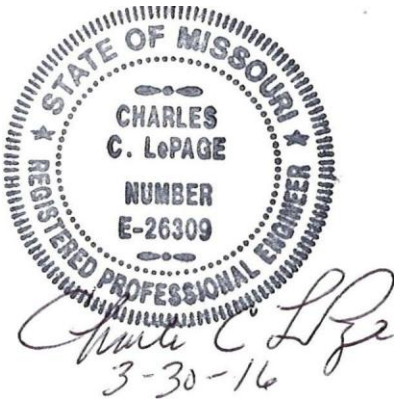
Warsaw, Missouri
Main Street Complete Streets
Preliminary Engineering Report

Prepared for: The City of Warsaw
181 Harrison Street
Warsaw, MO 65355
(660) 438-5522

Prepared by Charles LePage, P.E.
CFS Engineers
119 W. Pacific Street
Branson, MO 65611



Main Street's Two Front Doors

CDBG Application

Main Street Phase II as seen from Highway 7.

TIGER Application

Main Street Phase III as seen from Highway 65

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EXECUTIVE SUMMARY

Purpose of Study - The Main Street Complete Streets Preliminary Engineering Report (PER) is intended to evaluate the existing conditions, discuss critical needs and determine improvements that will promote growth and economic development, and enhance the quality of life, mobility, health and safety for citizens of the community. The PER will focus on two sections of Main Street.

- The CDBG section is Phase II of Main Street from MO-7 to Seminary Street.
- The TIGER section is Phase III of Main Street from US-65 to State Street

The PER includes consideration for all modes of transportation that are relevant for the Warsaw area. Within the Warsaw area, these would include private and commercial vehicles (cars, trucks, buses and recreational vehicles), bicycles, walking and wheel chair travel. This study will provide a description of existing conditions, the improvement needs, the proposed improvement specifics and the costs associated with the improvements.

The approach to determining the design components in the PER follows closely the six Livability Principles established by USDOT, HUD and the EPA **Partnership for Sustainable Communities**. The Livability Principles are explained as follows.

- **Provide more transportation choices.** Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.

- **Promote equitable, affordable housing.** Expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.

- **Enhance economic competitiveness.** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers, as well as expanded business access to markets.

- **Support existing communities.** Target federal funding toward existing communities—through strategies like transit oriented, mixed-use development, and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.

- **Coordinate and leverage federal policies and investment.** Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy

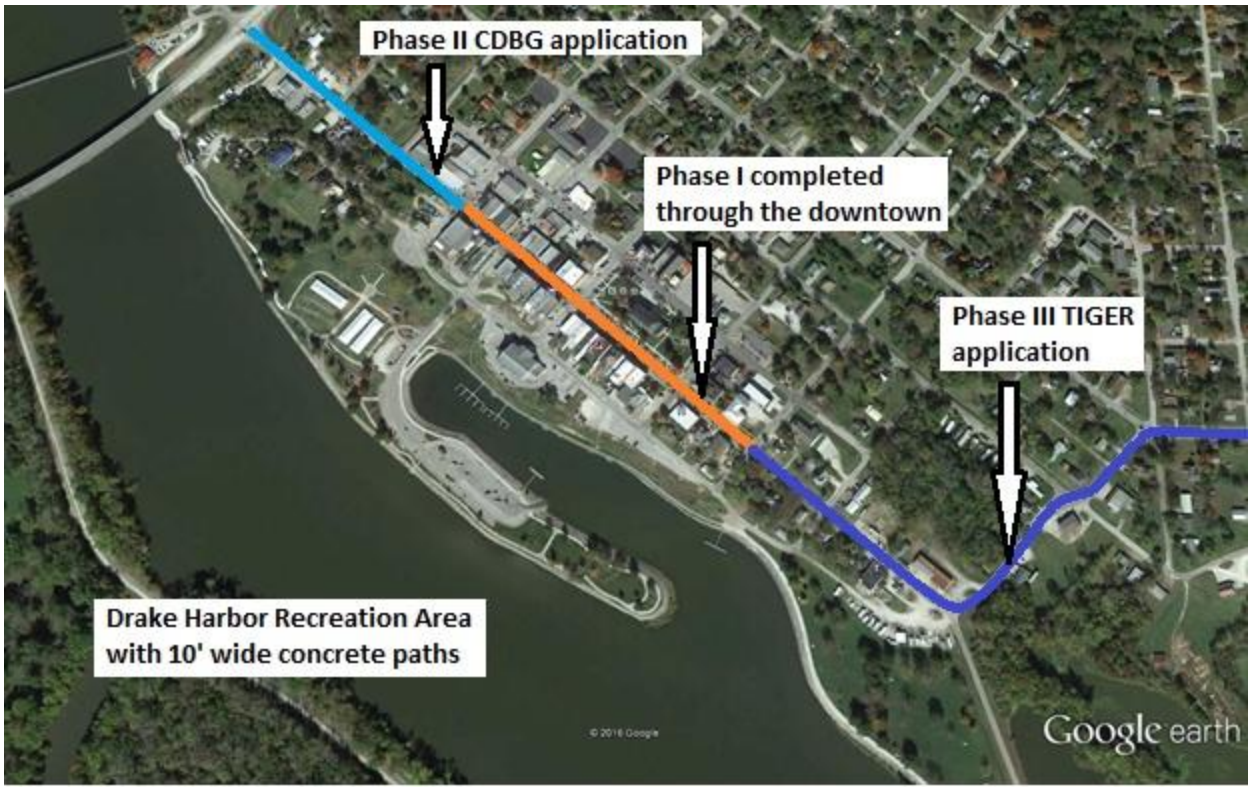
- **Value communities and neighborhoods.** Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.

Background - Warsaw, Missouri, the County Seat of Benton County, is a town of some 2,133 permanent residents. Warsaw is located between Missouri's two largest lakes, Truman Reservoir and Lake of the Ozarks that annually attract over 6 million visitors. In addition to its own population, Warsaw provides goods and services for citizens outside the community as well as to motorists travelling along the highway system passing through the City. Warsaw's growth can be attributed to its key location along transportation corridors for waterways, railroads, highways and other modes. This great location brings significant tourist and recreational traffic to Warsaw annually.

Because of its exceptional network of trails and waterfront amenities, Warsaw has seen accelerating numbers of cyclists visiting the area. In recent years, Warsaw has made significant infrastructure improvements to benefit all modes of transportation. The City has adopted a "Complete Streets" philosophy, as well as providing off-street trail and pathway corridors to improve pedestrian and bicycle mobility throughout the community. According to the City "This creates an engine for economic opportunity that will create revenue that the City can use for continuing its community development".

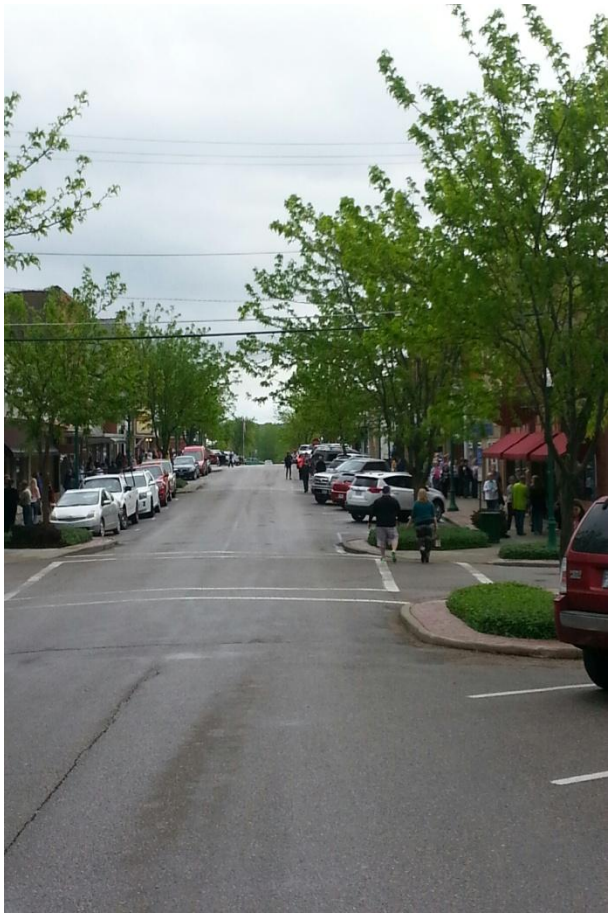
Main Street is a 1.51mile primary corridor through Warsaw with connections to two major highways; US-65 and MO Route 7. As traffic volume has increased along this corridor so too has pedestrian and bicycle traffic. The lack of proper pathway facilities along Main Street, has forced pedestrians, bicyclists and people in wheelchairs to operate at the edge of the travel lanes. Numerous driveways along the corridor add to the safety challenges for these travelers. These factors and others present the need for a "Complete Street Design" for Main Street that will improve traffic flow efficiencies, reduce accident rates and severity and provide safe routes for pedestrians and cyclists and further encourage non-motorized traffic.

The Main Street corridor improvements are divided into three sections.



Main Street Corridor

<u>Phase I</u> of the Main Street corridor was reconstructed between Seminary and just east of Commercial Street. These infrastructure improvements started in 2001, following the City's passage of an ordinance declaring the downtown a blighted area. Improvements for Phase I were funded from various sources. These sources included USDA Rural Development, Community Development Block Grant, Missouri Development Fund Board tax credits, TEA-21 and City matching funds for a total project of $739,744. With the support of the downtown business community, this major infrastructure improvement included water mains, storm sewers, sidewalks and lighting along a three-block section of Main Street. The lighting was selected to replicate historically correct lights used in the downtown during the early 1900's. This project won the ***State of Missouri 2002 Downtown Redevelopment Award***.



Phase II – CDBG

Main Street from MO Route 7 to Seminary Street is Phase II of the Main Street "Complete Streets" Improvement Plan. This phase of Main Street is proposed to be improved using CDBG funding. This report will discuss options for how this phase of Main Street is constructed with the available funding and how the remainder will be completed.

This 0.20 mile section of Main Street is a three-block commercial corridor which begins at Route 7 and includes intersections at Ferry Street, Bolivar Street and Polk Street and ties into the Phase I construction that started at Seminary Street. There is a significant amount of automobile, bicycle and pedestrian traffic in this area due to the nature of the businesses within this section and from the pass-through traffic. Public amenities to the West include parks, the Community pool, waterfront attractions and access to the Truman Dam. To the East, the downtown and harbor areas attract a high volume of visitors.

This portion of Main Street should be improved to include bike lanes, sidewalks, street lighting, enclosed storm sewers and improved gateway signing. Parking along this corridor should also be addressed by creating dedicated on-street parking where feasible, especially along the side streets.

The above pictures are examples of dedicated bike lanes with adjacent on-street parking.

Phase III - TIGER

Main Street between US-65 and east of Commercial Street is Phase III of the Main Street improvements and will be submitted for funding with a TIGER application to be submitted on April 29th, 2016.

This remaining section of the 1.51 mile corridor of Main Street should be reconstructed and widened to include turn lanes where needed as well as bike lanes and sidewalks. Improved street lighting, waterline extensions, enclosed storm sewers and additional signing to guide motorists to businesses, events and attractions should be part of the plan for Main Street improvements. These improvements are critical to attracting new commerce, residential revitalization, redevelopment, and major upgrades to infrastructure and transportation access along the City's most valuable community asset, the Warsaw riverfront.

Warsaw is within the Missouri Department of Transportation's (MoDOT) Southwest District. The two incomplete phases of Main Street were prioritized as the number one multimodal project in the district. This report is intended to address Phase II and Phase III of the Main Street corridor improvements.

The benefits of these phased improvements include

- creation of a gateways to the downtown
- reduced fuel usage and greenhouse gasses
- costs savings
- safer roadways for motorists and non-motorists alike
- increased health and wellness from walking and cycling as well as cleaner air
- beautification of the corridor
- improved safety with energy efficient LED lighted pedestrian way
- opportunities for economic redevelopment with the improved corridor
- improved access control of driveways
- improved quality of life

ROADWAY CLASSIFICATIONS

Rural collector road system: The rural collector routes generally serve travel of primarily intra-county rather than statewide importance and constitute those routes on which (regardless of traffic volume) predominant travel distances are shorter than on arterial routes. Consequently, more moderate speeds may be typical, on the average.

In order to define more clearly the characteristics of rural collectors, this system should be sub classified according to the following criteria:

Major collector roads.--These routes should: (1) Provide service to any county seat not on an arterial route, to the larger towns not directly served by the higher systems, and to other traffic generators of equivalent intra-county importance, such as consolidated schools, shipping points, county parks, important mining and agricultural areas, etc. ; (2) link these places with nearby larger towns or cities, or with routes of higher classification; and (3) serve the more important intra-county travel corridors.

Minor collector roads.--These routes should: (1) Be spaced at intervals, consistent with population density, to collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road; (2) provide service to the remaining smaller communities; and (3) link the locally important traffic generators with their rural hinterland.

MoDOT does not currently classify any roadways within the Warsaw City limits as collector roadways. Some of the streets within Warsaw could potentially be classified as Rural Minor Collector Roads. Examples would be Main Street, Commercial Street and Jackson Street.

Rural local road system: The rural local road system should have the following characteristics: (1) Serve primarily to provide access to adjacent land; and (2) provide service to travel over relatively short distances as compared to collectors or other higher systems. Local roads will, of course, constitute the rural mileage not classified as part of the principal arterial, minor arterial, or collector systems.

According to MoDOT's Functional Classifications Map all roadways within the Warsaw City limits as local roadways.

Warsaw's Local Road System Classifications: Within the boundaries of the City of Warsaw US-65 and MO Route 7 are classified as principal arterials; all other roads are considered local roadways. The local roads within the community can be grouped into two classifications: Primary Connectors and Secondary Connectors. Primary Connectors would include Main Street, Jackson Street, Commercial Street, Polk Street, the East Frontage Road and Truman Dam Access Road. All other roads would be considered Secondary Connectors and minor streets.

WARSAW'S TRANSPORTATION SYSTEM

The City of Warsaw currently has needs for street improvements along Main Street. These improvements are needed for various reasons such as enhanced safety, added capacity, reduced delays, and better access to regions of the community and to spur new development.

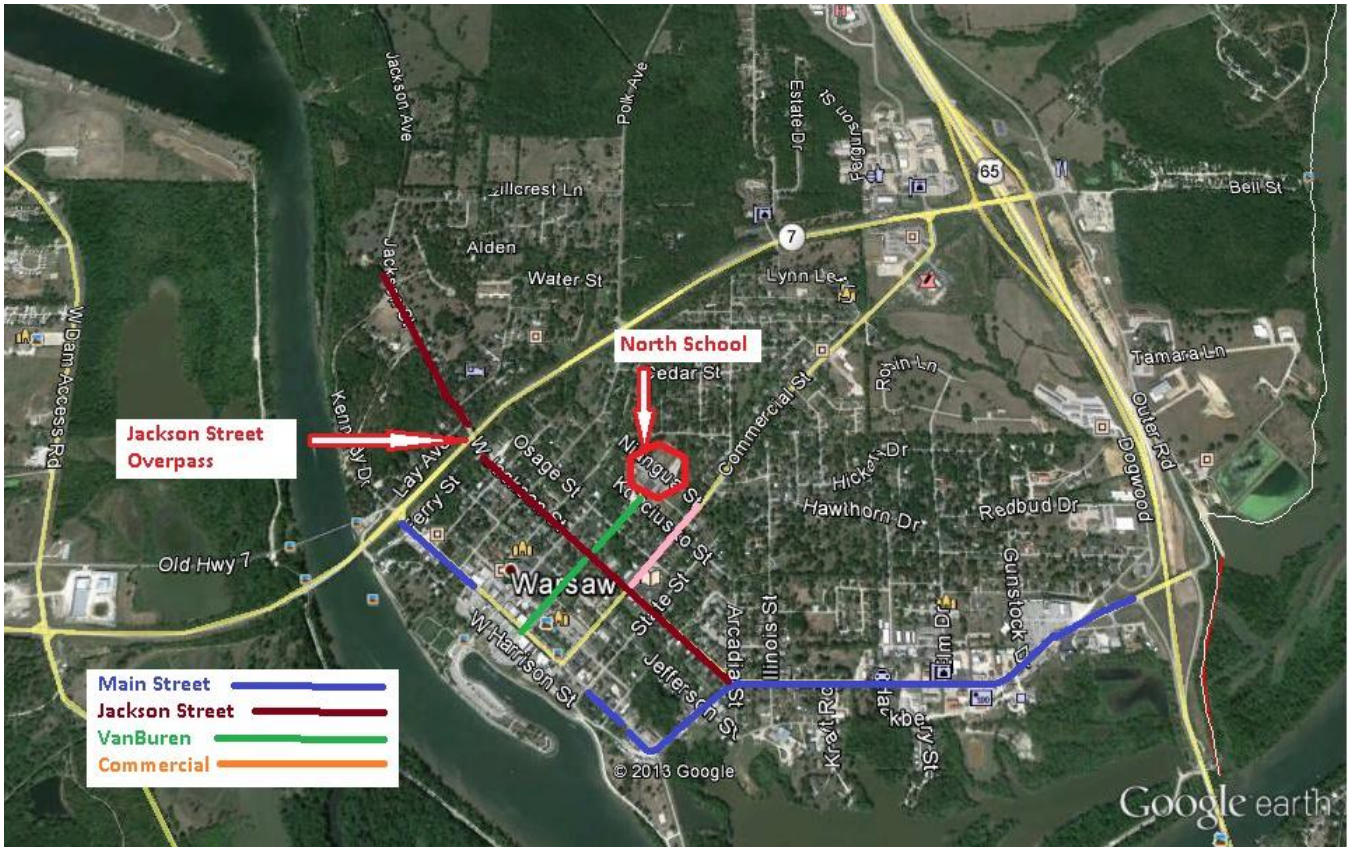


Figure 1 – Primary Connectors

The Main Street corridor is the primary gateway into the city of Warsaw from both US-65 and from MO Route 7. The roadway from Route 7 through the downtown generally runs in a southeast to northwesterly direction. From US-65 into downtown the roadway runs in an East to West direction to the intersection at Jackson Street and then runs southwesterly across the Town Branch Creek, then turns Northwesterly into downtown. Travelers coming from the East or West access Warsaw from MO Route 7. US-65 is the gateway for those coming from the North or South. Main Street should provide a welcoming appearance that showcases the City, and puts forth an image that travelers identify with Warsaw.

Improvement to this route **will significantly improve safety** and **access to and from the downtown to key primary points of economic vitality and interest**. The improvements should consist of new pavement, sidewalks, bike lanes and street lighting. The improvements should also include improved access to businesses, new storm water systems, utility upgrades and relocations, new signing and pavement markings.

EXISTING CONDITIONS:

Most of Main Street is a two-lane roadway with an open drainage system and varied width shoulders. The right-of-way width for Main Street is approximately 66 feet. There are utilities within the corridor e.g. water, sewer, gas, fiber, phone and power. Sidewalks are basically non-existing, and those that do exist, are in poor condition. The pavement is fair to poor condition and most of it is in need of an asphalt overlay. Traffic congestion is a regular problem along the entire corridor.

Phase I Downtown

As mentioned in the Executive Summary, Phase I of the Main Street improvements were constructed in 2001. Following these improvements, Benton County received an enhancement grant of $354,654. These funds were used around the downtown County Courthouse to replace sidewalks, add landscaping and create additional parking. The improvements adopted the same design elements used in the City of Warsaw's downtown improvements.

The City subsequently received additional CDBG funding in 2010 for improvements in the downtown. These improvements included demolishing an abandoned house along Washington Street and constructing a public parking. The project included constructing sidewalks, street lighting, storm sewers, waterline replacements, landscaping and on-street parking. This project was funded through CDBG, USDA, MDFB tax credits and City funds that totaled $216,823.11.

The downtown has benefited greatly from the 2001 improvements. Storefronts have improved their facades and businesses are thriving.

Due to historically correct nature of the façades and infrastructure improvements, the Downtown Revitalization has already yielded a return on a project investment of just over $1,000,000 in private investments in the existing downtown buildings and over $2,000,000 in new buildings since 1997. In 1999, one of the buildings won the ***State of Missouri's Excellence in Downtown Façade Renovation***.

Many of the design features in the two pictures above will carry through to Phase II and III.

These improvements started the first phases of improving Warsaw's economic mobility through enhanced multimodal connections to centers of employment, education and services that stimulate the economically distressed area. (Source: Stats America.) The downtown, combined with Drake Harbor Recreation Area, have become a center of pride for the community.

The Drake Harbor Recreation Area

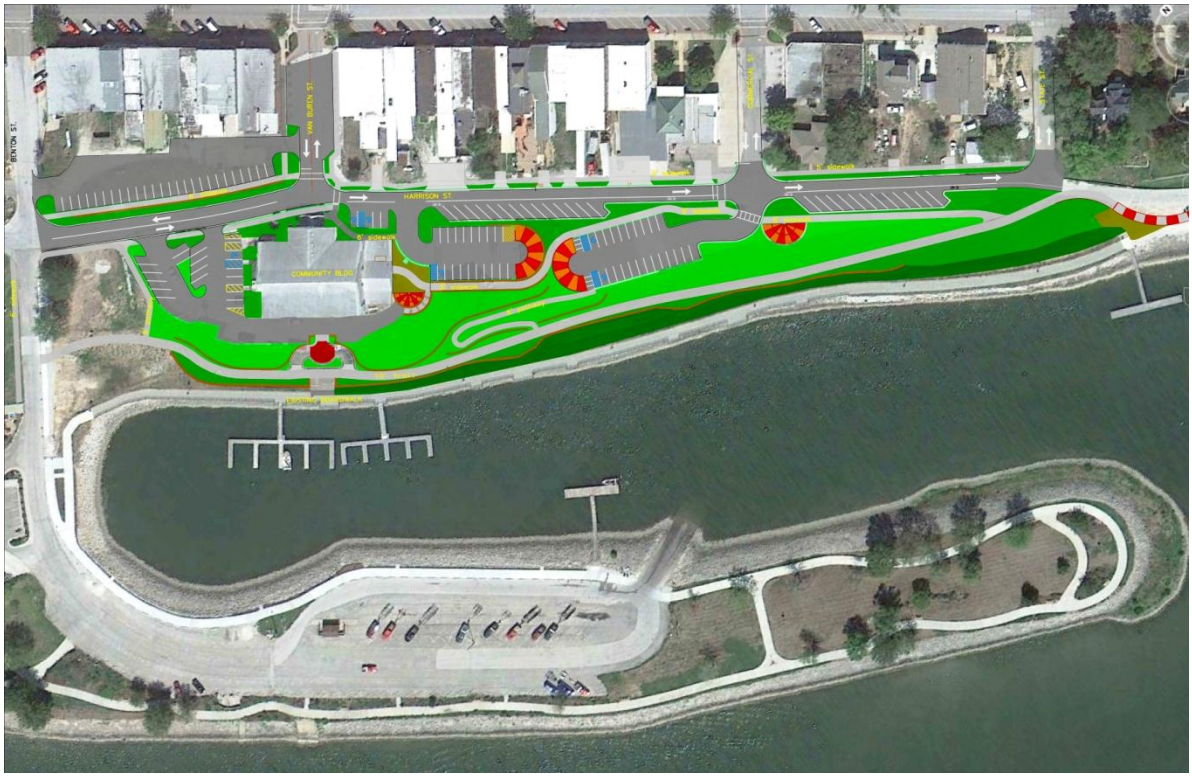
Staying true to the 1997 Downtown Revitalization Plan, the City continued to commit matching funds with grants to develop the **Drake Harbor Recreation Area** that includes multiuse paths that extend nearly six miles along the waterfront. A large percentage of the trails were constructed by city crews. The construction of the concrete paths, trail lighting and landscaping were tasks the city crews completed.

Above is Steam Boat Landing Amphitheater in Drake Harbor Recreation Area. This is directly behind where the proposed Phase II improvements will connect to the Phase I construction. According to the USACE, this area attracts around 78,000 vehicles a year.

Harrison Street and Steamboat Landing

Another part of the 1997 Downtown Revitalization Plan are the recently completed **Harrison Street and Recreation Trails Projects** between State Street and Benton Street. The Harrison Street "Complete Streets" project included ADA compliant sidewalks, bike lanes, crosswalks, street lighting, storm and sanitary sewer upgrades, waterline extensions and connections to riverfront trails.

The RTP Trails project included construction of a continuous trail from Benton Street to State Street with connections from Harrison Street to Steamboat Landing and the waterfront. These projects were funded with Transportation Enhancement Funds, Recreation Trail Program and City cash and In-kind match.



Overview of Harrison Street & RTP Trail Project. Main Street is at the top of the picture.

Recent Roadway Improvements by Other Agencies

US-65 was widened to a four lane divided highway by MoDOT from the north into Warsaw. This upgrade provided four-lane access from Interstate 70 to Warsaw. This enhancement significantly influences the City's need to improve Main Street from US-65 into the downtown area.

In 2014 MoDOT completed resurfacing and expanding the shoulders on Route 7 from Tightwad, Missouri to the newly completed US-65 expansion. These improvements included removing the 10 foot wide chip and seal shoulder and replacing it with paved asphalt shoulders that have a 6 foot buffer lane and a four foot bicycle lane on each side of the route with signage. This partnership allowed the complete streets network to extend another 2.1 miles. Currently there are no bicycle lanes connecting from the highway into the community.

The USACE has committed to sign and stripe shoulders for bicycle lanes along its public access road as a connection to the Highway 7 project including bike lanes on the North Dam Access Road which directly connects to both Highway 7 and Highway 65 north of the City. This will create an additional 2 miles of complete streets around the outside of the city limits and virtually encircle the community with bike accessibility.

The Main Street corridor has connectivity to all of the above mentioned improvements in and around Warsaw and should be upgraded to expand the network of safe facilities for bicyclists and pedestrians.

Major street and sidewalk improvements have been completed by the City along Main Street in the three block downtown central business district from Seminary Street to just east of Commercial Street. However, the majority of Main Street, including the entrances at the "**two front doors**" to the City has not been addressed.

Phase II CDBG Application

Existing Roadway Typical Sections Phase II Route 7 to Seminary Street:

This is the entrance into downtown from MO Route 7 highway and is one of the routes from downtown to Lay Park , athletic fields and the Community Pool to the west. This is also a link to the highway bike lane network. Through this section of Main Street, commercial businesses exist along both sides of the roadway including a gas station with convenience store, restaurants, car dealerships, gift shops and flea markets. These businesses and the recreational facilities to the west generate a significant amount of automobile and foot traffic.

Main Street just east of MO Route 7 consists of 44 feet of asphalt pavement containing two 12 foot lanes with a 10 foot shoulder on either side. From Ferry Street to Bolivar Street the roadway continues to be approximately 44 feet in width. Although the edge of travel lane is not striped there is a distinct crown in the roadway at the edge of the travelway. Parking is permitted along both sides of the roadway. An open ditch exists along the northerly side, while an enclosed storm sewer exists along the southerly side. The lack of sidewalks and proper pedestrian facilities leads to people walking in the roadway and crossing at unsafe locations as shown in the photos below.

Example of mother with 3 children walking along shoulder and then having to cross the road mid block due to a deep open drainage ditch.

Between Bolivar Street and Polk Street the roadway width narrows and varies between 34 feet and 38 feet of asphalt pavement (two 11 foot lanes with 8 foot shoulders). An enclosed 30" HDPE storm sewer pipe runs along the northerly side and empties into an open ditch just beyond the driveway into Cosmic Café. A retaining wall exists just beyond the right-of-way in front of the Cosmic Café. The driveway into the café is gravel and is very steep. A gutter exists along the southerly side at the outside edge of the shoulder.

A wide gravel parking area exists beyond the shoulder along the northerly side in front of the Cosmic Café. The parking along Polk Street and Main Street in this area is also somewhat limited and creates conflict issues for pedestrians and motorists.

Between Polk Street and Seminary Street the roadway varies between 42 feet and 44 feet. This provides two 11 foot lanes with 10 foot shoulders for parking on either side of the roadway. An 8 foot asphalt shoulder on the southerly side.

There is a group of various businesses under one roof along the northerly side of the roadway. These businesses are afronted by a paved sidewalk adjacent to the building. The sidewalk is in poor condition and does not meet any ADA compliance criteria. A series of porches project onto the sidewalk and prevent it from being of much use. The edge of the shoulder next to the sidewalk operates as a gutter.

A sanitary sewer line and a waterline run within the right-of-way along the south side. A concrete retaining wall exists at the back side of the south right-of-way, about 9.5 feet from the edge of the pavement.

The photo above was taken on Main Street as you approach Seminary Street and the downtown from the west. This picture illustrates another of the many safety issues with pedestrians having to walk in the street. These pictures were taken during a recent weekend event at the City. Notice all of the vehicles parked along the edge of the street that are blocking access to the existing inadeqate pedestrian facilities. These are typical of the issues along this section of Main Street.

The photo to the left is where the Phase I construction project began at Seminary Street. Phase II will connect sidewalks and streetscpe improvements similar to these.

Phase II CDBG Application

Existing Roadway Traffic Volumes Phase II Route 7 to Seminary Street:

The most recent traffic counts along Main Street were taken in the year 2000. The existing twenty-four hour, two-way traffic counts between Route 7 and downtown were 4500 to 4600 vehicles per day. Since 2000 buisness redevelopment along Main Street, combined with increased tourism and population growth has conservitably increased these volumes by 10% to 20%. A reasonable estimate for daily two-way traffic in 2016 would be 5200 to 5400 vehicles. Peak hour volumes would typically be about 10%, or 520 to 540 vehicles.

During peak fishing season and festival weekends these numbers would be significantly higher. Main Street is currently designated as the route for boats and recreational traffic into the harbor.

Traffic control along Main Street consists of a stop sign at the intersection of Route 7. The remainder of Main Street into the downtown has free movements. All side streets are controlled by stop signs.

The posted speed is 25 mph, which is appropriate for this roadway.

Phase III TIGER Application

Existing Roadway Typical Sections Phase III East of Commercial Street to US-65:

Additional information contained in Attachment A.

Main Street between Commercial Street and State Street has been mostly reconstructed. The existing foot roadway is 24 feet in width. Along the southerly side of the road, on-street parking is present with part diagonal parking and part parallel parking. A curbline is located at the edge of the roadway/parking with a two-foot band of brick pavers new 6 foot sidewalk beyond the curb. Along the northerly side of the street, on-street diagonal parking with curb and gutter and a new 5 foot sidewalk exist for about half of the block (145 feet). The remainder of the northerly side contains an open drainage trench and an older 4 foot sidewalk. This section of Main Street is commercial and includes a fire station.

Between State Street and Ballou Street the roadway consists of 30 feet of asphalt pavement with 8 foot gravel shoulders on both sides with a curb at the outside of the shoulders. A six foot sidewalk is adjacent to the back of the curb along the southerly side, while a 3.5 foot to 4 foot wide sidewalk exists along the northerly side, separated from the curb by a variable width grassy strip. This section of Main Street is residential.

East of Ballou Street to where the road turns north prior to the Town Branch Creek the sidewalk is in poor condition and ends after about 200 feet. The drainage in this area is undefined with no ditches or enclosed system. The asphalt pavement varies bewteen 32 feet and 35 feet in width and the right-of-way remains at 66 feet. This section of Main Street is mixed residential, light industrial and commercial.

At the Town Branch Creek the roadway pavement narrows to 20 feet wide with 24 feet of separation between the headwalls of the 10' x 8' reinforced concrete box bridge. There are no shoulders adjacent to the roadway in this area. As the road continues Northerly from the creek to Jefferson Street it widens to about 22 feet, but still contains no defined shoulder. Along the east side of the roadway there are large sections of wide undefined driveways. There are no defined drainage ditches or enclosed systems in this area and as a result water can be observed ponding along the roadway in some locations. There are no sidewalks along this

section of roadway and crossing the creek requires pedestrians or bikers to travel in the street. This section of Main Street is mixed residential on one side and commercial on the other.

At the intersection of Jefferson Street, the roadway alignment goes through a reverse curve and is oddly configured and should be considered for possible realignment.

Between Jefferson Street and Jackson, Main Street continues to be 22 feet in width. Drainage swales and shallow ditches are present and a very short segment of poor condition 3 foot wide sidewalk exists on one side. Utilities and right-of-way is consistent with the previous sections. Properties are of mixed use.

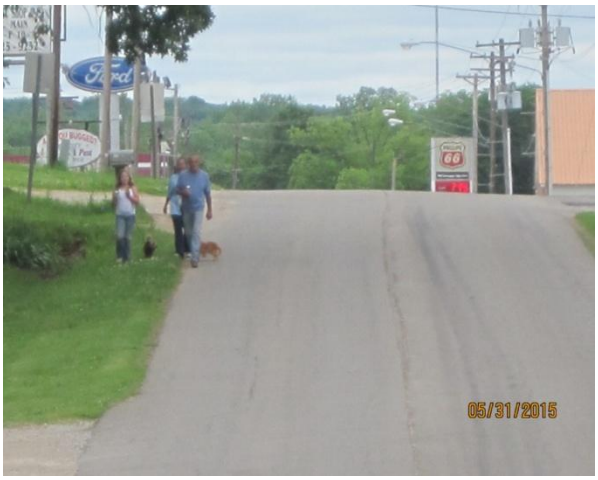
The intersection of Main Street, Jackson Street and Arcadia Street is a five-legged intersection, containing lots of utilities. Main Street has free movements, while Jackson and Arcadia are stop sign controlled. A new 5 foot sidewalk was recently constructed along the north side of Jackson Street coming from the west.

Between Arcadia and Illinois Street Main Street consists of 24 feet of asphalt pavement. Along the north side a 10 foot aggregate shoulder, an 8 foot open ditch and a 4 foot sidewalk exist. On the south side of the roadway there is a 4 foot turf shoulder with a 6 foot ditch and portions of a discontinuous sidewalk. Overhead power, occasional street lights and communication as well as water and gas are within the right-of-way. This section of roadway is residential.

Between Illinois and Hackberry, Main Street is a residential corridor. The roadway width is typically 23 feet and includes turf shoulders with open ditches. A 42”x 24” eliptical metal pipe crosses under the road at the low point. Utilities and right-of-way are consistent with the previous section. A short segment of 3 foot sidewalk exists in front of a public cemetary located on the south side at the intersection of Hackberry Street. The sidewalk is at an elevation that is about 2 feet lower than the roadway.

East of Hackberry, Main Street is a commercial corridor that experiences a lot of traffic movement including a high percentage of trucks. The roadway concsists of about 22 feet of asphalt pavement with varied shoulder materials and widths. A high percentage of the roadway is connected to wide and continuous driveways creating a high number of conflicts for pedestrians. Deep open ditches make it difficult to walk outside the travelway and as a result many pedestrians are seen walking in the roadway.

Examples of open ditches that illustrate the need for enclosing the drainage to constuct sidewalks.



Examples of pedestrians in the roadway and wide continuous driveays.

Phase III TIGER Application

Existing Roadway Traffic Volumes Phase III East of Commercial Street to US-65:

The year 2000 existing twenty-four hour, two-way traffic counts between Jackson/Arcadia Street and US-65 between Route 7 and downtown were 7000 to 8000 vehicles per day. Since 2000 buisness redevelopment along Main Street, combined with increased tourism and population growth has conservitably increased these volumes by 10% to 20%. A reasonable estimate for daily traffic in 2016 would be 7700 to 9600 vehicles. Peak hour volumes would typically be about 10%, or 770 to 960 vehicles.

During peak fishing season and festival weekends these numbers would be significantly higher. Main Street is currently designated as the route for boats and recreational traffic into the harbor. This section of Main Street in particular experiences a large amount of commercial truck traffic.

Traffic control along Main Street consists of a stop sign at Commercial Street. The remainder of Main Street between US-65 and the downtown has free movements. All side streets are controlled by stop signs.

The posted speed is 25 mph, which is appropriate for this roadway.

IMPROVEMENT PRIORITIES AND RECOMMENDATIONS

The 2015 Warsaw Livable Community Transportation Improvement Plan included the goal of constructing a multi-modal transportation network that connects neighborhoods to retail areas, recreation nodes, schools and most importantly, downtown Warsaw and the beautiful, historic Drake Harbor/Steamboat Landing.

Upgrading community connectors through the city as complete streets **will significantly improve safety** and **access to and from the downtown to key, primary points of economic vitality and interest**. The construction should consist of new pavement, sidewalks, bike lanes and 10' multi-use pathways where feasible. The improvements would also include improved access to properties and City streets, new storm water systems, utility upgrades and relocations, new signing, pavement markings and lighting.

Improvements to Main Street will provide connectivity from the completed downtown waterfront trail system to many parts of the community. Portions of existing alleyways and other streets and trails can also be incorporated into future bike/pedestrian corridor improvements that will link many parts of the community.

Map of Main Street Improvements

The proposed improvements to the Main Street corridor are separated into segments: Phase I reconstruction between Seminary and Commercial Street has been completed. Phase II is MO Route 7 to Seminary Street. Phase III is East of Commercial Street to US-65. Future phases will include improvements at the US-65 interchange.

Phase II CDBG Application

Phase II - Route 7 to Seminary Street

This section of Main Street should be improved to include on-street bike lanes, sidewalks, way-finding signage, curb and gutter with enclosed storm sewers and street lighting. Improvements should also consider adding defined off-street parking along the side streets to mitigate lost on-street parking. These improvements would transition into the downtown streetscape improvements and complete the gateway into Warsaw from Rte 7.

Photo taken near Route 7 with proposed improvements looking toward downtown. Parallel Parking may also be possible along the southeast side of the street.

Sidewalks should end at Ferry Street and connect to future Ferry Street improvements. Ferry Street at Main will be designed to allow a future connection for bicyclists and pedestrians to access the Jackson Street overpass. This future connection will create a safe route to the Jackson Street overpass. Currently a Transportation Enhancement Assistance Program grant (TEAP) is being completed to determine how this route will connect Main Street and Jackson Street.

Sidewalks should be ADA compliant and provide connections to properties. Where sidewalks have less than 2 feet of separation from the back of curb, the sidewalks should be widened to at least 6 feet. Retaining walls will likely need to be constructed where steep slopes adjacent to the roadway are encountered. If easements can be easily acquired, the slopes could be graded and walls could be omitted. Gravel driveways should be paved to the right-of-way line to reduce the amount of gravel washing onto the sidewalks and roadway. The roadway should also be milled and overlaid as part of the project.

Parking will be created on side streets. Additional parking can also be created on the southeast side of the street by using retaining walls to eliminate slopes and placing the parallel parking between the curb and bicycle lanes.

The infrastructure improvemenst for Phase II of Main Street will need to be completed utilizing multiple funding sources. After design is completed the City will need to work with its engineer to determine the full limits of what can be constructed with the available CDBG funds. One scenario would be to complete one side of the roadway as shown in the picture above, followed by the opoosite side at a later date. The CDBG project funding is approved for **$550,000.** . Initial conceptual design indicates this funding would cover the construction of the north side of the roadway improvements for curb and gutter, sidewalks, lighting, storm sewers, utility adjustments and grading. This funding would also cover the cost of milling and overlay of the roadway and pavement markings.

Future funding would cover the cost of adding on-street parking and the improvements along the south side of the road. The total estimated cost of these improvements as two separate projects including engineering, administration and construction inspection is approximately **$991,700.**

Summary of Improvements Phase II CDBG Application

- Widen Main Street as needed to provide bike lanes from Route 7 to Seminary St.
- Add sidewalks and LED street lighting for the entire length of the corridor
- Provide sidewalk connectivity to properties and buildings
- Replace the open-ditch drainage with and enclosed storm drainage system to allow for widening within the existing right-of-way
- Reconstruct driveway limits to resolve some of the access management issues
- Provide way-finding signage to better inform travelers of local amenities and destination locations.
- Provide on-street parking where possible on side streets
- Mill and overlay existing asphalt pavement
- Adjust sanitary & waterlines as needed

Phase III TIGER Application

Phase III – State Street to US-65

Main Street from State Street to Kraft Street This section of Main Street would begin where the downtown streetscape project ended, just west of State Street. The roadway should be improved to include sidewalks, way-finding signage, curb and gutter with enclosed storm sewers and street lighting. On-street parking should be accommodated for the two-block section east of State Street. Shared bike lanes or "Sharrows" should be marked on the roadway in this section due to limited space for widening.

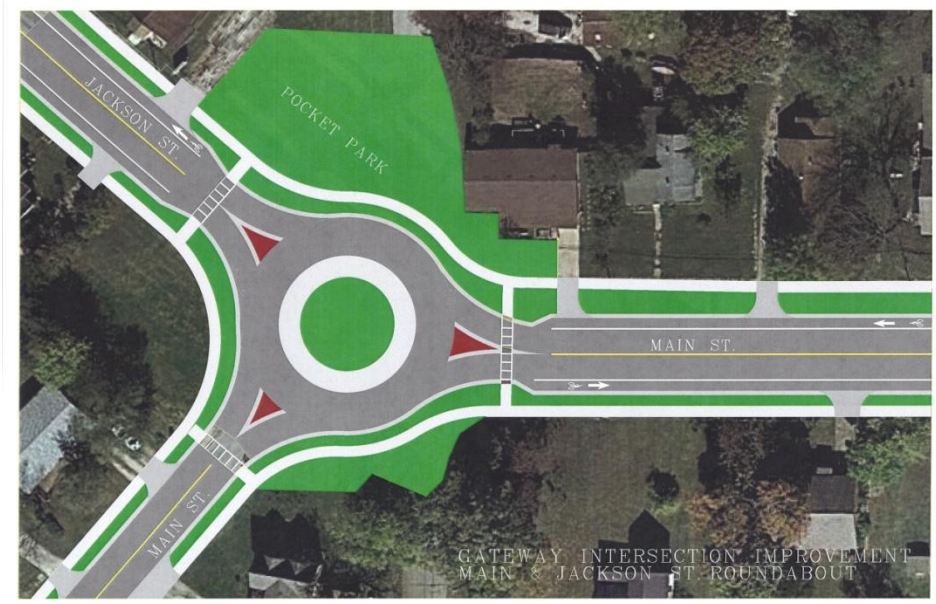
Example of roadway improvements with bike lanes and sidewalks

The Town Branch Creek will require widening of the existing bridge or constructing a pedestrian bridge to safely get pedestrians across the creek. A sidewalk constructed along the northwest side of the road between the Jefferson Street to past the Town Branch Creek is recommended at this time.

Consideration should also be given to straightening the roadway alignment at Jefferson Street. The house on this property is potentially going to be demolished by the owner and the City may be interested in acquiring the lot.

Constructing bike lanes through this section of roadway is not necessary as there are alternate routes for bike paths to access downtown, including Jackson Street. Also of note within the city limits is an opportunity to utilize an existing dedicated alleyway as a bike/pedestrian corridor. This alleyway extends through a large segment of the downtown from Van Buren Street to Main Street, with some portions graded with a gravel pathway. Future improvements would include additional grading, placing an aggregate or paved surface, building a pedestrian bridge across Town Branch Creek, adding signage and possibly lighting. This alleyway would provide a vital bike/pedway through the city.

Waterline and storm sewer upgrades should be performed along with the widening and paving of pathways to prevent future tearing up of pavement for waterline and storm sewer repair or replacement.



Example of how a roundabout might work at Main& Jackson

The section from the intersection of Jackson Street to Kraft should include widening for on-street bike lanes. This is a 5-legged intersection on Main Street could be reconstructed as a roundabout with landscaping and gateway features into downtown and the harbor. Closing one two of the street connections, such as the south and north legs of Arcadia is recommended. The City should approach the residents along this short street segment and determine if there are any negative impacts to closing this connection.

Main Street from Kraft Street to U.S. 65 This section of Main Street is mostly a commercial gateway into downtown from U.S. 65. The roadway in this area should be improved to include a center turn-lane, on-street bike lanes, sidewalks, way-finding signage, curb and gutter with enclosed storm sewers and street lighting.

The number of commercial driveways through this area of Main Street warrants the addition of a center turn lane to improve traffic flow and safety. Access management should be included to reduce and consolidate driveways where possible and to clearly define driveways in lieu of the entrances that span the full width of the business frontage. Any reconstruction and widening in this area should take into consideration the possible impacts of redevelopment and, if possible, incorporate that into the roadway reconstruction. The City should work closely with property owners to improve their frontage as part of these improvements.

West of the Hackberry intersection is a cemetery that will require avoidance from any construction impacts. This cemetery on the south side of Main Street makes it difficult to continue widening for a center turn lane and the frontage is mostly residential to the west.

The estimated cost for the Main Street improvements from State Street to US-65 is $5,183,553.

Example of widening for center turn lane through commercial section of Main Street

Fortunately there is adequate public right-of-way along Main Street to accommodate widening for bike lanes and adding or replacing sidewalks. In addition, most utilities can be avoided with the proposed improvements.

Summary of Improvements Phase III Tiger Application

The proposed Main Street improvements consist of:

- Replace an old 6" waterline with an 8" line from Kraft Street to Gunstock Street
- Extending an 8" waterline from State Street to Jackson Street
- Widen Main Street to provide bike lanes from US-65 to Jackson Street
- Widen to add a center turn lane between US-65 and Hackberry Street
- Add sidewalks and LED street lighting for the entire length of the corridor
- Replace the open-ditch drainage with and enclosed storm drainage system to allow for widening within the existing right-of-way
- Replace the poorly functioning 5-legged intersection at Jackson with a roundabout
- Provide a pedestrian crossing of the Town Branch Creek
- Define driveway limits to resolve some of the access management issues
- Provide way-finding signage to better inform travelers of local amenities and destination locations.
- Provide on-street parking where possible near State Street and Ballou
- Mill and overlay existing asphalt pavement
- Adjust sanitary sewer & other utilities as needed

COST ESTIMATE EXHIBIT – PHASE II CDBG APPLICATION

The estimate below is the items that would be constructed with the CDBG funding.

WARSAW, MISSOURI										
Complete Streets										
Phase II Main Street from RTE 7 to Seminary (CDBG Funded)										
ENGINEER'S OPINION OF PROBABLE COSTS (CONCEPTUAL										
	ITEM			QTY.		UNIT		UNIT COST		COST($)
Removal of Improvements				1		L SUM		$25,000.00		$25,000.00
Common Excavation				850		CY		$15.00		$12,750.00
Rock Excavation				100		CY		$25.00		$2,500.00
Embankment in Place				0		CY		$20.00		$0.00
Subgrade Compaction (6 Inch Depth)				6		STA		$320.00		$1,920.00
Compacting Embankment				700		CY		$2.00		$1,400.00
4" Type 1 Aggregate Base				1,000		SY		$8.00		$8,000.00
3" Asphalt Overlay				650		Ton		$90.00		$58,500.00
Cold Milling				3,670		SY		$4.00		$14,680.00
Asphalt Parking for Side Streets				0		Ton		$90.00		$0.00
Driveways & Paved Approaches				420		SY		$65.00		$27,300.00
6" Gravel				190		SY		$10.00		$1,900.00
Curb & Gutter				600		LF		$32.00		$19,200.00
S Curb				0		LF		$30.00		$0.00
Curb Inlets				3		EACH		$3,800.00		$11,400.00
18" Storm Sewer Pipe				40		LF		$50.00		$2,000.00
30" Storm Sewer Pipe				200		LF		$93.00		$18,600.00
18" End Section				2		EACH		$500.00		$1,000.00
Retaining Walls				0		SF		$45.00		$0.00
Sidewalk				440		SY		$42.00		$18,480.00
ADA Ramps				40		SY		$95.00		$3,800.00
Truncated Domes				84		SF		$50.00		$4,200.00
Pavement Marking				3,100		LF		$1.25		$3,875.00
Pavement Marking Symbols				3		EACH		$500.00		$1,500.00
Erosion Control				1		LSUM		$6,500.00		$6,500.00
Traffic Control				1		LSUM		$9,000.00		$9,000.00
Light Poles				5		EACH		$3,600.00		$18,000.00
Pole Foundations				5		EACH		$735.00		$3,675.00
Conduit & Wiring				1,200		LF		$8.00		$9,600.00
Seeding & Landscaping				1		LSUM		$7,500.00		$4,875.00
Signing				1		L SUM		$2,500.00		$2,500.00
Utility Adjustments				1		L SUM		$20,000.00		$20,000.00
								subtotal		$312,155.00
Contractor Construction Staking			{1.8%}	1		LSUM		$5,618.79		$5,618.79
Mobilization			{4.0%}	1		LSUM		$12,486.20		$12,486.20
Subtotal										**$330,259.99**
Contingency										**$39,539.00**
Total										**$369,798.99**
			Administrative Costs (4%)+$10,000							**$25,191.96**
			Engineering & Surveying Costs *							**$90,000.00**
		Construction Inspection & Testing Costs								**$60,000.00**
				Right-of-Way Costs						**$5,000.00**
Note * Engineering & Survey for Entire Project										
						Grand Total				**$549,990.95**

COST ESTIMATE EXHIBIT – PHASE II TOTAL COSTS

The estimate below is the total cost of Main Street improvements with the CDBG funding and future project funding.

WARSAW, MISSOURI										
Complete Streets										
Phase II Main Street from RTE 7 to Seminary (Total Costs - CDBG & Future Funding)										
ENGINEER'S OPINION OF PROBABLE COSTS (CONCEPTUAL										
	ITEM			QTY.		UNIT		UNIT COST		COST($)
Removal of Improvements				1		L SUM		$40,000.00		$40,000.00
Common Excavation				1,285		CY		$15.00		$19,275.00
Rock Excavation				150		CY		$25.00		$3,750.00
Embankment in Place				50		CY		$20.00		$1,000.00
Subgrade Compaction (6 Inch Depth)				6		STA		$320.00		$1,920.00
Compacting Embankment				1,135		CY		$2.00		$2,270.00
4" Type 1 Aggregate Base				4,600		SY		$8.00		$36,800.00
3" Asphalt Overlay				650		Ton		$90.00		$58,500.00
Cold Milling				3,670		SY		$4.00		$14,680.00
Asphalt Parking for Side Streets				500		Ton		$90.00		$45,000.00
Driveways & Paved Approaches				740		SY		$65.00		$48,100.00
6" Gravel				190		SY		$10.00		$1,900.00
Curb & Gutter				1,300		LF		$32.00		$41,600.00
S Curb				400		LF		$30.00		$12,000.00
Curb Inlets				6		EACH		$3,800.00		$22,800.00
18" Storm Sewer Pipe				700		LF		$50.00		$35,000.00
30" Storm Sewer Pipe				200		LF		$93.00		$18,600.00
18" End Section				2		EACH		$500.00		$1,000.00
Retaining Walls				500		SF		$45.00		$22,500.00
Sidewalk				900		SY		$42.00		$37,800.00
ADA Ramps				65		SY		$95.00		$6,175.00
Truncated Domes				120		SF		$50.00		$6,000.00
Pavement Marking				3,100		LF		$1.25		$3,875.00
Pavement Marking Symbols				6		EACH		$500.00		$3,000.00
Erosion Control				1		LSUM		$11,000.00		$11,000.00
Traffic Control				1		LSUM		$16,500.00		$16,500.00
Light Poles				10		EACH		$3,600.00		$36,000.00
Pole Foundations				10		EACH		$735.00		$7,350.00
Conduit & Wiring				2,400		LF		$8.00		$19,200.00
Seeding & Landscaping				1		LSUM		$15,000.00		$15,000.00
Signing				1		L SUM		$5,500.00		$5,500.00
Utility Adjustments				1		L SUM		$40,000.00		$40,000.00
								subtotal		$634,095.00
Contractor Construction Staking			{1.8%}	1		LSUM		$11,413.71		$11,413.71
Mobilization			{4.0%}	1		LSUM		$25,363.80		$25,363.80
Subtotal										**$670,872.51**
Contingency										**$90,630.88**
Total										**$761,503.39**
			Administrative Costs (4%)+$10,000							**$25,191.96**
				Engineering & Surveying Costs						**$90,000.00**
		Engineering for 2nd Project Bid Package								**$10,000.00**
	Construction Inspection & Testing Costs 1st Project									**$60,000.00**
	Construction Inspection & Testing Costs 2nd Project									**$35,000.00**
				Right-of-Way Costs						**$10,000.00**
						Grand Total				**$991,695.35**

COST ESTIMATE EXHIBIT – PHASE III TIGER APPLICATION

The estimate below is the cost of Main Street improvements between State Street and US-65.

WARSAW, MISSOURI									
Complete Streets									
Phase III E Main Street from State Street to U.S. 65									
ENGINEER'S OPINION OF PROBABLE COSTS (CONCEPTUAL)									
	ITEM			QTY.		UNIT		UNIT COST		COST($)
Removal of Pavement, sidewalk, etc				1		L SUM		$100,000.00		$100,000.00
Common Excavation				4,682		CY		$15.00		$70,227.78
Rock Excavation				350		CY		$25.00		$8,750.00
Embankment in Place				1,235		CY		$20.00		$24,699.26
Subgrade Compaction (6 Inch Depth)				56		STA		$320.00		$17,920.00
Compacting Embankment				3,745		CY		$2.00		$7,490.96
4" Type 1 Aggregate Base				12,701		SY		$8.00		$101,609.78
8" Asphalt Widening				3,915		Ton		$90.00		$352,350.00
3" Asphalt Overlay				2,230		Ton		$90.00		$200,700.00
Cold Milling				13,340		SY		$4.00		$53,360.00
Driveways				4,219		SY		$65.00		$274,227.78
6" Gravel				1,067		SY		$10.00		$10,666.67
Curb & Gutter				10,027		LF		$32.00		$320,864.00
S Curb				1,800		LF		$30.00		$54,000.00
Curb Inlets				47		EACH		$3,500.00		$164,500.00
Storm Sewer Pipe				5,145		LF		$50.00		$257,250.00
Storm Sewer Trencing & Backfill				3,811		CY		$22.00		$83,844.44
Storm Sewer End Section				13		EACH		$500.00		$6,500.00
Retaining Wall				1,600		SF		$45.00		$72,000.00
Sidewalk				4,189		SY		$42.00		$175,933.33
ADA Ramps				2,757		SF		$95.00		$261,915.00
Truncated Domes				500		SF		$50.00		$25,000.00
Pavement Marking				15,650		LF		$1.25		$19,562.50
Erosion Control				1		LSUM		$20,000.00		$20,000.00
Traffic Control				1		LSUM		$20,000.00		$20,000.00
Light Poles				83		EACH		$3,600.00		$298,800.00
Pole Foundations				83		EACH		$735.00		$61,005.00
Conduit & Wiring				11,800		LF		$8.00		$94,400.00
Seed & Landscaping				4		ACRE		$7,500.00		$30,000.00
Roundabout Concrete Apron				360		SY		$75.00		$27,000.00
RCB Widening				10		CY		$1,000.00		$10,000.00
Hand Rail				200		LF		$45.00		$9,000.00
Signing				1		L SUM		$10,000.00		$10,000.00
8" Waterline Replacement & Extension				3,700		LF		$60.00		$222,000.00
Valves, Hydrants, Meters				2		LSUM		$56,000.00		$112,000.00
				0				subtotal		$3,577,576.50
				0						
Contractor Construction Staking			{1.8%}	1		LSUM		$64,396.38		$64,396.38
Mobilization			{4.0%}	1		LSUM		$143,103.06		$143,103.06
Subtotal										**$3,785,075.94**
Contingency 12%										**$454,209.11**
Total										**$4,239,285.05**
			Engineering & Surveying Costs (10.5%)							**$445,124.93**
			Construction Inspection & Testing Costs (8%)							**$339,142.80**
			Right of Way & Construction Easement Costs							**$60,000.00**
						Utility Relocations				**$100,000.00**
						Grand Total				**$5,183,552.78**