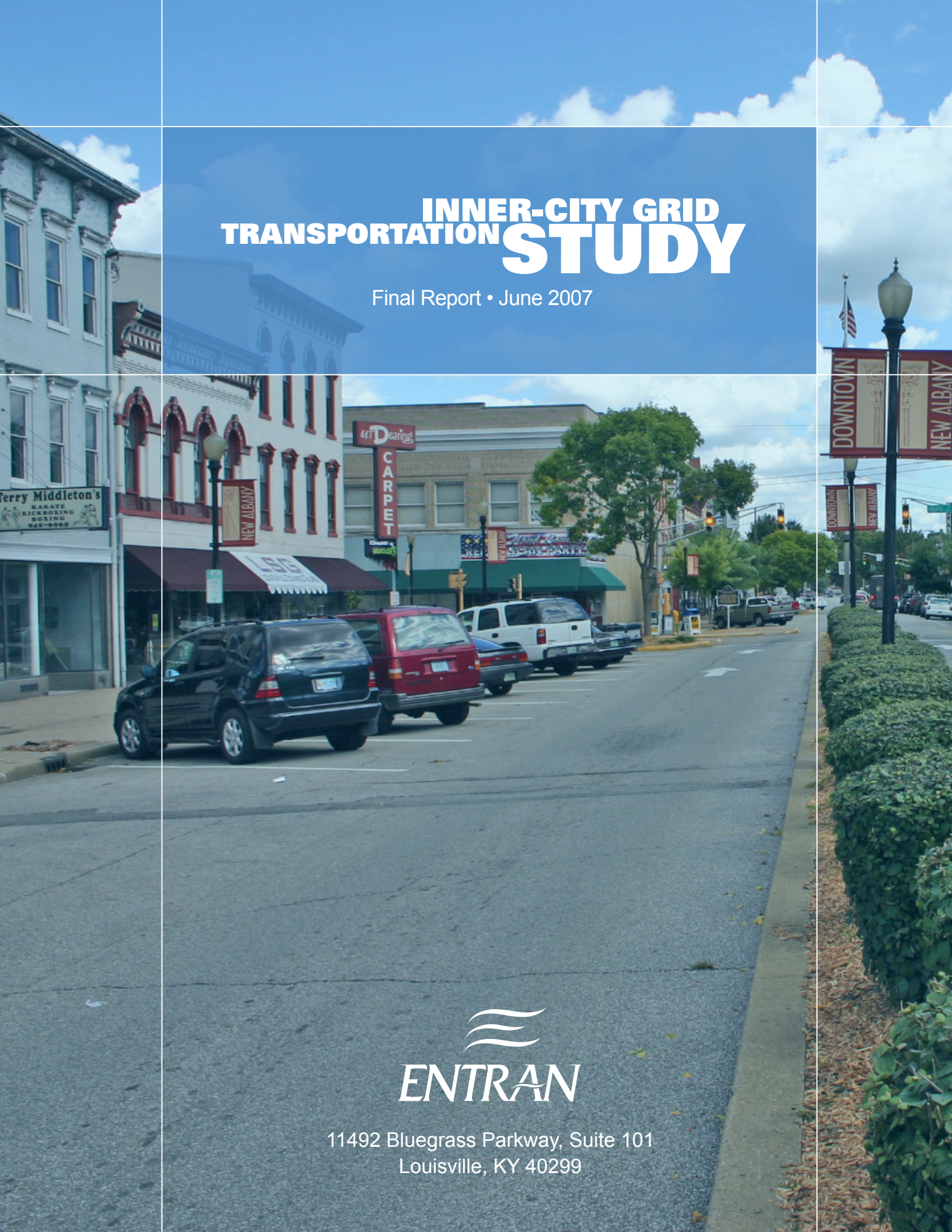
INNER-CITY GRID TRANSPORTATION STUDY

Final Report • June 2007

Submitted to
The New Albany Board of
Public Works and Safety

Submitted by
ENTRAN, PLC

ENTRAN
ENGINEERING INFRASTRUCTURE SOLUTIONS



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ENTRAN

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Executive Summary

The New Albany Inner-City Grid Transportation Study was undertaken to identify solutions to make transportation in Downtown New Albany safer and more pedestrian friendly. This study has been undertaken to seek feasible strategies to more effectively manage traffic within the downtown area to improve efficiency, safety, and the quality of life of neighborhood residents. Through a collaborative effort with the public, local government agencies, and the business community, this study sought strategies aimed at enhancing mobility in a responsible manner.

The goals of Inner-City Grid Study were to examine traffic calming solutions that would make the downtown street system more pedestrian friendly and to gauge public desire for converting portions of the existing one-way street system to two-way traffic. If through community input it was determined that such conversion was desirable, options that best-utilized the existing facilities were to be developed to accommodate two-way traffic.

With direction from the study goals and public comment, the following alternatives were developed:

1. No-Build (Do Nothing Alternative)
2. Low-Build Traffic Calming
3. High-Build Traffic Calming
4. Two-Way Street Conversion

The goal for the traffic calming alternatives is to decrease the average travel speeds for all motorists. By doing so, these alternatives can make the roadways safer for all users, including pedestrians, bicyclists, and motorists. A combination of point-type traffic calming measures that tend to reduce speeds at a particular location and measures that calm the entire streets should be implemented in combination to ensure that overall travel speeds are reduced and not just speeds at particular locations. The Low-Build alternative was developed as an effort to achieve some of the benefits of traffic calming in a cost-effective manner. This alternative uses speed tables, reduced lane widths, curb extensions, and bicycle lanes to affect the motorist's perception of the type of facility on which they are traveling.

The High-Build Traffic Calming Alternative builds upon the Low-Build Alternative by introducing a series of more costly techniques, including gateway treatments, raised intersections, and medians. Raised intersections are located at locations where high volumes of pedestrians may be found or at locations bordering on the Central Business District (CBD) or residential areas. Gateways, features incorporated into the streetscape that provide the driver with a visual cue that they are traveling from one type of area into another, are located at areas that serve as entry points into the CBD or residential areas The High-Build Alternative also introduces a more desirable, non-traversable median on Main Street with turning lanes at major intersections.

During a public meeting, local citizens voiced their desire to pursue two-way streets in downtown New Albany. Therefore, a single two-way alternative was developed with the goal of minimizing cost and right-of-way needs. The objective was to maximize mobility and roadway capacity within the existing roadway width while maintaining parking and respecting pedestrian needs. The two-way alternative included the conversion of Elm, Spring, and Market Street to two-way traffic flow between Scribner Drive and Vincennes Street (SR 111), and Bank and Pearl Street between Main and Oak Street.

Based on analysis of the two-way alternative, it appears as though the conversion of Market Street and Bank and Pearl Street would likely be easier to implement than Elm and Spring Street. In addition, as Elm and Spring Street affect the operations of Vincennes Street and the I-64 interchange to a much larger extent than the other facilities, they will likely require significant additional study and coordination with INDOT and perhaps the Federal Highway Administration (FHWA.) Therefore, if prioritization of the conversion process were to be considered, it is recommended that Market Street and Pearl and Bank Street be considered first. While outside the study area, if the conversion of Spring Street or

Market Street to two-way traffic is pursued further, consideration should be given to extending the two-way operations to the west to provide continuity as West Spring Street and West Market are currently two-way west of West Fifth Street.

1.0 Introduction

The New Albany Inner-City Grid Transportation Study was undertaken to identify solutions to make transportation in downtown New Albany safer and more pedestrian friendly. The project is needed because traffic and congestion have increased steadily over the years, and traffic speeds are contributing to the problem. Average travel speeds on streets within the study area are well above the posted speed limits. Vehicle crashes are on the rise as well – approximately 711 crashes were reported on streets within the study area between 2004 and 2006, and 172 of those crashes resulted in one or more injuries.

The City of New Albany contracted ENTRAN to seek feasible strategies to more effectively manage traffic within the downtown area to improve efficiency, safety, and the quality of life of neighborhood residents. Through a collaborative effort with the public, local government agencies, and the business community, the goal of this study is to recommend strategies aimed at enhancing mobility in a responsible manner. The focus area for the study is highlighted in **Figure 1-1**.

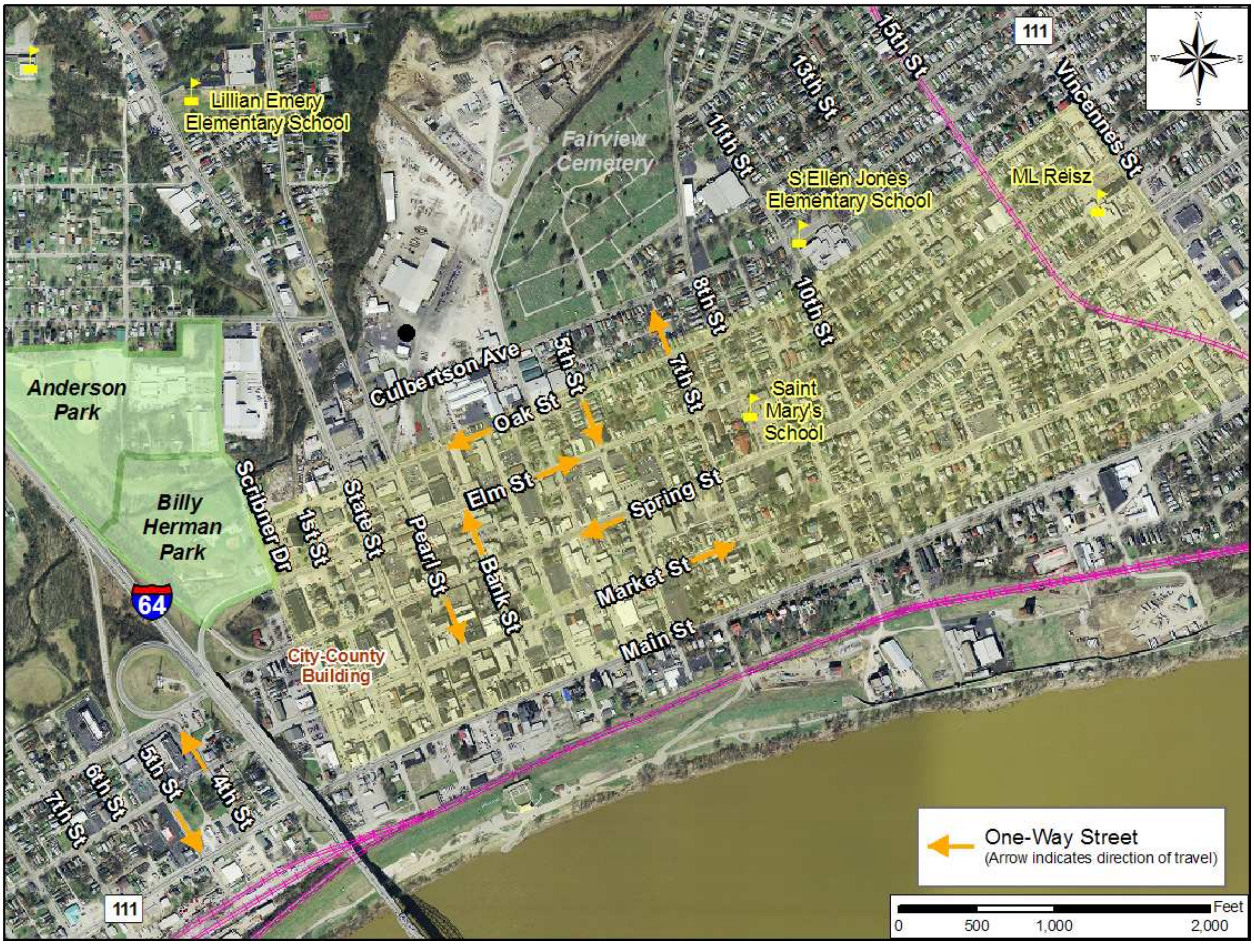
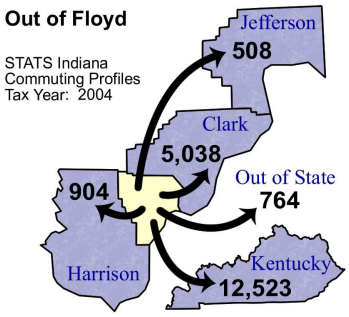


Figure 1-1: Study Area

The project began with two underlying goals. The first goal was to examine traffic calming solutions that would make the downtown street system more pedestrian friendly. The second goal was to determine the community desires with respect to converting portions of the existing one-way street system to two-way traffic and to gauge impacts to the transportation system if such changes were deemed desirable. If through community input it was determined that such conversion was desirable, options that utilized the existing pavement width were to be developed to accommodate two-way traffic.

According to Indiana commuting pattern data, Floyd County had a labor force of 47,486 in 2004, with 20,393 (43%) working outside the county. Of those, 12,523 had to cross the Ohio River each day to work in Kentucky. Statistics such as these highlight the importance of an efficient transportation system and the historical need for providing efficient ingress and egress for Floyd County and New Albany. However, as the downtown continues to grow and works to attract new residents and businesses, more attention needs to be devoted to moving people and not just vehicles in the community.



1.1 Traffic Calming

The Institute of Transportation Engineers (ITE) defines traffic calming as *"changes in street alignment, installation of barriers, and other physical measures to reduce traffic speeds and/or cut-through volumes, in the interest of street safety, livability, and other public purposes."*

Traffic calming goals include the following[1]:

- Increasing the quality of life
- Incorporating the preferences and requirements of the people using the area (e.g., working, playing, residing) along the streets, or at intersections
- Creating safe and attractive streets
- Helping to reduce the negative effects of motor vehicles on the environment
- Promoting pedestrian, cycle and transit use

General traffic calming objectives include the following[2]:

- To encourage citizen involvement in the traffic calming process by incorporating the preferences and requirements of the citizens
- To reduce vehicular speeds
- To promote safe and pleasant conditions for motorists, bicyclists, pedestrians, and residents
- To improve the environment and livability of neighborhood streets
- To improve real and perceived safety for non-motorized users of the streets
- To discourage use of streets by non-citizens/cut-through vehicular traffic

Numerous traffic calming measures can be implemented to encourage motorists to drive slower or to reduce traffic volumes on streets. However, the underlying objective for each measure is that it is self-enforcing; that is, the design of the measure itself requires motorists to travel at a slower speed and does not rely on reduction of speed limits or increased law enforcement to bring about the desired result. A summary of some of the types of traffic calming measures that may be considered appropriate for implementation within a downtown area is provided in **Table 1-1**.

[1] Lockwood, Ian. *ITE Traffic Calming Definition.* ITE Journal, July 1997, pg. 22.
[2] http://www.fhwa.dot.gov

Table 1-1: Example Traffic Calming Measures

Source: Institute of Transportation Engineers (ITE) & Federal Highway Administration (FHWA)

Traffic Calming Measure	Description	Application	Impacts	Approximate Cost
Chicanes	Series of curb extensions that alternate from one side to the other, forming S-shaped curves (deviations, serpentines)	Locations where speeding is the problem Mid-block locations only	Discourage high speeds by forcing horizontal deflection Easily negotiable by larger vehicles Must be designed to prevent drivers from deviating out of their travel lane	$15,000 and up
Choker	Curb extensions that narrow the street width	Local or collector streets Pedestrian Crossings Easily negotiable by large vehicles	Reduces pedestrian crossing width Minor decrease in traffic speeds (4-14%) and volumes (20% or less) May impact on-street parking and driveway access	$10,000
Median Islands	Islands located along roadway centerline that narrow travel lanes	Wide streets Pedestrian crossings Entrances to neighborhoods	Increases pedestrian safety by providing mid-point refuge Landscaping can improve street aesthetic Minor decrease in traffic speeds (7%) May reduce driveway access	Depends on length
Raised Intersections	Flat, raised area covering entire intersection with ramps from all street approaches Often with brick or other textured materials on the flat section and ramps Usually raised to the level of the sidewalk, or slightly below to provide a "lip" that is detectable by the visually impaired	Densely populated areas	Minor decrease in overall speeds (not as effective as Speed Tables) Make entire intersections more pedestrian-friendly Can "calm" two streets at once Creates a positive aesthetic value	$30,000 and up
Speed Tables	Long, raised (3"-4") speed hump with flat section in the middle Typically long enough to accomodate entire wheelbase of passenger car Can include crosswalk	Local and collector streets or main roads through small communities	Vehicles speeds are reduced, but usually remain higher than at speed humps (typically between 25 and 27 mph) Generally less than 3 secs. Of delay per hump for fire trucks Reduced average traffic (12%) and crashes (45%) Increase pedestrian visibility and likelihood that driver yields to pedestrian	$2,500 and up
Traffic Circles	Raised islands placed in intersections around which traffic circulates Stop or yield control at intersection	Intersections of local or collector streets One lane each direction entering intersection Used where large vehicle traffic is not major concern but speeds, volumes, and safety are problems	Decrease speeds (10%) and intersection collisions (70%) Can "calm" two streets at once May require the elimination of some on-street parking Emergency vehicles typically slow to 13 mph	$3,500 and up

Figure 1-2 illustrates schematics and example photographs of these traffic calming measures. Median islands are not shown.

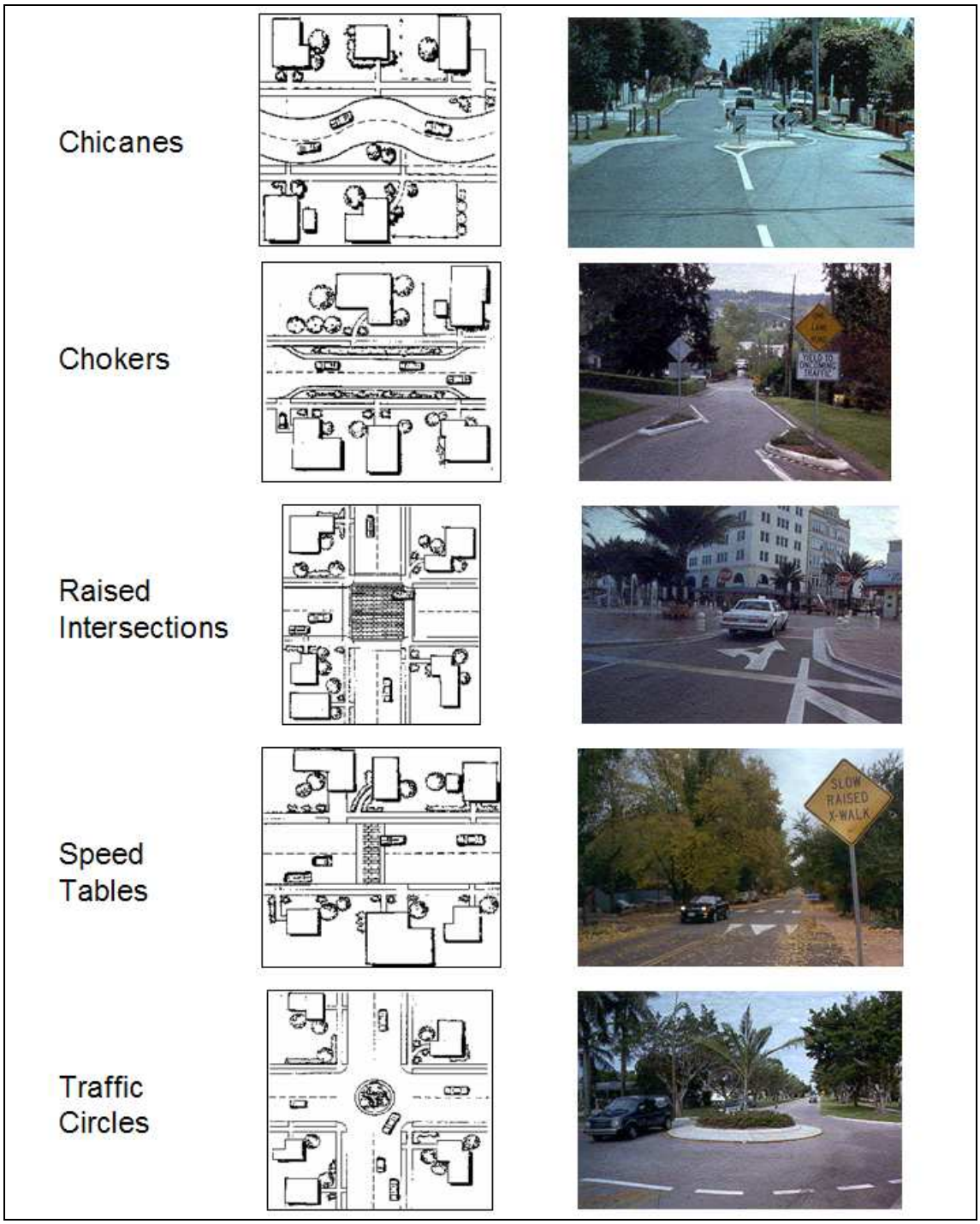


Figure 1-2: Traffic Calming Measures
Source: Institute of Transportation Engineers (ITE)

The general public often equates traffic control devices (i.e. stops signs or traffic signals) with traffic calming. However, studies have shown that using such devices in an effort to reduce speeds often has an opposite effect. Where stop signs have been placed in areas to decrease travel speeds and are not necessarily warranted for traffic control, it has been found that motorists will attempt to compensate for the delay caused by stopping by driving faster between stop signs. After a period of time, motorists will tend to disregard these stop signs and will simply slow down slightly rather than completely stopping.

2.0 Existing Conditions

The following sections summarize the existing conditions within the downtown New Albany transportation network.

2.1 Street Inventory

The study area street system consists of approximately eleven miles of roadway. **Table 2-1** provides a summary of the street characteristics for the primary roadways within the study area.

Table 2-1: New Albany Primary Street Characteristics

East-West Streets	Direction of Flow	Street Width	Parking
Oak Street	Westbound (Two-way east of Eighth)	24' - 40'	Parallel
Elm Street	Eastbound	40'	Parallel
Spring Street	Westbound	50'	Parallel
Market Street	Eastbound	40' - 100'	Parallel & Diagonal
Main Street (SR 111)	Two-way	50'	Parallel
North-South Streets	**Direction of Flow**	**Street Width**	**Parking**
Scribner Drive	Two-way	24 ' - 40'	Parallel (limited)
First Street/Hauss Square	Two-way	36' - 38'	Parallel
State Street	Two-way	52'	Parallel
Pearl Street	Southbound (Two-way north of Elm)	40'	Parallel
Bank Street	Northbound (Two-way north of Oak)	40'	Parallel
East Third Street	Two-way	34'	Parallel
East Fourth Street	Two-way	36' - 40'	Parallel
East Fifth Street	Southbound	25'	Parallel
East Eighth Street	Two-way	38'	Parallel
East Ninth Street	Two-way	24' - 40'	Parallel
East Tenth Street	Two-way	22' - 24'	Parallel
Vincennes Street (SR 111)	Two-way	44' - 52'	None

The street widths provided in Table 2-1 were estimated using planimetric drawings provided by the City of New Albany and represent the width between the curbs. Speed limits throughout the study area range from 20 to 30 miles per hour (MPH.) Through the Central Business District (CBD), on-street parking is striped; outside the CBD, parking lanes tend to not be striped.

Oak Street is a two-way residential street consisting of two travel lanes between Vincennes and Eighth Street. West of Eighth Street, Oak Street is one-way westbound with one to two travel lanes. Elm Street and Spring Street serve as a one-way couplet providing access to and from I-64 in the western portion of downtown New Albany. Elm is three lanes wide from Scribner Drive to State Street and two lanes to the east. Spring Street is three lanes wide from Vincennes to Scribner Drive. Market Street is two lanes wide between Scribner Drive and First Street and between Pearl and Vincennes Street. Between First and Pearl, Market is divided by a landscaped median with diagonal parking on one or both sides of the street; through this section, the street width is up to 100-feet wide between the curbs. The landscaped median and curb extensions through this section serve as a form of traffic calming. Main Street (SR 111) is the only two-way street that travels east-west through the entire study area.

Scribner Drive and First Street are two-lane, two-way streets traveling through the CBD. Scribner has turn lanes at major intersections. State Street is also two-lane, two-way but has turn lanes at each intersection. Pearl Street is a two-lane, one-way southbound street between Main Street and Elm Street (Pearl is two-way south of Main Street to the Ohio River levee); at Elm, Pearl becomes a two-lane, two-way street. Bank Street is two-lanes northbound between Main and Oak Street. At Oak, Bank becomes a two-lane, two-way street. East Third and East Fourth Street are both two-lane, two-way streets. East Fifth Street is one-way southbound with a single travel lane. East Seventh Street is a single northbound lane, except for the segments between Market and Spring Street and Elm and Oak Street which are two-lane, two-way. East Eighth Street begins at Spring Street as a two-way, two-lane street. East Ninth and East Tenth Street are two-way streets, but are wide enough to provide only a single traffic lane north of Spring Street as the roadways are approximately 22 to 24-feet wide with parking on both sides.

2.2 Traffic Characteristics

Current average daily traffic (ADT) volumes are not available for the downtown New Albany street network. However, the Kentuckiana Regional Planning and Development Agency (KIPDA), serving as the Metropolitan Planning Organization (MPO) for the region, maintains a travel demand model that is used to replicate existing travel conditions. **Figure 2-1** depicts the ADT volumes available from the current version of the regional travel demand model. Estimates based on recent peak hour turning movements are provided where daily traffic volumes are not provided in the KIPDA model.

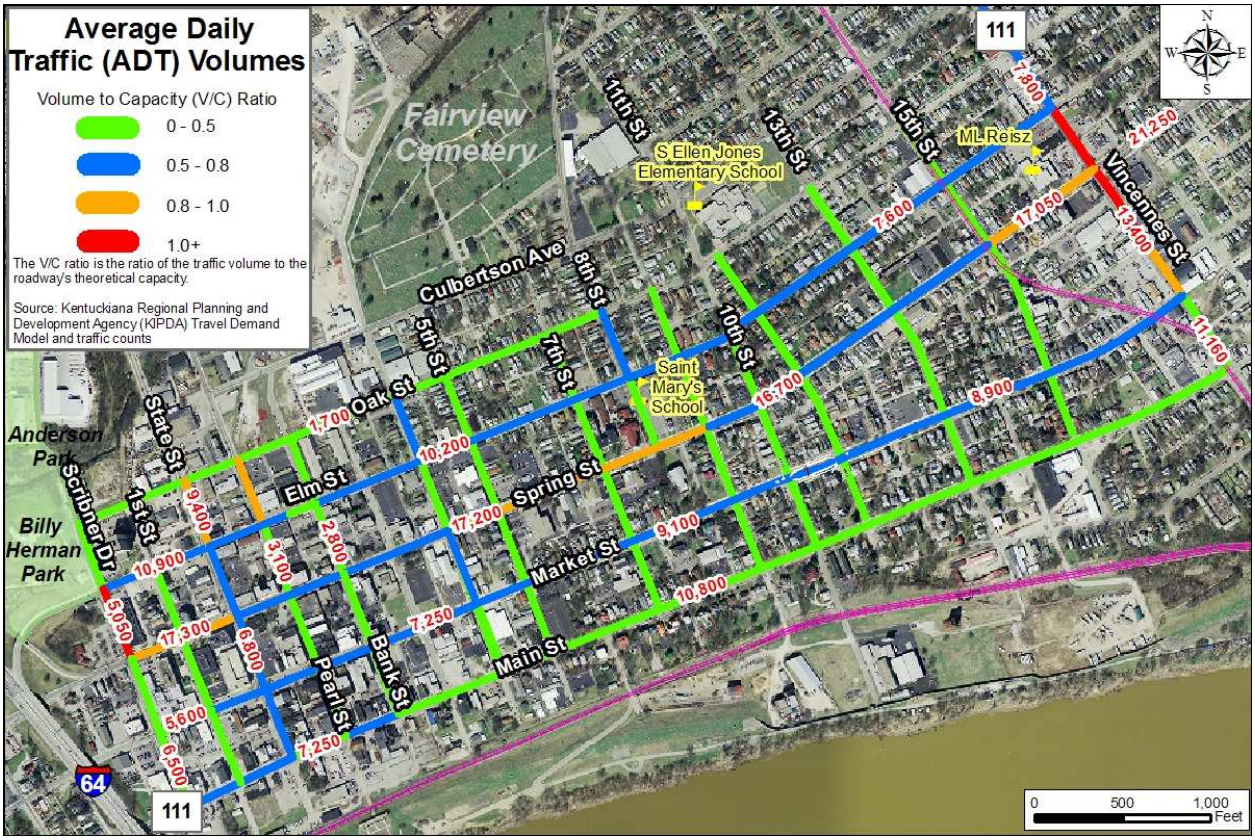


Figure 2-1: Average Daily Traffic (ADT) Volumes
Source: KIPDA regional travel demand model

Spring Street is the most heavily traveled roadway in the study area, carrying just over 17,000 vehicles per day. East of Vincennes, the existing two-way section of Spring Street increases to over 21,000 vehicles per day. Elm Street has the second-highest volume with just under 11,000 vehicles per day. The only sections of roadway that appear to be underestimated within the KIDPA regional travel demand model are Main Street and Vincennes Street in the southeast corner of the study area. According to the KIPDA model, this section of Main Street carries about 1,000 vehicles per day. However, a 2002 traffic count map produced by the Indiana Department of Transportation (INDOT) indicated this section of Main Street carried about 8,200 vehicles per day. Just north of Main Street, the 2002 count map shows approximately 11,160 vehicles per day on Vincennes Street.

Figure 2-1 also depicts the volume-to-capacity (V/C) ratios for the streets included in the KIPDA regional travel demand model. The V/C ratio is calculated as the actual daily volume of traffic along a roadway segment divided by the roadway's theoretical capacity. A V/C ratio over 1.0 indicates the roadway operates over capacity, and higher V/C ratios indicate more congested conditions. Most of the downtown street system operates well below capacity. The exceptions are the segments of Spring Street east of Scribner Drive (V/C = 0.86), between Fourth Street and Ninth Street (V/C = 0.81), and west of Vincennes Street (V/C = 0.81.) One segment of Scribner Drive between Elm Street and Spring Street is over capacity, with a V/C ratio of 1.12.

Because of its location and proximity to I-64, New Albany experiences a significant amount of "cut-through" traffic. **Figure 2-2** depicts the regional transportation network.

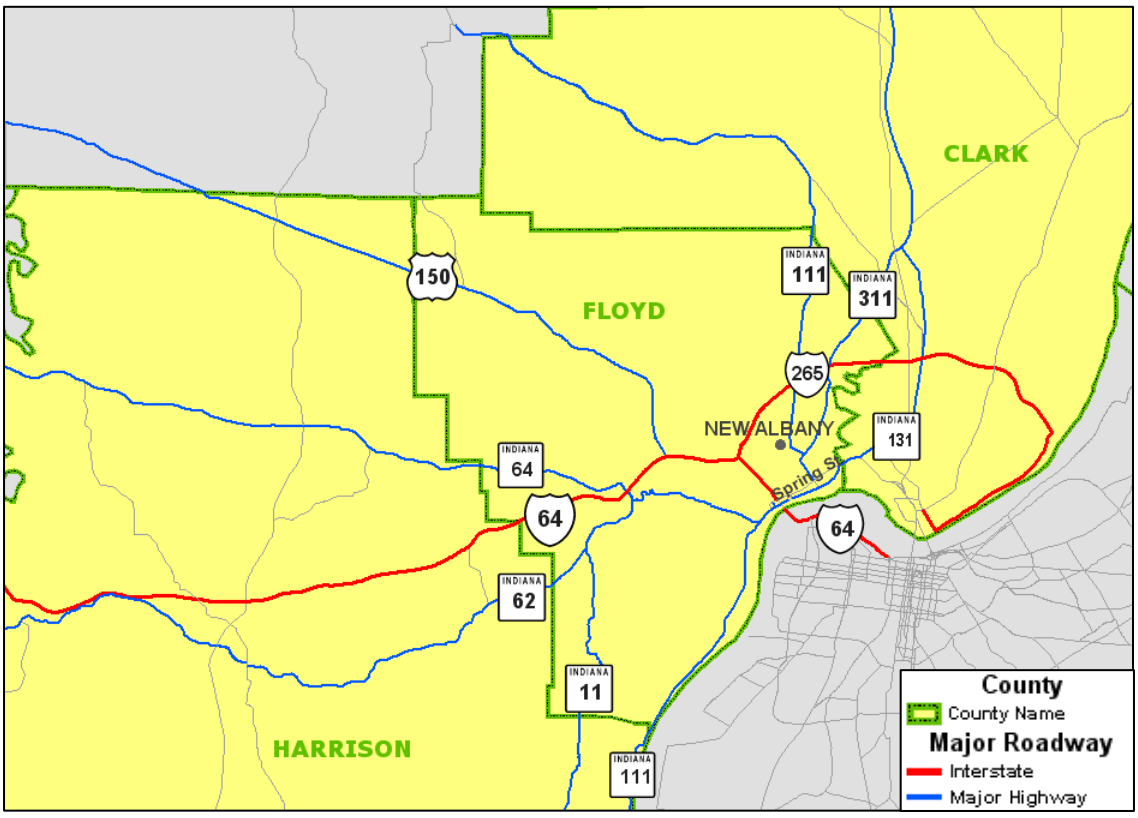


Figure 2-2: New Albany and the Regional Transportation Network

New Albany's streets, particularly Spring Street and Elm Street, provide connections to I-64 for motorists in Harrison County, Clarksville, Jeffersonville, etc. East of the study area, Spring Street has an interchange with SR 62 and SR 131 which provide access to I-65 and the nearby commercial areas of Clarksville. Motorists from these areas wishing to travel west on I-64 often find that using Spring Street to access I-64 is faster than traveling north on I-65 to I-265 west. In addition, peak hour congestion on the I-65 Ohio River crossing (Kennedy Bridge) and the I-64 Ohio River crossing (Sherman Minton Bridge) make alternative routes, such as Spring Street, more attractive.

The potential for motorists to divert from a city street such as Spring Street to another facility, such as I-265 (Lee Hamilton Highway), is difficult to estimate. Commute data provide one useful tool that can assist in approximating what portion of travel could divert to other facilities should some of New Albany's streets be converted to two-way traffic flow. **Table 2-2** presents a summary of the 2005 commuting trends for Floyd, Harrison, and Clark County. Harrison County is immediately west of Floyd County, and Clark County lies to the east.

Table 2-2: 2005 Commuting Pattern Data

	TO				
FROM	*Harrison*	*Floyd*	*Clark*	*Other*	*Totals*
Harrison	--	2,341	1,545	6,341	*10,227*
Floyd	856	--	5,295	14,509	*20,660*
Clark	498	4,464	--	19,300	*24,262*
Other	1,631	2,268	4,843	--	
Totals	*2,985*	*9,073*	*11,683*	*40,150*	--

Source: STATS Indiana (2005 Data)

In 2005, there were 36,234 individuals working in Floyd County. Of those, 27,161 (approximately 75 percent) lived and worked in Floyd County. The remaining 9,073 individuals commuted into Floyd County for work each day. The potential for diversion from study area streets would be greatest for workers commuting between Harrison and Clark County. The commuting data suggest 1,545 workers commuted from Harrison to Clark County and 498 commuted from Clark to Harrison County each day. Assuming roundtrip travel, this equates to 2,043 person trips that could reasonably use another route. Assuming an average vehicle occupancy rate of 1.2 persons per vehicle, approximately 1,700 commuter vehicles per day may be diverted. However, some portion of these trips is likely using alternative routes already. A portion of the remaining commuter trips may be likely diverted from the study area streets, but additional information (such as the commuters' zip codes) would be required to estimate what percentage might be likely to use routes outside the study area.

Speeding is a significant issue within the downtown New Albany area. A random sampling of traffic speeds were collected during off-peak hours along three of the east-west streets. The results are summarized in **Table 2-3**.

Table 2-3: Observed Travel Speeds

Roadway	Segment	Speed Limit (mph)	Average Observed Speed (mph)	Maximum Observed Speed (mph)
Elm Street	3rd to 4th St.	25	35	42
Spring Street	8th to 9th St.	25	31	35
Market Street	4th to 5th St.	25	33	43

As shown, average travel speeds are significantly higher than the posted speed limit. Along Elm Street, the average travel speed was 10 miles per hour (MPH) greater than the posted 25 MPH speed limit, and the maximum observed speed was approximately 17 MPH greater. The highest differential was noted along Market Street, where the maximum observed speed was 43 MPH, 18 MPH greater than the speed limit.

2.3 Crash History

The New Albany Police Department provided crash records for all crashes within the study area between January 1, 2004 and December 31, 2006. Crashes with global positioning system (GPS) coordinates provided are shown graphically in **Figure 2-3**.

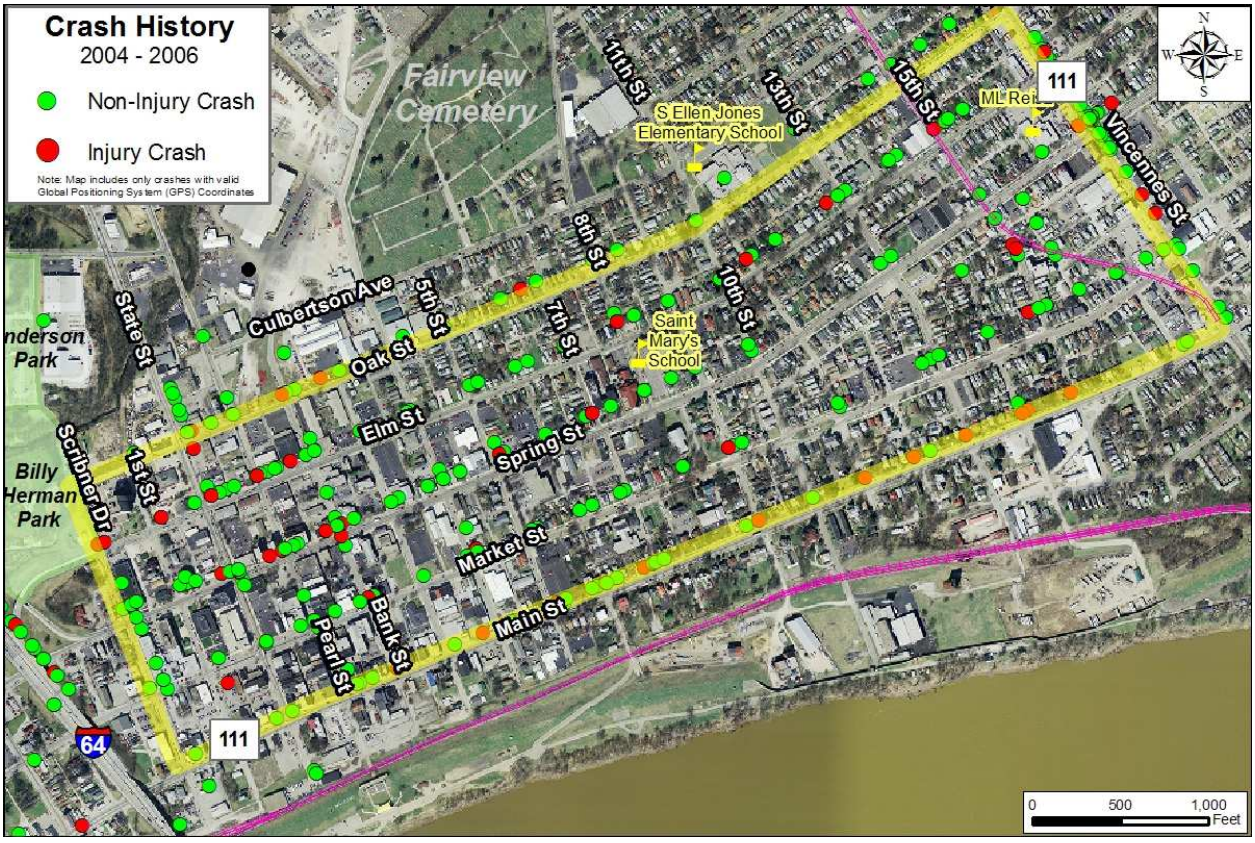


Figure 2-3: New Albany Crashes (2004-2006)

Table 2-4 provides a summary of the crashes. **Figure 2-4** presents a summary of the types of crashes.

A total of 711 crashes were reported on the primary streets within the study area. Right angle collisions constitute the majority of the crashes (235 collisions, 33%) followed by same direction sideswipes (118 collisions, 17%) and rear ends (112 collisions, 16%.) Approximately 49% (346 crashes) occurred at intersections. Weather conditions do not appear to contribute to a higher than expected crash rate as only 152 crashes (21%) occurred during periods with wet pavement. Average daily traffic volumes are not available for the city streets; therefore, crash rates were not calculated.

Table 2-4: New Albany Crash History (2004-2006)

Roadway	Beginning Intersection	Ending Intersection	Total Crashes	General Crash Type									Other		Location		Pavement Condition		Severity		
				Head On	Rear End	Backing	SS Same	SS Opposite	Right Angle	Left Turn	Rear to Rear	Other	Single Vehicle	Wrong Way on One Way	Intersection	Non-Intersection	Dry	Wet	FATAL	INJURY	PDO
Oak Street	Scribner Drive	E 5th Street	41	4	2	0	7	0	20	5	0	3	4	1	27	14	36	5	0	13	28
	E 5th Street	E 8th Street	14	1	2	0	6	0	5	0	0	0	2	1	4	10	9	5	0	2	12
	E 8th Street	Vincennes Street	10	2	1	0	3	0	0	0	0	4	2	0	2	8	8	2	0	0	10
Elm Street	Scribner Drive	E 5th Street	80	2	7	11	14	1	30	6	0	9	11	0	53	27	57	23	0	25	55
	E 5th Street	Vincennes Street	51	3	5	5	12	1	15	3	0	7	5	0	22	29	39	12	0	8	43
Spring Street	Scribner Drive	E 5th Street	106	1	22	11	16	1	35	6	0	14	5	1	57	49	84	22	1	25	80
	E 5th Street	Vincennes Street	37	3	8	2	8	0	9	3	1	3	2	1	18	19	31	6	0	9	28
Market Street	Scribner Drive	E 5th Street	41	0	4	2	4	0	19	7	0	5	2	1	26	15	31	10	0	9	32
	E 5th Street	Vincennes Street	30	1	4	3	7	0	9	3	0	3	1	0	13	17	25	5	0	4	26
Main Street	Scribner Drive	E 5th Street	39	4	10	1	4	1	8	7	0	4	4	0	23	16	33	6	0	7	32
	E 5th Street	Vincennes Street	52	2	16	3	8	2	9	1	0	11	4	0	18	34	42	10	0	18	34
East-West Street Totals			**501**	**23**	**81**	**38**	**89**	**6**	**159**	**41**	**1**	**63**	**42**	**5**	**263**	**238**	**395**	**106**	**1**	**120**	**380**
Scribner Drive	Oak Street	Main Street	20	2	4	2	2	0	7	2	0	1	2	0	11	9	15	5	0	5	15
First Street	Oak Street	Main Street	2	0	0	0	0	0	0	1	0	1	0	0	1	1	1	1	0	2	0
State Street	Oak Street	Main Street	69	2	8	9	4	0	34	6	0	6	1	0	10	59	51	18	0	22	47
Pearl Street	Oak Street	Main Street	11	0	0	1	4	0	4	1	0	1	0	0	8	3	9	2	0	2	9
Bank Street	Oak Street	Main Street	10	0	2	0	1	0	3	0	0	4	0	0	3	7	9	1	0	2	8
E Third Street	Oak Street	Main Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E Fourth Street	Oak Street	Main Street	10	0	2	2	0	1	3	0	0	2	2	0	5	5	7	3	0	2	8
E Fifth Street	Oak Street	Main Street	8	0	3	0	2	0	0	3	0	0	0	0	6	2	8	0	0	0	8
E Eighth Street	Oak Street	Main Street	7	0	1	0	2	0	3	0	0	1	0	0	5	2	4	3	0	2	5
E Ninth Street	Oak Street	Main Street	2	0	0	0	0	1	0	0	0	1	0	0	0	2	1	1	0	1	1
Vincennes Street	Oak Street	Main Street	71	1	11	6	14	2	22	9	2	4	13	0	34	37	59	12	0	14	57
North-South Street Totals			**210**	**5**	**31**	**20**	**29**	**4**	**76**	**22**	**2**	**21**	**18**	**0**	**83**	**127**	**164**	**46**	**0**	**52**	**158**

Note: PDO = Property Damage Only

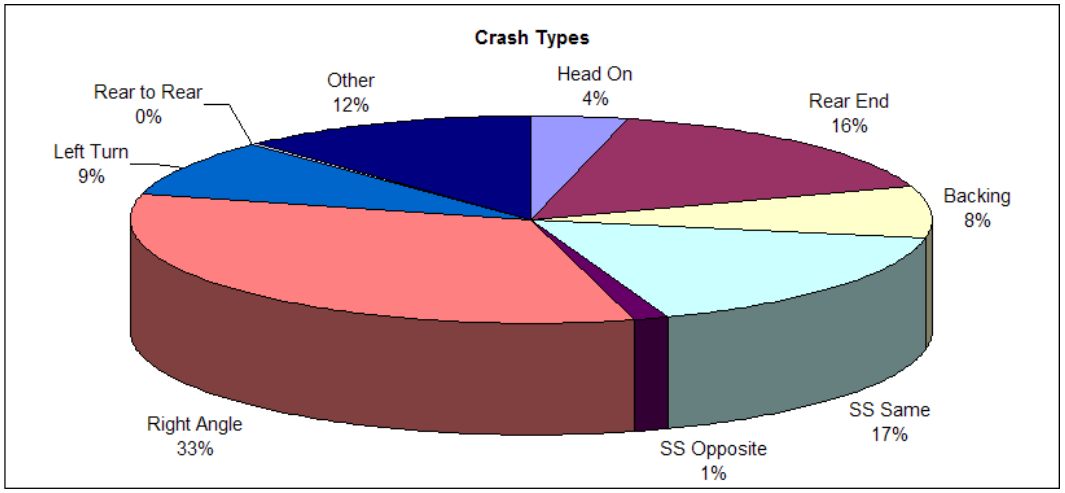


Figure 2-4: General Crash Types

Approximately 172 (24%) of these crashes resulted in one or more injuries, which is relatively high considering the posted speed limits within the study area. There was only one fatality reported during the study period. This crash occurred at the intersection of Spring Street and 4th Street and aggressive driving was noted as a contributing factor. Discussions with the City of New Albany revealed that additional fatalities have occurred within the study area in the recent past. According to these discussions, locations where fatalities have occurred in the past five years are as follows:

- Scribner Drive at Spring Street (two fatalities)
- Ninth Street at Spring Street
- 800 Block of East Main Street
- Bank Street at Main Street
- Market Street at the CSX railroad crossing (pedestrian fatality)

2.4 Rail

CSX Transportation maintains rail lines within the study area. (Norfolk-Southern also operates a rail line that parallels the river south of Main Street.) The CSX line crosses the Ohio River southeast of the study area and enters the study area at the Main Street intersection with Vincennes Street. North of Main Street, the line turns northwest across Market Street and then enters the Fifteenth Street corridor, where it travels in the middle of the street. One lane of traffic along 15th Street is maintained on each side of the rail line, as shown in **Figure 2-5**.

Figure 2-5: At-grade Rail Crossing at Oak and 15th Street
Source: Google Earth

Table 2-5 provides a summary of the at-grade rail crossings within the study area. Active rail crossing protection (gates) is provided only at the Main Street rail crossing at Vincennes Street. CSX is working with INDOT to improve conditions within the Fifteenth Street corridor.

Table 2-5: At-Grade Rail Crossings

Location	Type of Control	Concerns
Oak St. @ 15th St.	4-way stop	Rail line runs through the middle of 15th St.
Elm St. @ 15th St.	traffic signal	
Spring St. @ 15th St.	traffic signal	Crossing is in poor condition
Market St. near Vincennes St.	none	
Main St. @ Vincennes St.	2-way stop with railroad gates	Large intersection, no striping

2.5 Parking

A parking inventory within the Central Business District (CBD) of New Albany was performed through examination of aerial photography and site reconnaissance. The results are shown in **Figure 2-6**.

Figure 2-6: Existing Parking within the Central Business District

The parking inventory suggests that parking is abundant within the CBD. There are approximately 598 on-street parking spaces and 2,150 off-street parking spaces.

2.6 Transit

The Transit Authority of River City (TARC) provides bus service to downtown New Albany with four routes serving the area. The following route characteristics were provided by TARC.

22 Twenty-second Street This route operates from 41st & Bells Lane in the Park DuValle area to New Albany, Indiana serving Floyd Memorial Hospital, Indiana University Southeast and the New Albany Industrial Park. This route does not operate on Sundays and Holidays.

69 New Albany Express This route provides express service between Stone Ridge Apartments, New Albany, and downtown Louisville via State Street and I-64. Service operates morning and afternoon peak hours only. There is no service on weekends or holidays. TARC Route 82 provides local service over portions of this route.

73 Charlestown Road Express The 73 Charlestown Road Express provides express service between Indiana University Southeast, New Albany and downtown Louisville via I-64. Service operates during morning and afternoon peak hours only. There is no service on weekends or holidays. Limited local service along Grant Line Road is provided by TARC route 22 weekdays and Saturdays.

82 New Albany Shuttle This route operates between Sam's Club, Wal-Mart, River Falls Mall, Greentree Mall and the Knobs View Apartments in New Albany. Service is provided to the shopping areas along Lewis and Clark Parkway, downtown New Albany and Floyd Memorial Hospital. Service on this route continues to downtown Louisville from River Falls Mall. All route 82 trips continue to or come from route 2 at Giltner Road, serving Jeffersonville, downtown Louisville, U of L and Louisville International Airport.

These routes are shown in **Figure 2-7**. Bus stops are located throughout the study area, but no shelters are provided.

Figure 2-7: Bus Routes within the Study Area
Source: Transit Authority of River City (TARC)

2.7 Pedestrians and Bicycle Facilities

Sidewalks are provided throughout the study area. The City of New Albany has recently reconstructed some sidewalks along Elm Street and provided enhanced crosswalk ramps with textured surfaces. Special crosswalks (midblock or at unsignalized intersections) are provided at locations with high pedestrian volumes. **Table 2-6** provides a summary of the existing, striped crosswalks within the study area. Note that, in addition to those listed, the majority of the signalized intersections in the study area have striped crosswalks as well.

Table 2-6: Crosswalk Locations

Location	Traffic Control at Location	Reason for Crosswalk
Oak St. @ 8th St.	3-way stop	St. Marys School
Oak St. @ 10th St.	4-way stop	S. Ellen Jones Elementary School
Oak St. @ 11th St.	1-way stop	S. Ellen Jones Elementary School
Oak St. @ 13th St.	4-way stop	S. Ellen Jones Elementary School
Elm St. @ 8th St.	4-way stop	St. Marys School
Spring St. @ 8th St.	1-way stop	St. Marys School
Spring St. @ 9th St.	2-way stop	St. Marys School
Spring St. @ 15th St.	Traffic Signal	Railroad Crossing
Market St. @ 15th St.	2-way stop	
Main St. @ 6th St.	1-way stop	
Main St. @ 10th St.	2-way stop	
Main St. @ 15th St.	2-way stop	

There are no signed bicycle facilities or bicycle lanes located in the study area. Bicycles are not allowed to utilize sidewalks in New Albany, and sidewalk widths are not capable of accommodating bicycles and pedestrians. Therefore, bicyclists are forced to use the travel lanes.

2.8 Access Management

Access management is the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway. It also involves roadway design applications, such as median treatments and auxiliary lanes, and the appropriate spacing of traffic signals. The purpose of access management is to provide vehicular access to land development in a manner that preserves the safety and efficiency of the transportation system.

Roads are an important public resource and are costly to build, improve, or replace. By allowing closely spaced curb cuts, median openings, driveways near major intersections, and poorly coordinated traffic signals, a heavy burden is placed on the roadway, which in turn leads to unsafe and congested conditions. By managing access, government agencies can extend the life of roads, improve traffic safety, decrease congestion, improve traffic flow, and improve air quality, which helps preserve long-term property values and provides an improved quality of life. An effective access management program can reduce crashes as much as 50 percent, increase roadway capacity by 23 to 45 percent, and reduce travel time and delay as much as 40 to 60 percent.

Downtown New Albany does not present many significant issues with respect to access management. Traffic signals are uniformly spaced within the grid street system. Turn radii are limited at some locations due to building setbacks and sidewalks, but improvements would be costly. There are limited instances, however, where access management principles could be implemented to improve traffic conditions. Along Vincennes Street, several businesses have undefined entrances that should be more limited and better defined. Examples can be found north of Main Street. Most other locations have driveways that are set back from intersections, which is a highly desirable situation.

3.0 Public Involvement

The City of New Albany conducted a public meeting on March 13th, 2007 at the Calumet Club on Spring Street regarding the New Albany Inner-City Grid Transportation Study. The purpose of the meeting was to inform the residents of New Albany about the existing transportation issues in the downtown area and to obtain their input on such issues. A prior notice of the public meeting was announced on March 8th, 2007 in the local newspaper, *The News and Tribune*.

Exhibit boards were distributed for viewing and discussion purposes. The boards included the following:

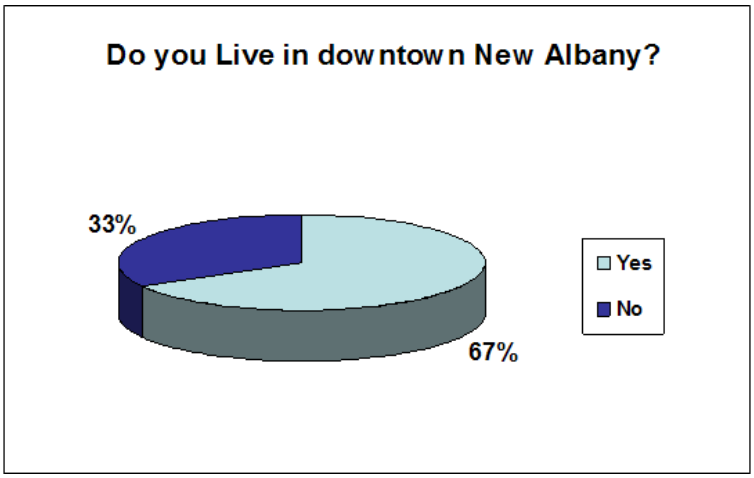
- Study Area Boundary
- Crash History Locations
- Average Daily Traffic Volumes
- Parking Inventory
- Examples of Traffic Calming Measures

A brief presentation discussed the existing conditions and some of the possible traffic-calming measures that could be considered for the area. A question-and-answer session followed the presentation. The verbal comments expressed from the meeting are summarized below:

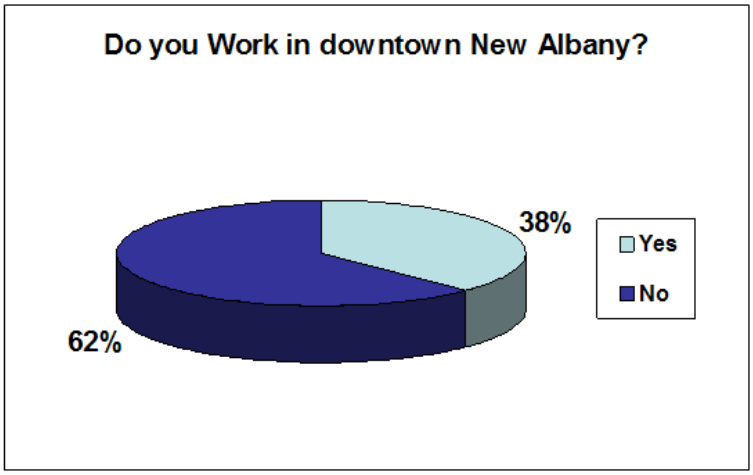
- It was confirmed that Main Street is included in the project study area.
- One attendee stated that two-way streets would be safer for the area because drivers fail to look both ways before entering one-way streets.
- A concern from one attendee was whether or not two-way streets would be safer for emergency vehicles.
- One attendee discouraged the conversion of Fifth Street to two-way because of the limited on-street parking with no off-street parking available for residents on that particular street.
- Several attendees expressed the issue of limited parking for residents in the area.
- The conversion of Pearl Street to two-way was encouraged by one attendee, stating that it would increase access to downtown businesses.
- One attendee stated that if the conversion from one-way to two-way for a particular street is considered, the entire street should be considered and not just the section located in the study area.
- Another attendee expressed that converting Spring Street to two-way would be acceptable with the condition that parking would remain available for businesses.
- The greenway development was mentioned by one attendee, stating that the project should consider connecting/extending the greenway into the downtown area.
- One attendee expressed that adequate on-street parking was available to residents and that many residents want to be able to park directly in front of their homes, instead of parking a few spots away.

A total of 25 attendees signed in. A questionnaire was provided to provide a formal opportunity for citizens to provide input into issues relevant to the study. A total of 24 completed questionnaires were received. The following sections discuss the findings from the questionnaires. Because of the number of responses, the results do not fully represent the opinions of the citizens who utilize the study area's current transportation network.

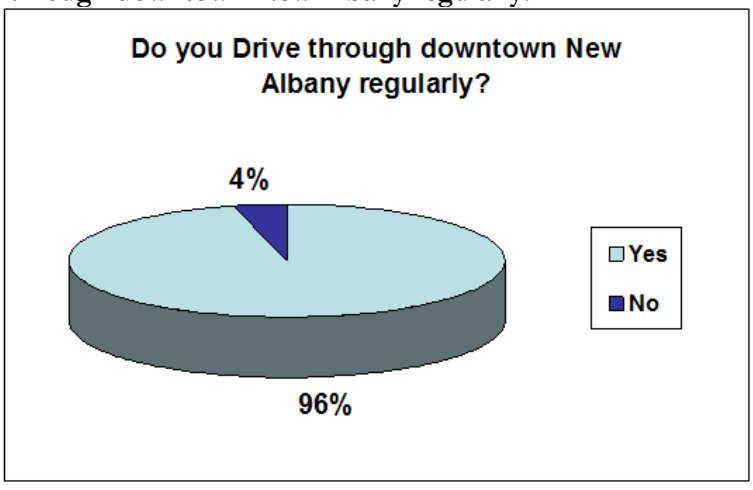
Question 1a: Do you live in downtown New Albany?



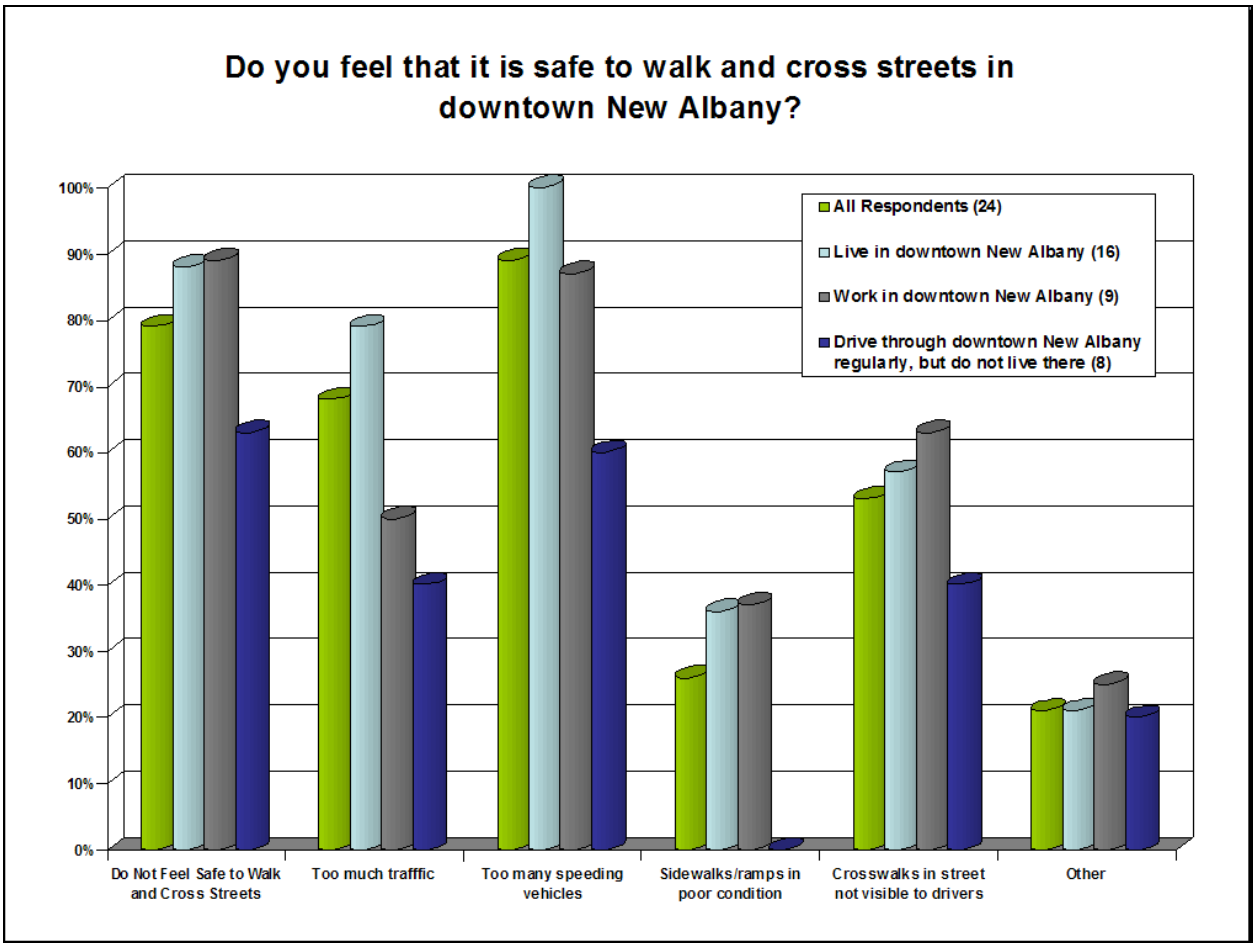
Question 1b: Do you work in downtown New Albany?



Question 1c: Do you drive through downtown New Albany regularly?



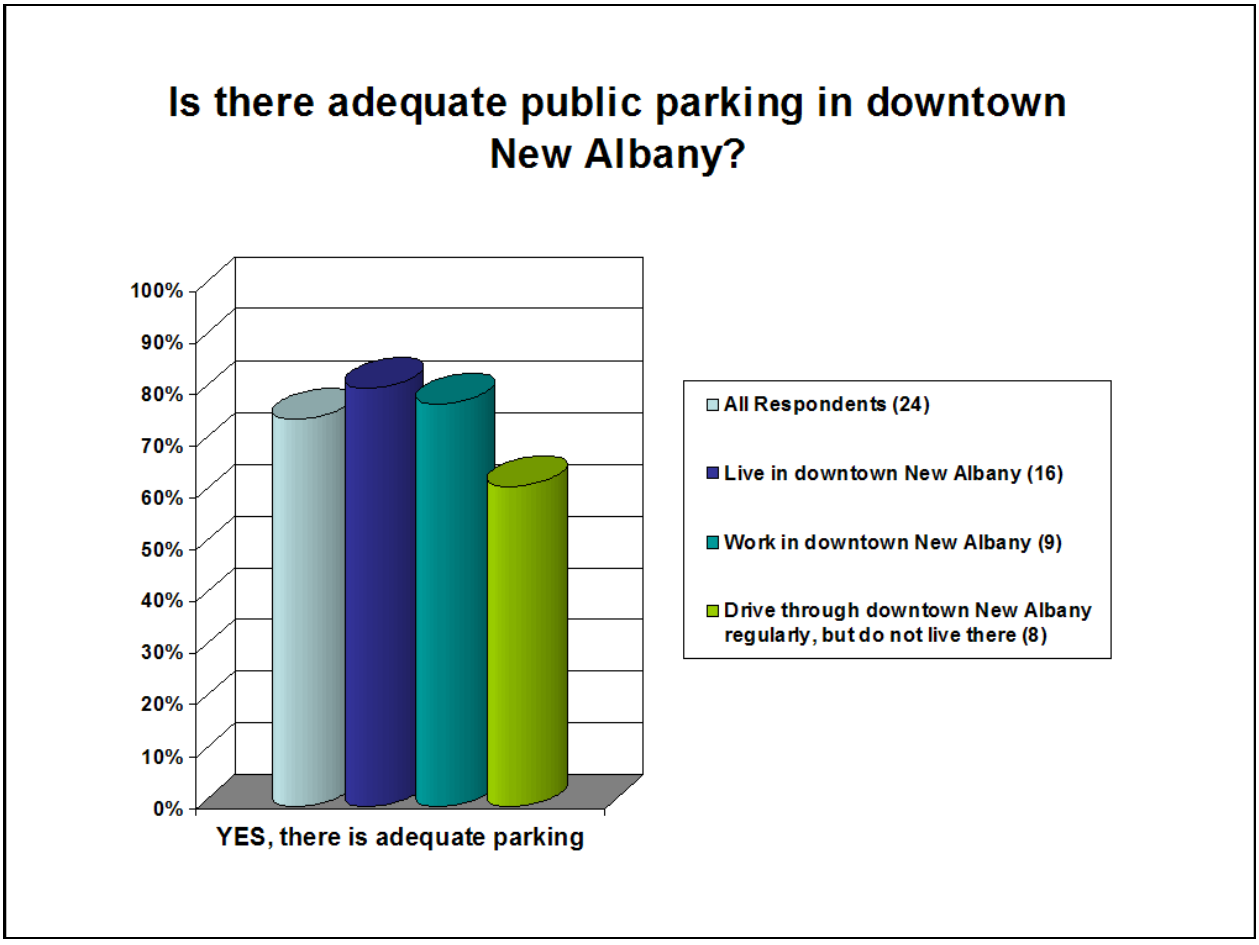
Question 2: Do you feel that it is safe to walk and cross streets in downtown New Albany? If you do not feel that is safe, please explain why.



Nearly 80% of the respondents said they do not feel it is safe to walk or cross streets in downtown New Albany. Nearly 90% of those respondents who live or work downtown do not feel that it is safe.

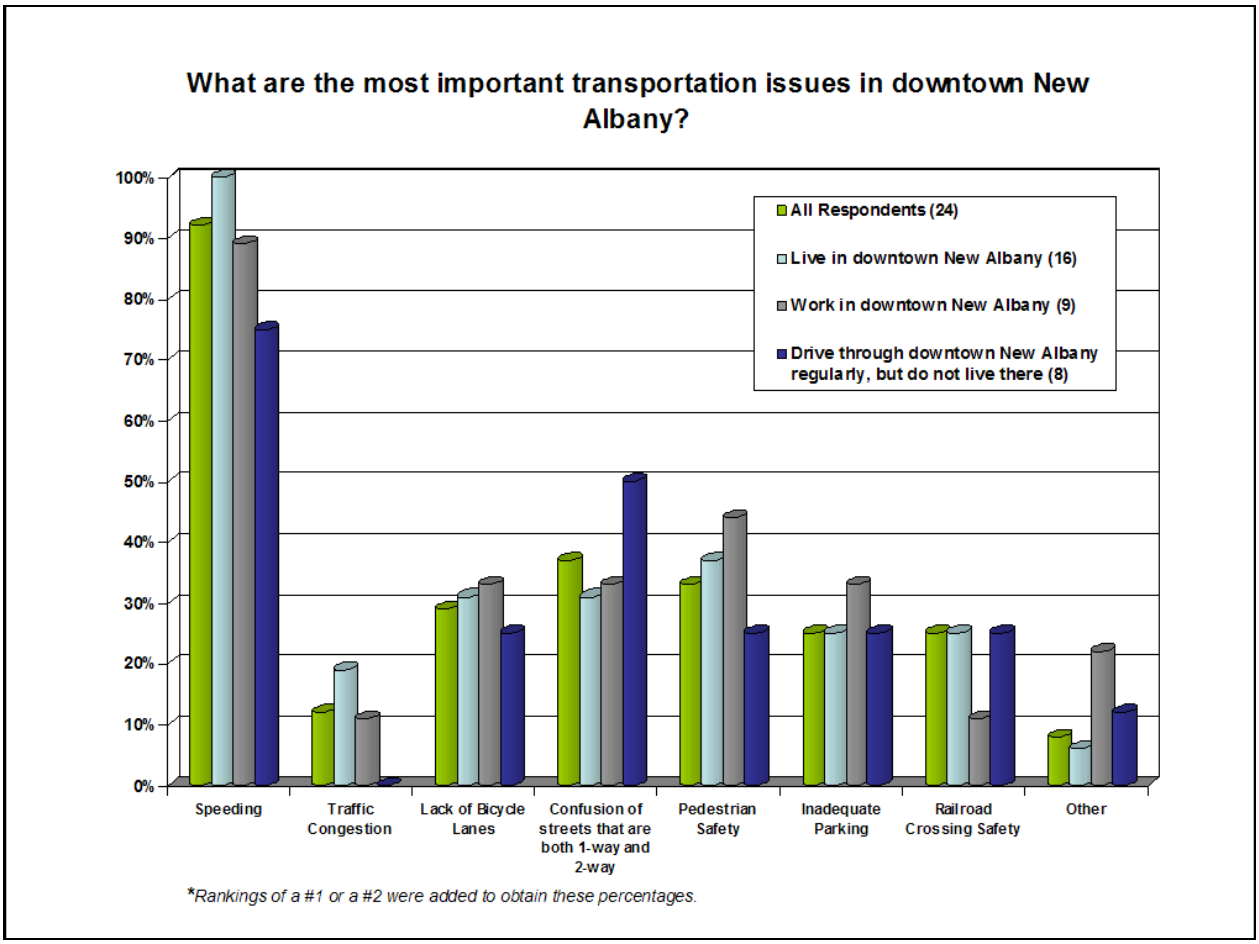
The primary reason why respondents feel that it is unsafe to walk or cross streets is because of the travel speeds. 100% of the respondents who live in the downtown area said that speeding is an issue. The second most frequent response was that there is too much traffic to cross streets safely. Other responses included poor lighting conditions in some locations and a lack of enforcement.

Question 3: Do you feel there is adequate public parking in downtown New Albany?



75% of the respondents said there is adequate public parking in downtown New Albany. Over 80% of the respondents who live downtown said there is adequate parking, and 78% of those who work downtown said there is adequate public parking. Some respondents indicated more parking along some of the side streets would be desirable, and some suggested more parking is needed along Pearl and Bank Street.

Question 4: Of the following transportation issues in New Albany, which do you feel are the most important issues that this study needs to address?

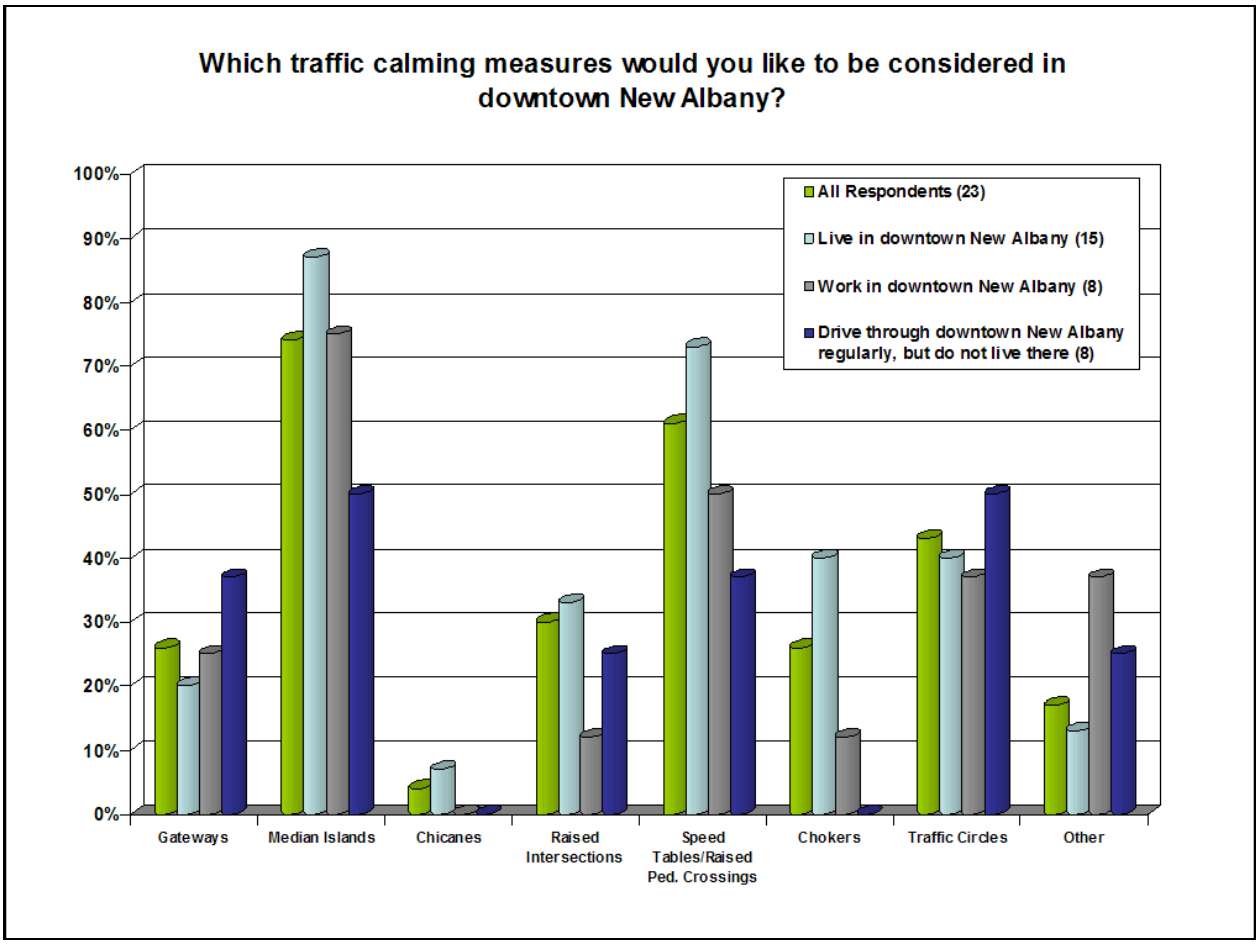


Respondents were asked to rank the listed options from 1-3, with 1 being the most important issue and 3 being the least important. 100% of the respondents who live in the downtown area said that speeding is a significant issue, and nearly 90% of those who live or work downtown said speeding was a significant issue. However, only 75% of those who drive through downtown regularly but do not live there said speeding was an issue.

The remaining issues had a more even distribution of responses. Confusion caused by streets that have segments that are both one-way and two-way and pedestrian safety appear to be issues universal to all respondents. 50% of those who drive through downtown regularly but do not live there said that inconsistent one-way streets are a significant issue. Over 44% of those who work downtown said pedestrian safety is an important issue. A lack of bicycle lanes in downtown (29% said this is an issue) appears to be a more significant issue than railroad crossing safety (25% said crossing safety is an issue.) Overall, traffic congestion does not appear to be a significant issue with only three respondents suggesting congestion is significant.

Other issues that were discussed include a lack of enforcement and that one-way streets make businesses less accessible.

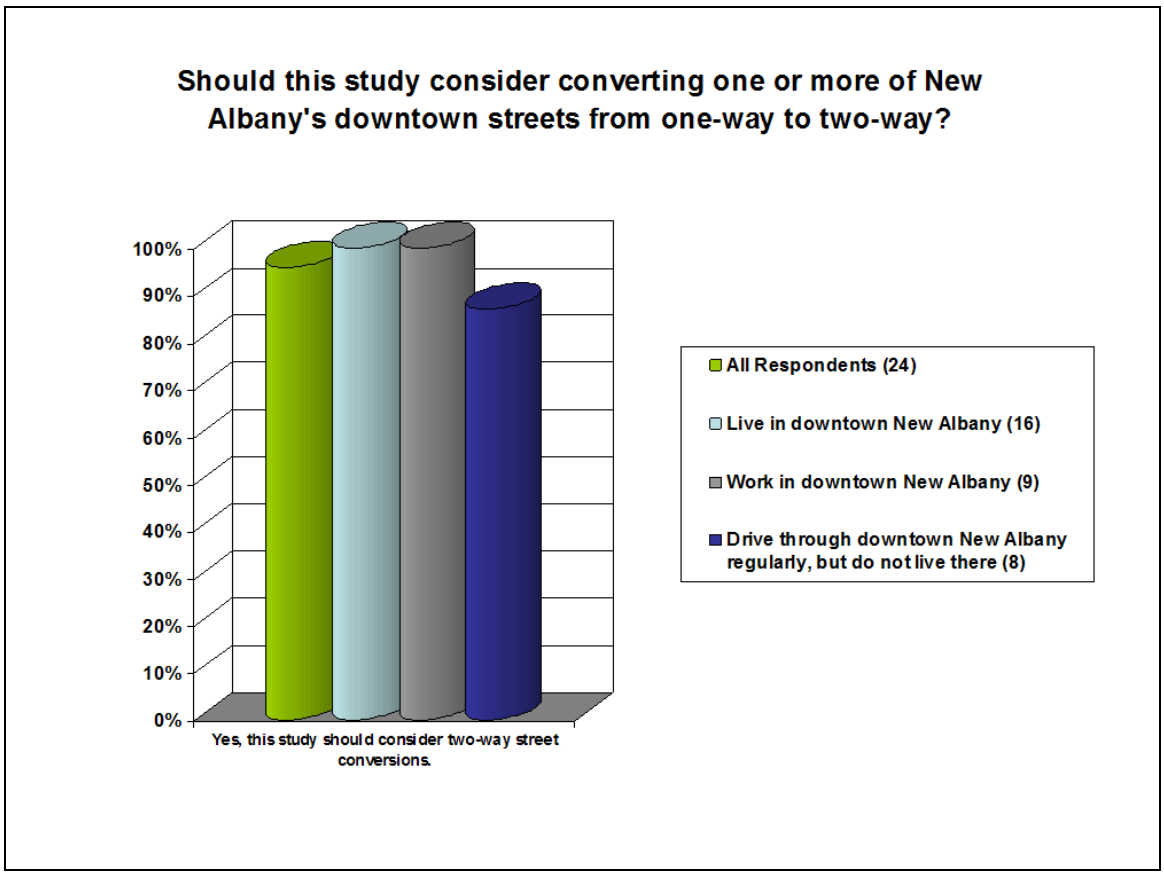
Question 5: Which traffic calming measures would you like to see carried out to promote safer driving in downtown New Albany?



Respondents were asked to identify which potential traffic calming issues they felt should be considered for implementation in downtown New Albany. Median islands and speed tables received the most responses, with nearly 74% saying medians should be considered and 61% saying speed tables should be considered. Over 43% of all respondents said traffic circles should be considered. Chicanes received the fewest responses, with only 4% (one respondent) saying chicanes should be considered.

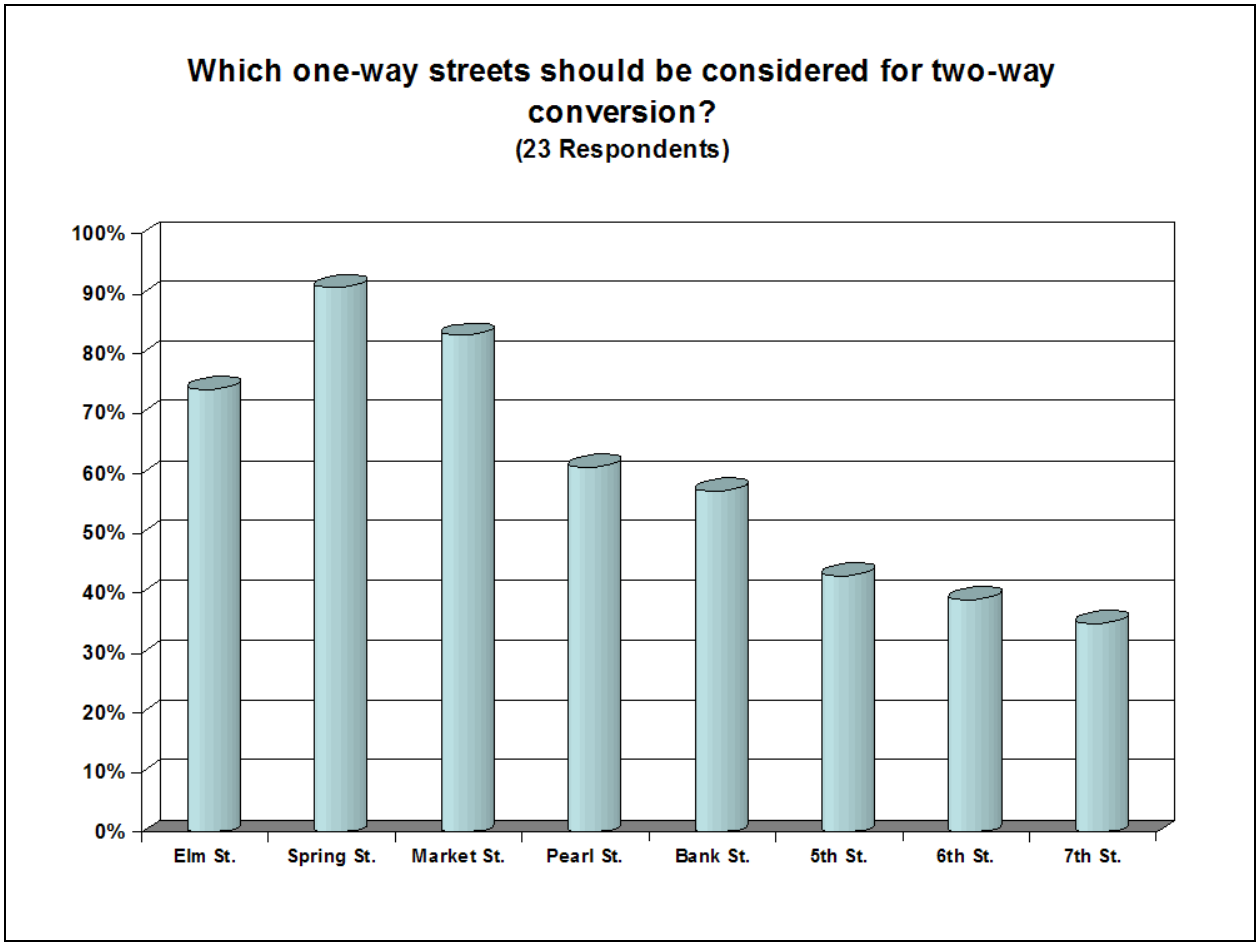
Other responses included conversion of one-way streets to two-way traffic and increased enforcement.

Question 6a: Do you think that this study should consider converting one or more of New Albany's downtown streets from one-way to two-way?



Only one respondent indicated that one or more of New Albany's downtown streets should not be considered for conversion from one-way to two-way traffic.

Question 6b: If so, which streets should be considered?



Spring Street saw the most responses for which street should be considered for conversion to two-way traffic, with 91% (21 respondents) saying it should be considered. Market Street saw the second most respondents (83%, 19 respondents), followed by Elm Street (74%, 17 respondents.) About 60% felt that Pearl Street and Bank Street should be considered.

With parking being considered to be an important issue by many, a surprising number of respondents indicated that 5th Street, 6th Street, and 7th Street should be considered for two-way traffic. Each of these facilities has segments that are currently two-way, but complete conversion of these streets would require the elimination of at least some on-street parking. However, many recognized that as being an issue and questioned if the conversions could be accomplished without eliminating parking.

4.0 Recommendations

Through a collaborative effort with the City of New Albany, a number of alternatives were developed for future consideration. Additionally, the study goals and public comments provided direction for this process. With these considerations in mind, the following alternatives were developed:

1. No-Build (Do Nothing Alternative)
2. Low-Build Traffic Calming
3. High-Build Traffic Calming
4. Two-Way Street Conversion

The No-Build Alternative is considered a baseline against which alternatives can be compared. This alternative assumes no transportation improvements are to be implemented.

4.1 Traffic Calming Alternatives

The goal for the traffic calming alternative is to decrease the average travel speeds for all motorists. By doing so, these alternatives can make the roadways safer for all users (e.g. pedestrians, bicyclists, and motorists.) Ultimately, a combination of point-type traffic calming measures that tend to reduce speeds at a particular location and measures that calm the entire streets should be implemented in combination to ensure that overall travel speeds are reduced and not just speeds at particular locations. The Low-Build alternative is depicted in **Figure 4-1**.

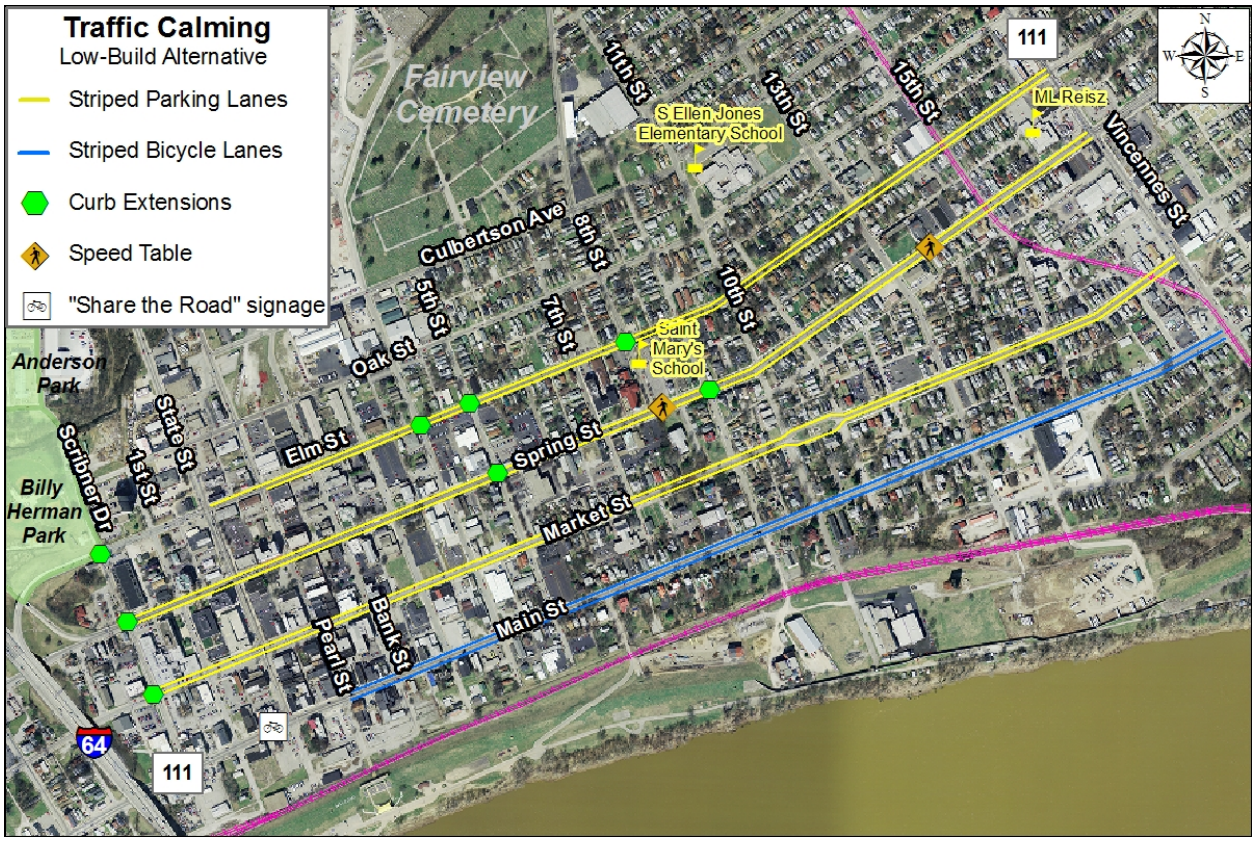


Figure 4-1: Low-Build Traffic Calming Alternative

The Low-Build alternative was developed as an effort to achieve some of the benefits of traffic calming in a cost-effective manner. This alternative uses reduced lane widths and bicycle lanes to affect the motorist's perception of the type of facility on which they are traveling.

As an example of an existing facility with wide travel lanes, **Figure 4-2** depicts the existing Main Street, which is approximately 50-feet wide (curb-to-curb.)

Figure 4-2: Main Street

Studies have demonstrated that wide travel lanes with wide shoulders encourage higher travel speeds than narrow lanes and shoulders. According to the American Association of State Highway and Transportation Officials (AASHTO), a minimum of ten-foot wide travel lanes can be utilized on urban arterials. (However, ten-foot wide travel lanes can produce adverse conditions if large truck volumes are present as trucks require larger turning radii.) Within the existing street width on Main Street, two 12-foot travel lanes, two six-foot bicycle lanes, and two seven-foot parking lanes can be provided, as depicted in **Figure 4-3**.

While the 12-foot lanes are still relatively wide, the bicycle lanes tend to have a calming effect on traffic and provide a safe path for cyclists to travel. The Main Street corridor provides access to the proposed Scribner Place Development which is to include a YMCA facility. Providing striped bicycle lanes along this facility to connect to the residential areas east is highly desirable. However, west of Pearl Street, Main Street narrows to 40-feet wide with parking. This width does not make it possible to accommodate on-street parking, turn lanes at intersections, and bicycle lanes. Therefore, west of Pearl bicyclists would shift to the travel lanes.

Figure 4-3: Two-Lane, Two-Way Street with Bicycle Lanes and Parallel Parking

The parking lanes along Elm, Spring, and Market Street are currently striped in the Central Business District (CBD) but are not striped east of the CBD (parking along Oak Street is not striped.) If parked vehicles are not present, this leads to the perception that the travel lanes are significantly wider than they truly are. By striping the parking lanes, full lane widths are maintained, but the roadway appears as though it is not as wide and can result in reduced travel speeds.

Speed tables are placed on Spring Street at mid-block locations. The first is east of Eighth Street at the crosswalk for St. Mary's School. The second is located west of the railroad crossing. Each of these locations can be utilized as a mid-block pedestrian crossing.

Curb extensions are incorporated into the streetscape of Elm, Market, and Spring Street to provide decreased pedestrian crossing widths at intersection locations where pedestrian volumes tend to be higher. At these locations, they serve as chokers that narrow the pavement width and also protect parked vehicles in that they extend to the edge of the striped parking lane. Along Scribner Drive, curb extensions are not feasible on all quadrants of the intersections because of the limited turning radii available from Scribner.

The High-Build Traffic Calming Alternative, depicted in **Figure 4-4**, includes the components from the Low-Build Alternative but adds more costly calming options. These additional options include gateway treatments, raised intersections, and medians.

Gateways are features incorporated into the streetscape that provide the driver with a visual cue that they are traveling from one type of area into another. They can include elaborate signage and landscaping, public displays of art, and enhanced lighting. The goal is to let the driver know they are entering into a unique place that is different from where they have been, where travel speeds are lower and the streets are not just vehicular throughways. The gateway treatments in the High-Build Traffic Calming Alternative are located at areas that serve as entry points into the CBD or residential areas. The Elm Street gateway, to be located near the Scribner Drive intersection, is to let motorists they are no longer on a high-speed (freeway) facility, but are now entering an urban environment where pedestrians, bicyclists, and parked vehicles may be present. On the east end, the Spring Street gateway is located just west of the Vincennes intersection to make drivers aware they are entering into downtown New Albany and in particular a residential neighborhood.

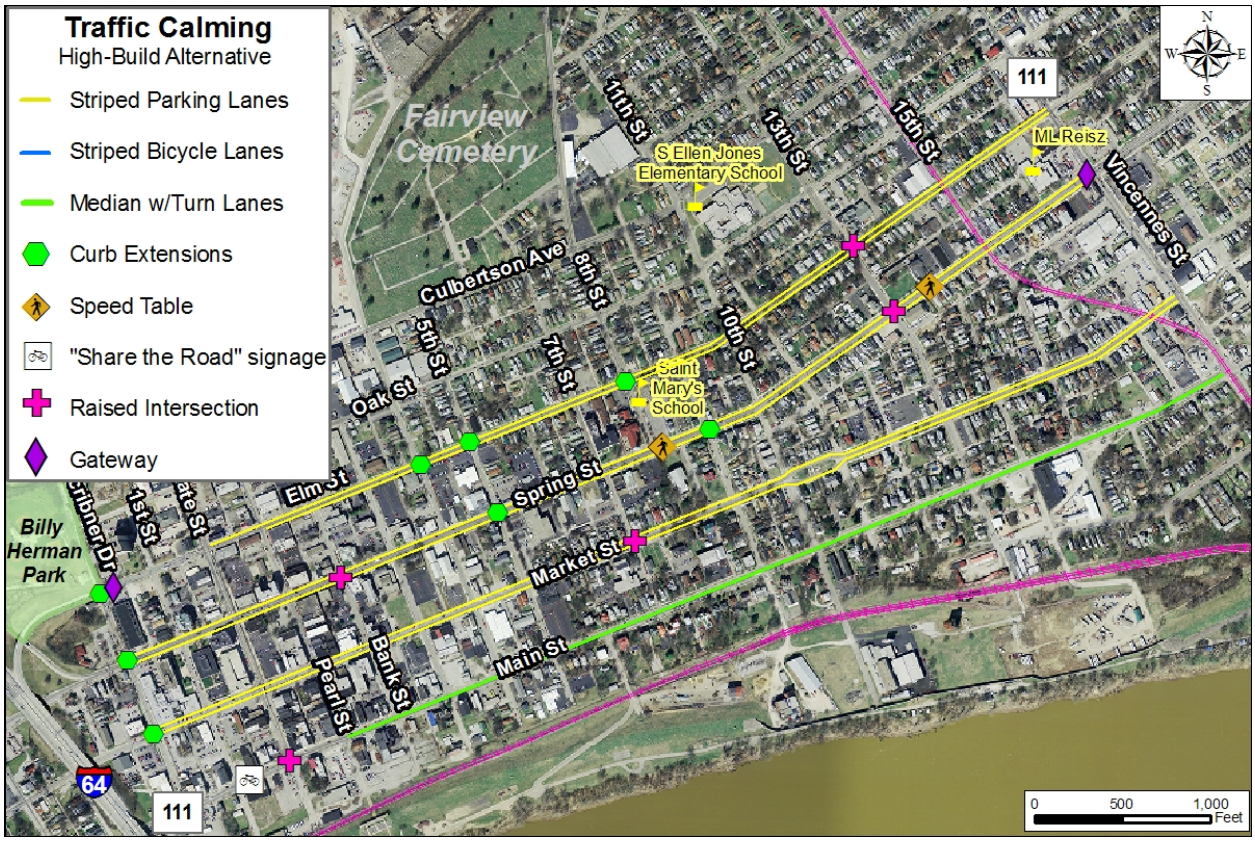


Figure 4-4: High-Build Traffic Calming Alternative

Raised intersections are located at locations where high volumes of pedestrians may be found or at locations bordering on the CBD or residential areas. Raised intersections provide traffic calming benefits for both intersecting streets and make the entire area more walkable and pedestrian friendly.

Rather than providing bicycle lanes along Main Street as in the Low-Build Alternative, the High-Build Alternative introduces a non-traversable median with turning lanes at major intersections. The non-traversable median, depicted in **Figure 4-5**, is preferred to a continuous center turn lane in that it virtually eliminates the possibility of head-on collisions, reduces travel speeds, and provides a pedestrian refuge for crossing the street. Turn lanes would not be necessary at every intersection along Main Street. However, no median openings should be provided unless turn lanes are also included as turn lanes with appropriate taper rates provide an opportunity for motorists to decelerate safely before turning, thereby reducing rear end collisions.

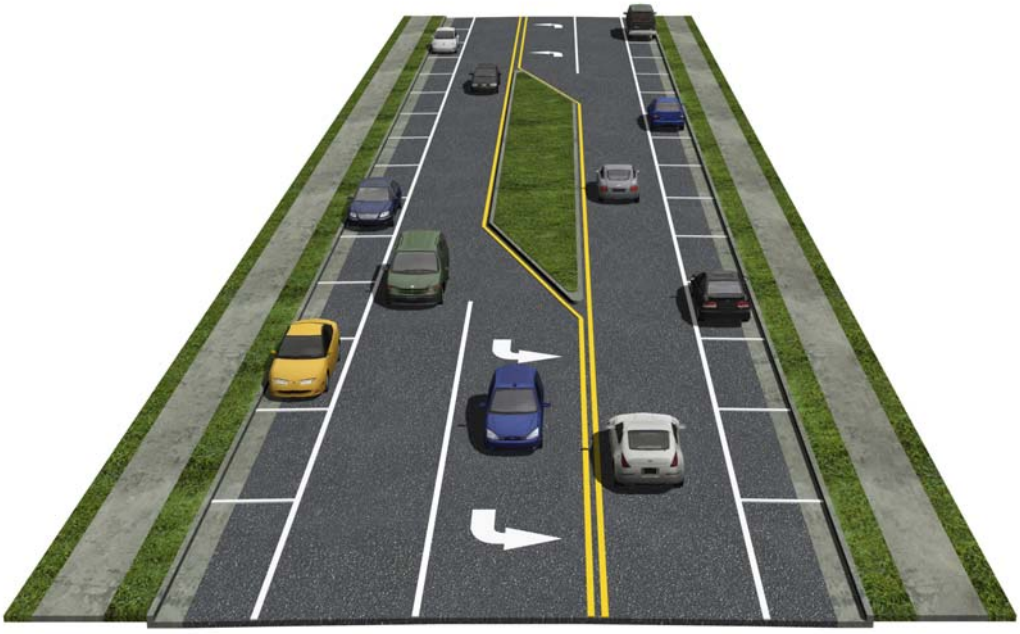


Figure 4-5: Non-Traversable Median with Turn Lanes

Typical sections for the Low-Build and High-Build Traffic Calming Alternatives can be found in the **Appendix**.

4.2 Two-Way Alternative

It has been argued that converting two-way streets to one-way streets decades ago was an effort to move traffic out of downtowns; some opponents say that this traffic never returned. One-way streets make for efficient movers of traffic, but can often introduce safety concerns for motorists, bicyclists and pedestrians because they tend to provide for higher travel speeds than two-way streets. (This can be seen in New Albany with its high percentage of fast-moving, through traffic, but traffic calming principles may alleviate some of the existing safety concerns.) The counter-argument is that two-way streets introduce more conflict points for bicyclists and pedestrians as they are forced to contend with traffic coming from more than one direction.

Public comments suggested that the conversion of most of the existing one-way streets downtown to two-way traffic should be considered as part of this study. The benefits of two-way streets are numerous. They tend to have slower travel speeds than one-way streets, they reduce confusion for motorists unfamiliar with the area, they provide better access to both businesses and residential areas, and in some circumstances they can reduce the traffic load on other one-way streets. Two-way streets also have numerous disadvantages. These disadvantages include a potential loss of vehicular capacity and on-street parking. The loss of on-street parking may result from the need to provide turning lanes at intersections or even the need to provide an additional travel lane. Finally, two-way streets increase the number of conflict points with which pedestrians must contend. Rather than crossing the street at locations where traffic is coming from a single direction, pedestrians are faced with traffic from two directions.

Traffic impacts alone should not be the deciding factor when it comes to converting one-way streets to two-way traffic. Opportunities for economic development can be hindered in some instances as certain businesses (such as Walgreen's)

have a formal policy against locating on one-way streets. Thus, municipal governments must look at the big picture when faced with this decision.

Based on the public's desire to pursue two-way streets in downtown New Albany, a single two-way alternative was developed with the goal of minimizing cost and right-of-way needs. The objective was to maximize mobility and roadway capacity within the existing roadway width while maintaining parking and respecting pedestrian needs. Typical sections for options for the two-way street alternatives are found in the **Appendix**.

Elm Street would be converted to a two-lane, two-way facility with on-street parking from State Street east to Vincennes Street, as depicted in **Figure 4-6**. The 40-foot street width could accommodate two 12-foot wide travel lanes and two eight-foot wide parking lanes. Some consideration should be given to eliminating the parking for short segments at the intersection approaches to provide left-turn lanes by pushing the through lanes to the outside of the pavement. An example location would be westbound Elm Street at State Street. West of State Street, it would be desirable to provide additional eastbound capacity (the current one-way direction for Elm) to accommodate traffic exiting I-64. This could be accomplished by restriping the facility with two 12-foot wide eastbound lanes and a single 12-foot westbound lane; maintaining the current one-way operation between Scribner and State Street could provide the needed eastbound capacity, but . The remaining four feet of width would provide two feet of offset to the curb lines and should be striped as the edge of the travel lane.

Figure 4-6: Two-Lane, Two-Way Street with Striped Parallel Parking

One issue that would require attention is the stop-controlled intersection at Elm and Bank Street. Under a two-way scenario, this intersection would likely need to have a traffic signal installed.

Spring Street is approximately 50-feet wide (curb-to-curb) throughout the study area. Between Third and Vincennes Street, a three-lane section could be introduced with two 12-foot wide travel lanes, two seven-foot wide parking lanes, and a center 12-foot wide turn lane. As an option to the center turn lane, it would be preferable to construct a non-traversable median with turn lanes at the intersections; however, this option would increase the cost. Active rail crossing protection (gates and flashing lights) are recommended at the grade crossing at Fifteenth Street.

West of East Third Street, two westbound lanes could be maintained on Spring Street, leaving a single eastbound lane and two parking lanes. This would preserve capacity in the current direction of traffic flow along Spring Street for access to the I-64 interchange. Left-turning movements for the westbound direction through this section are currently relatively low; however, protected left turn signal phasing followed by permitted phasing could be utilized to better accommodate left turns. As left-turn lanes are likely not feasible in the eastbound direction, there should be some consideration of not allowing left turns except where necessary (such as at State Street.) However, that does not appear to be an issue as the proposed demand for eastbound travel on Spring Street is anticipated to be relatively light.

Market Street has differing widths throughout the study area. Between Scribner Drive and West First Street/Hauss Square, two 12-foot wide travel lanes (one per direction) could be implemented. The diagonal parking along the north side of the street would require restriping as it is currently angled to serve eastbound traffic; this is the case for all the diagonal parking along the north side of the street. From West First Street to State Street, two travel lanes could be provided on each side of the existing median, with the inner lane being 12-feet wide and the outer lane (adjacent to the diagonal parking) being 16-feet wide. The additional width on the outer lane helps accommodate vehicles backing out of the diagonal parking spaces. This scenario is demonstrated in **Figure 4-7**.

Figure 4-7: Four-Lane, Two-Way Street with Diagonal Parking

Between State and Pearl Street, two eastbound lanes could be maintained (12-foot wide inner and 16-foot wide outer), but only one 12-foot wide lane can be accommodated westbound. Allowing left turns from this single lane to southbound State Street would be discouraged. From Pearl Street to East Tenth Street, two 12-foot wide lanes could be provided. Between East Tenth and East Eleventh Street, Market Street widens out to approximately 98 feet with a 50-foot wide linear park within the median. It would be desirable to stripe the inner four feet of the traveled way with hash marks and a lane edge line to provide a single 12-foot wide lane in each direction and an eight-foot wide parking lane, as shown in **Figure 4-8**.

Between Eleventh and Thirteenth Street, Market Street is 40-feet wide and can accommodate a single 12-foot wide travel lane in each direction with two 8-foot wide parking lanes. From Thirteenth Street to Vincennes, Market Street is 50-feet wide. Within that cross section, it is possible to provide a single 12-foot wide travel lane in each direction with two 7-foot wide parking lanes and a center 12-foot wide turn lane. Land use through this segment becomes more commercial as it approaches Vincennes, and a center turn lane would fit into that context. However, a non-traversable median with turn lanes should also be considered as an option. Active rail crossing protection (gates and flashing lights) are recommended at the grade crossing west of Vincennes.

Figure 4-8: Two-way Option for Market Street between East 10th and East 11th Street

Bank Street and **Pearl Street** are both 40-feet wide north of Main Street and have parallel parking on both sides. Within that cross section, a single 12-foot wide travel lane in each direction with two 8-foot wide parking lanes can be provided. The eight-foot parking lanes are preferred in this commercial setting. One issue that is likely to become more problematic if Bank and Pearl Street are converted to two-way is how to deal with delivery vehicles. Currently, a delivery vehicle can stop in one of the travel lanes while unloading. While this may not be a common practice, it does occur from time to time as demonstrated in **Figure 4-9**. In this example, a city maintenance vehicle has stopped in the left lane to unload mulch. Consideration should be given to designating some parking areas for delivery vehicles only.

Figure 4-9: Unloading Vehicle on Pearl Street

While outside the study area, if the conversion of Spring Street or Market Street to two-way traffic is pursued further, consideration should be given to extending the two-way operations to the west to provide continuity. West Spring Street and West Market are currently two-way west of West Fifth Street. Converting the segment of Market between Scribner should be relatively simple, but the Spring Street segment will require extensive coordination with INDOT as it will impact operations of the I-64 ramps.

4.3 Traffic Simulation Results

Peak hour (A.M. and P.M.) traffic simulation models were developed for the downtown New Albany streets using the TransModeler traffic simulation package developed by Caliper Corporation. This software provides a direct interface to the regional travel demand model and can be used to accurately depict traffic conditions and to evaluate alternatives with respect to various performance measures. Peak hour turning movements were collected at numerous intersections throughout the study area as recent, existing counts were not available. Once the existing models were calibrated to reflect existing traffic volumes and speeds, a single two-way alternative was developed that included Elm, Spring, Market, Bank, and Pearl Street with two-way traffic. The travel demand was held constant between the scenarios; that is, the volume of traffic entering and passing through the network in the existing network was assumed to continue to pass through in the two-way scenario, although other travel options exist. The model results for the A.M. peak hour are shown in **Table 4-1**, and the P.M. results are in **Table 4-2**. Performance measures that are included are travel time (in minutes), average travel speed (in miles per hour, MPH), and Level of Service (LOS.) LOS provides an indication of the quality of traffic conditions in the form of a letter grade. LOS ranges from A to F, with A representing free-flow, uncongested conditions and F representing severe congestion and over-capacity conditions. LOS D is considered acceptable in an urban setting.

Table 4-1: A.M. Peak Hour Simulation Results

Roadway Segment	AM Existing Street Network			AM Two-Way Street Network		
	Travel Time (min)	Average Speed (mph)	Level of Service (A-F)	Travel Time (min)	Average Speed (mph)	Level of Service (A-F)
Elm Street						
Eastbound - Scribner Dr to 5th St	1.1	23.4	C	3.5	12.6	E
Eastbound - 5th St to Vincennes St	1.9	22.9	B	3.8	16.0	C
Westbound - Vincennes St to 5th St	----	----	----	2.7	19.8	B
Westbound - 5th St to Scribner Dr	----	----	----	2.3	18.3	B
Spring Street						
Eastbound - Scribner Dr to 5th St	----	----	----	1.6	19.2	B
Eastbound - 5th St to Vincennes St	----	----	----	1.5	29.3	A
Westbound - Vincennes St to 5th St	1.5	29.7	B	1.7	25.7	C
Westbound - 5th St to Scribner Dr	1.7	14.5	E	1.5	18.7	C
Market Street						
Eastbound - Scribner Dr to 5th St	1.1	22.8	C	1.7	19.1	C
Eastbound - 5th St to Vincennes St	1.6	27.9	C	1.5	30.6	B
Westbound - Vincennes St to 5th St	----	----	----	1.6	29.0	B
Westbound - 5th St to Scribner Dr	----	----	----	1.6	20.4	B
Main Street						
Eastbound - Scribner Dr to 5th St	1.4	18.5	D	1.5	16.7	D
Eastbound - 5th St to Vincennes St	1.2	38.0	A	1.4	32.5	B
Westbound - Vincennes St to 5th St	1.2	38.4	A	1.4	33.6	B
Westbound - 5th St to Scribner Dr	1.3	18.7	D	1.5	16.3	D
Pearl Street						
Northbound - Main St to Oak St	----	----	----	0.9	20.2	B
Southbound - Oak St to Main St	1.4	15.4	B	1.2	17.4	B
Bank Street						
Northbound - Main St to Oak St	1.1	16.9	B	0.7	25.8	A
Southbound - Oak St to Main St	----	----	----	0.7	25.9	A

Table 4-2: P.M. Peak Hour Simulation Results

Roadway Segment	PM Existing Street Network			PM Two-Way Street Network		
	Travel Time (min)	Average Speed (mph)	Level of Service (A-F)	Travel Time (min)	Average Speed (mph)	Level of Service (A-F)
Elm Street						
Eastbound - Scribner Dr to 5th St	1.5	17.2	C	3.6	12.4	E
Eastbound - 5th St to Vincennes St	1.9	21.9	B	3.2	15.1	C
Westbound - Vincennes St to 5th St	----	----	----	3.1	17.0	C
Westbound - 5th St to Scribner Dr	----	----	----	3.0	14.3	D
Spring Street						
Eastbound - Scribner Dr to 5th St	----	----	----	1.6	16.2	E
Eastbound - 5th St to Vincennes St	----	----	----	1.8	23.9	B
Westbound - Vincennes St to 5th St	1.4	30.4	B	3.4	21.6	D
Westbound - 5th St to Scribner Dr	1.8	14.0	E	1.5	17.3	D
Market Street						
Eastbound - Scribner Dr to 5th St	1.2	21.7	D	1.3	23.3	C
Eastbound - 5th St to Vincennes St	1.7	26.9	C	1.5	29.5	B
Westbound - Vincennes St to 5th St	----	----	----	1.4	32.0	B
Westbound - 5th St to Scribner Dr	----	----	----	1.1	27.7	B
Main Street						
Eastbound - Scribner Dr to 5th St	2.2	16.1	D	1.4	20.0	C
Eastbound - 5th St to Vincennes St	1.2	38.4	A	1.4	33.5	A
Westbound - Vincennes St to 5th St	1.2	37.4	A	1.5	31.8	B
Westbound - 5th St to Scribner Dr	1.6	15.7	E	1.5	17.4	D
Pearl Street						
Northbound - Main St to Oak St	----	----	----	1.1	20.8	B
Southbound - Oak St to Main St	1.2	15.2	B	1.7	13.8	B
Bank Street						
Northbound - Main St to Oak St	1.0	20.2	B	0.9	23.9	B
Southbound - Oak St to Main St	----	----	----	0.8	25.2	A

The simulation results indicate that overall travel speeds will be decreased under a complete two-way scenario. However, is also suggests that there may be some operational concerns along portions of Elm Street and Spring Street. The west end of Elm Street between Scribner Drive and Fifth Street sees eastbound travel time increase from 1.1 minutes in the existing condition to 2.9 minutes in the two-way scenario and LOS declines from C to E. The remainder of Elm Street appears to operate acceptably with two-way traffic during the A.M. peak. In the P.M., the travel time along eastbound Elm Street between Scribner Drive and Fifth Street increases from 1.5 minutes to 3.9 minutes and average speeds decrease from 17.2 MPH to 8.3 MPH (LOS remains unchanged.) AS is the case with the A.M., the remainder of Elm Street appears to operate in an acceptable manner east of Fifth Street.

Operations along Spring Street do not appear to be significantly worse under the two-way scenario than in the existing condition. Average speeds tend to decrease and travel times increase, but not exceedingly so. The only exception is west of Vincennes Street during the P.M. peak. In the afternoon rush hour, westbound Spring Street experiences a significant amount of traffic traveling in the direction of I-64. If parking is maintained along this section, a single traffic lane can be provided in each direction of travel. However, if two-way operations along Spring Street are to be pursued, consideration should be given to eliminating parking along the north side of the street to provide an additional westbound travel lane at

least in the vicinity of Vincennes Street. Further west, there are few traffic signals and a single lane will likely be able to accommodate the travel demand.

Conditions along Market Street improve under the two-way scenario. Some of this improvement can likely be attributed to the additional opportunities for eastbound travel that are introduced with the two-way conversion of Spring Street. Operations along Main Street are not adversely affected by the conversion of traffic to two-way.

Based on these findings, it appears as though the conversion of Market Street and Bank and Pearl Street would likely be easier to implement than Elm and Spring Street. In addition, as Elm and Spring affect the operations of Vincennes Street and the I-64 interchange to a much larger extent than the other facilities, they will likely require significant additional study and coordination with INDOT and perhaps the Federal Highway Administration (FHWA.) Therefore, if prioritization of the conversion process were to be considered, it is recommended that Market Street and Pearl and Bank Street be considered first.

4.4 Cost Estimates and Funding Sources

Conceptual cost estimates have been developed for each alternative. It is assumed that much, if not all, of the recommendations within each alternative would be accomplished under a single contract. This provides for some economy of scale rather than requiring more costly individual contracts for individual components. There are many variables that cannot be considered in a planning-level study such as this, and without detailed design plans or specifications it is not possible to develop detailed costs for individual items such as curb extensions, raised intersections, or gateways. Costs for items such as these have been estimated based on prior experience and available literature, but actual construction costs can be significantly higher. In order to account for unknown conditions (i.e. utility impacts, etc.), a 25% contingency factor has been applied to each alternative's cost. The cost estimate for the Low-Build Traffic Calming Alternative is shown in **Table 4-3**, the High-Build Traffic Calming Alternative in **Table 4-4**, and the Two-Way Alternative in **Table 4-5**. Based on the findings from the simulation analysis, the Two-Way Alternative has been further divided into a low-build scenario that includes Market Street and Pearl and Bank Street, and a high-build that includes Spring and Elm Street.

These costs include the conversion of the east-west streets from the existing two-way sections west of I-64 (in the case of Spring and Market Street) or Scribner Drive (Elm Street.) However, the Spring Street cost does not include modifications that may be required at the I-64 interchange, but it does include the cost for a new traffic signal which will likely be required at the entrance ramp to eastbound I-64.

Table 4-3: Cost Estimate for the Low-Build Traffic Calming Alternative

Street	Segment	Description	Units	Cost
Oak Street	Entire length	Stripe 7 ft. residential parking on both sides of street	1.1 Miles	$2,900.00
Elm Street	Entire length	Stripe 2-12 ft. driving lanes and 8 ft. residential parking on both sides of street	1.2 Miles	$4,600.00
	Scribner Dr.	Curb extensions, except for NW corner of intersection	3 Each	$4,500.00
	From Post Office to Vincennes St.	Curb extensions at select intersections	12 Each	$18,000.00
	8th St.	Curb extensions	4 Each	$6,000.00
Spring Street	Entire length	Stripe business/residential parking	1.2 Miles	$2,900.00
	From 4th St. to Vincennes St.	Stripe 3 existing driving lanes to one 11 ft. lane and two 10 ft. lanes with striped parking on both sides of street and 5 ft. bike lane on south side of street (adjacent to 11 ft. lane)	0.7 Miles	$5,700.00
	Scribner Dr.	Curb extensions, except for SW corner of intersection	3 Each	$4,500.00
	Between Bank St. and 7th St.	Curb extensions at select intersections	8 Each	$12,000.00
	Between 8th and 9th St.	Speed table	1 Each	$5,000.00
	Near 13th St.	Speed table	1 Each	$5,000.00
Market Street	Entire length	Stripe business/residential parking	1.2 Miles	$3,200.00
Main Street	From Pearl St. to Vincennes St.	Stripe 2-12 ft. driving lanes, 8 ft. business/residential parking and 5 ft. bike lanes on both sides of street	1.03 Miles	$5,500.00
	From Scribner Dr. to Pearl St.	Bike route designation with "Share the Road" signage		$500.00
			SUBTOTAL	$80,300.00
			CONTINGENCY (25%)	$20,075.00
			DESIGN (7%)	$5,621.00
			MOBILIZATION (3%)	$2,409.00
			DEMOBILIZATION (1.5%)	$1,204.50
			TOTAL COST	**$109,609.50**

Table 4-4: Cost Estimate for the High-Build Traffic Calming Alternative

Street	Segment	Description	Units	Cost
Oak Street	13th St.	Raised Intersection	1 Ea	$40,000.00
Elm Street	Just past Scribner Dr. or State St.	Gateway	1 Ea	$20,000.00
	13th St.	Raised Intersection	1 Ea	$40,000.00
Spring Street	Just west of Vincennes St.	Gateway	1 Ea	$20,000.00
	Bank St.	Raised Intersection	1 Ea	$40,000.00
Market Street	7th St.	Raised Intersection	1 Ea	$40,000.00
Main Street	From Pearl St. to Vincennes St.	Construct 10' non-traversable median	1.0 Miles	$309,000.00
	State St.	Raised Intersection	1 Ea	$40,000.00
			SUBTOTAL	$549,000.00
			CONTINGENCY (25%)	$137,250.00
			DESIGN (7%)	$38,430.00
			MOBILIZATION (3%)	$16,470.00
			DEMOBILIZATION (1.5%)	$8,235.00
			TOTAL COST	**$749,385.00**

Table 4-5: Cost Estimate for the Two-Way Traffic Alternative

2-way Street Considerations - Low Build				
Street	**Segment**	**Description**	**Length (mi)**	**Cost**
Market Street	W. 5th St. to Vincennes St.	Convert to 2-way 2-lane section	1.41	$515,300.00
Pearl and Bank Streets	Elm St. to Main St.	Convert to 2-way 2-lane section	0.49	$532,250.00
2-way Street Considerations - High Build				
Street	**Segment**	**Description**	**Length (mi)**	**Cost**
Elm Street	Scribner Dr. to Vincennes St.	2 EB and 1 WB from Scribner Dr. to State St.; 2-lane section with striped parking from State St. to Vincennes St.	1.15	$388,750.00
Spring Street	W. 5th St. to Vincennes St.	2-way 2-lane from W 5th St. to I-64 EB Ramp; 2 WB and 1 EB lanes from I-64 EB Ramp to 3rd St.; 3-lane section with center continuous turning lane or median from 3rd St. to Vincennes St.	1.41	$675,250.00
			SUBTOTAL	$2,111,550.00
			CONTINGENCY (25%)	$527,887.50
			DESIGN (7%)	$147,808.50
			MOBILIZATION (3%)	$63,346.50
			DEMOBILIZATION (1.5%)	$31,673.25
			TOTAL COST	**$2,882,265.75**

Funding for the traffic calming options can come from a number of sources. Hazard Elimination-Safety (HES) funds may be applied for to improve intersections or corridors where crash rates are high. The Safe Routes to School Program can be utilized to improve pedestrian conditions within areas near schools. This would be a candidate funding source for the speed tables on Spring Street. Transportation Enhancement funds can be sought for improving pedestrian conditions or making corridors ore pedestrian friendly. This may be an appropriate source of funding for raised intersections and curb extensions. The conversion of one-way to two-way traffic will likely require traditional sources such as state (INDOT) or local funding.

4.5 Other Recommendations

In addition to traffic calming and two-way traffic alternatives, recommendations have been developed to improve other issues with the New Albany transportation system. One location of concern is the grade crossing at Main Street and Vincennes Street. This two-way stop-controlled intersection is over 100-feet wide from the southwest curb line to the northwest and the rail line travels through the southbound lane on Vincennes Street north of Main Street. There is currently a single travel lane on each side of the rail lines south of Main Street. The eastern rail line appears to be abandoned. An option for improving this intersection is shown in **Figure 4-10**.

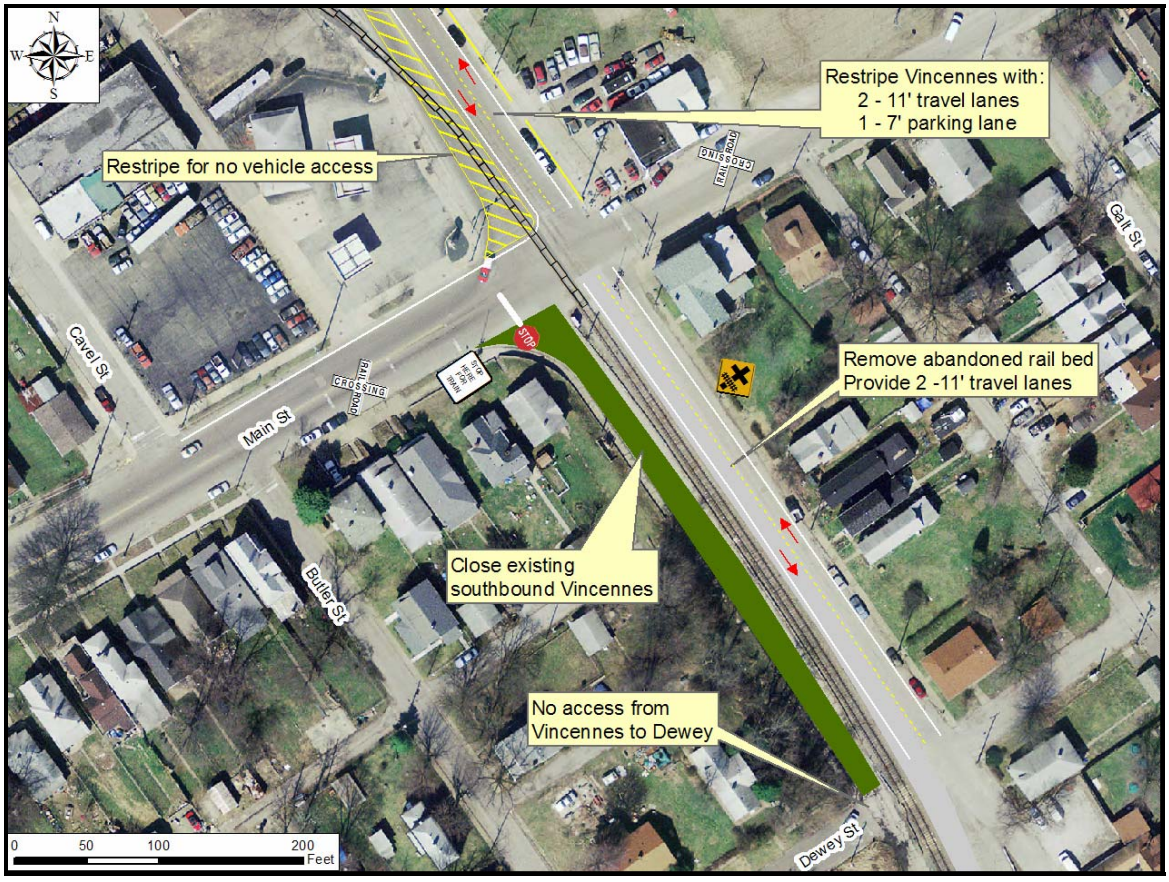


Figure 4-10: Possible Intersection Improvement – Main Street at Vincennes Street

This option consists of the following improvements:

1) Removal of the abandoned east track bed south of Main Street. (rail has been removed)
2) Closure of the southbound leg (west side) of Vincennes Street south of Main Street. Traffic can still access Dewey Street via Butler Street and Sixteenth Street from Main Street.
3) Conversion of the east side of Vincennes Street south of Main Street to a two-lane, two-way roadway
4) Realignment of the north leg of Vincennes Street with the south to eliminate the skew angle at the grade crossing. The existing street width appears wide enough to accommodate two 11-foot wide travel lanes. Eliminating the parking along the east side of the street immediately north of Main Street would be desirable.
5) Construction of a concrete curb along the west side of Vincennes Street north of Main Street to eliminate the possibility for vehicles to cross the tracks except for at the Main Street intersection.

CSX has also indicated a desire to minimize rail-vehicle interactions within the 15th Street corridor. One way to achieve this goal is to construct a concrete curb along the rail line, thereby preventing vehicles from entering or exiting the alleys between the major intersections. **Figure 4-11** depicts what the section of 15th Street between Spring Street and Elm Street may look like if such an option were pursued.

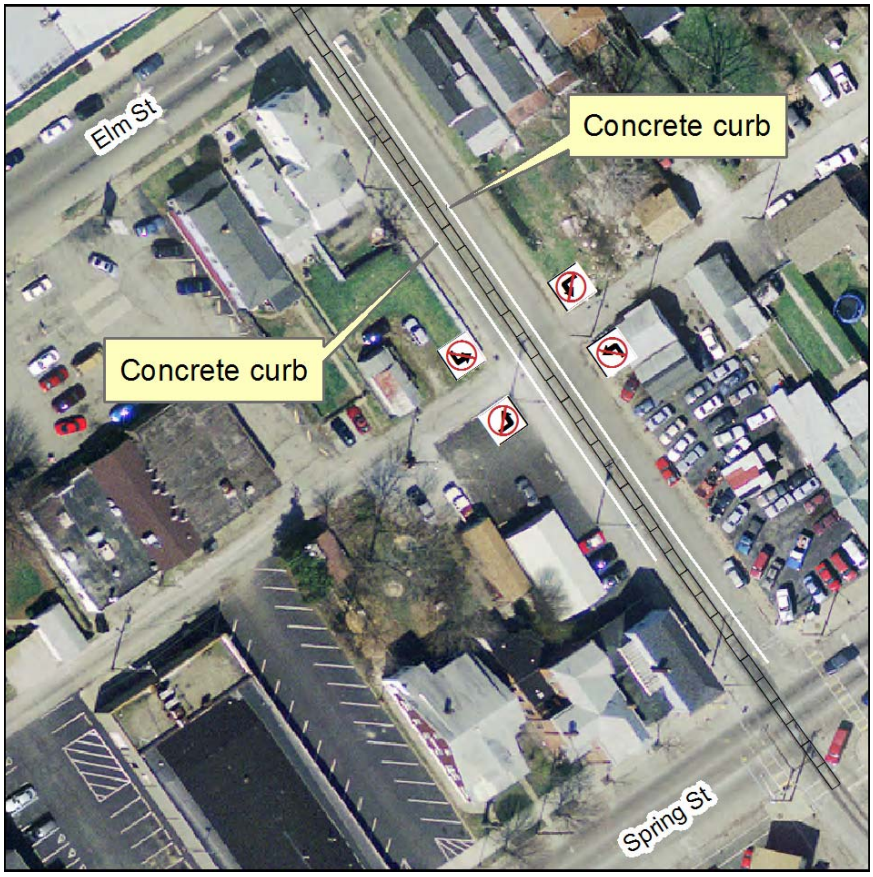


Figure 4-11: Possible Rail Improvement – 15th Street

Finally, the City of New Albany has expressed an interest in establishing a better connection between the neighborhoods at the east end of Spring Street, west of the bridge over Silver Creek. The area is shown in **Figure 4-12**.

Currently, Spring Street is an obstacle to north-south traffic and pedestrian flow. No left turns are allowed from eastbound Spring Street to northbound Beharrell Avenue, and vehicles are required to use a slip ramp cross under the bridge and turn north. It is not possible for vehicles to cross Spring Street at Beharrell Avenue. Crossing at the intersections to the west is difficult as travel speeds along Spring tend to be high and there are no traffic control devices to impede traffic flow to provide safe gaps. The closest signalized intersection where pedestrians can safely cross Spring Street is at Silver Street, approximately 1,800 feet west of Beharrell.

Figure 4-12: East Spring Street

The City should consider the signalization of Beharrell or Woodrow Avenue to provide an opportunity for more convenient and safer travel (both vehicular and pedestrian) across Spring Street. This would require a traffic signal warrant analysis to determine if a signal is warranted at either location.

ENTRAN

Appendix: Typical Sections

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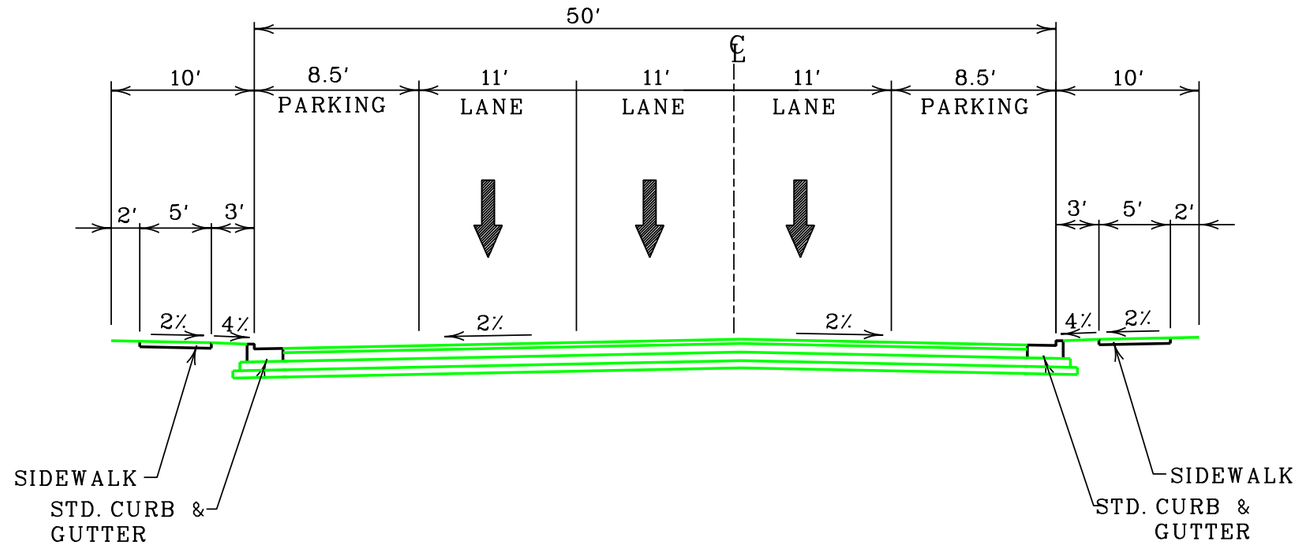

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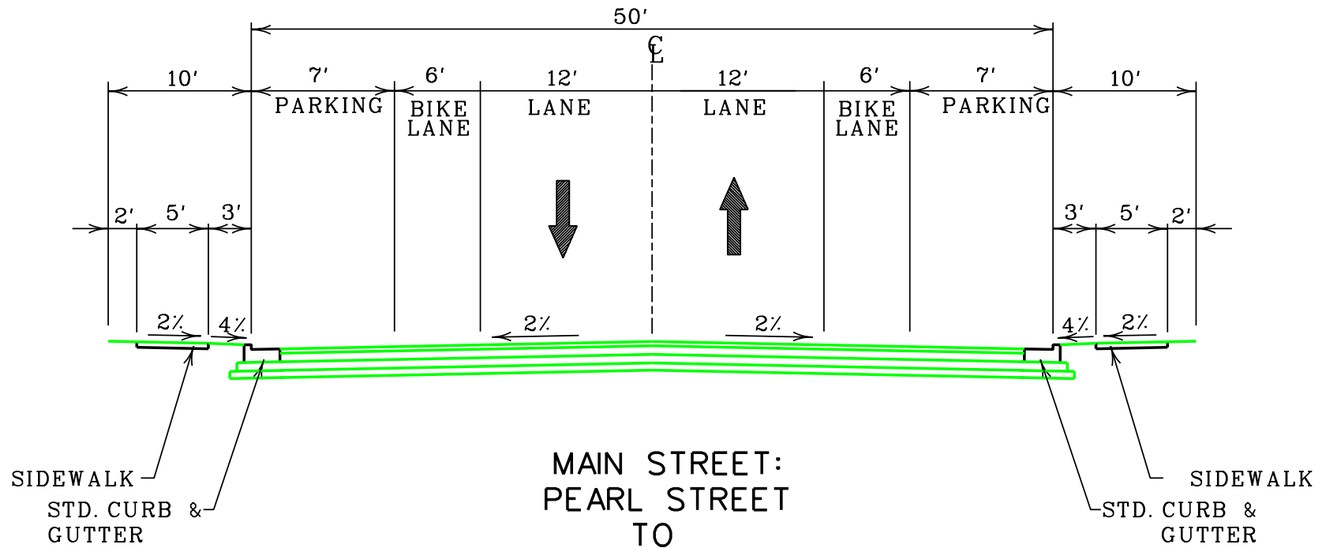

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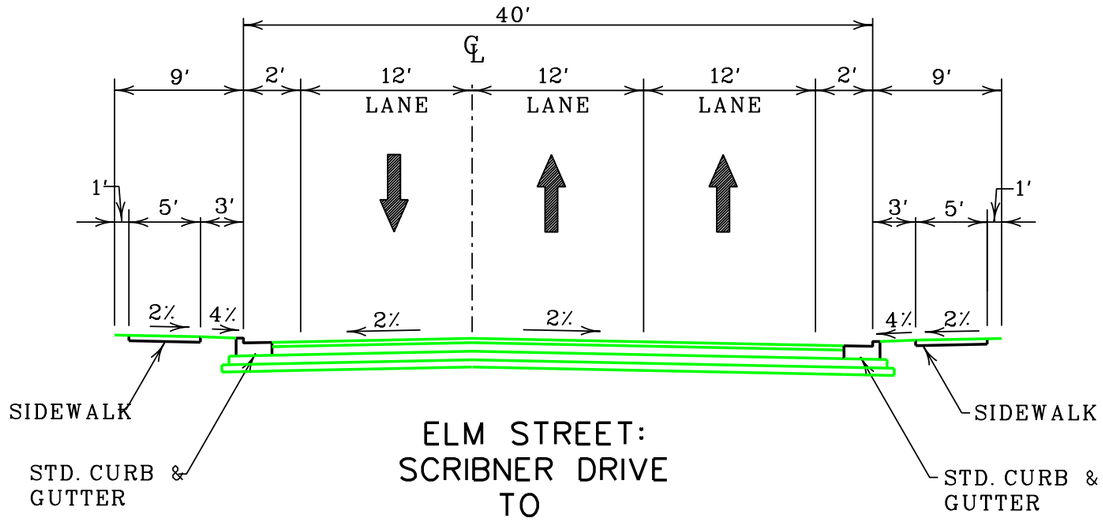

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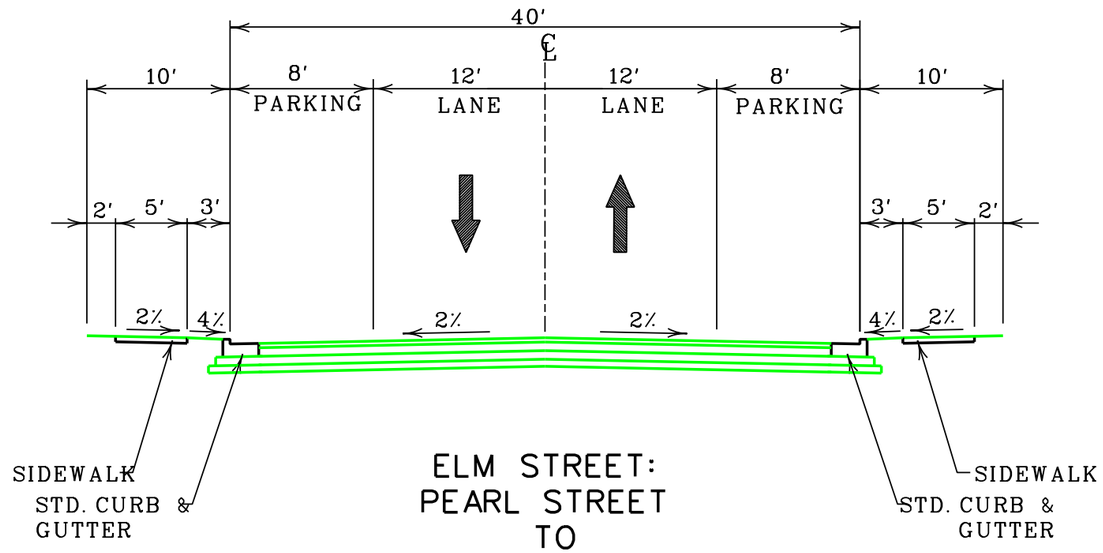

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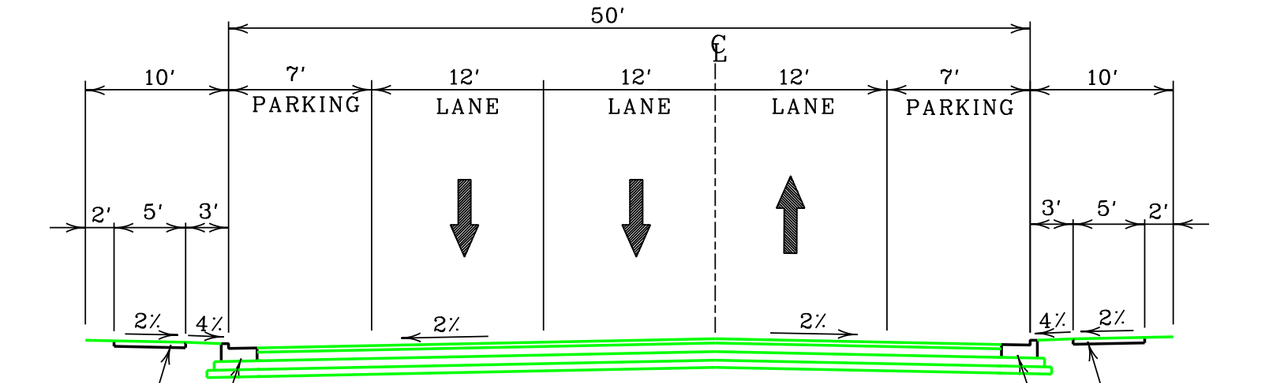

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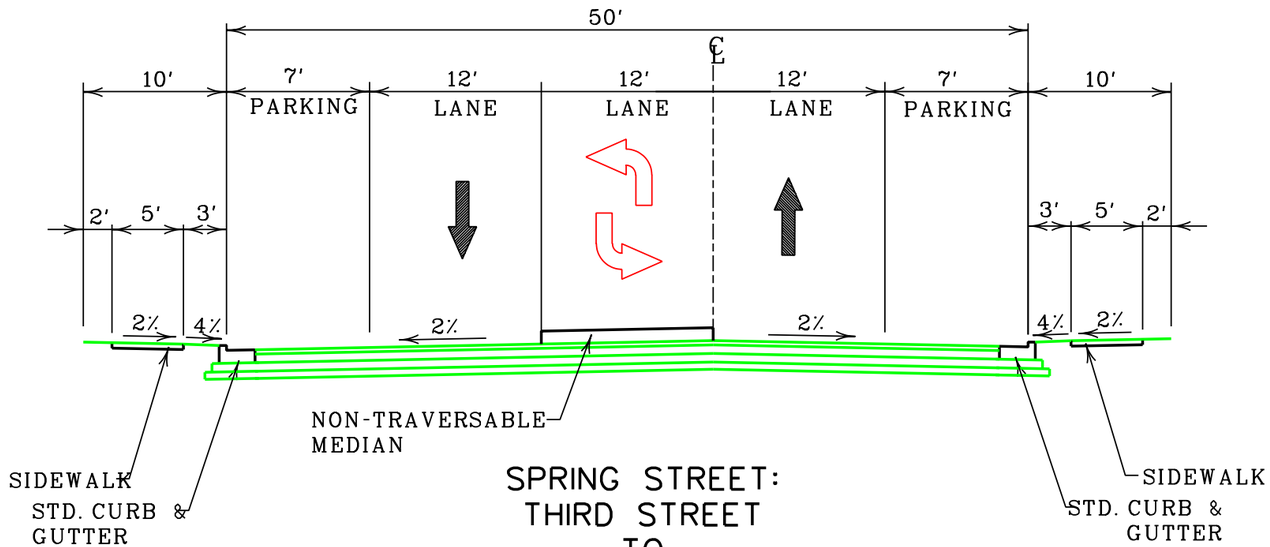

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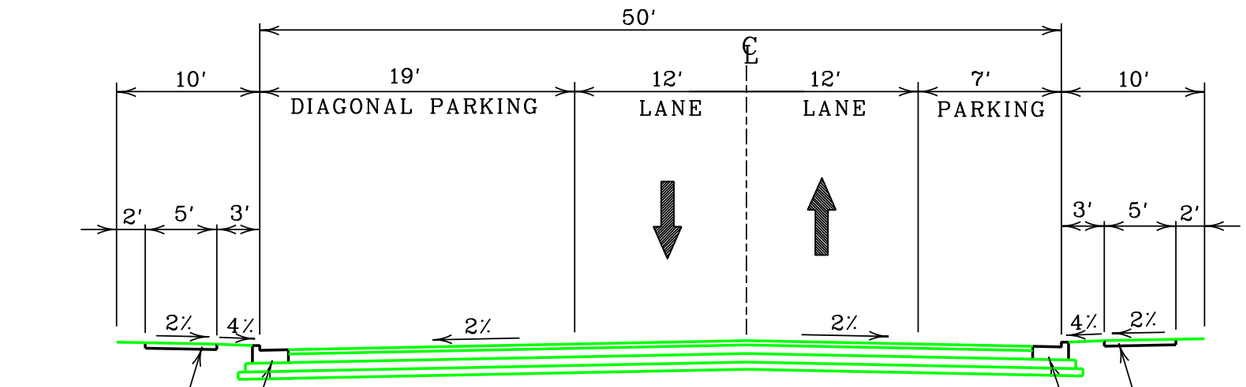

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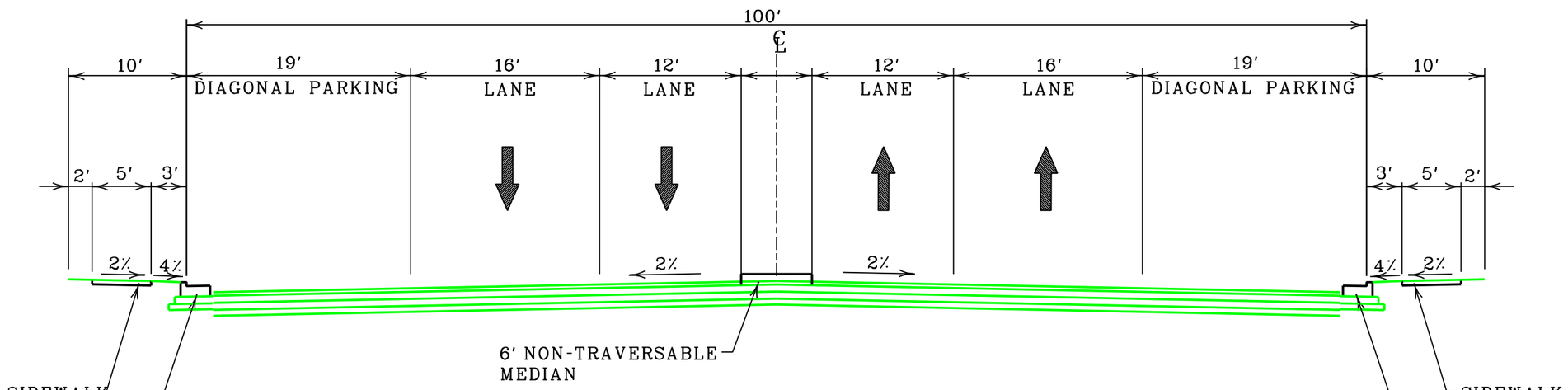

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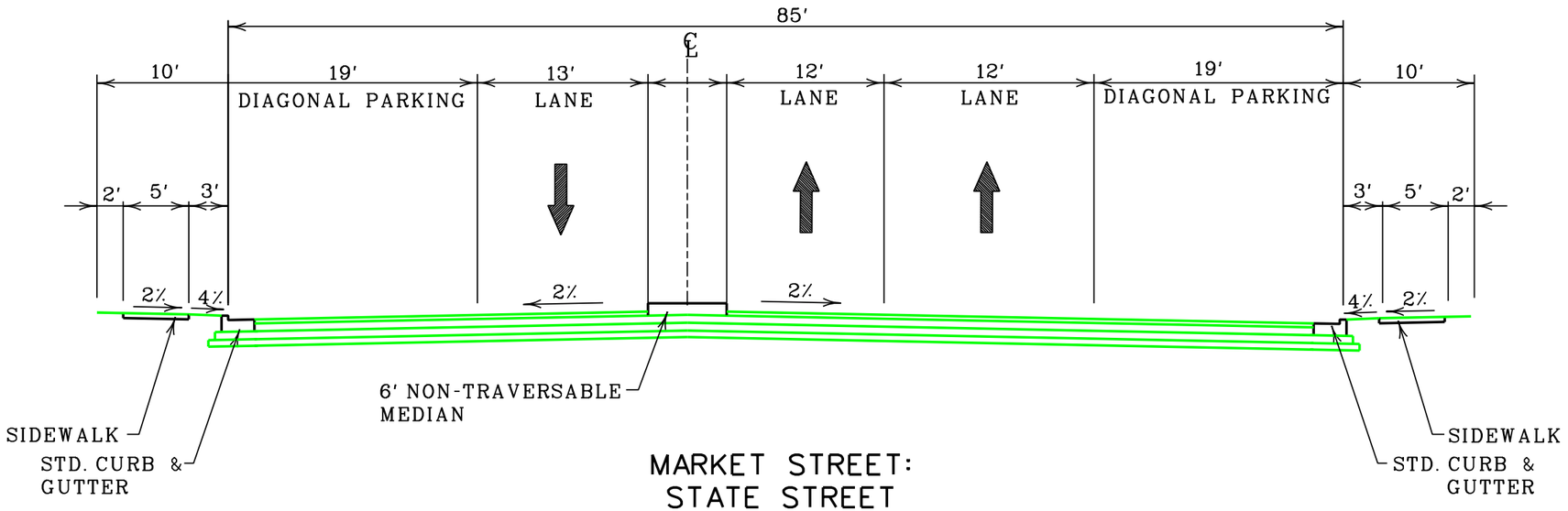

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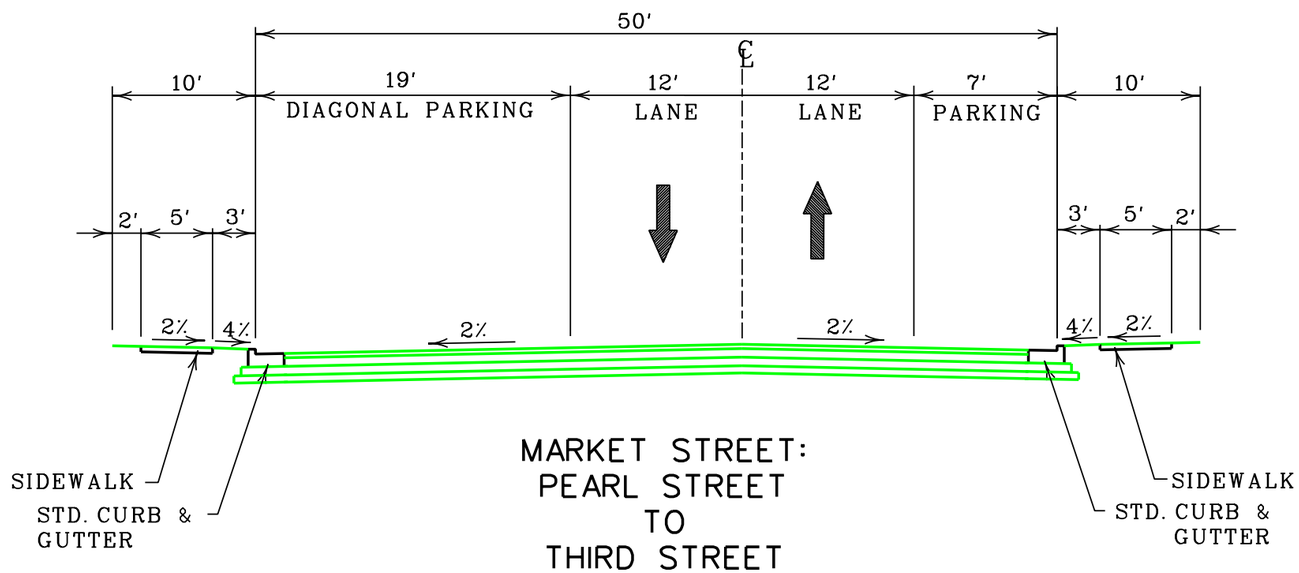

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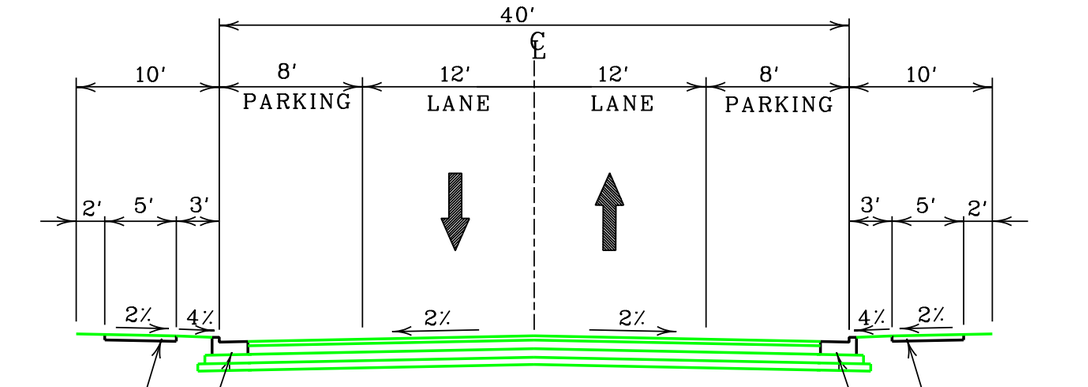

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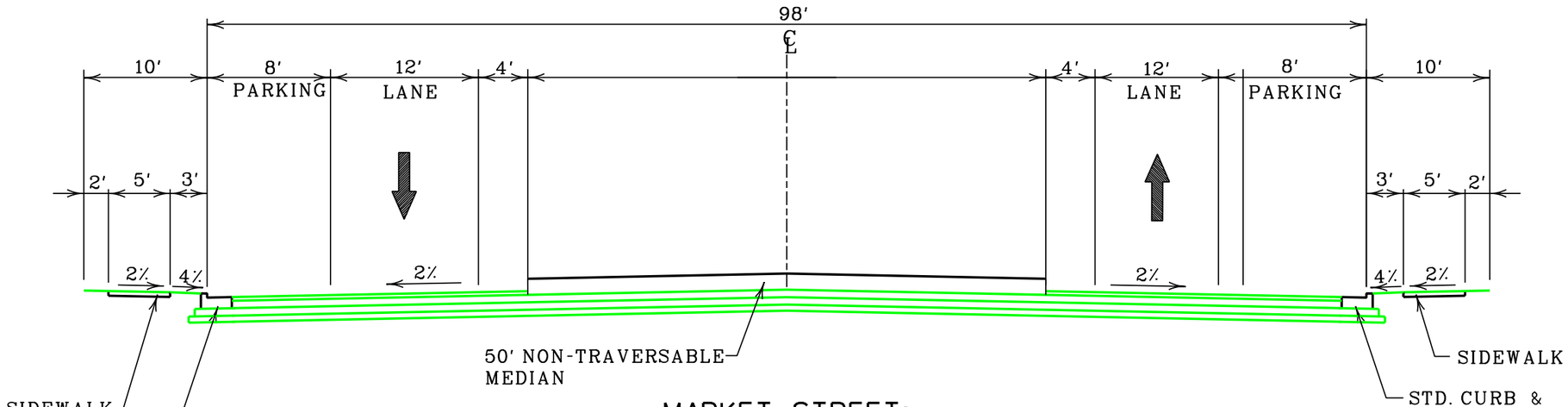

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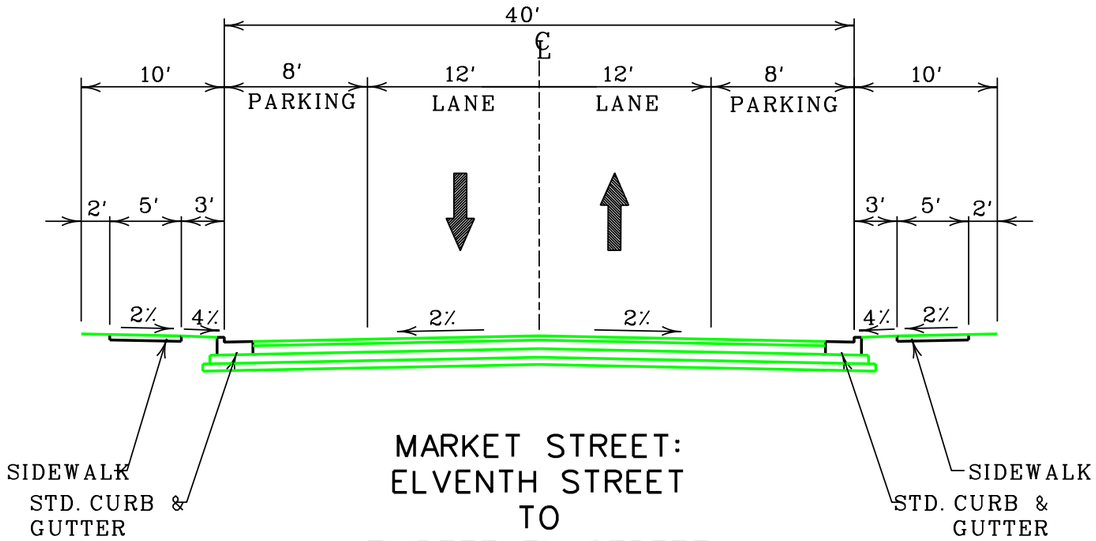

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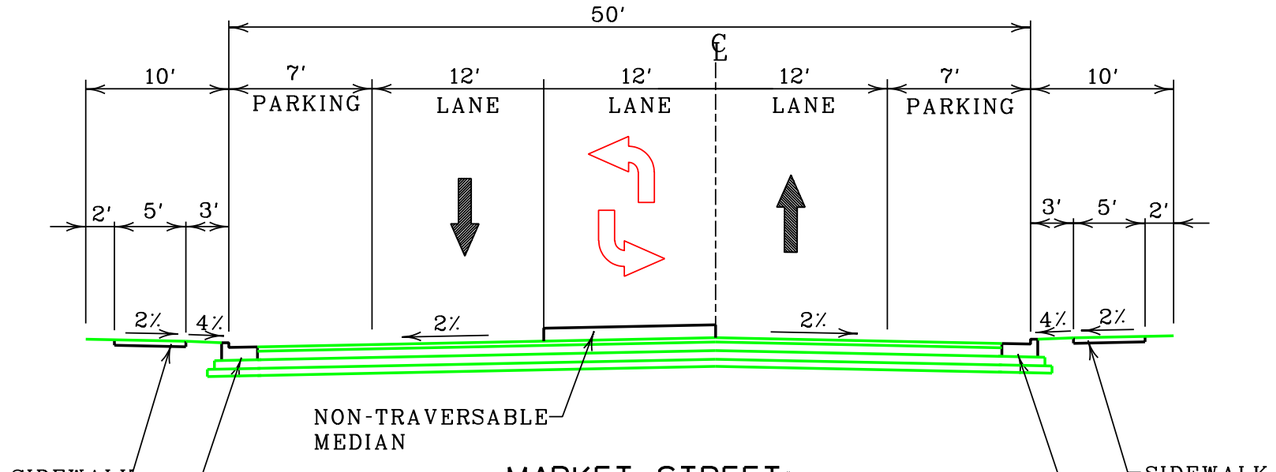

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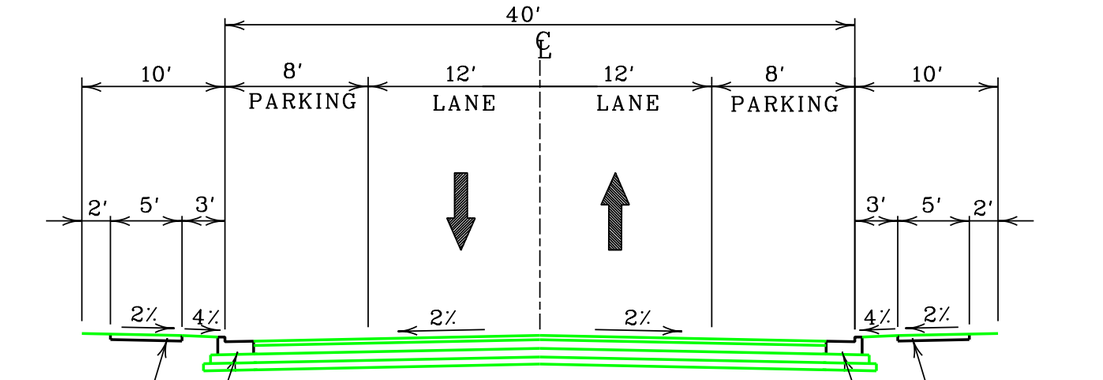
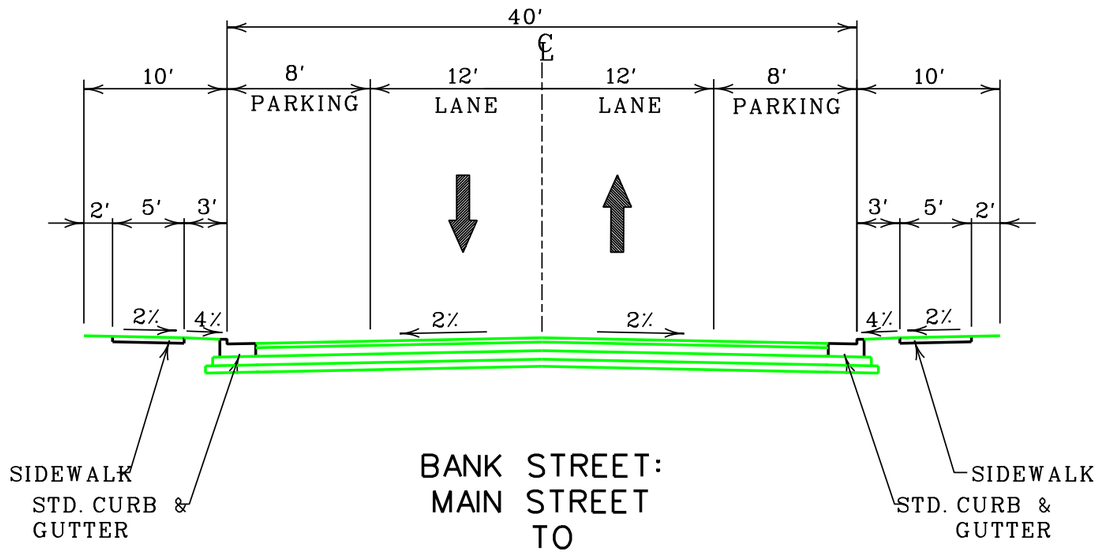
COUNTY OF	ITEM NO.	SHEET NO.
FLOYD	N/A	

TWO-WAY ALTERNATIVE
HIGH-BUILD



PEARL STREET:
MAIN STREET
TO
ELM STREET



BANK STREET:
MAIN STREET
TO
OAK STREET

NOT TO SCALE.
SIDEWALK DIMENSIONS SHOWN
FOR REFERENCE ONLY.

TYPICAL SECTIONS
PEARL & BANK STREET

PREPARED BY DATE
CHECKED BY DATE
APPROVED BY DATE

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