useful at locations with long crossing distances and high volumes of pedestrian traffic, and may be appropriate along Saginaw Street and other roadways within downtown Flint.

6.4 Implementation and Phasing

6.4.1 Recommended Project Phasing

Due to the nature of the proposed operational changes to the study area roadway network, careful consideration should be given to the phasing of project implementation to assure that each interim phase yields a functional roadway network. Should phasing be required due to funding constraints or other considerations, the following approach is recommended:

Phase 1 – Grand Traverse Street

It is recommended that conversion of Grand Traverse Street from one-way to two-way operation be conducted as the first phase, as the improvement has a stand-alone utility, and will not negatively impact operation of adjacent streets. This phase should include intersection radius adjustments and signal improvements along Grand Traverse Street necessary to fully implement the ultimate configuration of cross-streets. Signal indications should be added for the future two-way conversion of Kearsley, 1st, 2nd and 3rd Streets, although they would not be made operational until later phases proceed.

An optional sub-phase for Grand Traverse Street is the exclusion of improvements to the Grand Traverse/Church Street intersection from the initial implementation. The northbound lane could instead begin at 9th Street, thereby allowing all traffic to and from I-69 to utilize Grand Traverse Street in two directions. However, without ultimately addressing the Grand Traverse/Church Street intersection, continuity of the corridor as a through route will not be achieved.

In addition, Phase 1 could include striping and signage improvements along Beach Street, Harrison Street and others, where a more significant operational change is not recommended. This would enable provision of additional on-street parking spaces and new bike lanes at low cost, as a way to build public support for the overall goals of the project.

Phase 2 – Kearsley/2nd Streets

Kearsley and 2nd Streets are the primary east-west arteries proposed for conversion to two-way operation, and are "paired" in that they currently provide one-way connections between downtown and the western portion of Flint. This phase would include all necessary signal replacements and striping/signage improvements for full conversion of these two roadways.

Phase 3 – 1st, 3rd and 4th Streets

The final phase would include conversion of the remaining east-west streets to two-way operation.

This recommended phasing plan is based on both operational considerations and relative benefits of each improvement. However, should the opportunity or need to accelerate an improvement arise based on development activity or other reasons, careful consideration should be given to the affects of that stand-alone modification on circulation.

6.4.2 Estimated Cost and Funding Opportunities

Given constrained financial conditions in Flint and across the State, estimated cost and funding options are in important consideration for implementation of any planned improvements. Table 6.1 details the estimated implementation cost for the Recommended Alternative.

Table 6.1: Recommended Alternative Cost Estimate

Item	Units	Unit Cost	Recommended Alt. Quantity	Recommended Alt. Cost
Signal Replacement	Each	$ 75,000.00	26	$ 1,950,000.00
Intersection Radius Adjustment*	Each	$ 10,000.00	4	$ 40,000.00
Pavement Markings	Per Block	$ 2,000.00	81	$ 162,000.00
Traffic Signage Updates	Per Block	$ 400.00	81	$ 32,400.00
Grand Traverse/Church Intersection Improvements	Lump Sum	$ 90,000.00	1	$ 90,000.00
Harrison/Saginaw Intersection Improvements	Lump Sum	$ 75,000.00	0	$ -
		Engineering (10%)		$ 227,440.00
		Contingency (20%)		$ 454,880.00
		TOTAL ALTERNATIVE COSTS:		$ 2,274,400.00

*Does not include potential right-of-way cost

As illustrated in Table 6.1, the anticipated cost for implementing the Recommended Alternative is $2.35 Million, with over $2 Million of that cost attributed to the replacement of traffic signals. Again, while there may be limited potential to modify the existing traffic signals to accommodate conversion to two-way operation, it is assumed that, due to the age of the equipment, full replacement will be required. Table 6.2 presents an approximate breakdown of this cost by roadway.

Table 6.2: Implementation Costs by Corridor

Roadway	Limits	Implementation Cost*
Grand Traverse Road	Church to Kearsley	$591,400.00
Kearsley Street	Wallenburg to Chevrolet	$193,200.00
First Street	Saginaw to Grand Traverse	$354,300.00
Second Street	Cesar Chavez to Chevrolet	$663,000.00
Third Street	Cesar Chavez to Grand Traverse	$431,700.00
Fourth Street	Saginaw to Church	$4,800.00
Beach Street	9th Street to Kearsley	$24,000.00
Harrison Street	5th Street to Kearsley	$12,000.00

*Note: Estimated cost by corridor does not take into account the sequencing of intersection improvements. Depending on the ultimate phasing scenario, additional costs will be required for early projects that may then be reduced during later projects where intersection improvements overlap.

A number of funding programs could potentially be leveraged to support these improvements. *Congestion Mitigation and Air Quality (CMAQ)* funding has been secured recently by other agencies in the region for signal retiming programs and signal improvements. Along with *CMAQ* funding, *Surface Transportation Program- Urban (STPU)* funds are another option for conducting signal modernization projects. CMAQ is a federal grant program, and requires no local matching funds.

A summary of traditional and innovative funding sources can be founding Appendix E.