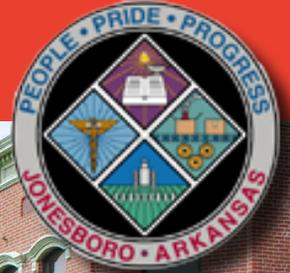




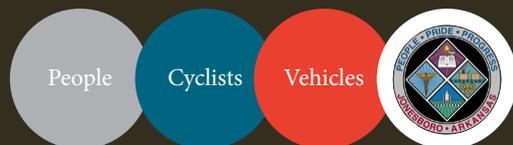
City of Jonesboro, Arkansas



Downtown Jonesboro Pedestrian / Bicycle Safety Study



Improving mobility for pedestrian and bicyclist while maintaining the current function of vehicular traffic.



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Acknowledgements

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Special thanks to: Honorable Mayor Harold Perrin

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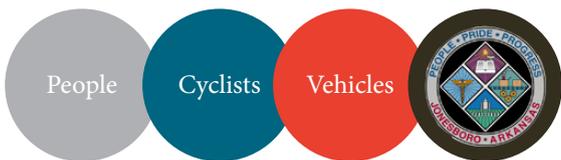
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01: Introduction



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The Jonesboro Metropolitan Planning Organization (MPO) desires to improve the mobility functions with respect to pedestrian, bicycle and vehicular traffic in the downtown section of the city. The main focus of this study is improving mobility for pedestrian and bicyclist while at the same time not diminishing the current function of vehicular traffic. Safety of pedestrians and bicyclists is a concern and this study will make recommendations to improve safety within this important district of the city.

Project Goals

- ***Identify the best method to improve bicycle access and safety within the study area***
- ***Identify opportunities to improve pedestrian movement within the study area***
- ***Identify appropriate bicycle connection from ASU to downtown Jonesboro***
- ***Identify appropriate measures to reduce negative traffic impacts within the study area***



PURPOSE AND NEED STATEMENT

PURPOSE

The purpose of this project is to evaluate alternatives and develop recommendations for the Downtown Jonesboro study area that can be implemented to improve accessibility and mobility conditions for pedestrians and cyclists in this economically and culturally important district. A review of crash data will be supplemented with on-site observations to determine the locations of highest need. Recommendations will be developed using both traditional and state-of-the-art countermeasures for non-motorized and traffic safety.

This study will evaluate potential impacts of the alternatives considered. Impact evaluations will inform the recommended alternative. The study area includes Main Street and spans north to Johnson Avenue, south to Oak Street, west to Union Street and east to Church Street.

This project was developed by the Jonesboro MPO, city and local officials in response to broad public interest from neighborhood and business community stakeholder groups in improving pedestrian and bicycle safety, accessibility, and accommodations along and within the downtown Jonesboro study area. Officials sensed a general interest from the public in improving conditions for current and future pedestrians and cyclists within downtown Jonesboro and the neighborhoods on the east and west side of downtown. The primary problems this project seeks to address are the accessibility and barriers to safe bicycle and pedestrian travel in the City of Jonesboro by recognizing downtown as a primary point of bicycle and pedestrian trip origination and also a destination.

NEED

The heart of downtown Jonesboro today is Main Street, which extends south into downtown from Johnson Avenue initially as a bidirectional four-lane roadway before converting to a one-way pair with Union Street just south of the railroad tracks. Main Street is currently a northbound one-way street from Oak Street to Cate Street. The majority of this one-way segment of Main Street feature two 9 to 10 foot vehicular lanes and parallel on-street parking along both sides. Sidewalks are present for the entire one-way segment through downtown and are generally wider than seven feet. However, there are large segments where the elevation difference between the roadway and the sidewalk exceeds two feet. The one-way portion of Union Street is generously wide, with vehicular lanes in excess of 13 feet in width and parallel on street parking on both sides. Church Street is currently bi-directional and features intermittent parallel on street parking along both sides. There are currently no bike lanes or any other dedicated bicycle facilities within the study area. Observations of the existing conditions and testimony of existing users of the study area indicate there is at least a perception of danger for cyclists and pedestrians in the area. Crash data will be analyzed to determine the level of actual injury to bicyclists and pedestrians within the study area. A broadly held conception of the public seems to be that Main Street is a dangerous place for cyclists and pedestrians due to the speed and volume of vehicular traffic and narrowness of the roadway. Public officials and citizens have indicated that they believe it is currently desirable yet difficult and perhaps dangerous to bike along the streets or cross the streets as pedestrians within downtown.

The desired conditions would be for downtown Jonesboro to become a network of multi-modal corridors that are equally safe, attractive and accommodating for all users.

EXISTING PLANNING EFFORTS

As part of the planning teams effort to gain an understanding of existing conditions and allied planning efforts that could impact the recommendation of this study, existing planning documents were reviewed. A listing of the resources that were gathered and reviewed are listed below.

- ASU Campus Bicycle Master Plan
- Pedestrian and Bicycle Crash Data for the City of Jonesboro
- Johnson Avenue Traffic Counts
- 2035 Metropolitan Transportation Plan
- 2014 Jonesboro Area Traffic Report
- 2014 Jonesboro MPO Community Values Survey Final Report
- Jonesboro Downtown Action Agenda Updated 2013

Some interesting findings in these reports that reveal preference include the following.

ASU Campus Bicycle Master Plan

The ASU plan calls for Aggie Road to be the primary connector to down town. Aggie Road has far less traffic and continues in an east by west direction across campus all the way to University Boulevard.

Pedestrian and Bicycle Crash Data for the City of Jonesboro

Downtown crash reveals a slightly lower rate of crashes than are found on Johnson Avenue. Refer to Section 2 of this study for more detailed discussion.

Downtown Traffic Counts

Main Street and Union Street are one of the main north south corridors in the city. Refer to Section 2 of the study for more detailed discussion.

2035 Metropolitan Transportation Plan

Jonesboro Area MPO developed the 2035 Metropolitan Transportation Plan (MTP) in 2011. The vision of the plan is stated as:

“Develop and maintain a safe, efficient, well-integrated, and environmentally compatible transportation system that fosters livable communities and provides convenient choices for accessing destinations throughout the Jonesboro Metropolitan Planning Area”.

In forwarding the vision, Metropolitan Planning Organization developed several goals and priorities. Following priorities of the MTP are relevant to the goals of this project.

Priority 1.02 – Enhance mobility and support the use of alternate transportation modes by encouraging improved access to public transportation, carpooling, bicycling and walking.

Priority 5.01 – Encourage the construction of sidewalks to facilitate non-motorized transportation.



Priority 5.02 - Provide and maintain a continuous network of safe and convenient bikeways connected to other transportation modes and to the regional and state bikeway system consistent with future local street design standards.

Priority 5.04 - Recognizing that automobile, transit, and bicycle users are also pedestrians at either end of every trip, provide aesthetically pleasing and diverse experiences for pedestrians.

Priority 7.01 - Develop a list of needed transportation improvements that are eligible for federal funding - including highways, transit, and non-motorized travel facilities - for inclusion in the Transportation Improvement Programs (TIPs).

The analyses and recommendations of the Downtown Jonesboro Pedestrian/Bike Safety Study are in line with the priorities listed above.

2014 Jonesboro Area Traffic Report

The 2014 Jonesboro Area Traffic Report compiles the average daily traffic on various streets in the Jonesboro MPO area. Several of these locations are within the study area. The ADT published in the report, in addition to the counts conducted by the City of Jonesboro, were used in conducting the existing conditions analysis.

2014 Jonesboro MPO Community Values Survey Final Report Home, Neighborhood and Community

The factors that residents rated as the most important in deciding where to live, based upon the combined percentage of “very important” and “important” responses were: high quality public schools (87%), privacy from neighbors (86%), being within an easy commute to work (66%), and easy access to the highway (61%).

Neighborhood Recreational Opportunities

Fifty-eight percent (58%) of residents prefer to live in a neighborhood where parks and recreational opportunities are within driving distance, but not walking distance, compared to 42% who prefer to live in a neighborhood where some parks and recreational opportunities are within walking distance.

Neighborhood Transportation Options

Sixty-one percent (61%) of residents prefer to live in a neighborhood where virtually all trips into and out of the neighborhood are made by automobile, compared to 39% who prefer to live in a neighborhood that is accessible by pedestrians, bicycles and transit, as well as automobiles.

The items that residents rated as the most important in improving the quality of life in the area where they live, based upon the combined percentage of “very important” and “important” responses were: maintaining local streets and roads (97%), improving and constructing highways (82%), and adding and maintaining sidewalks (52%).

Jonesboro Downtown Action Agenda Updated 2013

Downtown would be safe and feel safe, especially for pedestrians. This would include “slowing down traffic” on Main Street, improving crosswalks, adding police foot patrols, and accommodating and be safe for those riding bicycles.

A Downtown hotel – or consistent transportation to and from hotels – would allow visitors to enjoy Downtown’s art, entertainment, shops and restaurants. Downtown would also be better connected to Arkansas State University, making it easier for students to go to and from Downtown.

Neighborhoods adjacent to Downtown would be improved with sidewalks, more lighting, and repaired lighting. Residents would feel safe walking to and from Downtown.

Connectivity

There is a great desire locally to connect the following portions of the city:

- Downtown
- North Jonesboro
- Johnson Avenue
- Matthews Medical Mile
- Arkansas State University (ASU)

CONCLUSIONS OF EXISTING PLANNING EFFORTS

A review of existing planning documents presents two widely held differences in community preference. When it comes to transportation improvements relating to vehicular movement, there is wide spread support for roadway improvements with little thought of bicycles. The 2014 Jonesboro MPO Community Values Survey Final Report clearly documents a citizen desire for good roads that provide an easy commute to work. It also shows support for improved sidewalks. What is not clear from the survey is whether or not there is a desire for more mobility options such as bicycle lanes or greenways as part of the transportation system. The neighborhood comments in the survey show a much closer balance between neighborhood preferences to be close to parks and recreation opportunities that are reached by walking as opposed to driving. This trend is in keeping with communities across the country that are striving to encourage citizens to walk more and drive less.

A review of downtown preferences creates a totally different set of ideas. Improving walkability and connectivity of downtown to surrounding area is clearly a high priority and one that is equally as important as safe driving. There is a desire in the downtown area for improved lighting and overall connectivity with ASU in order to make downtown a destination for both students and prospective students.

One of the biggest obstacles articulated in the various studies is the railroad crossings. The need for improved north to south transportation movements for all modes of transportation is hampered by the cost of grade separated crossings over the railroad. Existing bridges over the railroad are functioning at or beyond capacity and there is also the need to expand rights of ways at new or proposed crossings to provide safe multi-modal bridges.

The current north south traffic patterns utilize Main Street as a major one way arterial street to reach the bridge over the railroad. This creates unsafe parking, pedestrian and bicycle

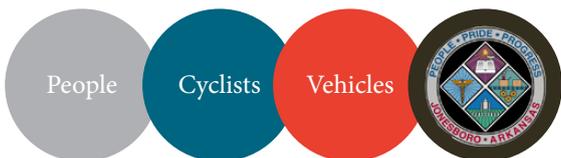


movements on Main Street which has extremely narrow lanes. This creates a less than ideal downtown shopping environment as noted in several of the studies. As the main north south access route to Johnson Avenue, increased traffic volumes and similar pedestrian and bicycle conflicts are also created as documented in the bicycle and pedestrian crash data found in this study.

With the desire for easy commutes from residential areas, improving traffic flow through downtown will be an important consideration for this and future studies. Also important moving forward is the need to improve connectivity between surrounding neighborhoods and ASU and downtown. As downtown continues to grow as a commercial destination and as additional medical facilities move into the area, alternatives to all trips being vehicular in nature will be needed.



02: Evaluation of Existing Conditions



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INVENTORY OF EXISTING CONDITIONS

DOWNTOWN JONESBORO

The study area of the Downtown Jonesboro Pedestrian/Bicycle Safety study is bounded by Union Street to the west, Church Street to the east, Main Street Bridge to the north and Oak Street to the south. Union Street and Main Street serves as a one-way couplet with two travel lanes in each direction and on-street parking for most of the study area. However, the similarity between the two streets end there. The characteristics of these streets and others in the study area unique to themselves as they serve different land-uses.

Street	Number of Lanes	Lane Width (feet)	On-Street Parking (feet)	Bike Lane	Sidewalk (feet)
Union Street	2	10-15	7-11	none	5.5-11.5
Main Street	2	10-11	6-7	none	5-9.5
Church Street	2	10-14	7-9	none	4-8
Cate Avenue / Burke Avenue	2	9.5-13	none	none	3.5-6.5
Huntington Avenue	2	10-15	7-8	none	5.5-9.5
Monroe Avenue	1	10-14	7.5	none	4.5-6
Washington Avenue	3	10-17	6.5-7.5	none	5-7.5
Jefferson Avenue	2	10-12	7.5-10	none	4-6.5
Matthews Avenue	3	10-11	7	none	5
Oak Avenue	2-3	12-17	13	none	4-6.5



UNION STREET

Within the study area, Union Street is a one-way street with two travel lanes in the south direction. It is designated as a principal arterial in the 2035 Metropolitan Transportation Plan (MTP) and provides regional connection as well as access to businesses in downtown Jonesboro. The travel lanes on Union Street in the study area range from 10 – 15 feet in width. Union Street serves as a one-way couplet with Main Street, which is a major thoroughfare for Jonesboro. Southbound traffic travelling through the study area on Main Street diverts from Main Street at the Main Street Bridge onto Union Street until reaching Oak Avenue, where the southbound traffic then makes a left onto Oak Avenue and reconnects with Main Street by making a right at the intersection of Main Street and Oak Street. Union Street extends past Oak Street, but the majority of traffic utilizing Union Street makes the movement previously described. The posted speed limit on Union Street is 25 mph. Within the study area, Union Street provides access primarily to commercial businesses and churches. Generally, 2-hour on-street parallel parking is allowed on both sides of Union Street in the study area, ranging from 7 – 11 feet in width.

Sidewalks are provided on both sides of Union Street in the study area, ranging from 5.5 – 11.5 feet in width. The sidewalk condition on a section of Union Street from the Main Street Bridge to Cate Avenue/Burke Avenue is in poor condition. Generally, on-street parking separates the sidewalk from the moving vehicles on Union Street. There are two mid-block crossings on Union Street, north of Huntington Avenue. However, only one of the crosswalks has pedestrian crossing signs. One non-standard pedestrian crossing pavement marking is also installed south of Huntington Avenue without accompanying pedestrian crossing signs. Pedestrian crossing pavement markings and signs are also installed at the unsignalized intersection of Union Street and Jefferson Avenue, as well as mid-block between Jefferson Avenue and Matthews Avenue. Two new mid-block crossings with curb extensions were recently constructed south of Matthews Avenue as part of the First United Methodist Church expansion project. No bike lanes are provided on Union Street.

MAIN STREET

Main Street is a northbound one-way street within the study area with two travel lanes and serves as a major thoroughfare for Jonesboro. It is also designated as a principal arterial in the 2035 MTP. The average lane width on Main Street for the majority of the study area is 10-11 feet; the standard pavement width for major thoroughfares is 12 feet. However, in urban areas, 10 feet wide travel lanes are acceptable. As previously mentioned, Main Street serves as a one-way couplet with Union Street from its intersection with Oak Avenue to the Main Street Bridge. The posted speed limit on Main Street is 25 mph. The southern portion of Main Street within the study area primarily provides access to banks and churches; the northern portion is more congested, primarily providing access to a mix of land uses including restaurants, offices, and retail shops. Generally, 2-hour on-street parallel parking is allowed on both sides of Main Street in the study area, primarily with a width of 6 – 7 feet; the standard width for on-street parking is 8 – 8.5 feet.

Sidewalks are provided on both sides of Main Street in the study area, ranging from 5 – 9.5 feet in width. A majority of the sidewalks are separated from the moving vehicles by on-street parking or by 3-5 feet grass strip. In addition, curb extensions are provided on all intersections, except at the Matthews Avenue and Oak Avenue intersections with Main Street. Three mid-block crossings with curb extensions and pedestrian crossing signs are also provided on Main Street; one south and two north of Huntington Avenue. These curb extensions provide additional protection for pedestrians crossing Main Street, reduce the distance needed to cross



and increase the visibility of the pedestrians for the motorists. Furthermore, in areas north of Huntington Avenue, there is a two feet wide space between the curb and sidewalk that is used as a step to negotiate the grade difference between the pavement and sidewalk. Decorative street lights are installed on these steps. No bike lanes are provided on Main Street.

CHURCH STREET

Within the study area, Church Street is a two-way street generally traveling in a north-south direction with one travel lane in each direction and turn lanes at intersections. The lane width on Church Street ranges from 10 – 14 feet. Church Street provides a connection between Highland Drive to the south and Cate Avenue to the north. The posted speed limit on Church Street is 30 mph. The development on Church Street is less congested than on Main Street and Union Street, comprising a mix of churches, schools, offices, with some commercial businesses located along the northern portion. Limited 2-hour on-street parallel parking is provided on both sides of Church Street along the northern portion, with widths ranging from 7 – 9.5 feet.

Sidewalks are provided on both sides of Church Street in the study area, ranging in width from 4 – 8 feet. However, sidewalks are missing from the parking lot of the property located on the southwest quadrant of Jefferson Street and Church Street intersection. In addition, sidewalks are in poor condition on the west side of Church Street, north of Oak Avenue. No bike lanes are provided on Church Street.

CATE AVENUE / BURKE AVENUE

Cate Avenue/Burke Avenue is a two-way street that generally travels in an east-west direction with one travel lane in each direction. The lane width on Cate Avenue/Burke Avenue ranges from 9.5 – 13 feet in the study area. Cate Avenue becomes Burke Avenue west of Main Street. The posted speed limit on Cate Avenue is 30 mph and the posted speed limit on Burke Avenue is 25 mph. In the study area, Cate Avenue/Burke Avenue provide access to commercial businesses, offices, and a surface parking lot with 2-hour parking. On-street parking is not provided on Cate Avenue/Burke Avenue in the study area. Sidewalks are provided on both sides of Cate Avenue/Burke Avenue in the study area, ranging from 3.5 – 6.5 feet in width. No bike lanes are provided on Cate Avenue/Burke Avenue.

HUNTINGTON AVENUE

Huntington Avenue is a two-way street that generally travels in an east-west direction with one travel lane in each direction and includes turn lanes at intersections within the study area. The lane width on Huntington Avenue in the study area ranges from 10 – 15 feet. No speed limit was observed on Huntington Avenue. The street primarily provides access to offices and commercial businesses within the study area. On-street 2-hour parallel parking is provided on both sides of Huntington Avenue between Main Street and Church Street, and on the north side of Huntington Avenue between Main Street and Union Street. The on-street parking spaces on Huntington Avenue range from 7 – 8 feet in width. Sidewalk is provided on both sides of Huntington Avenue in the study area, and ranges from 5.5 – 9.5 feet in width. No bike lanes are provided on Huntington Avenue.

MONROE AVENUE

Within the study area, Monroe Avenue is a one-way street that generally travels in a westbound direction with one travel lane ranging from 10 – 14 feet in width. In the study area, Monroe Avenue primarily provides access to alleys running parallel to Main Street as well as to a 2-hour



parking lot on the northwest corner of Main Street and Monroe Avenue. No posted speed limit was observed on Monroe Avenue. A few 2-hour on-street parallel parking spaces are provided on the south side of Monroe Avenue west of Main Street. Sidewalk is provided on both sides of Monroe Avenue in the study area, ranging from 4.5 – 6 feet in width. No bike lanes are provided on Monroe Avenue.

WASHINGTON AVENUE

Within the study area, Washington Avenue is a two-way street that generally travels in an east-west direction with one travel lane in each direction and turn lanes at intersections. The travel lanes on Washington Avenue in the study area range from 10 – 17 feet in width. In the study area, Washington Avenue provides access to the county courthouse, a vacant office building, a bank, and parking lots. Washington Avenue provides connection between the Joe N Martin Expressway to the west and Marion Berry Parkway and Arkansas State University to the east. East of Marion Berry Parkway, Washington Avenue combines with Matthews Avenue. The posted speed limit on Washington Avenue is 30 mph. West of Main Street, 2-hour parallel parking is provided on the south side of Washington Avenue adjacent to the courthouse; east of Main Street, 2-hour parking is provided on the north side of Washington Avenue. No bike lanes are provided on Washington Avenue. In the study area, sidewalk is provided on both sides of Washington Avenue with widths ranging from 5 – 7.5 feet. No bike lanes are provided on Washington Avenue.

JEFFERSON AVENUE

Within the study area, Jefferson Avenue is a two-way street that generally travels in an east-west direction. Although centerline pavement markings are not provided, Jefferson Avenue provides sufficient width for 10-12 feet travel lanes, to accommodate one lane in each direction. Jefferson Avenue provides connection between Church Street to the east and Gee Street to the west. Jefferson Avenue provides access in the study area to private parking lots, a bank, a church, an office, and the courthouse. The posted speed limit on Jefferson Avenue is 30 mph. In the study area, on-street 2-hour parallel parking with widths ranging from 6.5 – 10 feet is provided on both sides of Jefferson Avenue west of Main Street and on the south side of Jefferson Avenue west of Church Street. Private on-street parking is located on the north side of Jefferson Avenue east of Main Street. Sidewalk is provided on both sides of Jefferson Avenue in the study area, with widths ranging from 4 – 6.5 feet. No bike lanes are provided on Jefferson Avenue.

MATTHEWS AVENUE

Within the study area, Matthews Avenue is a two-way street that generally travels in an east-west direction with one travel lane in each direction and turn lanes at intersections. The lane widths on Matthews Avenue range from 10 – 11 feet in the study area. The posted speed limit on Matthews Avenue in the study area is 15 mph. Matthews Avenue provides connection between Washington Avenue near its ramp to the Joe N Martin Expressway to the west and Red Wolf Boulevard and the Mall at Turtle Creek to the east. Within the study area, Matthews Avenue provides access to a church, medical office, and office buildings. In the study area, on-street parking is provided on the south side of Matthews Avenue west of Main Street, with a width of 7 feet. Sidewalk is provided on both sides of Matthews Avenue in the study area with an average width of 5 feet. No bike lanes are provided on Matthews Avenue.

OAK AVENUE

As previously mentioned, the segment of Oak Avenue between Union Street and Main Street is primarily utilized by southbound traffic on Union Street to reconnect with Main Street by turning



right onto Main Street from Oak Avenue. Therefore, Oak Avenue is a one-way street in the eastbound direction between Union Street and Main Street with three 12-foot wide lanes and no on-street parking. East of Main Street, Oak Avenue is a two-way street with one 17-foot wide lane in each direction; on-street parking is provided on the south side with a width of 16 feet. The posted speed limit on Oak Avenue is 30 mph. In the study area, Oak Avenue provides access to offices, a single-family home, and an empty lot. Sidewalk is provided on both sides of Oak Avenue with widths ranging from 4 – 6.5 feet. No bike lanes are provided on Oak Avenue.

TRAFFIC VOLUMES

As a part of the study, 24-hour traffic volumes were obtained from the City of Jonesboro on several sections of the study area streets. Most of the traffic volumes were obtained in November 2014, while some of the traffic volumes were obtained in May 2014. Figure 1 shows the 2014 average daily trip (ADT) on the major streets in downtown Jonesboro. The data showed that the highest ADT counts in downtown Jonesboro are on Main Street and Union Street which carry approximately 7,000 vehicles daily on its two 1-way travel lanes. The traffic volume on Main Street stays fairly constant between 6,636 ADT to 7,000 ADT within the study area. However, the traffic volume on Union Street decreases from approximately 7,748 as it enter from the north on the Main Street bridge to approximately 5,300 ADT, south of Oak Avenue.

Section 2

Church Street carries a slightly lower traffic volume of 5,600 vehicles daily in two directions, with one travel lane in each direction. The traffic volume decreases significantly north of Washington Street, where it carries approximately 1,862 daily vehicles in two travel lanes.

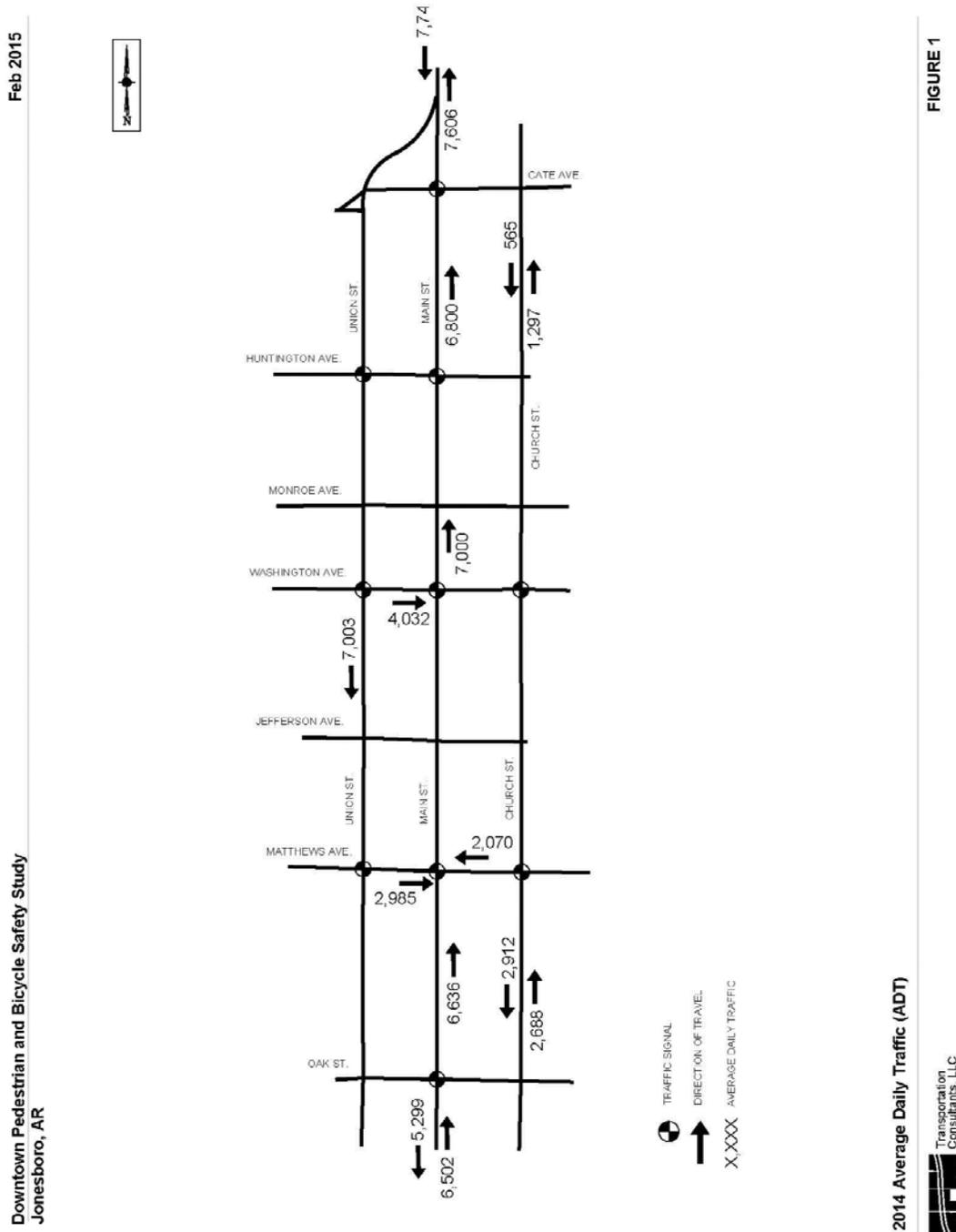


Figure 2.1:2014 Average Daily Traffic on Major Streets in Downtown

In addition to the 2014 ADT, the project team also reviewed the historic traffic volume obtained from Arkansas State Highway and Transportation Department (AHTD). Figure 2.2 shows the historic traffic volume on the Main Street bridge over the BNSF and Union Pacific tracks, Main Street south of Cate Avenue, Union Street south of Cate Avenue, Main Street south of Oak Avenue and Church Street south of Oak Avenue. The historic data shows that while the 2014 traffic volume has decreased slightly from the 2008-2012 levels, it has stabilized since 2013 and is likely to experience modest growth in the future. The traffic volume on Main Street, south of Oak Avenue, shows continuing decline since 2012, which is likely an anomaly in the data.

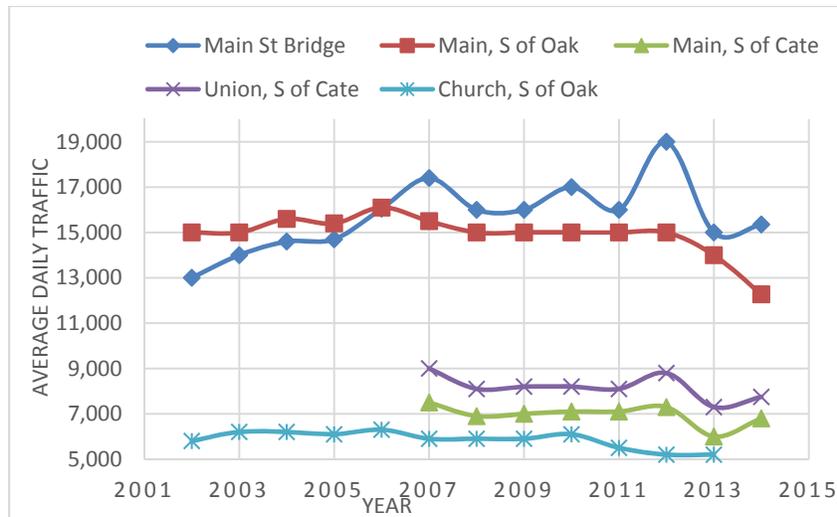


Figure 2.2: Historic ADT Trend in Downtown Jonesboro

EXISTING CONDITION ANALYSIS

The project team conducted the operational analysis of the downtown streets to understand the existing conditions of the automobile, bike and pedestrian modes of transportation. The analysis was conducted based on the 2010 Highway Capacity Manual (HCM) methodologies published by the Transportation Research Board (TRB) for arterial level-of-service. The project team used the Highway Capacity Software (HCS) and ARTPLAN 2012. The segment level-of-service is based on the combination of travel time delay due the signal control and the speed traveled below the free-flow speed for each segment. The arterial level-of-service (LOS) represents the average LOS across all segments. The arterial LOS threshold is shown in Table 2.1. LOS A is considered the best, while LOS F is considered the worst operation.

Table 2.1: Arterial Level-of-Service Threshold

Arterial LOS	Class 1 Arterial (Posted Speed \geq 40mph)	Class 2 Arterial (Posted Speed <40mph)
	Average Speed (mph)	Average Speed (mph)
A	> 40	> 28
B	> 31 and < 40	> 22 and < 28
C	> 23 and < 31	> 17 and < 22
D	> 18 and < 23	> 13 and < 17
E	> 15 and < 18	> 10 and < 13
F	< 15	< 10



The bike level-of-service (BLOS) and pedestrian level-of-service (PLOS) are based on the segment scores calculated according to the methodology described in the 2010 HCM and as revised by Florida Department of Transportation (FDOT). The score takes into consideration the presence of bike and pedestrian facilities, traffic volumes on adjacent travel lanes, protection from moving vehicles, etc. The BLOS and PLOS are determined by comparing the bike and pedestrian score to the threshold shown in Table 2.2.

Table 2.2: Bike and Pedestrian Level-of-Service Threshold

BLOS / PLOS	Segment Score
A	< 2.00
B	> 2.00-2.75
C	> 2.75-3.50
D	> 3.50-4.25
E	> 4.25-5.00
F	> 5.00

Using the level-of-service threshold describe above, the existing condition analysis was conducted on Main Street, Union Street and Church Street from Cate Avenue to Oak Avenue. The existing traffic signals were used to divide the street into different segments. The street features, signal timing, traffic volume, etc., were used in the analysis to determine the level-of-service of each segment as well as the overall arterial result. Table 2.3 shows the results of the analysis.

As shown in the table, the overall automobile level-of-service on Main Street is LOS D with average speed of 16.6 mph. This is considerably slower than the posted speed limit of 25 mph, which is mainly due to the presence of traffic signals, higher traffic volume, narrow travel lanes and on-street parking. Similarly, because of the lack of bike facility, narrow travel lanes and high traffic volume on Main Street, it is found to currently operate at BLOS E. The majority of downtown Jonesboro has sidewalks with on-street parking serving as a protection buffer from moving vehicles. As a result, Main Street is found to currently operate at PLOS B.

Table 2.3: Existing Condition Analysis Results

Street	Segment	Average Daily Traffic	Auto LOS	Average Speed (mph)	Bike LOS	Pedestrian LOS
Main Street	Oak Matthews to	6,636	C	17.1	D	B
	Matthews Washington to	6,800	C	18.3	E	A
	Washington Huntington to	7,000	D	15.8	E	A
	Huntington Cate to	6,800	D	15.8	D	A
	Overall	-	D	16.6	E	B
Union Street	Cate Huntington to	7,748	D	14.8	D	A
	Huntington Washington to	7,376	D	16.3	D	A
	Washington Matthews to	7,003	C	18.4	D	A
	Matthews Oak to	5,229	C	18.9	D	A
	Overall	-	C	17.2	D	A
Church Street	Oak Matthews to	5,600	C	19.2	D	B
	Matthews Washington to	3,731	C	18.4	D	A
	Washington Cate to	1,862	C	20.4	C	A
	Overall	-	C	19.4	D	A

The Cate Avenue to Washington Avenue segments of Union Street were determined to operate at auto LOS D due to relatively high traffic volume. However, overall, Union Street is currently operating at LOS C with average speed of 17.2 mph. There are currently no bike facilities on Union Street, even though the lane widths and on-street parking are wider than Main Street. This results in the facility operating at BLOS D. Similarly, there are pedestrian facilities on Main Street with on-street parking acting as a protection buffer. Hence, Union Street is determined to be operating at PLOS A.

All the segments of Church Street are currently operating at automobile LOS C with overall average speed of 19.4 mph. The relatively high level-of-service can be attributed to low traffic volume and wide travel lanes on certain segments of the street. However, lack of bike facility renders the street to BLOS D. Sidewalks are present on all segments of the street with on-street parking creating a protection buffer on some segments. As such, the street is currently operating at PLOS A.





CRASH DATA

Crash data from 2003-2014 for the downtown district of Jonesboro was provided by the Jonesboro Police Department, and is summarized in these four tables. As shown, 6% of Jonesboro’s total pedestrian crashes and 5% of the city’s total bicycle crashes during this time occurred within the study area. Furthermore, most of the pedestrian crashes occurring within the study area happened on Union Street or Main Street. In addition, most of the bicycle crashes occurring within the study area during this time happened on Main Street. It should also be noted that the majority of pedestrian crashes in the study area occurred during the daytime, and all bicycle crashes occurred during the daytime.

Table 2.4

Location	Pedestrian Crash		Bicycle Crash	
	Day	Night	Day	Night
Union Street – Cate to Oak	4	1	0	0
Main Street – Johnson to Oak	3	1	3	0
Church Street – Cate to Oak	1	0	1	0
Huntington Avenue – Church to Union	0	1	0	0
Subtotal	8	3	4	0
Total	11		4	
Percent of City	6%		5%	

Note: Day is considered 6:00 AM – 6:00 PM, and night is considered 6:00 PM – 6:00 AM

Figure 2.3 shows the location of the pedestrian and bicycle crashes in downtown Jonesboro, as well as on Johnson Avenue, Aggie Road, Washington Avenue and Matthews Avenue.

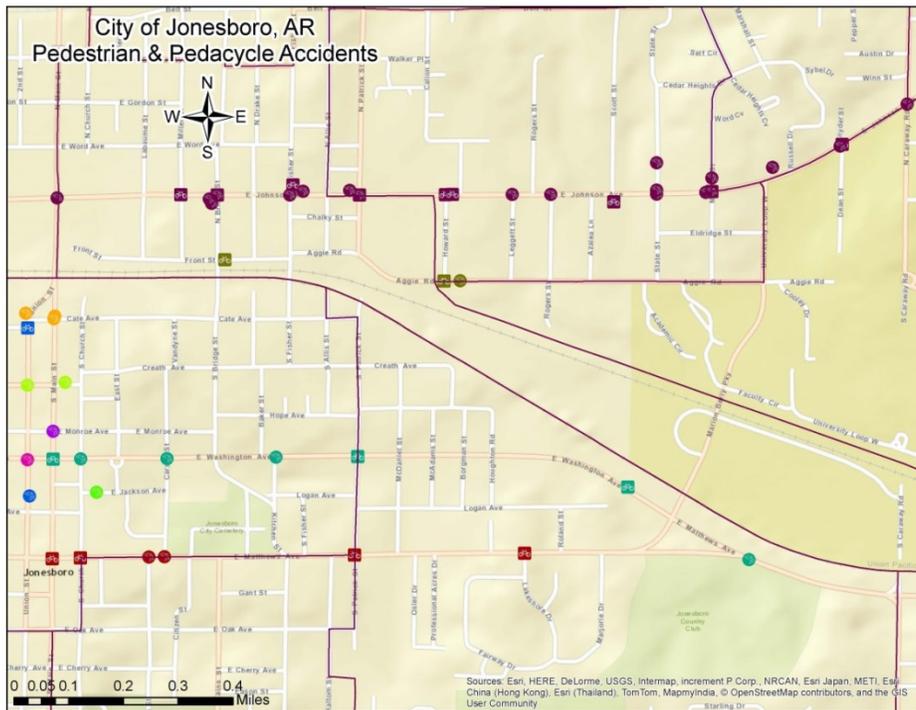


Figure 2.3: Pedestrian and Bike Crash Locations



PARKING

Overall, the downtown Jonesboro study area includes access to approximately 786 parking spaces. Approximately 597 of these parking spaces are free to the public, including approximately 308 on-street spaces and 289 off-street spaces. The majority of the public on-street parking spaces within the study area are signed as 2-hour parking. Of the 289 off-street public parking spaces, approximately 219 are signed as 24-hour parking and approximately 70 are marked as 2-hour parking.

The majority of the on-street parking in the study area is provided along Union Street and Main Street. Approximately 119 public on-street parking spaces are provided along Union Street and 97 are provided along Main Street. The average parking width on Union Street ranges from 7 – 11 feet, and the average parking width on Main Street is narrower, ranging from 6 – 7 feet; the standard on-street parking width is 8 – 8.5 feet. Less parking is provided along Church Street than on the one-way couplet of Main Street and Union Street, with approximately 39 public on-street parking spaces provided; no on-street parking is provided along Church Street south of Jefferson Avenue. Additionally, 53 on-street parking spaces are provided along the cross-streets within the study area; 16 public on-street parking spaces are provided along Huntington Avenue, 3 along Monroe Avenue, 10 along Washington Avenue, 13 along Jefferson Avenue, 4 along Matthews Avenue, and sufficient space for 7 along Oak Avenue is provided.

As previously mentioned, access to approximately 289 off-street public parking spaces are provided within the study area, the majority of which are signed as 24-hour parking. A 24-hour public parking lot is located along the west side of Union Street, north of Monroe Avenue, and includes approximately 103 parking spaces. Additionally, a 24-hour public parking lot is located along the east side of Union Street, south of Huntington Avenue, and provides approximately 33 parking spaces. Another 24-hour public parking lot is located along the east side of Church Street south of Cate Avenue. In addition to the 24-hour public parking spaces, approximately 70 2-hour off-street public parking spaces are provided within the study area. A 2-hour public parking lot is located along the north side of Burke Avenue between Main Street and Union Street, and provides approximately 33 public off-street parking spaces. Along the west side of Main Street, north of Monroe Avenue, is a 2-hour public parking lot that provides approximately 28 parking spaces. Lastly, 9 2-hour off-street public parking spaces are provided along the west side of Church Street between Monroe Avenue and Washington Avenue.

In summary, more than sufficient public parking is provided within the study area. During field observation and discussion with community members at the stakeholder meetings, parking was not identified as a major issue in downtown Jonesboro, as utilization of the existing parking spaces was found to be relatively low.



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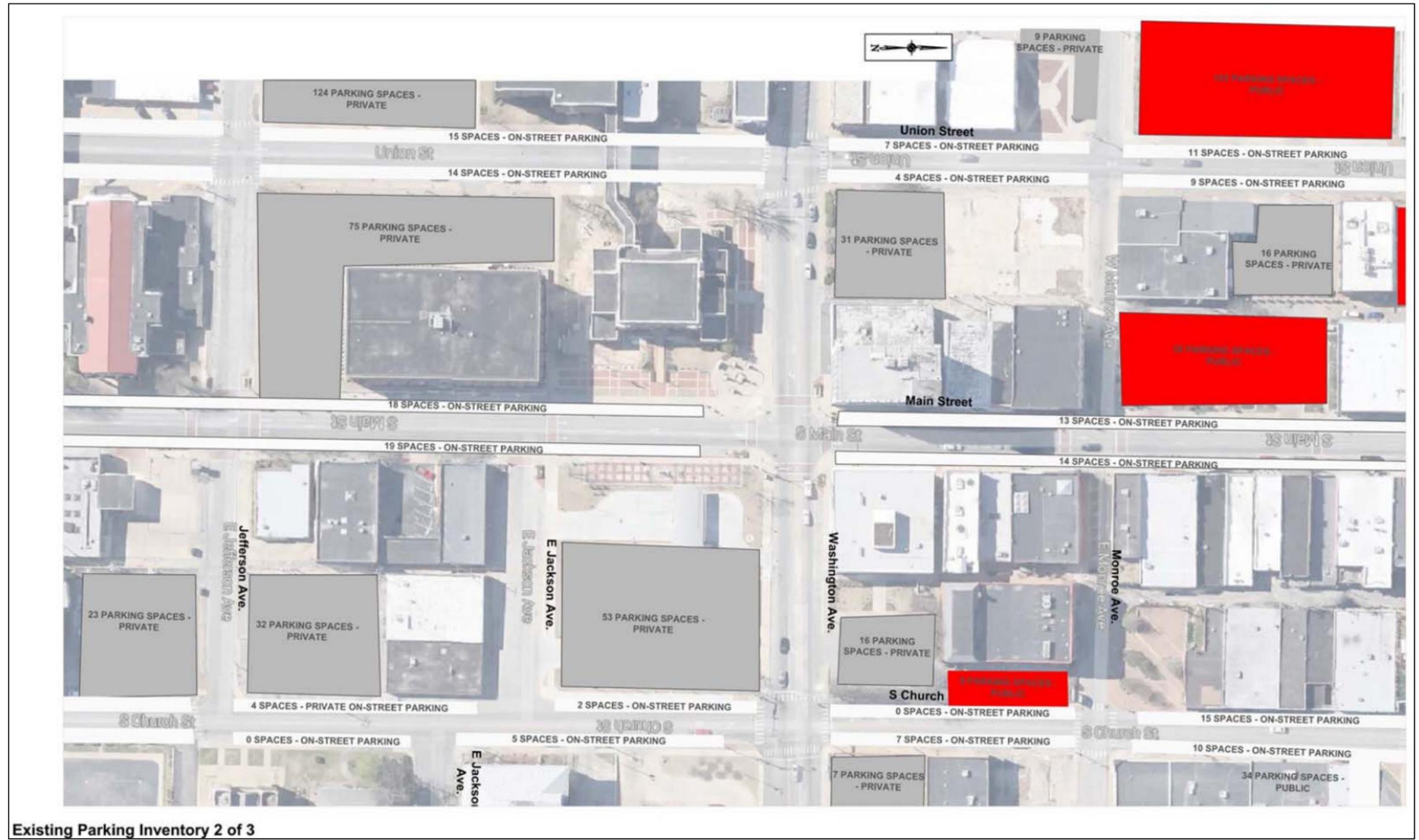
Figure 2.4



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Figure 2.5



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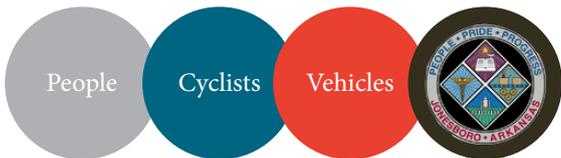
Figure 2.6



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03: Public Input



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Public Input

KICKOFF MEETING

A kickoff meeting was held on July 18, 2014 with representatives of the Jonesboro MPO and Jonesboro Engineering Department. At this meeting, planning team members had the opportunity to review the project scope with staff members and gain a better understanding of opportunities and challenges associated with this study. Some of the key points discussed at this meeting included:

- Identify appropriate measures to improve pedestrian and vehicular safety in downtown Jonesboro
- Identify appropriate bike connection from ASU campus to downtown Jonesboro
- Maintain north to south traffic flows that meet or exceed current volumes while improving safety

Traffic patterns through the downtown district were discussed. The one way pair of Main Street and Union Avenue serves as a primary north south connector for the city. Recent speed signs have been added to Main to try to slow traffic. Street lights are set on Main Street so that if you speed you will not hit the lights. City staff know the lane widths on Main Street are too narrow as are parking spaces but there is not room to widen them.

Safety of all user groups should be looked at as part of the study. There is a desire for improved pedestrian and bicycle flows on the north side of the city particularly between the ASU campus and downtown. The downtown district seems to have adequate parking but supporting street



lighting and sidewalks need improvements. There are some mid-block crossings in the district and bump outs for improved pedestrian safety.

Several other challenges and opportunities that exist along Johnson Avenue were discussed.

- Trains stopped blocking at-grade crossing at Fisher Street impact access between downtown and ASU (BNSF and Union Pacific)
- ASU redeveloping area south of Aggie Road, west of Marion Berry Parkway
- St. Bernard is developing properties along Washington Avenue which could bring more traffic to downtown
- Main Street is an arterial. Master Street Plan for the city is currently being prepared and will likely be completed by September. Alternative north-south route is being sought. Patrick Street provides access to adjacent county and has been identified as potential north-south connection.
- No trucks are allowed in downtown – city ordinance
- Main Street has about 8-9000 ADT
- Main Street and Bridge Street are primary grade separated crossings
- Downtown parking study was recently completed and showed about 765 parking spaces. Removing on-street parking in downtown will be difficult but possible.
- Union / Matthew is largest intersection in downtown that dictates the cycle length for the whole downtown signal system

STAKEHOLDER GROUPS

The discussion then moved to groups that were active in the community and who would be good to serve on a stakeholders group for this study as well as the allied study known as the Downtown Jonesboro Pedestrian/Bicycle Safety Study.

- North Jonesboro Neighborhood Initiative (desire safe crossing of Johnson Ave.)
- ASU International Students
- ASU bicycle user groups both student and faculty
- ASU campus Landscape Architect
- North Jonesboro Redevelopment Incentive Group
- Chamber of Commerce
- Downtown Jonesboro Group
- St. Bernard's / St. Bernard's Foundation
- Ridge Riders
- NEA Baptist Hospital
- NEA Bicycle Coalition
- Ark. Health Department
- Riceland
- Gear Head Bicycle shop owner
- City Youth Ministries (on Union)
- Andy Shatley - endurance cyclist
- Mark Enos local architect may remember about streetscape on Main

Refer to Section 4 for concepts presented to Stakeholders.

STAKEHOLDER MEETING

The first stakeholder meeting was held September 18, 2014 at the downtown public library. The meeting focused on both the Downtown Jonesboro Pedestrian/Bicycle Safety Study and Johnson Avenue Bicycle Study. A summary of findings of this meeting is provided in the following paragraphs.

MEETING OVERVIEW

The meeting was very well attended by the stakeholder committee members and interested Citizens. Lose and Associates staff members kicked off the meeting by providing an overview of the two projects and the agenda for the meeting activities.

Planning team members from RPM Transportation then provided an overview of recently completed pedestrian crossing counts on Johnson Avenue. These counts had been collected between North Caraway Road and Main Street.

Lose & Associates staff then presented some concept sketches that had been developed for improvements on Johnson Avenue, connectivity concepts between the ASU campus and downtown and potential options for rerouting traffic in the downtown district.

Following the presentation, participants were given the options of going to one of three tables to provide ideas and discuss opportunities and concerns for making pedestrian and bicycle improvements in the study area while enhancing vehicular traffic flows and safety for all forms of transportation.

GROUP ONE – DISCUSSION ON JOHNSON AVENUE IMPROVEMENTS

Concerns/ Opportunities

- Limit open left turns using medians to improve safety
- Use medians to restrict left turns at small intersections
- Mid-block cross walks are a good idea to improve safety
- Hawk signal at mid-block crosswalks are preferred
- Consider difference in cyclist's confidence and ability. Johnson Avenue needs to be safe for all users groups
- Mid-block crosswalks limit vehicular / pedestrian conflict with turning cars
- Restrict truck traffic on Johnson Avenue
- Street lighting needs to be improved (some lights out, others flicker)
- Generally people did not like the concept which removes a car lane on Johnson Avenue to make room for a bike lane
- Question: Can sidewalks be made wider to accommodate a bike lane?
- Rogers Street intersection: bring median across to prevent left turn and improve safety

Refer to the Johnson Avenue Bicycle / Pedestrian Study for more information.



GROUP TWO – CONNECTIVITY BETWEEN ASU CAMPUS AND DOWNTOWN

Concerns/ Opportunities

- Aggie Road best option to connect campus with downtown district. Also extends through campus and on east side of campus there is adequate room for bike lanes. Matches up with proposed bike paths on ASU campus plan.
- Prefer separate bicycle and pedestrian systems on Aggie Road.
- Potential to add park on old plant property purchased by the city.
- If new railroad bridge crossing is developed at South Patrick Street old bridge at South Bridge Street could become dedicated greenway/bikeway crossing.
- Provide improved bicycle and pedestrian crossing at North Fisher Street. Consider closing this crossing to cars to get railroad to stop blocking track to discourage vehicles from using the crossing.
- Create downtown loop by providing bike lanes along East Washington Avenue and connect to campus over Marion Berry Bridge. Would transition to shared road condition on bridge.
- East Washington Avenue also connects to new bus station so would provide multi-modal access for students and visitors to downtown.
- Trains parking on track cause a problem at Fisher Street crossing.
- Bridge Street bridge is narrow and no room for bicycle lanes.
- Aggie Road and Marion Berry Parkway intersection is very busy and currently not safe. This intersection is to be upgraded from four way stop to signalized intersection in near future.
- Ambulances use East Washington as route to St. Bernard's Medical Center.
- Creating a safe pedestrian and bicycle railroad crossing will be a challenge.

Refer to the Johnson Avenue Bicycle / Pedestrian Study for more information.

GROUP THREE – DOWNTOWN PEDESTRIAN/BICYCLE SAFETY IMPROVEMENTS

We presented three concepts and received the following comments:

- Reduce Vehicular Speed - Participants did not believe that reducing speed would be effective even if the signal timing is changed to slow traffic. They believe that people will still drive fast in downtown. As such, this concept was not favored in the group.
- Remove on-street parking - Participants were in favor of removing on-street parking to make the corridor safer. They showed openness for back-in parking. Participants would like to see bike lanes provided on Main Street.
- Re-direct northbound traffic to Church Street.
 - Participants were strongly in favor of this concept. They felt that this concept would allow Main Street to be utilized for community events and made more walkable.
 - Of the options presented, the participants favored converting Main Street to two-way traffic, while maintaining direct access from Union and Church Street (Option 2 for both North and South End).
 - Participants liked the idea of providing bike lanes on Union and Church Street, but would like to see bike lanes on Main Street as well.

- Certain sections of Church Street may not be wide enough for bike lanes. Hence, curbs may need to be moved.
- Oak Street / Church Street and Union / Oak Street are safety concern.
- Pedestrians cross Church Street, just north of Buffalo Avenue between the medical center and parking lot. Pedestrian crossing accommodations at this location may be needed.

ASU CAMPUS STAFF INPUT MEETING

On December 8, 2014 a meeting was held on the Campus of Arkansas State University to discuss the Johnson Avenue Bicycle/ Pedestrian Safety Study and the Downtown Jonesboro Pedestrian Safety Traffic Study progress and to seek input from university officials.

MEETING MINUTES

The planning team began the meeting by giving an overview of the two projects and history of the studies. Particularly the change in focus from accommodating bicycles on Johnson Avenue to identifying alternative bicycle and pedestrian connections between ASU and downtown Jonesboro base on the September stakeholder meeting.

KEY COMMENTS

The group discussed potential connections between ASU and downtown.

The Campus officials generally like the idea of using Aggie Road as the primary connection to downtown. East Washington Avenue could also be useful as a second route but they felt like it was far enough away from campus to be out of their sphere of influence and felt that the East Washington Avenue corridor would be better discussed with the hospitals, residents and business owners so they offered no opinion other than general approval if corridor stakeholders liked that option as well.

DOWNTOWN STAKEHOLDERS MEETING

On January 15, 2015 a meeting was held in the first floor conference room of the Municipal Center at 300 S. Church Street to discuss the Johnson Avenue Bicycle/ Pedestrian Safety Study and the Downtown Jonesboro Pedestrian Safety Traffic Study to seek input from downtown Jonesboro business owners/representatives.

MEETING MINUTES

Planning team members began the meeting by giving an overview of the two projects and history of the studies. Particularly the change in focus from accommodating bicycles on Johnson Avenue to identifying alternative bicycle and pedestrian connections between ASU and downtown Jonesboro and a focus on improving pedestrian safety at critical crossing locations along Johnson Avenue. Beautification of Johnson is also a priority.



Team members explained options for connecting ASU to downtown including a crossing at Fisher Street. It was noted that it is highly probable that Fisher Street will be closed to vehicular traffic in the future and that the City and railroad are looking at options to make this happen.

The existing crossing is in a location where trains from opposite directions are able to pass. Approximately 35 trains a day pass through this area. It was estimated that the tracks are blocked approximately 60% of the time. It was noted by the planning team that the city should try to retain the rights to a pedestrian and bicycle crossing at this location.

After discussion of links between the University and Downtown, planning team members initiated a presentation on the various options for downtown traffic circulation. Three options for rerouting traffic were presented.

Audience Comments and Questions

- The question was raised by a member of the audience, if East Street had been considered as an alternate route. Planning team members explained that the study area was contained to Main Street, Union Street to the West and Church Street to the East.
- Comment was given that some would like to see 4 or 5 blocks of Main Street closed and used like an outdoor plaza with no vehicular traffic. Blytheville and Batesville, Arkansas were two locations that were given as examples where this has been done successfully.
- Comment was made that consideration should be given to making everything downtown 2-way.
- Participant would like downtown to be an arts and entertainment destination location.
- Delivery hours for downtown businesses should be during controlled times like is done in other cities.
- There are 786 parking spaces in the downtown area so losing on-street parking should not be a major issue to business owners.
- There is a perception that it is a long walk from parking areas to businesses. Improving pedestrian connections between parking lots and downtown businesses would help with this perception.

Preference Survey

At the conclusion of the meeting, a 2 question survey was given to participants to see which of the five options were preferred. The results were as follows:

Q1. Which potential solution do you prefer for Downtown Jonesboro?

<u>Responses</u>	<u>Choices</u>
4	Reduce Vehicular Speed
2	Remove On-Street Parking
13	Re-Direct NB Thru traffic to Church Street and re-purpose Main Street
1	Other:

Q2. If you choose 3rd solution in Q1, which Main Street revitalization option do you prefer?

<u>Responses</u>	<u>Choices</u>
0	Option A: Maintain existing layout
3	Option B: Reduce to one 1-way + cycle track
7	Option C: Angled parking + one 1-way + bike lane
2	Option D: Convert to 2-way traffic
4	Option E. Convert to 2-way traffic + bike lane
2	Other: Close Main Street

Write in Comments Included:

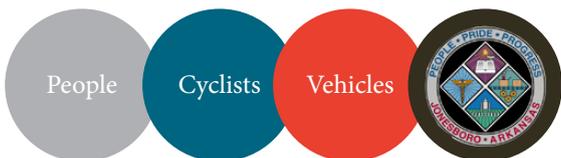
- Attract destination type uses first then do Option E.
- Angled parking and biked lanes create a pedestrian friendly Main Street for better commerce.
- Why not remove traffic all together on Main Street?
- Main Street (1st 5 blocks) seen as an open pedestrian-friendly shopping mall. Also would function as town square. If this is not an option then I choose Option C for question 2.



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04: Development of Improvement Recommendations



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DOWNTOWN TRAFFIC AND SAFETY ASSESSMENT AND FINDINGS

SUMMARY OF ISSUES

Based on the results of the existing conditions analysis and inputs from the community members during the stakeholder meetings, the following issues were identified in the study area:

Issue 1: Mobility vs Accessibility Conflict

All streets provide varying degrees of mobility and accessibility to their users. Mobility refers to the desire of users to travel from one point to another without undue delay. Accessibility refers to the need to access the property or businesses along the street. Higher accessibility reduces the speed and safety, and thus reduces the mobility of the street. A proper management of these conflicting characteristics of a street is critical for better performance of a transportation network.

Main Street in downtown Jonesboro is a street where there is a distinct conflict between mobility and accessibility. Even though Main Street and Union Street are not state facilities, they are designated as principal arterials in the 2035 Metropolitan Transportation Plan and provides one of the few direct north-south connections between State Route 18 (Highland Drive) and State Route 91 (Johnson Avenue). Furthermore, they continue in the alignment of State Route 141 (Main Street), north of the BNSF & Union Pacific railroad tracks. These transportation network realities ensures that the Union Street – Main Street couplet serve as a major mobility street connection with relatively high traffic volume. Hence, a fairly large percentage of traffic on the Union Street – Main Street couplet can be assumed to be travelling through downtown.



However, Main Street, between State Route 18 (Highland Drive) and State Route 91 (Johnson Avenue), also pass through downtown Jonesboro with a high concentration of retail and office land-uses. These businesses require a high degree of accessibility to stay in business and contribute to the local economy. These businesses are also served by free two-hour on-street parking on Main Street and Union Street. This high need for accessibility conflicts with the high degree of mobility that Main Street dictates due to its location in the transportation network of the city, as described above. As a result of this conflict, Main Street in downtown Jonesboro is struggling to define itself; whether it's a slow multi-modal street, providing ample access to the historic business district and retail, or whether it's a faster, vehicular-centric street connecting two areas of town.

Issue 2: Narrow Travel Lanes and On-Street Parking

Main Street is one of the major destinations in Downtown Jonesboro, with several retail businesses and offices catering to the residents of the community. This results in a relatively high traffic volume on the street. However, the travel lanes on Main Street are 10' wide, which is narrower than on a regular highway where lane widths are 12' wide. Nonetheless, in urban core areas like downtown Jonesboro, 10' travel lanes are an acceptable industry standard. Unfortunately, the on-street parking on both sides of Main Street are only 6'-7' wide, which are narrower than 8'-8.5' standard. These narrow on-street parking widths result in parked vehicles encroaching on the travel lanes on a regular basis. Hence, the effective width of the travel lane is narrower than the 10' wide lane pavement marking. This results in an unsafe mobility environment for drivers, bicyclists and pedestrians alike.

Issue 3: Unsafe Biking Environment

Currently, there are no bike lanes on any of the streets in downtown Jonesboro. Furthermore, due to the narrow on-street parking widths, even if the bicyclist were traveling near the center of the travel lanes, they would potentially be in the "door zone" of the parked vehicles. This results in an unsafe biking environment in downtown Jonesboro.



Issue 4: Unsafe Mid-block Pedestrian Crossing at Undesignated Locations

During site visits to the study area, the vehicular speed on Main Street was observed to be relatively low, approximately 15-25 mph. However, even at this speed, there is an approximate 73% chance of injury and 3.7% chance of fatality if a pedestrian is truck by a vehicle (Florida, 1993-1996). Due to the short distance to cross the two travel lanes, pedestrians take the chance to cross mid-block, emerging from parked vehicles, even though there are designated mid-block crossings in the study area. In light of the high traffic volume on Main Street, mid-block crossings at undesignated locations creates an unsafe crossing environment for the pedestrians.

Issued 5: Poor Lighting

One of the keys to safe streets for all forms of transportation is good lighting. Within the downtown study there are various types of street lighting and lighting levels. On Main Street there are attractive pedestrian scale light fixtures, but the balance of the study area is predominantly lit by cobra head fixtures mounted on taller poles. There is no consistency to the spacing of the cobra head fixtures or lighting provided in the public parking lots. Comments

received in public input meetings and noted in the recent community survey conducted by the MPO included the concern that there is inadequate lighting for good pedestrian movement in downtown and surrounding neighborhoods.

Team members made no footcandle measurements in the study area but did make visual observations and agree with the citizen comments that additional lighting is needed to improve safety throughout the study area. Along Main Street, lights are provided fairly uniformly spaced throughout the corridor, but they do not provide adequate lighting to create a safe pedestrian experience. Outside of Main Street, there is no uniformity to the spacing of the street lights, thus there are numerous dark areas along most streets within the downtown district. Some streets have long areas with no lighting at all, except lighting mounted on buildings. The best lighting in the entire downtown area is adjacent to Saint Bernard's where parking lots and roadway are well lit.

While improved lighting will help all forms of transportation, it is vital for improved pedestrian safety. Sidewalks should be lit so that pedestrians can clearly see their path of travel and, obstructions and grade changes along the route. As much of the business in downtown occurs after dark, lighting all sidewalks and roadways to a higher level should be a high priority. As downtown develops as a destination activity zone, safe lighting should be provided from the time you exit your car until you reach your destination.

In addition to improved pedestrian safety lighting, roadways should be lit to recommended roadway lighting levels. One of the keys to improved safety is providing uniform levels of lighting within roadway corridors, not random lighting which creates light and dark spots. With high traffic volumes in the downtown district, improved lighting may be the most important factor in improving safety for all forms of transportation downtown.

Below is a summary of the lighting illuminance levels recommended by the Illuminating Engineering Society of North America. All levels are given in footcandles, unless otherwise noted.

PEDESTRIAN LIGHT LEVELS

CLASSIFICATION	MINIMUM AVERAGE HORIZONTAL ILLUMINANCE	MINIMUM AVERAGE VERTICAL LEVELS FOR SPECIAL PEDESTRIAN SECURITY
Sidewalk and Type A Bikeways		
Commercial Areas	1	2.2
Intermediate Areas	0.6	1.1
Residential Areas	0.2	0.5
Walkway Distance from Roadways and Type B Bikeways		
Walkways, Bikeways and Stairways	0.5	0.5
Pedestrian Tunnels	4.3	5.4
Crosswalks traversing roadways in the middle of long blocks and at street intersections should be provided with additional illumination.		





ROADWAY LIGHTING

MAINTAINED LUMINANCE VALUES IN CANDELAS PER SQUARE FOOT				
Road Area Classification	Luminance (Avg)	Luminance Uniformity		Veiling Luminance Ration (V/Avg.)*
		Avg/Min	Max/Min	
Freeway Class A	0.06	0.35/0.1	0.6/0.1	0.03/0.1
Freeway Class B	0.04	0.35/0.1	0.6/0.1	0.03/0.1
Expressway (Commercial)	0.1	0.3/0.1	0.5/0.1	
Expressway (Intermediate)	0.08	0.3/0.1	0.5/0.1	0.03/0.1
Expressway (Residential)	0.06	0.35/0.1	0.6/0.1	
Major (Commercial)	0.12	0.3/0.1	0.5/0.1	
Major (Intermediate)	0.09	0.3/0.1	0.5/0.1	0.03/0.1
Major (Residential)	0.06	0.35/0.1	0.6/0.1	
Collector (Commercial)	0.08	0.3/0.1	0.5/0.1	
Collector (Intermediate)	0.06	0.35/0.1	0.6/0.1	0.04/0.1
Collector (Residential)	0.04	0.4/0.1	0.8/0.1	
Local (Commercial)	0.06	0.6/0.1	1/0.1	
Local (Intermediate)	0.05	0.6/0.1	1/0.1	0.04/0.1
Local (Residential)	0.03	0.6/0.1	1/0.1	

*V = veiling luminance

For divided highways, where the lighting on one roadway may differ from that on the other, calculations should be made on each roadway independently. For freeways, the recommended values apply to both mainline and ramp roadways.

This information has been collected by the Illuminating Engineering Society of North America (IESNA) and summarized by the International Dark-Sky Association. Please note that these values are recommendations, not standards. Standards are set at the federal, state, county or community level. The IESNA does not set standards, though IESNA recommendations are often used by those who set standards.

Lighting in the downtown study area needs to be improved to meet minimum standards. An approach that combines ornamental pedestrian scale lights and taller fixtures is recommended. The city has already selected and installed an ornamental pedestrian scale light fixture on Main Street. This fixture should be used throughout downtown on all streets to provide sidewalk lighting. At the current spacing, these fixtures are not providing adequate light levels, as previously noted. To provide adequate lighting, the fixture spacing needs to be adjusted so there is less space between fixtures, or taller light poles should be added along the roadway to supplement the ornamental fixtures and achieve proper lighting levels. In the parking areas, tall fixtures can be used to provide adequate lighting to reach sidewalk systems along the streets.



DEVELOPMENT IMPROVEMENT RECOMMENDATIONS

In order to address the issues identified above and voiced in the stakeholder meetings, the project team identified three potential solutions. These solutions were presented in the stakeholder meetings and feedback was obtained.

Solution #1 Reduce Vehicular Speed – Estimated Cost \$0.00

One of the most cost-effective solutions to address some of the issues is to reduce the vehicular speed in downtown Jonesboro. The reduction of speed will help improve the safety of pedestrian crossings and bicyclists. In addition, it will also help improve vehicular safety by reducing the severity of crashes.

However, reducing the vehicular speed will have minimal impact on the volume of traffic on Main Street. Hence, the issues of mobility and accessibility conflict, and narrow travel lanes and on-street parking will not be addressed by reducing the speed. Furthermore, it may be difficult to enforce the reduction in speed. As such, the effectiveness of this solution may be limited.

Solution #2 Remove On-Street Parking – Estimated Cost - \$48 - 52K

As highlighted above, one of the main reasons for feeling unsafe while driving or riding bikes in downtown Jonesboro is the narrowness of the on-street parking on Main Street. If the existing on-street parking is removed from at least one side of the street, there will be enough room to widen the on-street parking on the remaining side and provide a standard 5' bike lane. This will help improve the traffic flow and safety for bicyclists.

However, this solution will not reduce the traffic volume on Main Street. Furthermore, removing the on-street parking will result in higher speed due to wider travel lanes. Hence, the severity of crashes is likely to increase with this solution. Another drawback is that, along with the on-street parking, the existing curb extensions at the intersections and mid-block crossing would likely need to be removed from the side where on-street parking is removed. This will increase the cost of the solution substantially. Forty-seven to fifty on-street parking spaces will be lost.

Solution #3 Re-Direct Northbound Through Traffic to Church Street – Estimated cost \$1.8-2.1 Million

One of the most effective ways to address the mobility and accessibility conflict issues described above is to separate the two functions of the road onto two different streets. To address the mobility function of Main Street, the northbound through traffic may be diverted to Church Street, which runs parallel to Main Street to the east. This will allow the drivers a relatively faster way to access Johnson Avenue and areas to the north of the railroad tracks.

Re-directing the northbound through traffic from Main Street to Church Street is anticipated to reduce the traffic volume on Main Street by 30-45%. Drivers wanting to access the retail businesses and offices on Main Street will still be able to use Main Street, thus improving the accessibility of the businesses while improving safety due to reduced traffic volume. Similarly, the safety for bicyclist and pedestrians will also be improved. Furthermore, the reduction in traffic volume will allow for the revitalization of Main Street by redistributing the pavement width to other modes of transportation.

However, re-directing the northbound traffic to Church Street will require significant infrastructure improvements. For example, in the south end of downtown, near Oak Avenue, Main Street would need to be realigned to Church Street. Similarly, in the north end of

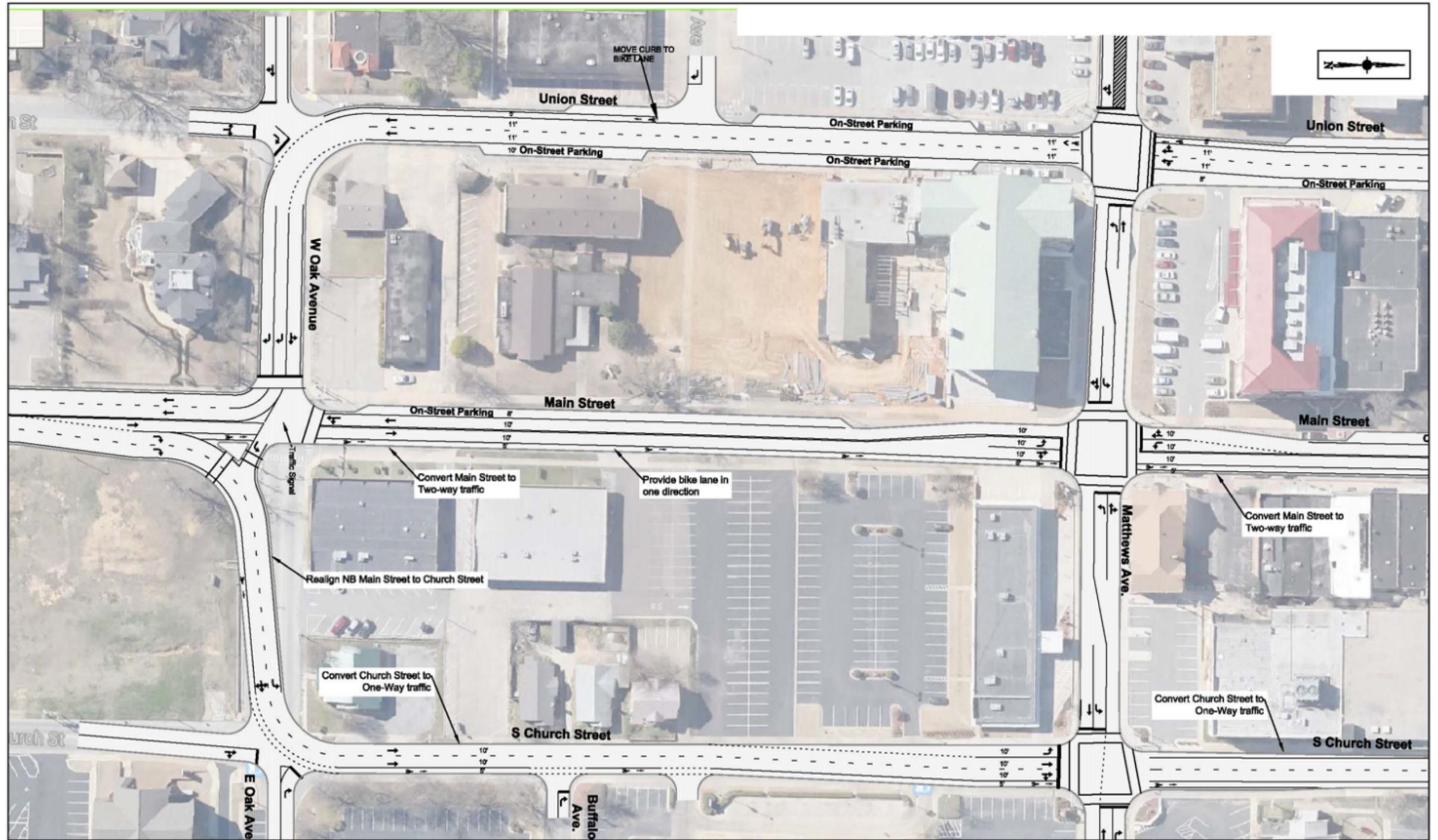


downtown, near Cate Avenue, Church Street needs to be re-directed back to the Main Street Bridge. In addition, traffic signals along Church Street will likely need to be re-designed to account for it being converted from the existing two-way traffic to one-way traffic. Based on the AHTD planning level cost estimate, the re-routing of Main Street traffic to Church Street is anticipated to cost between \$1.8 - \$2.1 million. This estimate does not include the cost of right-of-way acquisition, utility relocation (if needed) or the development of a potential downtown park as shown in the concept.

Figures 4.1-4.3 show an example of the potential solution of re-directing northbound through traffic from Main Street to Church Street. The layout is shown for illustration purpose only to help explain how the solution might work. The concept includes a design for a potential park that could be built along Cate Avenue and that would serve as the gateway into downtown as traffic crosses the bridge. Parallel parking has been shown along the perimeter of the park on Union Street and pull in parking has been shown on Cate Avenue. The layout for Main Street shown in the figure is one of several options available if this solution is chosen. The Main Street layout shown in the figure is not the preferred option of the project team.



Figure 4.1



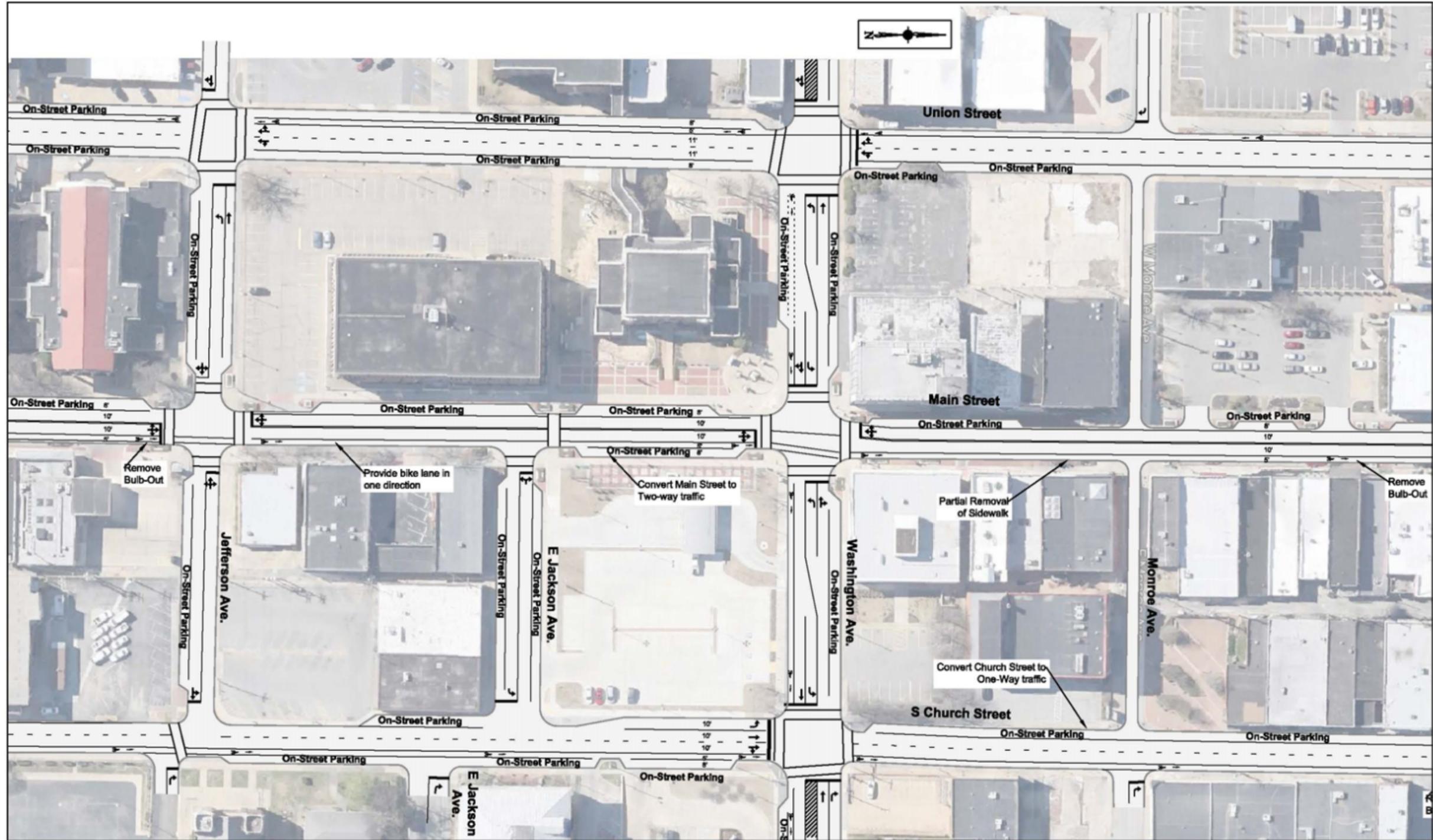
DRAFT CONCEPT: Example Layout - Option E



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Figure 4.2



DRAFT CONCEPT: Example Layout - Option E



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Figure 4.3



DRAFT CONCEPT: Example Layout - Option E





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MAIN STREET REVITALIZATION

During the two stakeholder meetings held in September 2014 and January 2015, Solution #3 – Re-directing Northbound Through Traffic to Church Street, was chosen as the preferred solution by the majority of the participants. This solution allows for re-envisioning of Main Street as the majority of traffic is diverted to Church Street. With lower traffic volume and improved accessibility, several revitalization options can be implemented on Main Street. These options have several benefits that improve vehicular, bike and pedestrian safety for downtown visitors and businesses. Some of the options have greater impact on on-street parking spaces and existing curb extensions than others. The following text describes five revitalization options that range from maintaining the existing layout to converting Main Street to 2-way traffic. The pros and cons of each option are included in the description.

Option A: Maintain Existing Layout on Main Street

Figure 4.4 shows the general layout of Option A. This option maintains the existing layout on Main Street. It shows two 10' travel lanes for 1-way traffic heading northbound and 7' on-street parallel parking. Hence, one of the benefits of this option is that no physical improvements are needed to implement this option. As a result, the cost of implementation is very low. The only difference would be less traffic volume as the majority of through traffic is diverted to Church Street.

However, this option does not address three of the four issues raised in the existing conditions analysis. That is, even though the accessibility is improved due to re-directing through traffic to Church Street, the on-street parking widths will continue to be narrower than the standard 8'-8.5' width. Hence, parked vehicles will continue to encroach on the travel lanes and adversely impact the safety of drivers. Furthermore, bike and pedestrian safety issues will continue to be a concern as they are not directly addressed by this option.

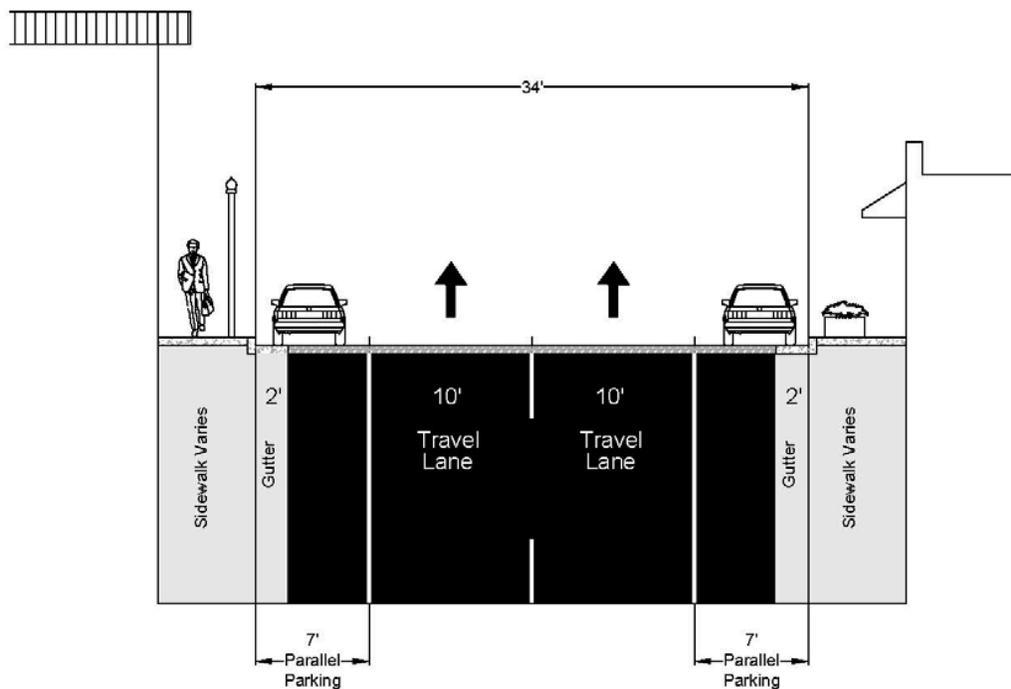


Figure 4.4: Option A: Maintain Existing Layout on Main Street



Option B: One 1-Way Lane and Cycle Track

One of the main benefits of re-directing northbound through traffic from Main Street to Church Street is the availability of extra vehicular capacity on Main Street. In order to revitalize downtown Jonesboro and make it more attractive for visitors and community members, the extra capacity may be reused for other modes of transportation. In other words, the existing two 1-way northbound lanes on Main Street can be reduced to one 1-way northbound lane. The extra space can be provided to increase the on-street parking width so that it meets the minimum standard. In addition, a two-way cycle track can be built between the parked vehicles and the sidewalk, which will protect the bicyclists from moving vehicles on the travel lane. Hence, this option provides the highest degree of bike accommodation. As a result, it will greatly improve the bike and pedestrian safety in downtown Jonesboro. Furthermore, no physical improvement on Main Street is needed to implement this option as the two-way cycle track can be transitioned to one of the two existing travel lanes where curb extensions are located. Other benefits of the option included reduced average traffic speed due to the reduction of the number of travel lanes and approximately 45% reduction in traffic volume.

One of the drawbacks of the option is the reduction of on-street parking by approximately 28 spaces. This reduction is required to accommodate the transition of the cycle track from the curb to the travel lane on either side of the curb extensions at the intersections and mid-block crossings. Furthermore, on-street parking may need to be restricted during delivery hours to ensure that the adjacent businesses have access to the street to receive their merchandize.

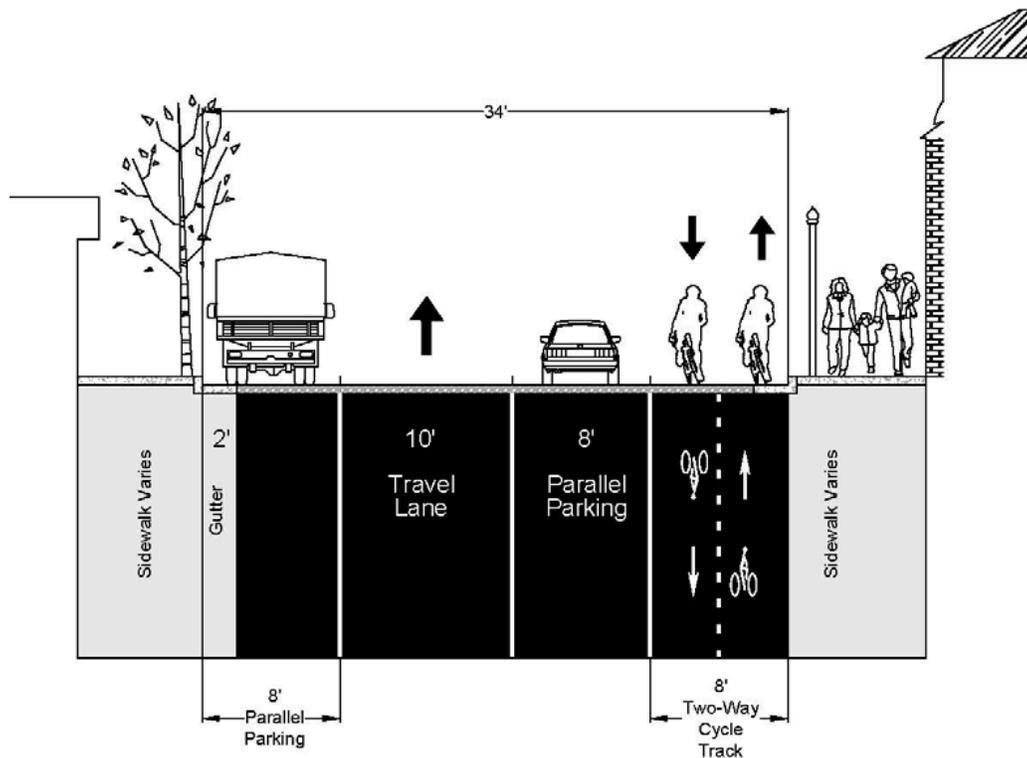


Figure 4.5: Option B: One 1-way Lane and Cycle Track





Option C: Angled On-Street Parking and Bike Lane

As the existing two 1-way travel lanes are reduced to one 1-way travel lane on Main Street, this option designated the extra space to angled on-street parking on one side of the street and a bike lane on the other side. The angled parking ensures that the total number of on-street parking spaces remain unchanged from the existing number of on-street parking. Furthermore, back-in angled parking provides several safety benefits, including not having to back out onto the travel lane when exiting the parking space, being directed to the sidewalk when exiting the vehicle, able to load the trunk of the vehicle from the sidewalk, etc. Furthermore, the extra space also allows for installing bike lanes on the opposite side of the angled parking, which gives a designated space for bike traffic. In addition, the bike lane may be used temporarily by delivery trucks to serve the businesses on that side of the street.

One of the drawbacks of the option is that the existing curb-extensions at the intersections and mid-block crossings may need to be removed from one side of Main Street. However, a detail review of the option needs to be conducted to determine whether the option can be implemented without removing the curb extension. This may require restricting angled on-street parking from areas near the curb extension to accommodate the transition of the travel lane.

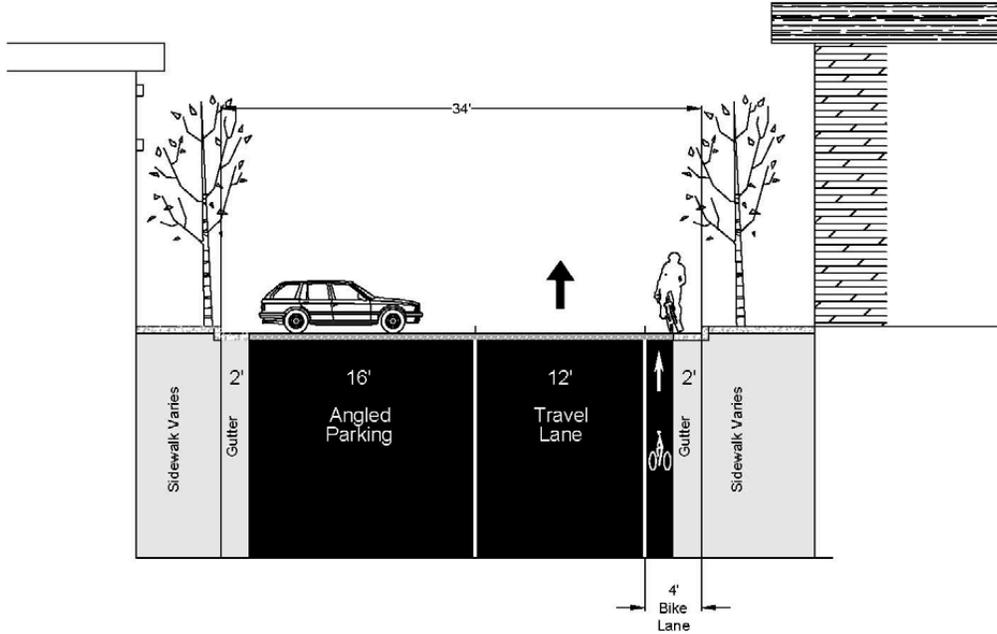


Figure 4.6: Option C: Angled On-Street Parking and Bike Lane

Option D: 2-way Traffic on Main Street

Upon diverting the northbound through traffic to Church Street, Union Street and Church Street will form the one-way couplet that serve the majority of through traffic in downtown Jonesboro. As mentioned previously, this will help improve the vehicular mobility in the area as drivers will be able to drive relatively faster than traveling along Main Street. Furthermore, in order to improve the accessibility of Main Street, the traffic on Main Street can be converted to 2-way traffic. As a result, the businesses can be directly accessed from both the north and south side of town, without having to travel out of direction. As the 2-way on Main Street will be located in



between the 1-way couplet on Union Street and Church Street, the vehicular circulation on Main Street is anticipated to be significant. Hence, the traffic volume on Main Street is anticipated to be reduced by 30% only. This option will not require any physical infrastructure improvement as the 2-way travel lanes can be accommodated within the curb-to-curb width near the curb extension at the intersections and mid-block crossings.

Converting to 2-way traffic will require widening the narrow on-street parking and travel lanes. This ensures that vehicles traveling in opposite direction maintain a safe distance while passing each other. Widening the on-street parking on one side also means that the on-street parking on the other side will be too narrow to be viable. Hence, with this option, on-street parking can only be located on one side of the street, which will result in reduction of 47 to 50 on-street parking spaces. Furthermore, on-street parking may need to be restricted during delivery hours. The travel lanes can be narrowed to 11' at the locations of curb extension to accommodate them within the existing curb-to-curb width.

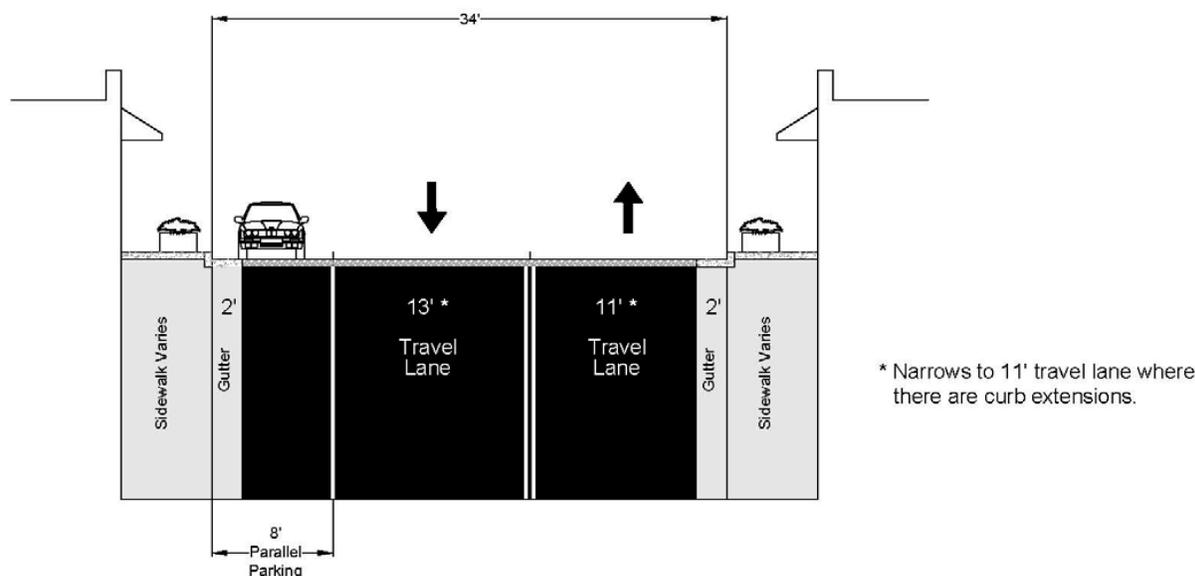


Figure 4.7: Option D: 2-Way Traffic on Main Street

Option E: 2-way Traffic and Bike Lane

As discussed in Option D, converting Main Street to 2-way traffic will require the removal of on-street parking on one side of the street. This allows for ample space to provide bike lanes, in addition to widening the remaining on-street parking and travel lanes. As discussed in Option D, converting to 2-way traffic will help improve accessibility and vehicular circulation in downtown Jonesboro, while reducing the traffic volume by approximately 30%. With the addition of a bike lane in Option E, the safety of bicyclist is greatly improved.

One of the drawbacks of this option is that the curb extension on one side of the street will need to be removed to accommodate the two travel lanes and the bike lane. The removal of on-street parking will reduce its number by 47 to 50 spaces.



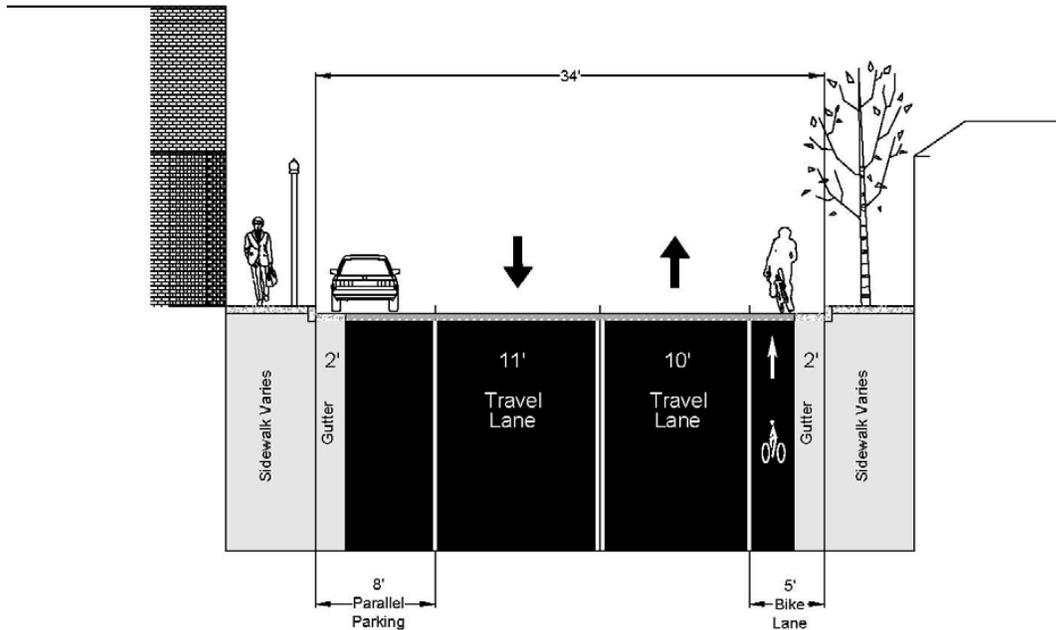


Figure 4.8: Option E: 2-Way Traffic and Bike Lane on Main Street

OPERATIONAL COMPARISON

The vehicular, bike and parking impacts of the various Main Street revitalization options described above were conducted as part of the study. The vehicular impact is reported as arterial level-of-service (Auto LOS) which is based on the combination of travel time delay due to signal control and the speed of the vehicles. It represents the average LOS for all segments. The automobile level-of-service (Auto LOS), bike level-of-service (BLOS) and pedestrian level-of-service (PLOS) are calculated according to the methodology described in the 2010 Highway Capacity Manual.

As shown in the table, in comparison with the existing conditions on Main Street, all options presented in the study result in better or maintain the existing automobile LOS D. The analysis showed that the average automobile speed will be reduced by approximately 1-1.3 mph, except for Option A where average speed is likely to increase by 1.8 mph. In addition, the bike level-of-service (BLOS) is anticipated to improve significantly from BLOS E in the existing condition to BLOS A for Option B and BLOS B and C for other options. This improvement is primarily due to the addition of bike lanes and the reduction in traffic volume and speed. Similarly, the pedestrian level-of-service (PLOS) is also anticipated to improve due to the reduction in traffic volume and speed as a result of diverting the northbound through traffic to Church Street.



Table 4.1: Comparison of Operation on Main Street Revitalization Options

	Traffic Volume	Auto LOS	Average Speed	Bike LOS	Pedestrian LOS	On-Street Parking Spaces
Existing Main Street	-	D	16.6	E	B	97
Main Street Options						
A: Existing Layout + Divert to Church	↓ 45%	C	18.4	C	A	97
B: One 1-way + Cycle track	↓ 45%	D	15.4	A	A	69
C: Angled Parking + Bike Lane	↓ 45%	D	15.4	B	A	98
D: 2-Way	↓ 30%	D	15.8	C	A	47
E: 2-way + Bike Lane	↓ 30%	D	15.3	B	A	47

Option A results in the improvement in the automobile level-of-service from LOS D during existing condition to LOS C. This improvement is mainly attributed to the estimated 45% reduction in traffic volume due to diverting the northbound through traffic to Church Street, while the existing two lane 1-way layout of Main Street is maintained. Hence, the average speed on Main Street is anticipated to increase from 16.6 mph in current conditions to 18.4 mph under Option A. While this increase in speed is beneficial for drivers wanting to travel through Main Street, the accessibility of the street is reduced as higher speed makes it unsafe to park in the on-street parking spaces. Furthermore, higher speed also makes it unsafe for pedestrians to cross Main Street, even though the reduction in traffic volume will provide more opportunity to cross the street. Similarly, the bike LOS is anticipated to improve from BLOS E during the existing condition to BLOS C due to the reduction in traffic volume. This improvement in BLOS shows that the reduction in traffic volume has a larger positive impact on BLOS than the increase in vehicular speed.

Option B reduces the number of travel lanes to one 1-way traffic to match the reduction in traffic volume and adds a two-way cycle track. This reduction in travel lanes resulted in automobile LOS D with average speed of 15.4 mph. Hence, the average speed on Main Street is anticipated to be reduced slightly in comparison to the existing condition. This will help improve the safety of Main Street for both drivers and pedestrians. Furthermore, under Option B, the safety of bike travel is greatly enhanced as the on-street parking acts as a protection buffer from the moving vehicles in the travel lanes. In addition, the two-way cycle track provides mobility for bicyclist in both north and south direction. As a result, the bike level-of-service for Option B is improved to BLOS A, compared to BLOS E during the existing condition. Similarly, the pedestrian level-of-service is improved to PLOS A due to reduction in traffic volume and greater separation from moving vehicles. The number of on-street parking spaces under Option B is anticipated to be reduced by approximately 28 spaces to accommodate the transition of the two-way cycle track to one of the existing travel lanes where curb extensions are present.





Option C converts the parallel on-street parking on one side of Main Street to back-in angled parking, while eliminating on-street parking from the other side. However, the total number of on-street parking spaces will remain relatively the same as the loss of parallel parking from one side of Main Street can be gained by the back-in angled parking. This configuration allows for improved safety for drivers while the automobile LOS is maintained at LOS D. In addition, due to the inclusion of a bike lane in this option, the bike level-of-service is improved to BLOS B, while the pedestrian level-of-service is improved to PLOS A.

Option D converts Main Street to 2-way traffic. As a result, the reduction in traffic volume is anticipated to be only 30%. Furthermore, as one side of the on-street parking is removed, resulting in wider travel lanes, the average travel speed is increased slightly to 15.8 mph, while the automobile level-of-service is maintained at auto LOS D. Without a dedicated bike lane in this option, the bike level-of-service is anticipated to be BLOS C, while the pedestrian level-of-service is improved to PLOS A.

Option E adds a bike lane to Option D. As a result, the bike level-of-service will improve to BLOS B, while the automobile LOS remains LOS D. Similar to Option D, the two-way traffic on Main Street under this option will greatly improve the vehicular accessibility and circulation in downtown Jonesboro. However, in order to accommodate the travel lanes and bike lane, on-street parking will need to be removed from one side of Main Street under this option.

PRIORITIZATION STRATEGY FOR PROJECT IMPLEMENTATION

Lighting Study

A lighting study should be undertaken within the downtown district. It is clear that additional lighting is needed throughout downtown and a lighting study that measures current light levels and makes recommendations to bring safe and uniform light levels to the area is needed. Options need to be explored to determine the most cost effective way to light downtown streets and parking areas.

Cost: To be determined based on recommended lighting solution.

Pedestrian Improvements

In addition to the improvements on Main Street, pedestrian improvements are recommended on Church Street and Union Street to expand the pedestrian environment beyond Main Street. These include the following:

- Install curb extensions to reduce the pedestrian crossing distance, increase visibility of pedestrians and reduce vehicular speed at all the intersections and mid-block crossings along Union Street and Church Street. The curb extension should accommodate recommended bike lanes on both the streets.
- Maximize the sidewalk and planter space where feasible by maintaining 8-foot on-street parking, two 10-foot travel lanes and one 5-foot bike lane.
- Rehabilitate existing sidewalks and reduce the number of existing curb-cuts, where feasible.

Cost: To be determined based on detailed engineering design of the improvements.



Bicycle Improvements

As shown in Figure 4.2, the study recommends providing 5-foot bike lanes on Union Street and Church Street between Oak Avenue and Cate Avenue. In addition, bike lanes are included on several options for Main Street revitalization. Installation of safe bike lanes will encourage more cyclists to use the facility, and help enhance the vitality of the downtown area.

Cost: Included in the roadway improvement project cost.

Roadway Improvements

Based on the comments received to date from the community members, a high percentage of members prefer to divert the northbound traffic volume on Main Street to Church Street. As described above, this option has several benefits, including reducing the accessibility and mobility conflict on Main Street and providing various options for Main Street revitalization. Hence, as a prioritization strategy, the City of Jonesboro may phase the final recommended solution in two phases, as described below:

Phase 1: Divert Main Street traffic to Church Street

This phase will divert the Main Street traffic to Church Street. This will include:

- Construct diversion of northbound Main Street traffic to Church Street, south of Oak Avenue
- Construct re-diversion of Church Street traffic to the Main Street bridge, north of Cate Avenue
- Re-design the existing traffic signals at Main Street / Oak Avenue, Church Street / Matthews Avenue and Church Street / Washington Avenue intersections
- Re-stripe pavement markings along Church Street from Oak Avenue to Main Street Bridge
- Cost estimate: \$1.8-2.1 Million (excluding ROW acquisition and utility relocation cost).

Phase 2: Determine the Preferred Option for Main Street Revitalization

As described in this report, there are several benefits and drawbacks of various revitalization options for Main Street in downtown Jonesboro. In order to determine the preferred revitalization option, greater community participation and discussion may be needed. The options presented in this report provide a wide variety of choices. In summary, the primary features of the options are shown at the end of this section. It includes planning level cost estimates of the options. The cost estimate does not include sidewalk improvement or cost of preparing engineering drawings, etc. These opinions of probable cost need to be updated upon selection of the preferred option based on detailed engineering design.

Option A: Maintain Existing Layout

- Less traffic, higher speed, no bike facility
- Cost estimate: \$0

Option B: One 1-way Lane + Cycle Track

- Less traffic, highest bike facility
- Cost estimate: \$18-\$23K (no curb improvement assumed)





Option C: Angled parking + one 1-way + bike lane

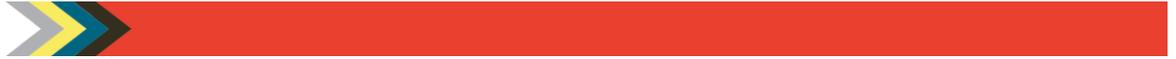
- Less traffic, improved parking, bike facility
- Cost estimate: \$13-\$18K (no curb improvement assumed)

Option D: 2-way Traffic

- More traffic (than Option A, B and C), better circulation, less parking
- Cost estimate: \$375 - \$390K (no curb improvement, includes signal modification)

Option E: 2-way Traffic + bike lane

- More traffic (than Option A, B and C), better circulation, less parking, bike facility, more construction
- Cost estimate: \$410-\$425K (includes curb improvement and signal modification)



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