

## MEMORANDUM

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April 7, 2010

TO: Board of Mayor and Aldermen

FROM: Carl Baughman, P.E., Traffic/Transportation Engineer  
Eric S. Stuckey, City Administrator

SUBJECT: Study of West Main Street and 11<sup>th</sup> Avenue Improvements

### **Purpose**

The purpose of this memo is to report to the Board of Mayor and Aldermen (BOMA) the results of the Engineering Department study of possible improvements for the intersection of West Main Street and 11<sup>th</sup> Avenue.

### **Background**

Over the years there have been multiple requests and concerns expressed by citizens regarding the intersection at West Main and 11<sup>th</sup> Avenue. Within the past year, the Police Department received the citizen concern regarding the sight distance at the northeast corner of the intersection. During this same timeframe the City's Traffic Engineer also received citizen comments and suggestions regarding changes to the intersection. In late 2009 the Engineering Department performed an investigation of the accident experience and field conditions here, and found that sight distance limitations were a factor in certain crashes. A proposal to set back the parking along the two Main Street approaches was submitted to the surrounding residents in the form of a survey for their consideration. The consensus was to keep the parking as it is, therefore the Engineering Department, in accordance with the Central Franklin Area Plan, has performed this overall intersection improvements study. During the course of this study it became known that two crashes occurred within a year-and-a-half in which rain contributed to property damage crashes to the fence at 1022 West Main on the northeast corner.

The study consisted of various data collection and analysis items, specifically traffic volumes, speeds, parking patterns, and crash investigations. Various issues of the current intersection were identified, and various options for improvements were developed based on these issues. The alternatives were evaluated in a matrix as to how the options addressed the problems, toward choosing the most beneficial options.

### **Data**

This intersection was last studied in 2006 in response to a Mayor's Ward meeting. There was no action taken as a result because there was no superior alternative for improvement. Now in early 2010 we have updated data from which we can identify intersection trends. Specifically, the volume trends are as given in Table 1:



**Table 1 - West Main Street at 11<sup>th</sup> Avenue Volume Trends 2006-2010**

Direction	Westbound	Eastbound	Southbound	Northbound	Overall
2010 ADT <sup>1/</sup>	4430	4690	2160	880	12,160
2006 ADT <sup>1/</sup>	4300	4020	2900	950	12,170
Trend pattern	+5%	+24%	-26%	-8%	-0.01%
By street	West Main Street +15% (+4% annually)		11 <sup>th</sup> Avenue -21% (-5% annually)		

<sup>1/</sup> 24-hour volume by direction given

Clearly the volume trend is for increasing traffic on the West Main thoroughfare, such that the distribution of intersection traffic is now 75% Main and 25% 11<sup>th</sup> (formerly 68% Main and 32% 11<sup>th</sup>). This result presents a strengthening case for the continuation of free flow on Main Street.

Regarding peak hour level of service, the critical period is the afternoon with Level of Service C conditions under the two-way Stop control; the morning peak hour operates at LOS B. LOS C represents minimum acceptable delay and flow conditions. The available stacking distance between the offset 11<sup>th</sup> Avenue legs is about 75 feet although the lane is not dedicated for stacking. Left turn stacking in the eastbound direction exceeds the available distance about 30% of the time with the maximum stacking length about 100 feet. While left turn stacking in the westbound direction is not critical in the afternoon and in the morning, note that all of the 11<sup>th</sup> Avenue through traffic becomes West Main Street left turn traffic because of the negative offset of 11<sup>th</sup> Avenue. In other words, the available 3-car distance between the 11<sup>th</sup> Avenue legs is marginally sustainable for left turn stacking. Regarding pedestrians, there were so few observed during the six hours of manual traffic counting as to not be worth counting.

Regarding speeds, a speed sample of 340 vehicles collected on Thursday morning March 18, 2010 at 1110 West Main Street showed a prevailing speed of 35 mph eastbound and 38 mph westbound. The highest speed recorded was 40 mph (westbound going away from the intersection) representing about 1% of the sample.

From on-site visits, citizen concerns and data collection efforts the problem conditions at the intersection were identified as given in the columns of Table 2. The impacts of various improvement options are related to the problem conditions in the cells of the table.

**Options**

**Table 2 - West Main Street at 11<sup>th</sup> Avenue Intersection Impacts**

Improvement Options	Problems				
	Negative offset of 11 <sup>th</sup> Av legs	Single lane on all intersection legs	Parking along Main Street	Damage to nearby fence	Speeding on W Main St
Left turn lanes on W Main <sup>1/</sup>		LTL warranted both directions, consumes shldr	LTL will set back parking	Lane shifting may better direct Lt turns	Horizontal deflections slow speeds
Prohibit left turns off 11 <sup>th</sup>	Improves LOS, but worsens WB stacking	Traffic diverts to nearby neighborhoods			
Mini-circle (at 11 <sup>th</sup> N only) <sup>2/</sup>		Consumes shldr, introduces wrong way movements	Short parking setbacks on approaches	Re-directs left turns around circle	Travel speeds would be @ 20 mph±
Traffic Signal at entire intersection <sup>3/</sup>	Creates very long intersection clearance times	Not effective without LTL on Main Street	Adds delay but meets warrants		
All-way Stop control	Adds extreme delay and confusion	Stacking on Main St. blocks driveways		May minimize damage, but unwarranted	Every vehicle decelerates & accelerates

<sup>1/</sup> Likely to require easement for relocation of utility pole

<sup>2/</sup> Likely to require Right-of-Way for placement of mini-circle

<sup>3/</sup> Likely to require Right-of-Way for signal support placement and sidewalks

Combinations of improvements are also possible, for instance separate left turn lanes on West Main Street could be installed without or with signalization. Stacking and the resulting interference from the internal left turns on West Main Street would be reduced by removing the through traffic from the left turn movements such that a signal would be unwarranted. The overall LOS would significantly improve to LOS A both morning and afternoon under the two-way Stop condition. The separation of the left turns and thru traffic in the internal area of the intersection facilitates flow for both Main Street and 11<sup>th</sup> Avenue motorists. There would be some slowing of Main Street traffic from the lane shifting needed to traverse the intersection, but the tapers would extend onto the shoulders and require parking setbacks to be approved by Ordinance. An added benefit would be improved NE and SW corner sight distance for needed safety enhancements. There would also need to be proper clearance established from a utility pole on the north side of the intersection, provided that a pavement core sample indicates sufficient load bearing capability of the shoulder pavement. To revise the markings to this extent on West Main Street would be done by milling of the asphalt and a new overlay surface for placing the new markings. The estimated cost of this improvement is about \$42,000, exclusive of the costs for the utility pole easement and relocation.



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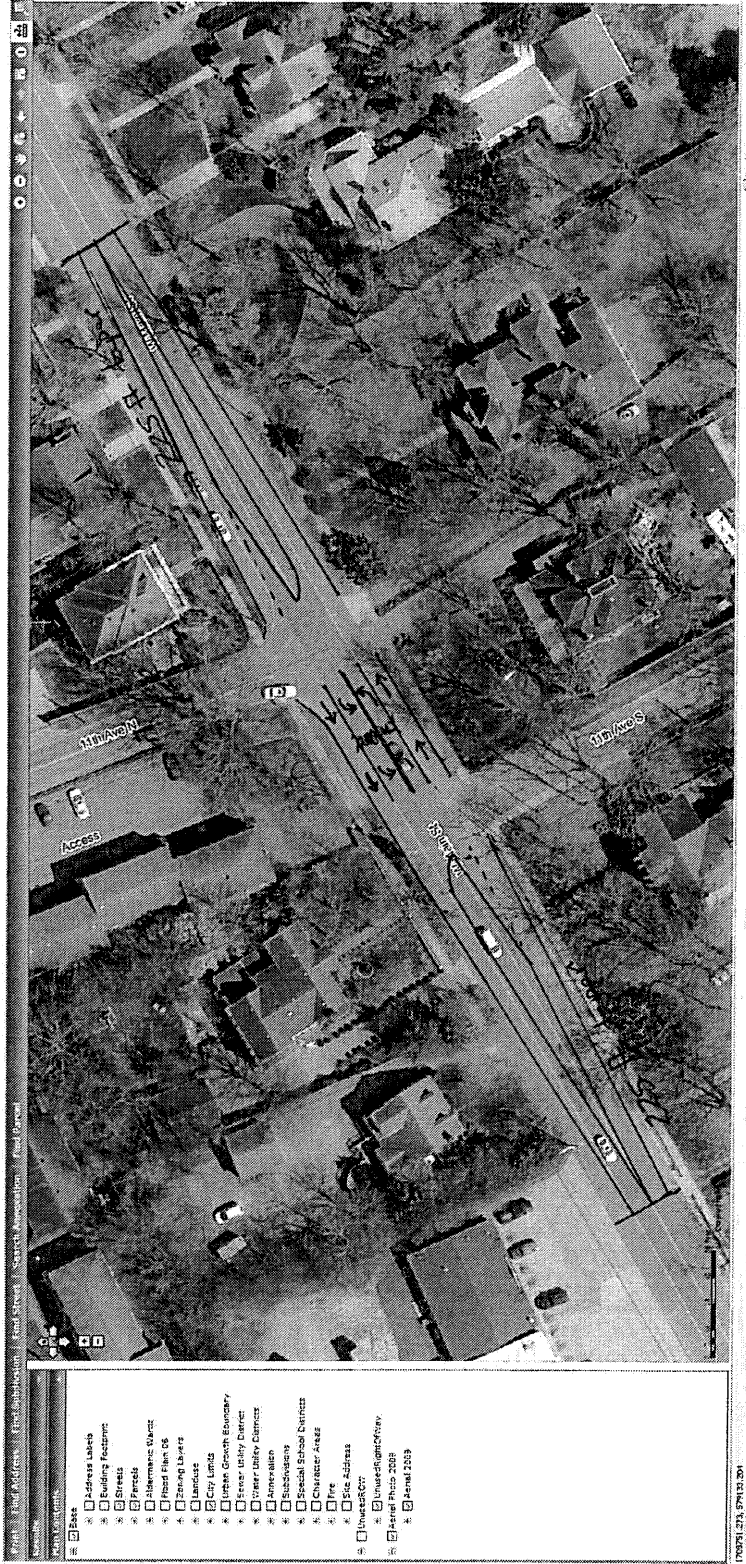
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The other options are either too problematic or expensive with the possible exception of prohibiting left turns from 11<sup>th</sup> onto Main; that worsens the internal stacking condition by eliminating the breaks in southbound approach flow occurring from left turning vehicles. The mini-circle would cost about \$80,000 and a traffic signal would cost about \$150,000, exclusive of the Right-of-Way costs.

### **Recommendation**

Per the discussion following Table 2, the optimum recommendation for intersection improvements is to install side-by-side left turn lanes internal to the intersection; this would include tapers for the Main Street thru lanes and parking setbacks to accommodate the added travel lanes. The estimated cost of \$42,000 plus utility pole adjustment costs could be funded by the Signal CIP budget or other project budget as an intersection improvement. If this recommendation is considered not worthwhile, then no action would be the condition with its continuing marginal operation and safety record.

Attachments



WEST MAIN & 11TH AVE

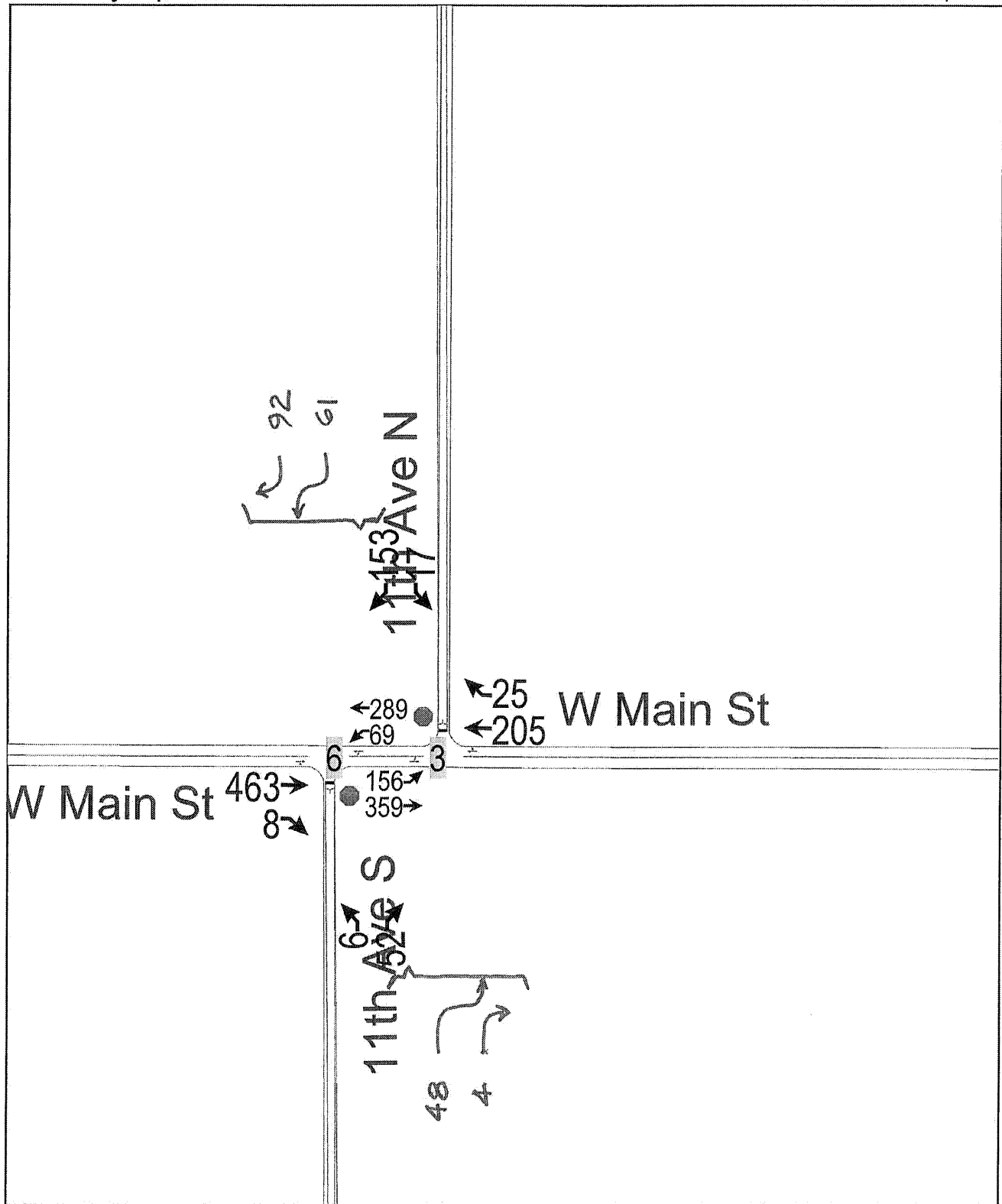
Left turn lane recommendation

1 in. = 100 ft.

CBB 4/01/10

W Main St @ 11th Ave  
Exist 2-Way Stop Control

AM Peak Hour Volumes  
Counted Feb. 23, 2010

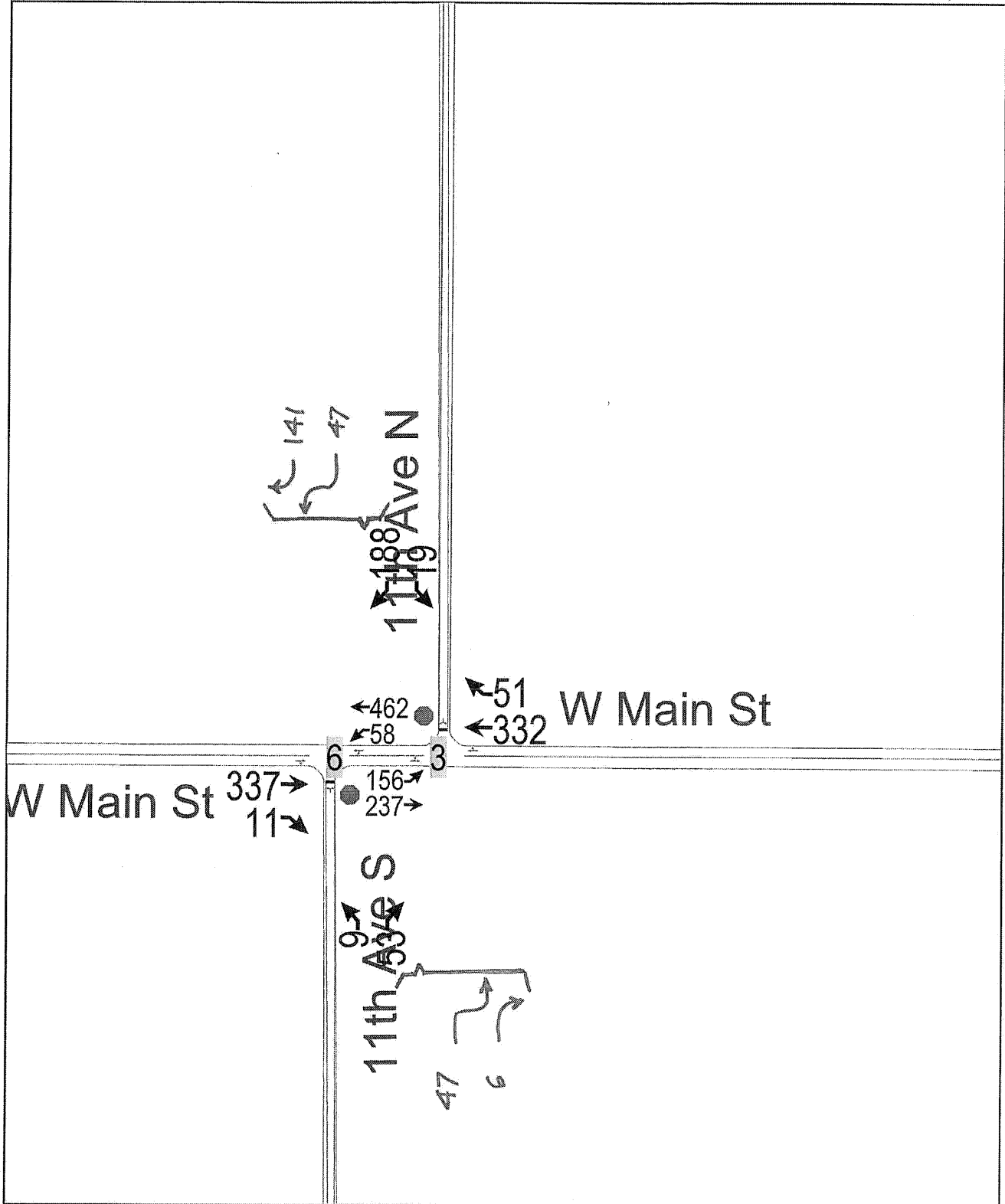


Exist TWSC  
CBB

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4/7/2010

W Main St @ 11th Ave  
Exist 2-Way Stop Control

PM Peak Hour Volumes  
Counted Feb. 23, 2010



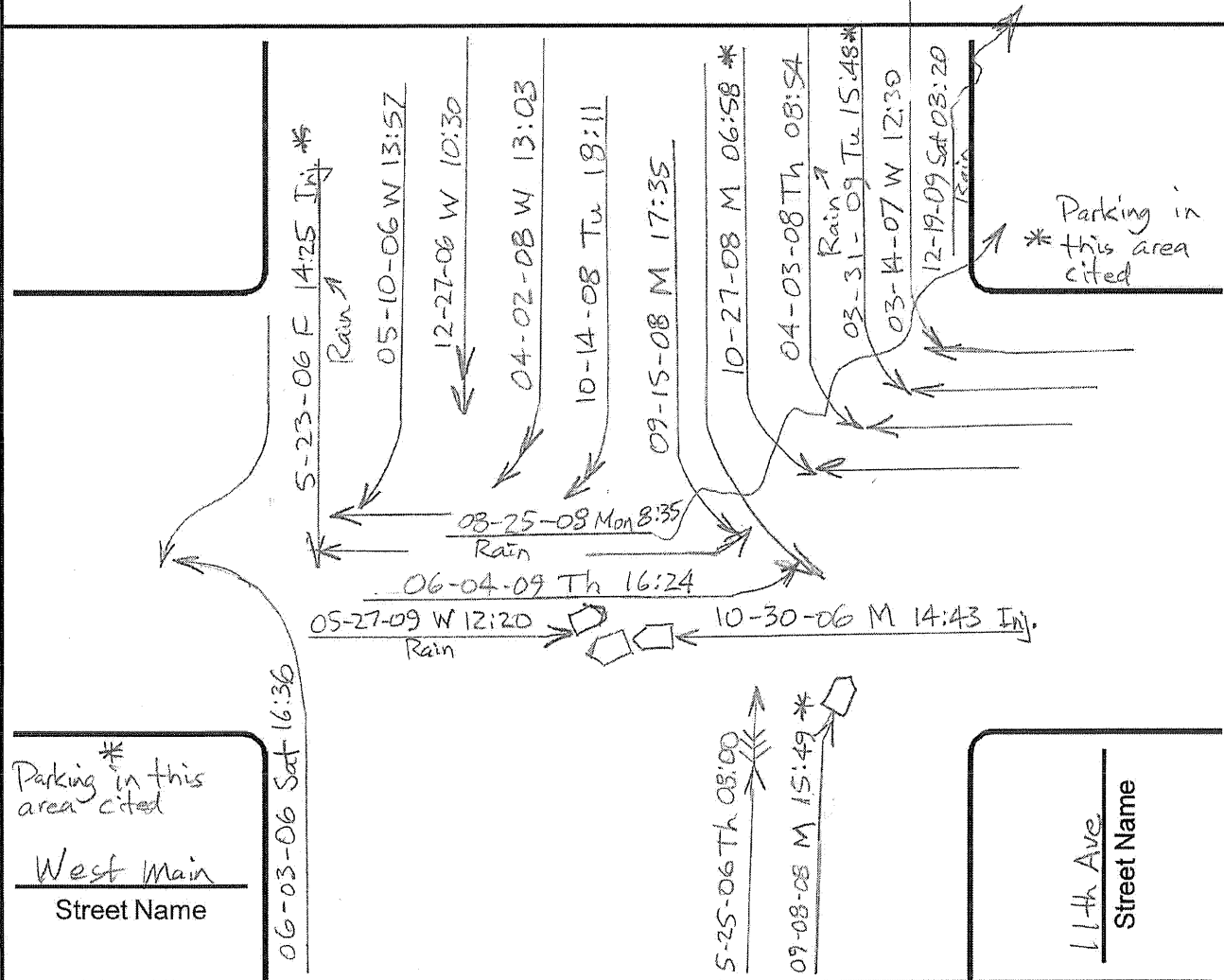
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION  
**COLLISION DIAGRAM**

FORM 750-020-05  
 TRAFFIC ENGINEERING  
 10/99

LOCATION ID: West Main Street at 11th Avenue  
 COUNTY: Williamson CITY: Franklin  
 PERIOD: 01/06 TO 12/09 PREPARED BY: Carl Baughman



\* Parking in this area cited  
West Main  
 Street Name

11th Ave  
 Street Name

COLLISION SYMBOLS		CONDITION CODES	
	VEHICLE PATH		REAR-END COLLISION
	BACKING VEHICLE		HEAD-ON COLLISION
	NON-INVOLVED VEH.		SIDE SWIPE
	PEDESTRIAN PATH		OUT OF CONTROL
	FIXED OBJECT		OVERTURNED VEHICLE
	PARKED VEHICLE		LEFT TURN COLLISION
	PERSONAL INJURY		RIGHT ANGLE COLLISION
	FATALITY		
		PAVEMENT CONDITION: D= DRY W=WET I=ICY	
		WEATHER CONDITION: C= CLEAR R= RAIN F= FOG S= SNOW	
		LIGHT CONDITION: L= DAYLIGHT N= NIGHT (DARK)	
		TIME OF DAY (MILITARY)	

CRASH SUMMARY				
	PROP. DMG ONLY	INJURY	FATAL	TOTAL
DAYTIME	15	2		17
NIGHTTIME	1			1
TOTAL	16	2		18