

JAYHAWK WATERSHED

Stormwater Report

July 31, 2018

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1.0 Report Purpose

The purpose of this report is to describe and trace the history of the Jayhawk Watershed as it relates to the neighborhood of Old West Lawrence and in particular, the existing primary storm sewer line that traverses it. This report will provide a timeline of events and property transfers within the watershed as they pertain to the parcel of land addressed as 812 Ohio Street. Furthermore, the report will also provide the history associated with the 1996 Stormwater Master Plan as it pertains to the storm sewer line crossing through the parcel at 812 Ohio Street.

2.0 Time Line

The time line shown in **Appendix A** illustrates the history of events for the Jayhawk Watershed in addition to the recent events regarding 812 Ohio Street.

3.0 Priority Evaluation - 1996 Stormwater Master Plan

The 1996 Stormwater Master Plan recommended 41 projects as capital improvements. These recommendations were developed after consideration of the benefits, performance and cost of a broad range of options including land use or zoning changes; drainage easement, removal of damageable improvements, detention; open channels; and enclosed storm drains. The resulting recommended improvement projects are essentially all structural improvements to the storm drainage infrastructure consolidated into 41 defined projects scattered throughout the City. The plan split the projects into three groups: Group I, Group II and Group III. The following table indicates the parameters for each respective group.

Group I:	Identified as the highest priority group with the critical projects defined as those where recurring residential or commercial structure flooding by surface runoff is, or appears to be, the direct result of the inadequacy of the existing storm sewer drainage system.
Group II:	Includes those areas where the inadequacy of the existing improved drainage system results in severe flooding of major streets, which impedes pedestrian and vehicular traffic, including emergency vehicles, and creates access problems to public and/or private property for a number of people.
Group III:	This group includes the remainder of the projects, which deal primarily with erosion and nuisance situations. This is considered the lowest priority group of the three categories.

The total number of projects for each Group as well as the number of projects completed to date in each Group are shown in the following table (refer to **Appendix B** for a more detailed listing of the projects):

GROUP	Total # of projects RECOMMENDED	Total # of projects COMPLETED
Group I:	11	8
Group II:	9	1
Group III:	21	7

4.0 Master Plan Progress & Funding

The stormwater utility completed 13 of the total 41 projects prior to 2006. The debt service for these 13 projects resulted in double debt service bond payments through 2008 with a complete debt payoff in 2018. The original estimated costs for all projects within the 1996 Stormwater Master Plan totaled approximately \$31.7 million. In 2015, the Maple Street Pump Station was completed at a cost of nearly \$6.1 million. This project comprised of two of the Group III projects (#37 & #39) listed within the master plan. In the summer of 2017, the 23rd and Ousdahl Project, a Group II project (#8), was completed at a cost of \$3.1 million, bringing the total amount of expenditures on storm sewer infrastructure to \$19.3 million. It should be noted that the last two projects constructed comprised of nearly half of the total expenditures spent to date.

Stormwater fees are charged by an equivalent residential unit (ERU). An ERU represents 2,366 square feet of impervious surface (roof, pavement). All parcels of land in Lawrence are subject to this rate charge, including City and other tax-exempt properties. The consultant who produced the master plan originally recommended that the starting rate be \$4.00/ERU. The adopted starting rate in 1997 was \$2.00/ERU.

All of the completed projects were funded with revenue collected from the stormwater rate charge with the exception of the Maple Street Pump Station which was funded with revenue from Infrastructure Sales Tax. It should be noted that nearly 25% of the stormwater revenue has been transferred to the General Fund every year since 2006 to help fund the construction of curb and gutter with the street maintenance program.

5.0 812 Ohio Street – Project #23

Project #23 in the 1996 Stormwater Master Plan assumed the replacement of the storm sewer would be within its existing alignment or at least relatively close to it. Given the information at the time the plan was developed, it was not known that the house at 812 Ohio was constructed directly over the existing storm sewer line. Until the City Commission meeting of July 17, 2018 current city staff were unaware of structure flooding in the 800 block of Ohio Street.

Given the realization the house was constructed over the existing storm sewer, not only would the original alignment of Project #23 change so would its overall scope. Refer to **Appendix C** to see a map indicating the original alignment of Project #23, as well as two design options. Option A would be a realignment of the current system and would utilize the existing street right of way of both 8th Street and Ohio Street. This option would include the reconstruction of the streets and the relocation of water lines in addition to storm sewer enhancements. The cost of Option A has an estimated total of \$1.9 million for construction and engineering. Option A would alleviate localized flooding as well as the encumbrance of the storm sewer upon the parcels east of Ohio Street.

Option B would be a reconstruction of the existing constricted section of storm sewer as it was presented at the July 17 City Commission Meeting. Replacing the constricted section of storm sewer has an estimated cost of \$600,000 for construction and engineering however; this option leaves the existing storm sewer alignment under the residence at 812 Ohio Street.

6.0 Capital Improvement Project (CIP) Selection Process

Currently there are five storm water projects listed within the current CIP. Three of the five are projects listed within the 1996 Master Plan. Both the "17th & Alabama" (#11) and the "19th and Maple Lane" (#34) projects are Group I projects while the "13th & Brook" (#33) project is a Group III project. Prioritization of projects has followed the grouping of the master plan, with modifications arising from new information. For example, the discovery of failing infrastructure, which is the case for both the "Naismith Drainage Channel" project and the concrete channel west of Arrowhead Drive between Princeton Boulevard and Peterson Road. Both of these projects have failing concrete slope protection and if are not addressed soon have the potential to cause localized flooding of adjacent structures or damage to adjacent infrastructure.

7.0 Future Development

The Stormwater Management Criteria (SMC) was developed in concert with the 1996 Master Plan and addresses future development and its corresponding increase in impervious surface. All property developed/redeveloped within the City has to adhere to the SMC. One of the requirements within the criteria is to determine if stormwater detention is necessary to avoid stormwater runoff problems within the watershed. For example, the University of Kansas was required to install the detention basin northwest of the stadium with improvements made to the west and south of the stadium.

8.0 Stormwater Utility - Asset Management

With the acquisition of the video truck and corresponding operation crew in late October 2017, detailed data and video is currently being collected for all existing storm sewer infrastructure. This will be extremely beneficial as the stormwater utility plans for future projects. As data is collected and ultimately once all existing lines have been inventoried a proactive approach to maintenance and replacement can take place instead of being reactive. To date, approximately 55,000 linear feet of storm sewer has been inspected out of a total of nearly 850,000 linear feet. Recently constructed storm sewer lines can now be inspected for defects prior to the expiration of their one-year warranty with the contractor repairing defects. The use of asset management software (Lucity) in tandem with geographical information systems (GIS) will allow a more efficient management of a storm sewer network that comprises of approximately 7200 structures, 16 miles of open channel, 160 miles of storm sewer pipe and four storm water pump stations.

Appendix A

812 Ohio Timeline

812 Ohio Timeline

Before commencing the timeline of events relative to 812 Ohio Street, it is first necessary to orient the reader regarding the properties and lots in question. There are 3 properties, covering 4 lots, that are relevant here (moving from north to south):

800 Ohio Street, which is located on all of Lot 90 and the North half of Lot 92;

806 Ohio Street, which is located on the South half of Lot 92 and the North half of Lot 94; and

812 Ohio, which is located on the South half of Lot 94 and Lot 96.

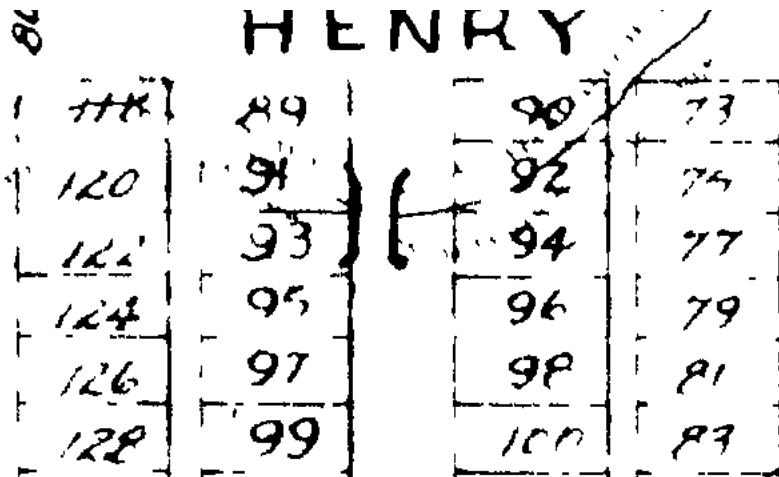
It should be noted that 800 Ohio Street is located on the southeast corner of the intersection of 8th Street and Ohio Street, and the remaining properties are located immediately south of it.

October, 1854 - The City of Lawrence is founded and A.D. Searl creates a map/plat of Lawrence City as part of the Kansas Territory. The Map shows a ravine that begins on what is now the KU campus, running northeast, traversing Ohio Street between Henry Street (8th Street) and Warren Street (9th Street), crossing Lots 90 and 92 on Ohio Street (just north of 812 Ohio), continuing through what is now Watson Park, before emptying into the Kansas River .

January 29, 1861 - Kansas enters the union as the 34th State.

August 21, 1863 - William Quantrill raids Lawrence, burns a quarter of the City and kills 164 citizens.

June 1864 - Holland Wheeler (City Engineer) completes a new plat of Lawrence, entitled "City of Lawrence, Kansas, with its Additions." That plat shows Lots 90, 92, 94, and 96 on Ohio Street and shows a ravine traversing Ohio Street and passing through Lots 90 and 92. It appears that a bridge spanned the ravine on Ohio Street directly in front of Lots 92 and 94:



1880 – A map called “A Bird’s Eye View of Lawrence” is published. That map shows a ravine running south of the area of Henry Street (8th Street) and crossing Ohio Street. As can be seen from the map, at that time, Lots 90, 92, 94, and 96 were vacant lots:



1890 – Holland Wheeler (creator of the 1864 map) owns Lots 90, 92, 94, and 96 and constructs a house on Lot 90 (currently 800 Ohio), located on the corner of Ohio Street and Henry Street (8th Street). The remaining lots remain vacant and a large ravine traverses them.

August 22, 1903 – R.H. Wheeler and Emma A. Wheeler convey Lot 90, Ohio Street to Lillian Peirce.

August 22, 1903 – R.H. Wheeler and Emma A. Wheeler convey Lots 92, 94 and 96, Ohio Street to P.H. Peirce and wife (Lillian Peirce). Mr. and Mrs. Peirce reside in the house at 800 Ohio Street and the lots to the south (Lots 92, 94, and 96) remain vacant. A large ravine traverses the property to the south of the house, crossing Lots 92 and 94.

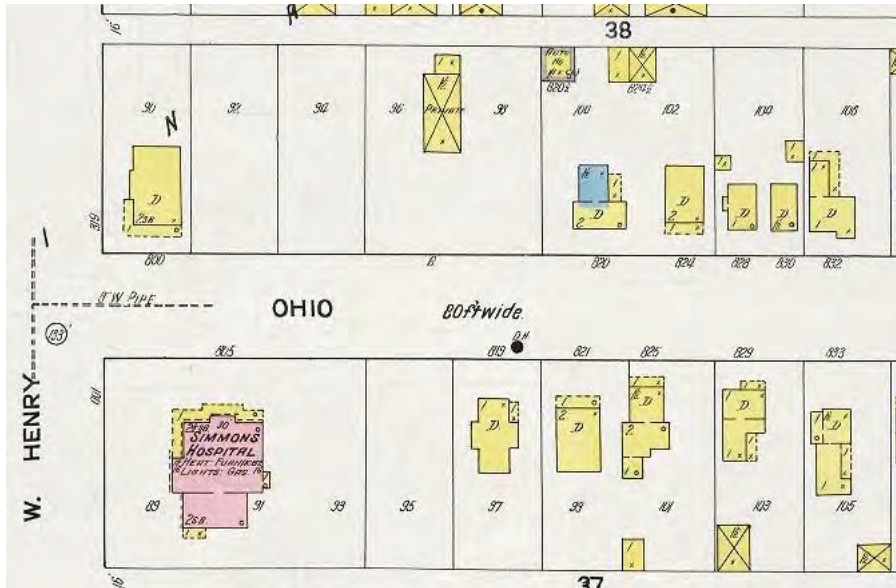
March 14, 1911 – Kansas Legislature enacts “An act providing for the building of storm water sewers by cities of the second class having a population of not less than 10,000 inhabitants, and providing for the issuing of bonds to pay the cost thereof”. L. 1911, Section 103 (later codified at G.S.A. 14-522 *et seq.*)

August 15, 1911 – Taking advantage of the new Act, the Governing Body of the City of Lawrence passes Ordinance No. 738, providing for the construction of a storm water sewer system running generally from McCook Field on the KU campus, following generally the route of the ravine shown in the maps above, through the area in question, through what is now Watson Park, and draining into the Kansas River. This plat shows that the stormwater system realigned the former ravine and traverses Lot 90, 92, 94 and 96 on Ohio Street. The storm sewer is a six-foot arched, brick sewer and is buried underground:



(It must be noted that the City did not record any easements for the construction of the storm sewer).

April 1912 -- The Sandborn Fire Map of 1912 shows the house at 800 Ohio and vacant lots to the south on Lots on 92 and 94 and the north half of Lot 96. The map shows a structure of some sort, located on the south half of Lot 96 and north half of Lot 98. The map also shows an 8-inch water pipe, located in the Ohio Street right of way:



January 1917 – The first City Sanitary Sewer System is constructed in the alley between Ohio Street and Tennessee Street.

1938 – The house at 806 Ohio Street is built.

May 19, 1939 - Lillian B Peirce conveys 806 Ohio Street, which includes the South half of Lot 92 and the North half of Lot 94, to Leonard Jella. Ms. Peirce also conveys to Mr. Jella an easement over the North half of Lot 92 and Lot 90 (800 Ohio Street) to permit Mr. Jella access to that property in the event there are issues with the sewer, which was connected to the sewer on 800 Ohio Street. Ms. Peirce retained ownership of Lot 90 and the North half of Lot 92 (800 Ohio Street, where she resided) and the South half of Lot 94 and all of Lot 96 (812 Ohio Street).

April 4, 1946 - Lillian B. Peirce conveys to Christian Jensen and Mollie Jensen the South half of Lot 94 and Lot 96 (812 Ohio Street).

November 5, 1948 - Christian and Mollie Jensen convey 812 Ohio Street to George L. Kapfer and wife.

February 17, 1953 - George L. Kapfer and wife convey 812 Ohio Street to Charles W. Kapfer and Lanell Kapfer.

1953 – The Kapfers construct the house currently located at 812 Ohio Street. It should be noted that 812 Ohio Street (the South half of Lot 94 and all of Lot 96) had remained undeveloped from 1854 to 1953.

April 27, 1987 - Lanell Kapfer conveys 812 Ohio Street to Thomas L. Paschall and Veronica Paschall.

1996 - The City adopts its Stormwater Master Plan.

March 28, 2017 - Thomas Paschall and Veronica Paschall, convey 812 Ohio Street to Donna J. Geisler and Sarah E. Merriman. Ms. Geisler and Ms. Merriman plan to demolish the 1953 structure and to construct a new, larger house on the property.

May 22, 2017 - J. Stephen Lane, architect for Ms. Geisler and Ms. Merriman, sends an e-mail to Matt Bond, City's Stormwater Engineer, stating that his clients have purchased 812 Ohio Street and that he would like to meet with Mr. Bond at his earliest convenience to discuss the storm sewer.

May 30, 2017 - Mr. Lane and Mr. Bond meet and discuss the existing storm sewer line and its exact location at 812 Ohio Street. (At this point in time, it should be noted that the City's maps show the storm sewer on the property, but not running under the existing house).

June 16, 2017 - The City locates the storm sewer line via video truck.

July 26, 2017 - The City emails Mr. Lane an updated alignment of the storm sewer, showing that it runs directly underneath the existing structure at 812 Ohio Street.

July 26, 2017 - Mr. Lane informs his clients, Ms. Geisler and Ms. Merriman, that the storm sewer crosses the property in a location different than that first believed and that it restricts their plans to construct a new house on the property.

July 31, 2017 - Brad Finkeldei, attorney for Ms. Geisler and Ms. Merriman, calls Scott McCullough, Director of Planning and Development Services, to discuss the situation at 812 Ohio Street. Mr. McCullough advises Mr. Finkeldei that he will discuss the matter with Randy Larkin, Senior Assistant City Attorney.

August 7, 2017 - Mr. McCullough contacts Mr. Finkeldei and lets him know that Mr. Larkin is aware of the situation, is researching it, and that he would get back to him the following week (Mr. Larkin was out of town from August 9, 2017, through August 14, 2017, on a previously scheduled trip).

Week of August 14, 2017 - Mr. Larkin and Mr. Finkeldei speak on the telephone about the storm sewer that bisects 812 Ohio Street and the right of its owners, Ms. Geisler and Ms. Merriman, to construct a house over the City's storm sewer. Mr. Larkin asked Mr. Finkeldei to provide him some legal authority that would support his contention that his clients are able to build over the storm sewer.

August 17, 2017 - Mr. Finkeldei sends Mr. Larkin authority for the proposition that, when there is an easement by implication, the owner of the easement is limited in its authority to control anything outside the actual location of the easement. In this situation, the City would have limited authority to control activities on the surface of the property when its easement is located underground. Of course, the City would have the right to protect its rights underground from encroachment from above.

August 22, 2017 - Mr. Finkeldei sends Mr. Larkin a follow-up, asking if he need more information. Mr. Larkin had researched Mr. Finkeldei's authority in the meantime, but remained unpersuaded that the law of easements by implication was necessarily applicable to easements by prescriptions (which is type of easement in this case). Mr. Larkin responded with an e-mail to that effect.

August 23, 2017 - Mr. Finkeldei responds that, based on his previous authority, he believes the law of easements by implication was applicable to easements by prescription.

August 25, 2017 (approximately) - Mr. Larkin and Mr. Finkeldei have a telephone conversation, where Mr. Larkin states that he has been persuaded by Mr. Finkeldei's authority. Mr. Larkin states that the City would agree (assuming all other conditions for building are met) to permit his clients to construct a house on 812 Ohio Street if (a) they commissioned an engineering study, warranting that the structure to be built would not harm the storm sewer and if (b) his clients would execute and record a Release of Liability, which would release the City from any liability if the storm sewer collapsed and caused damage to the structure. Mr. Finkeldei stated that he would inform his clients of that and also asked for a copy of the videotape of the storm sewer if the City had one.

September 7, 2017 - Mr. Larkin sends Mr. Finkeldei an e-mail saying that a copy of the videotape of the storm sewer was now available. Mr. Finkeldei retrieved the copy from the City Attorney's Office.

October 8, 2017- Mr. Finkeldei sends Mr. Larkin an e-mail asking if the City had ordered Matt Bond not to talk to Mr. Lane, because Mr. Lane was having difficulty making contact with Mr. Bond. Mr. Larkin responds that no such order had been made and that the difficulty in contact probably had to do with the press of business. Mr. Larkin also asks if his clients had accepted the terms they had discussed or if they were still investigating it.

October 9, 2017 - Mr. Finkeldei replies to Mr. Larkin's response and states that his clients were still investigating to see whether the terms would be acceptable. Primarily, there were interested in the exact location and depth of the storm sewer.

October 24, 2017 - Ms. Geisler calls Matt Bond and asked to meet with him.

October 26, 2017 - Mr. Bond sends an e-mail to City personnel, asking if the City has taken a position regarding the construction of a house over the storm sewer. Mr. Larkin called Mr. Bond and explained that the details of what would need to be done to permit such construction.

November 11, 2017 - A second video of the storm sewer is made. (At approximately this time, the exact location and depth of the storm sewer was determined. Based on its location and depth, Ms. Geisler and Ms. Merriman determined that the terms of the City were not economically feasible).

December 15, 2017 - Melissa Hoag Sherman, attorney for Ms. Geisler and Ms. Merriman, sends an open records request to the City, seeking certain records related to 812 Ohio Street.

December 21, 2017 - The City responds to Ms. Sherman's open records request.

January 16, 2018, - Ms. Sherman transmits a letter to the City, demanding that it move the illegal storm sewer from her clients' property or her clients would take whatever recourse would be available to them.

January 26, 2018 - City Attorney Toni Wheeler responds to Ms. Sherman's letter declining to "relocated the lawfully constructed and necessary storm sewer at this time." Ms. Wheeler also encloses a copy of the plat of the Henry-McCook Storm Sewer Plat that was inadvertently omitted from the response to her request for open records.

March 7, 2018 - Ms. Geisler and Ms. Merriman send an e-mail to Tom Markus, City Manager, asking to meet with him regarding 812 Ohio Street. A meeting is scheduled for March 22, 2018. In advance of the meeting, staff brief Mr. Markus regarding 812 Ohio Street.

March 22, 2018 - Ms. Geisler, Ms. Merriman, Ms. Sherman met with City Manager Tom Markus, Planning Director Scott McCullough, and Randy Larkin from the City Attorney's Office. At that meeting, Ms. Geisler and Ms. Merriman states that the City's terms of construction were not economically feasible and asks whether the City had explored other options, like rerouting the storm sewer, that would permit them to construct a house at 812 Ohio Street. The City agrees to explore other options.

May 4, 2018 - City engineers complete cost assessments and estimates regarding rerouting storm sewers around 812 Ohio Street and the area in general. It is estimated that the cost of rerouting the entire storm sewer system, in accordance with the 1996 Stormwater Master Plan, would be in excess of \$5,000,00.00. It is estimated that the cost of rerouting the storm water sewer around the 800 block of Ohio Street would be approximately \$1,000,000.00. The cost of buying the property, based on what was paid for it, is estimated to be \$250,000.00 (the property is appraised approximately at \$150,000). Based on those costs and budgetary constraints, City Staff chooses to take no action.

May 15, 2018 - City Commissioners are apprised of the situation regarding 812 Ohio Street and City Staff's decision to take no action.

May 24, 2018 - Tom Markus, Scott McCullough, and Randy Larkin meet with Ms. Geisler, Ms. Merriman, and Ms. Sherman and tell them that the City's plan, based on the costs, is to do nothing and that Ms. Geisler and Ms. Merriman are free to pursue whatever options are available to them, including pursuing engineering plans for construction of a house over the storm sewer.

June 3, 2018 - Ms. Sherman's legal assistant (from Spencer Fane law office) calls the City Manager's Office asking for time for Ms. Sherman, and her clients, Ms. Geisler and Ms. Merriman, to meet with City Commissioners to discuss 812 Ohio Street.

June 26, 2018, Ms. Geisler, Ms. Merriman, and Ms. Sherman meet with Commissioner Matthew Herbert and Toni Wheeler and Randy Larkin from the City Attorney's Office. In addition to explaining the situation regarding 812 Ohio Street, Ms. Geisler and Ms. Merriman make a presentation regarding recent flooding in the area and ask how they can get that project in the City's budget. Commissioner Herbert states that they were free to appear at public comment and, during the budget process, to make a request that it be added to the City budget, just like any other citizen.

July 17, 2018 - Following a number of form letters that had been sent to the City from residents of the area, Ms. Geisler, Ms. Merriman, and several neighbors appear at the City Commission meeting and make, as "General Public Comment," a presentation regarding flooding in the area of the 800 block of Ohio Street.

Appendix B

1996 Stormwater Master Plan Detailed Project Listing

1996 Stormwater Management Master Plan Progress

41- Recommended Capitol Improvement Projects

11 - Group I Projects (8 COMPLETED)		9 - Group II Projects (1 COMPLETED)			21 - Group III Projects (7 COMPLETED)			
ID#	Project Location	Current Status	Group		Project #	1996 Estimate	†2017 CPI ADJUSTED	*Construction Cost Only
1	15th Street 3500 West			3		\$91,200	\$146,674.02	
2	8th/9th Holiday			3		\$130,000	\$209,074.80	
3	Crestline and Westdale Culverts			3		\$139,500	\$224,353.35	
4	15th and Iowa West		2			\$790,400	\$1,271,174.80	
5	Lawrence Avenue, 6th to Harvard			3		\$540,000	\$868,464.57	
6	29th Court	▶ COMPLETED - 1999	1		57-ST7-1097(C)	\$148,000	\$238,023.62	\$25,930.00 ◀
7	Ridge Court	▶ COMPLETED - 2005	1		CITY STRM CREW	\$110,000	\$176,909.45	◀
8	23rd & Ousdahl	▶ COMPLETED - 2017	2		PW1134	\$1,022,800	\$1,644,936.22	\$3,107,393.09 ◀
9	Carolina, 21st to 23rd	▶ COMPLETED - 1999	1		51-ST6-896(C)	\$2,563,100	\$4,122,150.98	\$1,768,157.22 ◀
10	21st, Stewart to Naismith Drive	▶ COMPLETED - 2003	1		22-ST6-301(C)	\$1,256,600	\$2,020,949.21	\$1,564,580.41 ◀
11	Alabama, 17th to Naismith Drive	CURRENT 5-yr CIP	1		PW19S1CIP	\$2,563,100	\$4,122,150.98	
12	22nd to 23rd Street 1400 West			3		\$297,500	\$478,459.65	
13	26th Street 2300 West			3		\$544,250	\$875,299.70	
14	27th to Saratoga	▶ COMPLETED - 2003		3	62-ST8-1002(C)	\$526,000	\$845,948.82	\$282,300.20 ◀
15	Indian and Massachusetts			3		\$325,000	\$522,687.01	
16	23rd and Haskell West		2			\$111,000	\$178,517.72	
17	3rd & Michigan	▶ COMPLETED - 1999	1		50-ST5-896(C)	\$1,140,300	\$1,833,907.68	\$904,009.00 ◀
18	4th and Minnesota	▶ COMPLETED - 1996		3	50-ST5-896(C)	\$400,900	\$644,754.53	◀
19	North Michigan Culvert	▶ COMPLETED - 2003		3	64-CP20-999(S)	\$102,100	\$164,204.13	◀
20	6th and Arkansas		2			\$304,900	\$490,360.83	
21	7th and Michigan	▶ COMPLETED - 2000		3	62-CP19-1298(C)	\$159,000	\$255,714.57	\$567,442.85 ◀
22	12th & Kentucky to 8th & Tennessee		2			\$946,000	\$1,521,421.26	
23	8th and Ohio		2			\$463,500	\$745,432.09	
24	Stadium to 9th and Mississippi		2			\$1,140,000	\$1,833,425.20	
25	8th and Connecticut	▶ COMPLETED - 2000		3	4-ST2-97(P)	\$482,000	\$775,185.04	◀
26	9th, Vermont to New Hampshire	▶ COMPLETED - 1999	1		56-ST6-1097(C)	\$137,000	\$220,332.68	\$561,527 ◀
27	14th and Massachusetts East			3		\$266,400	\$428,442.52	
28	13th and Oregon	▶ COMPLETED - 2004	1		19-ST3-301(C)	\$2,248,000	\$3,615,385.83	\$2,564,975.20 ◀
29	21st, Kentucky to Barker Court	▶ COMPLETED - 2004	1		21-ST5-301(C)	\$604,000	\$971,393.70	\$1,922,019.27 ◀
30	19th, Kentucky to Learnard		2			\$1,282,900	\$2,063,246.65	
31	19th and Haskell North			3		\$163,800	\$263,434.25	
32	16th, Kentucky to Learnard		1			\$2,299,700	\$3,698,533.27	
33	13th and Brook Culvert	CURRENT 5-yr CIP		3	PW17S2CIP	\$171,000	\$275,013.78	
34	Maple lane, 19th to Brook	CURRENT 5-yr CIP	1		PW20S1CIP	\$1,080,000	\$1,736,929.13	
35	15th, Summit to Prairie			3		\$175,100	\$281,607.68	
36	East 19th Street Culvert			3		\$35,000	\$56,289.37	
37	5th and Lyon to Levee	▶ COMPLETED - 2015		3	PW1133	\$3,323,000	\$5,344,273.62	\$6,079,180.66 ◀
38	8th and Maple to Levee			3		\$1,648,000	\$2,650,425.20	
39	5th and Elm to Levee	▶ COMPLETED - 2015		3	PW1133	\$226,000	\$363,468.50	◀
40	North 2nd, Turnpike to North Street		2			\$1,494,800	\$2,404,038.58	
41	7th and Elm to Levee			3		\$285,700	\$459,482.09	

TOTAL \$31,737,550 \$51,042,477 \$19,347,514.90

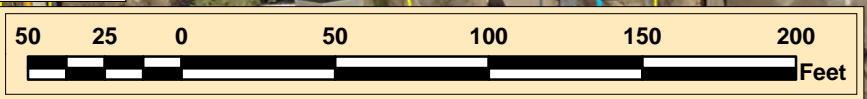
†These cost were adjusted using the Consumer Price Indices

Appendix C

Map of Original Project #23 Alignment and Option's A & B



City of Lawrence



Option A
(Red Line + Purple Line)

Option B
(Blue Line + Purple Line)

Original Intended Alignment
of Project #23 as shown in
the 1996 Stormwater Master Plan

