City of Columbia

701 East Broadway, Columbia, Missouri 65201

Agenda Item Number: REP 113-15
Department Source: City Utilities - Water & Light
To: City Council
From: City Manager & Staff
Council Meeting Date: 11/16/2015
Re: Electric Substation & Transmission Line Report - request for project history, costs, impact of changing route & real estate

Documents Included With This Agenda Item

Council memo
Supporting documentation includes: Diagrams (construction, route, etc.), Historical Information

Executive Summary

In 2007 Columbia Water & Light identified the need for an additional electric substation and transmission lines to satisfy federal transmission planning standards and address load growth issues. In 2010 a 161 kilovolt (kV) solution was identified and a route selection process began with area residents. The 10 proposed routes were narrowed down to one route which is now known as Option A. At that time, City Council asked the utility to look at a 69 kV alternative for powering the substation and a 161 kV line that could be routed along the west side of the city limits to satisfy federal transmission planning standards. Eight options for Option B was reviewed with area residents and feedback was collected. The most publically acceptable route for Option B was presented to the City Council along with a staff suggested alternative, Option B-2, which routed the 161 kV line further west onto mainly city-owned property. At the July 15, 2013 Council meeting, Option A, built overhead, was approved by a vote of five to two. After an open house meeting to discuss electric transmission pole structure locations for Option A held on September 30, 2015 concerns were raised by some residents in the area about the route selection process.

Discussion

Historical overview: Columbia is considered a Balancing Authority and Transmission Operator by federal electric reliability entities since power for the University of Missouri and the City of Fulton flow through Columbia's transmission system. Approximately 90% of Columbia's electricity is imported via transmission lines. The North America Electric Reliability Corporation standards state that transmission outages cannot cause the overloading of any neighboring transmission elements and/or cause cascading outages. After looking at electric load and demand on Columbia's system and where possible problems could occur an additional 161 kV feed into the Grindstone substation was constructed in 2007-2008. The second part of the project was to add a substation in the southern portion of Columbia along with electric transmission lines. From surveys and comments, it seems that Columbians understand the need for this project.

From 2009 through 2015, the project has been subject to public discussion with feedback gathered

throughout the process. There have been six Interested Parties meetings/open houses for the substation and transmission line project. Before the final routing option was selected in 2013, invitations were sent to customers and property owners within 250 feet of any of the 18 different proposed routes informing them of the Interested Parties meetings. At each meeting, comments were collected from those living in the area. A transmission project list-serv was established in 2010 for people to receive e-mailed updates about the project. Articles were included in the newsletter sent with utility bills and this project was heavily reported by the local media. In January 2013 a letter was sent to 39,500 Columbia Water & Light electric customers urging them to take a survey regarding the project since it involved reliability of the electric system and electric customers would be paying for the project. The purpose of the letter was to gather feedback for the City Council before the project's public hearing. The Water & Light Advisory Board endorsed Option A being built overhead. Different aspects of this project have been covered at City Council work sessions and meetings 12 times. Three City Council meetings were reserved for the public hearing on the final route selection and whether to build the lines overhead or underground. At the July 15, 2013 meeting, there were 17 people who testified. After council discussion, Option A, built overhead, was approved by a vote of five to two.

Bond Funding: An April 7, 2015 election was passed to fund electric system improvements. The transmission line route along Providence/Route K was not included in the bond issue project list. At this time the combination of the Millcreek-Grindstone, Millcreek-Perche lines provide the best cost/benefit value. The Millcreek-McBaine line does provide future benefits and will be constructed with future revenue based on the following considerations:

- When modeling of the Millcreek load shows an interconnection problem caused by transmission outages.
- When development of this line is needed to mitigate financial impacts on Columbia's energy flow leaving the MISO transmission area.
- If a 69 kV connection at Millcreek substation is needed.
- If a Columbia Water & Light load serving substation south of the Millcreek substation is needed.
- To enhance the reliability of the local bulk electric system.

Any changes to the transmission line route would impact the estimated financing needed and may impact the bond rating for the City of Columbia. Below are the amounts budgeted for the bond proposal that voters approved for the substation and transmission line project:

Transmission & Substation Project Total	**$36,150,000**
Millcreek 161/69 kV substation	$5,000,000
Millcreek, Grindstone & Perche interconnection	$18,000,000
Substation upgrades Grindstone & Perche	$1,000,000
Underground distribution lines in transmission corridor	$5,000,000
Substation feeder reconfiguration	$7,150,000

Impact of Changing Routes: As of October 2015, $7.1 million has been spent on the substation and

transmission project. The largest portion spent so far is for the 161 kV substation land ($1.5 million) and equipment ($2.3 million). The engineering work on line route studies, surveying, soil sampling, utility locates, determining pole locations has cost approximately $3.3 million. Money is continuing to be spent on this project. Evaluation of easement acquisition is currently being studied for the Option A route.

If the route were changed, it is estimated that $5.6 million would be lost and would need to be re-budgeted. Work on surveying, soil sampling, utility locating, determining pole locations would have to be done again. The total cost for building Option B may need more money budgeted for easements since few exist along this route. Changing to Option B would delay the in service date by four to five years. Since Option B utilizes the heavily loaded 69 kV system, the electric utility would have to do new modeling to see when additions would be needed to meet needs within Columbia and the Balancing Authority area.

There is a need for electric load serving capacity in 2018. The transformer loading of the Grindstone, Hinkson Creek and Perche Creek substations continues to remain at critical levels. In designing a reliable electric system, one must reserve extra capacity to pick up system loading from other areas of the city in case of high loads and/or problems with the system occur. For this reason it is recommended that substations with two transformers not be loaded more than 50% and substations with three transformers not be loaded more than 66.6%. Historical loading is listed below.

Year	Grindstone: 3 Transformers	Hinkson Creek: 3 Transformers	Perche Creek: 2 Transformers
2007	41.5%	67.6%	61.8%
2010	44.7%	68.6%	64.4%
2015	48.6%	64.2%	72.0%

Estimated Costs & Potential Rate Impacts for Constructing Electric Transmission Lines

	Option A	**Option B**	**Option B-2**
Estimated years before more improvements needed	20 +	10 to 20	10 to 20
Miles of 161 kilovolt lines	12.07	6.99	9.84
Miles of 69 kilovolt lines	0	2.97	2.97
Total overhead construction cost	$13,135,117	$10,151,122	$12,229,788
Total underground construction cost	$91,898,566	$75,833,448	$97,532,778
Cost/Customer each month for 20 years: overhead	$1.18	$0.91	$1.10
Cost/Customer each month for 20 years: underground	$8.26	$6.82	$8.77

NOTES:
-Easement costs are not included in the estimates. Option A makes extensive use of existing rights-of-way and platted easments.
-Unlike distribution lines, transmission lines are not commonly buried due to high costs and lower life expectancies.

Real Estate Impact

Linear feet of different types of zoning for each transmission line route option are listed below. MP, OP zoning classifications have been included in the commercial footages and PUD zoning have been included in residential footages.

Option A

Agricultural – 17,600
Commercial – 23,760
Residential – 36,160

Option B
161kV Line:
Agricultural – 56,000
Commercial – 2,600
Residential – 24,000

69kV Line (modeled as extension from existing infrastructure path):
Agricultural – 2,200
Commercial – 10,500
Residential – 2,000

There was a question about how this project would impact home loans. It is recommended that this should be reviewed by a lending professional or real estate appraiser. Staff can contract for these services if desired by the Council. For residents that currently have a home loan, the existing easements and right-of-way should have been noted in the property title work when the home was purchased.

Another point that has been brought up is about one utility's transmission lines built outside the system's territory. Building transmission lines outside of a utility's service territory is commonly done to provide interconnectivity between utilities. Both Associated Electric Cooperative and Ameren have transmission lines in the City limits of Columbia. The City of Columbia currently owns transmission lines outside of its electric service territory including lines outside of Boone County.

Fiscal Impact

Short-Term Impact: NA
Long-Term Impact: NA

Vision, Strategic & Comprehensive Plan Impact

Vision Impact: Not Applicable
Strategic Plan Impact: Infrastructure...Connecting the Community
Comprehensive Plan Impact: Infrastructure

Suggested Council Action

None

Legislative History

City of Columbia

701 East Broadway, Columbia, Missouri 65201

Please see Report Supporting Documentation

Department Approved

City Manager Approved

City of Columbia
701 East Broadway, Columbia, Missouri 65201

SUPPORTING DOCUMENTS INCLUDED WITH THIS AGENDA ITEM ARE AS FOLLOWS:

Diagrams (construction, route, etc.)
Historical Information

AT A GLANCE

Columbia Water & Light's Electric Transmission and Substation Project

HISTORICAL INFORMATION

2007
Need for substation & transmission identified

Jan. 2009
Interested Parties meeting for substation

Feb. 2010
Project overview at Council work session

March 2010
City Council approved acquiring substation property

Feb. 2011
Report with comments from Option A area residents and cost/details re: undergrounding lines

April 2011
Report to Council re: feedback reviewed to determine best route for Option A

April 2011
Council authorized engineering firm contract change to explore Option B

Aug. 2012
Report to the City Council on Option B route options & feedback from area residents. Option B-2 was suggested by staff for route on city-owned property

Jan. 2013 Letter about project survey was sent to 39,500 Columbia Water & Light electric customers

May 2013
Report to Council – reviewed community feedback

June 2013
City Council work session – complete history of project

Jan. 2015
Council work session - project website and hotline reviewed

April 2015
Bond election – included funding for transmission/ substation

Sept. 30, 2015
Open House for transmission structure placements

2007 — 2009 — 2010 — 2011 — 2012 — 2013 — 2014 — 2015

Sept. 2009
Criteria for proposed transmission line routes reviewed at work session

Oct. 2010
Three Interested Parties meetings for ten proposed routes for Option A*

Nov. 2010
Work session-comments from area residents and EMF info. Council asked for another route option

Aug. 2011
Report to the City Council on eight possible Option B routes

Sept. 2011
Interested Parties meeting with possible routes for Option B reviewed*

Nov. 2012
Interested Parties meeting – review of Option A & B*. EMF discussed

July 2013
City Council Public Hearing – Option A to be built overhead was decided

2013 - 2015
Customers/property owners & neighborhood/home owners associations within 150 feet of route notified of survey and soil sampling

CITY COUNCIL **INTERESTED PARTY MEETING/PUBLIC FEEDBACK** * Comments collected from those living in all the areas of the proposed routes