

MetroLink Northside/ Southside/ Downtown Study

Executive Summary

There are many utilities located along each of the alternate alignments. The presence of utilities can greatly affect the constructability and costs associated with the different alternate alignments. General information on these utilities was collected during this study. The purpose of this document is to tentatively identify significant utility conflicts with the alternate alignments. Specifically, a general understanding of the general location, kind and extent of utilities present in the study area was obtained via reviews of maps and communications with utility personnel. Field verification was not included in this study, but should be included in further studies.

A list of likely utilities in the project area was created and the locations and extent of these utilities were reviewed. Existing utilities in the area for which information was collected include combined sewers, water and gas. The information contained within this report reveals that numerous utilities in the project corridor will need to be relocated. The presence and extent of fiber optics and high-voltage electric infrastructure, however, will require further consideration as the project enters the physical design phase.

It is important to note that not all utilities in the study area have been identified. Therefore, the information on utilities presented in this report will be considered approximate and will be used to guide the planning phases only. Utilities should be further studied during preliminary engineering. Once specific plans are in place, and before design documents are finalized and construction is initiated, precise utility information should be obtained directly from the utilities to the fullest extent possible.

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Section 1

Introduction

The purpose of this report is to tentatively identify utility conflicts with the study area. In this study, all utility companies that are known to be active and have infrastructure in the City of St. Louis were contacted. The following list denotes those companies that were identified, including those for which utility information is not currently available.

- Ameren UE (electric)
- MCI (fiber optics)
- Sprint (fiber optics)
- Trigen (steam pipe)
- MetroLink (service lines)
- St. Louis City Water (water lines)
- Laclede Gas (gas)
- SBC (fiber optics)
- Charter Communications (fiber optics)
- AT&T (fiber optics)
- Explorer Pipeline (gas)

Due to several companies not responding to the request for information, not all utilities were able to be reviewed and identified. Existing utilities in the area for which information was collected include:

- Combined sewers (Metropolitan St. Louis Sewer District)
- Water (St. Louis City Water)
- Gas (Laclede Gas)

Existing utilities identified within MetroLink right-of-way will be subject to the Metro's Facilities Design Criteria Manual latest design standards for their relocation, adjustment, replacement, and/ or abandonment. Acceptable procedures for utilities encountered running parallel or crossing the tracks are as follows:

1. Supported in place and maintained in operation during construction;
2. Temporarily relocated and maintained in operation; and replaced by a new utility line in the original location upon completion of the facility.
3. Permanently relocated to a new location beyond the immediate limits of construction.

Generally speaking, it will be necessary to create a utility free zone under the tracks. Metro's Facilities Design Criteria Manual requires utilities running parallel to the tracks be at a standard minimum distance of 15 ft. from the centerline. It is important to note that the distance from centerline to centerline for median-running light rail tracks is 14 ft. This will result in a required minimum distance of 44 ft. needed to separate parallel running utilities on opposite sides of the right-of-way. Utilities crossing under the tracks shall where possible, cross perpendicular to the tracks. In general, all gas, water and sewer pipelines crossing the MetroLink right-of-way are to be encased. These pipelines shall also be designed to meet MetroLink loadings and provide cathodic protection. For the purposes of

this preliminary utilities report, the identified utility conflicts within the right-of-way are discussed briefly as well as approximate sizes and quantities given.

Section 2

Utility Infrastructure

2.1 Combined Sewers (Metropolitan St. Louis Sewer District)

There are several sections of sewer infrastructure in the study area. The sewer infrastructure within the study area consists of combined gravity sewers, some of which may be 100 years old. Combined sewers are those which collect and carry both stormwater and sanitary wastewater in the same system. It is important to note that some of the larger sewers are egg-shaped and constructed of brick, possibly in need of rehabilitation. In general, the sewers in the study area vary in size from 6-inch diameter to 20-ft. tunnels. Typically, the lines have cover depths of 48-inch and more. In certain major crossing locations, it may be necessary to provide sewer loading support. For significant conflicts, the sewer bridges similar to those used for the Cross County MetroLink project may be a possible solution in providing necessary loading support. This type of sewer bridge reinforcement will be much less expensive than other alternatives and it will result in an adequate structure. Reinforcement will also require less time and coordination than a conventional sewer replacement.

2.2 Water (St. Louis City Water)

St. Louis City Water Division has several pressurized water mains in the area. The water main infrastructure within the study area is thought to primarily consist of cast iron pipe. Some of the newer pipes are likely ductile iron pipe and some the larger pipes are steel. The lines in the study area vary in size from 6-inch to 54-inch. Typically, the lines have cover depths of 42-inches or more. Some of these lines may have to be relocated and/ or encased when they are located within the utility free zone under the tracks. It shall be noted there are numerous service lines that are 6-inch or smaller which can be relocated easily.

2.3 Gas (Laclede Gas)

Laclede Gas has several pressurized mains in the study area. The gas main infrastructure consists primarily of cast iron, ductile iron and steel pipes. The gas mains in the study area vary in size from 2-inch to 30-inch. Typically, the lines have cover depths between 24" and 48". Some of these lines may need to be relocated and/ or encased in the same manner as the water lines.

2.4 Electric (Ameren)

Ameren UE has both underground and overhead electric transmission and distribution lines running through the study area. Ameren did not provide any utility maps, but a conversation with Ameren revealed that there are major underground facilities along the Downtown alignments and some overhead lines along the Northside and Southside alignments. Specifically, the underground facilities consist of duct banks and manholes for major power feeds to the adjacent buildings. These facilities are located in right-of-way and lay parallel to the proposed routes. It is believed the Olive Street/ Chestnut alignment has fewer conflicts than the 9th Street/ 10th Street downtown alignment. A windshield survey helped locate the major overhead high voltage towers along these alignments. Specifically, there is one major overhead power feed crossing the Natural Bridge alignment and one

which crosses 14th St. just south of I-64. The presence of these high voltage towers will require that further consideration be given to this utility in future stages. In general, it is a Metro requirement that there must not be any electric lines near station platforms.

2.5 Communications (MCI, Sprint, SBC, Charter and AT&T)

No requested information has been received at this time. Information from these communication providers should be obtained during preliminary engineering. Due to the sensitivity of fiber optics, it is important to note that special care is necessary during relocations.

2.6 Steam Pipe Infrastructure (Trigen)

Trigen has a few steam lines in the downtown area consisting primarily of cast iron pipe. Conversation with Trigen revealed that the steam lines in this area vary in size from 4-inch to 20-inch. The steam lines have cover depths ranging from 3 ft. to 15 ft.

Section 3

Sewer, Water and Gas Utility Conflicts with Alternate Routes

As previously mentioned, all utility companies that are known to be active and have infrastructure in the City of St. Louis were contacted. The purpose of Section 2 was to briefly discuss the infrastructure of these utilities throughout the entire study area. However, all utility companies did not respond to the request for information. Therefore, this Section is used to identify the major existing utilities (sewer, water and gas) in the study area for which information was collected. Base maps from these utility companies were used to identify the major utility conflicts. The tables in this section summarize the extent of the identified sewer, water, and gas utility conflicts within the various study areas and corresponding alignments. Following each alignment, specific significant conflicts (larger than 10 ft.) are noted. The study areas (Northside, Southside, and Downtown) and corresponding alternate alignments are as follows:

Northside:

- Natural Bridge Avenue/14th Street

Southside:

- Jefferson Avenue/I-55
- Gravois Avenue/UPRR (no longer an alternative)
- Chouteau Avenue/UPRR

Downtown:

- 9th Street/10th Street One-Way Couplet
- Olive Street/Chestnut Street Loop (no longer an alternative)

It is important to note that the Gravois Avenue/UPRR and Olive Street/Chestnut Street Loop alignments are no longer considered alternatives. However, for the purposes of this report, each alignment's total identified utility conflicts are shown in the tables.

For all alignments, the identified sewer, water and gas utilities within the right-of-way and running parallel are included. Also, only the larger utilities within the right-of-way and crossing the tracks are included. Because the distances from the centerline of the right-of-way to the parallel running utilities are not accurately known, it was assumed that all lines running parallel will need to be relocated from beneath the tracks and all large lines crossing the tracks will need to be encased and/or load protected. However, some of the alignments have City right-of-way which might result in some of the utility relocations to be done by the utility companies. The information was taken from the available utility maps and the values shown are approximate only. Potential costs for utility relocation can be found in the Cost Estimate Summary.

3.1 Northside

3.1.1 Natural Bridge Avenue/14th Street

The Natural Bridge Avenue LRT Alternative connects downtown St. Louis to I-70 at Goodfellow Boulevard and is approximately 6.8 miles in length. The alignment begins at the intersection of Convention Plaza and 14th Street on the north end of downtown St. Louis

and proceeds north in the center of 14th Street to the intersection with North Florissant Avenue. The alignment then turns and proceeds northwest in the center median of North Florissant Avenue to the intersection with Palm Street. The alignment then turns and proceeds west in the center of Palm Street to Parnell Street where Palm Street turns into Natural Bridge Avenue. The alignment continues west in the center of Natural Bridge Avenue to the intersection with Goodfellow Blvd. The alignment then turns and proceeds north in the center of Goodfellow Blvd. Prior to Stratford Avenue the alignment elevates on retained fill and turns north on an elevated structure and terminates with a station and park-and-ride located at the intersection of Goodfellow Blvd. and Stratford Avenue.

Table 3.1 Sewer - Natural Bridge Avenue/14th Street

	Combined Sewer Size (Largest Dimension)					Total Distance (ft)
	Less than 24"	24" up to 48"	4' up to 10'	10' to 20'	Unknown*	
Parallel Distance (ft)	11,910	4,050	900	0	4,540	21,400
Crossing Distance (ft)	0	80	0	0	0	80
Total Distance (ft)	11,910	4,130	900	0	4,540	<u>21,480</u>

* Sizes of sewers could not be determined from the utility maps provided.

Table 3.2 Water – Natural Bridge Avenue/14th Street

	Water Main Size			Total Distance (ft)
	Less than 12"	12" up to 30"	30" to 54"	
Parallel Distance (ft)	8,790	24,520	4,500	37,810
Crossing Distance (ft)	0	920	700	1,620
Total Distance (ft)	8,790	25,440	5,200	<u>39,430</u>

Table 3.3 Gas – Natural Bridge Avenue/14th Street

	Gas Main Size		Total Distance (ft)
	Less than 12"	12" to 30"	
Parallel Distance (ft)	17,980	29,600	47,580
Crossing Distance (ft)	0	0	0
Total Distance (ft)	17,980	29,600	<u>47,580</u>

3.2 Southside

3.2.1 Jefferson Avenue/I-55

The Jefferson Avenue alternative connects the Multimodal Transit Center to the I-55 corridor just south of the Bayless Avenue interchange and is approximately 8.6 miles in length. The alignment begins at the MMTC and proceeds south on the west side of the 14th Street bridge to Chouteau Avenue. At Chouteau, the alignment turns west and proceeds in the center of Chouteau Avenue to S. Jefferson Avenue. At Jefferson, the alignment turns

south and proceeds down the center of S. Jefferson Avenue to where Jefferson converges with Broadway Street. At the intersection of Broadway and Gasconade Streets the alignment exits Broadway and enters the I-55 right-of-way. The alignment then proceeds south along the west side of I-55 to E Virginia Avenue where it elevates and crosses over I-55, proceeding down the east side of I-55 to its terminus at the proposed Bayless park-and-ride.

Table 3.4 Sewer – Jefferson Avenue/I-55

	Combined Sewer Size (Largest Dimension)					Total Distance (ft)
	Less than 24"	24" up to 48"	4' up to 10'	10' to 20'	Unknown *	
Parallel Distance (ft)	6,410	4,830	1,840	0	940	14,020
Crossing Distance (ft)	2,340	320	150	895	280	3,985
Total Distance (ft)	8,750	5,150	1,990	895	1,220	<u>18,005</u>

* Sizes of sewers could not be determined from the utility maps provided.

Table 3.5 Water – Jefferson Avenue/I-55

	Water Main Size			Total Distance (ft)
	Less than 12"	12" up to 30"	30" to 54"	
Parallel Distance (ft)	6,940	17,190	0	24,130
Crossing Distance (ft)	0	0	0	0
Total Distance (ft)	6,940	17,190	0	<u>24,130</u>

Table 3.6 Gas – Jefferson Avenue/I-55

	Gas Main Size		Total Distance (ft)
	Less than 12"	12" to 30"	
Parallel Distance (ft)	27,730	18,030	45,760
Crossing Distance (ft)	0	0	0
Total Distance (ft)	27,730	18,030	<u>45,760</u>

Conflicts larger than 10 ft. diameter are:

1. 130 ft. of 15 ft. x 20 ft. sewer crossing Chouteau Ave. near McKay Pl. (Sheet 103)
2. 45 ft. of 10'x11' brick sewer crossing Jefferson Ave. near the Chippewa St. intersection (Sheet 206)
3. 720 ft. of 12.5'x 12' sewers crossing Jefferson Ave. near Alaska Ave. (Sheet 213)

3.2.2 Gravois Avenue/UPRR

Note this alignment is no longer a Southside alternative. However, for the purposes of this report, the alignment's total identified utility conflicts are shown in the tables below.

Table 3.7 Sewer – Gravois Avenue/UPRR

	Combined Sewer Size (Largest Dimension)					Total Distance (ft)
	Less than 24"	24" up to 48"	4' up to 10'	10' to 20'	Unknown *	
Parallel Distance (ft)	9,260	4,515	3,110	5,710	150	22,745
Crossing Distance (ft)	130	310	0	0	0	440
Total Distance (ft)	9,390	4,825	3,110	5,710	150	23,185

* Sizes of sewers could not be determined from the utility maps provided.

Table 3.8 Water – Gravois Avenue/UPRR

	Water Main Size			Total Distance (ft)
	Less than 12"	12" up to 30"	30" to 54"	
Parallel Distance (ft)	15,500	4,020	4,930	24,450
Crossing Distance (ft)	0	0	0	0
Total Distance (ft)	15,500	4,020	4,930	24,450

Table 3.9 Gas – Gravois Avenue/UPRR

	Gas Main Size		Total Distance (ft)
	Less than 12"	12" to 30"	
Parallel Distance (ft)	24,730	2,270	27,000
Crossing Distance (ft)	0	0	0
Total Distance (ft)	24,730	2,270	27,000

Conflicts larger than 10 ft. diameter are:

1. 280 ft. of 12 ft. diameter sewer running parallel to the UPRR starting at Eichelberger St. heading south
2. 1,010 ft. of 13 ft. x 9.5 ft. sewer running parallel to the UPRR starting at Eiler St. heading south
3. 2,500 ft. of 15 ft. x 11 ft. sewer running parallel to the UPRR starting 1,010 ft. past Eiler St. heading south
4. 1,920 ft. of 13 ft. x 12 ft. sewer running parallel to the UPRR starting at Holly Hills heading south

3.2.3 Chouteau Avenue/UPRR

The UPRR alternative also connects the Multimodal Transit Center to the I-55 corridor just south of the Bayless Avenue interchange and is approximately 11.2 miles in length. The alignment begins at the MMTC and proceeds south on the west side of the 14th Street bridge to Chouteau Avenue. At Chouteau, the alignment turns west and proceeds in the center of Chouteau Ave to Spring Avenue. At Spring Avenue the alignment turns southwest to the intersection of Hickory Street and 39th Street. The alignment then turns

and proceeds south in the center of 39th Street to Folsom Avenue. The alignment then turns and proceeds west in the center of Folsom to the UPRR right-of-way. Once in the UPRR right-of-way the alignment parallels the freight track and continues south to the I-55 corridor. At I-55, the alignment leaves the UPRR right-of-way and proceeds south along the east limits of the I-55 corridor to the terminus at the proposed Bayless park-and-ride.

Table 3.10 Sewer – Chouteau Avenue/UPRR

	Combined Sewer Size (Largest Dimension)					Total Distance (ft)
	Less than 24"	24" up to 48"	4' up to 10'	10' to 20'	Unknown*	
Parallel Distance (ft)	6,850	3,170	780	7,520	1,140	19,460
Crossing Distance (ft)	0	0	0	410	0	410
Total Distance (ft)	6,850	3,170	780	7,930	1,140	19,870

* Sizes of sewers could not be determined from the utility maps provided.

Table 3.11 Water – Chouteau Avenue/UPRR

	Water Main Size			Total Distance (ft)
	Less than 12"	12" up to 30"	30" to 54"	
Parallel Distance (ft)	3,200	13,700	500	17,400
Crossing Distance (ft)	800	1,300	450	2,550
Total Distance (ft)	4,000	15,000	950	19,950

Table 3.12 Gas – Chouteau Avenue/UPRR

	Gas Main Size		Total Distance (ft)
	Less than 12"	12" to 30"	
Parallel Distance (ft)	16,270	15,180	31,450
Crossing Distance (ft)	0	0	0
Total Distance (ft)	16,270	15,180	31,450

Conflicts larger than 10 ft. diameter are:

1. 130 ft. of 15 ft. x 20 ft. sewer crossing Chouteau Ave. near McKay Pl. (Sheet 103)
2. 100 ft. of 15 ft. x 20 ft. sewer crossing Chouteau Ave. near Cardinal St. (Sheet 104)
3. 180 ft. of 12.5 ft x 15 ft. sewer crossing Chouteau Ave. near Vandeventer Ave. (Sheet 107)
4. 1,810 ft. of 16.5 ft x 16 ft. sewer running parallel in Chouteau Ave. starting at Theresa Ave. heading west (Sheets 105-106)
5. 280 ft. of 12 ft. diameter sewer running parallel to the UPRR starting at Eichelberger St. heading south (Sheet 117)
6. 1,010 ft. of 13 ft. x 9.5 ft. sewer running parallel to the UPRR starting at Eiler St. heading south (Sheet 117)

7. 2,500 ft. of 15 ft. x 11 ft. sewer running parallel to the UPRR starting 1,010 ft. past Eiler St. heading south (Sheets 117-118)
8. 1,920 ft. of 13 ft. x 12 ft. sewer running parallel to the UPRR starting at Holly Hills heading south (Sheet 118-119)

Table 3.13 Southside Summary

	Southside Total Distances (ft)			
	Combined Sewer	Water	Gas	Total Distance
Jefferson Ave/I-55	18,005	24,130	45,760	<u>87,895</u>
Gravois Ave/UPRR	23,185	24,450	27,000	<u>74,635</u>
Chouteau Ave/UPRR	19,870	19,950	31,450	<u>71,270</u>

3.3 Downtown

3.3.1 9th Street/10th Street One-Way Couplet

This downtown alternative connects Convention Plaza on the north side to the Multimodal Transit Center on the south side. The alignment begins at the intersection of Convention Plaza and 14th Street and proceeds east in the center of Convention Center Plaza to 9th and 10th Streets where it splits into a one-way couplet with a single track southbound on 10th and northbound on 9th. At Clark Street the tracks rejoin and proceed west on Clark Street to 14th Street. At 14th, the alignment crosses the intersection and turns south into the Multimodal Transit Center and a proposed new platform.

Table 3.14 Sewer – 9th Street/10th Street One-Way Couplet

	Combined Sewer Size (Largest Dimension)					Total Distance (ft)
	Less than 24"	24" up to 48"	4' up to 10'	10' to 20'	Unknown*	
Parallel Distance (ft)	4,440	18,820	13,150	0	2,160	38,570
Crossing Distance (ft)	0	0	0	0	0	0
Total Distance (ft)	4,440	18,820	13,150	0	2,160	<u>38,570</u>

* Sizes of sewers could not be determined from the utility maps provided.

Table 3.15 Water – 9th Street/10th Street One-Way Couplet

	Water Main Size			Total Distance (ft)
	Less than 12"	12" up to 30"	30" to 54"	
Parallel Distance (ft)	5,380	5,035	0	10,415
Crossing Distance (ft)	0	240	180	420
Total Distance (ft)	5,380	5,275	180	<u>10,835</u>

Table 3.16 Gas – 9th Street/10th Street One-Way Couplet

	Gas Main Size			Total Distance (ft)
	Less than 12"	12" to 30"	Unknown*	
Parallel Distance (ft)	3,960	5,490	1,120	10,570
Crossing Distance (ft)	0	0	0	0
Total Distance (ft)	3,960	5,490	1,120	10,570

* Sizes of sewers could not be determined from the utility maps provided.

3.3.2 Olive Street/Chestnut Street Loop

Note this is no longer a downtown alternative. However, for the purposes of this report, the alignment's total identified utility conflicts are shown in the tables below.

Table 3.17 Sewer – Olive Street/Chestnut Street Loop

	Combined Sewer Size (Largest Dimension)					Total Distance (ft)
	Less than 24"	24" up to 48"	4' up to 10'	10' to 20'	Unknown*	
Parallel Distance (ft)	2,940	5,640	260	0	1,160	10,000
Crossing Distance (ft)	0	0	0	0	0	0
Total Distance (ft)	2,940	5,640	260	0	1,160	10,000

* Sizes of sewers could not be determined from the utility maps provided.

Table 3.18 Water – Olive Street/Chestnut Street Loop

	Water Main Size			Total Distance (ft)
	Less than 12"	12" up to 30"	30" to 54"	
Parallel Distance (ft)	5,650	6,855	840	13,345
Crossing Distance (ft)	0	590	120	710
Total Distance (ft)	5,650	7,445	960	14,055

Table 3.19 Gas – Olive Street/Chestnut Street Loop

	Gas Main Size			Total Distance (ft)
	Less than 12"	12" to 30"	Unknown*	
Parallel Distance (ft)	8,810	0	290	9,100
Crossing Distance (ft)	0	0	0	0
Total Distance (ft)	8,810	0	290	9,100

Table 3.20 Downtown Summary

	Downtown Total Distances (ft)			
	Combined Sewer	Water	Gas	Total Distance (ft)
9 th St/10 th St	38,570	10,835	10,570	<u>59,975</u>
Olive St/Chestnut St	10,000	14,055	9,100	<u>33,155</u>

Section 4

Summary

In conclusion, the following points must be noted:

All utility owners identified in this report were contacted. The following list denotes those companies that were identified, including those for which utility information is not currently available.

- Ameren UE (electric)
- MCI (fiber optics)
- Sprint (fiber optics)
- Trigen (steam pipe)
- MetroLink (service lines)
- St. Louis City Water (water lines)
- Laclede Gas (gas)
- SBC (fiber optics)
- Charter Communications (fiber optics)
- AT&T (fiber optics)
- Explorer Pipeline (gas)

Due to several companies not responding to the request for information, not all utilities were able to be reviewed and identified. Existing utilities in the project area for which information (utility base maps or verbal) was collected include:

- Electric (Ameren UE) - Verbal
- Steam pipe (Trigen) - Verbal
- Combined sewers (Metropolitan St. Louis Sewer District) - Utility Base Map
- Water (St. Louis City Water) - Utility Base Map
- Gas (Laclede Gas) - Utility Base Map

As the final planning and design of the alignments progress, each utility should be consulted in order to obtain more accurate utility location and size information. During this process, it is anticipated that the details of resolving any remaining utility conflicts will be revealed.