

Source: Water & Light

Agenda Item No: Item (B)

To: City Council

From: City Manager and Staff

Council Meeting Date: Jul 1, 2013

Re: Public Hearing for transmission connection to the new proposed substation and system transmission improvements

**EXECUTIVE SUMMARY:**

Staff has prepared for Council consideration a resolution setting a public hearing for July 15<sup>th</sup> 2013 regarding connection of the new proposed substation and system transmission improvements. A total of six interested party meetings and a community survey have been conducted on this project. In these interested party meetings, staff worked to inform the public regarding the options available then collected feedback to refine the options. The first interested party meeting was conducted in October of 2010 and concluded with the survey in February 2013. The information collected from our community communication and decision process is represented in our Community Impact Matrix and the Survey Results. Based on this information Water & Light Staff is recommending Option A for connection of the new proposed substation and system transmission improvements. Staff has included some undergrounding concepts and options to consider. Once a final alignment has been determined, more detailed design will be conducted to further refine cost estimates to include the costs of design, right of way, easement, construction and other contingencies. The conceptual cost estimates range from \$10 million to \$97 million depending on which alternative is chosen. The current Capital Improvement Program has \$2.3 million appropriated for design and construction for the new proposed substation connection and system transmission improvements. Funding for this project is planned from the sale of future Revenue Bonds that will spread the costs of these improvements to future users.

**DISCUSSION:**

In 2005 loading issues started to occur on the southern side of Columbia's electric system. At that time Water & Light participated in regional electric system planning to address these issues. The following system improvements were identified in this planning process.

1. Addition of a 161KV Transmission Line into Grindstone substation
2. Addition of a 161KV Transmission Line into Perche Creek substation
3. Addition of a load serving substation in the southern part of Service Territory

This Public Hearing is for route selection for the addition of the 161KV Transmission Line into Perche Creek substation and the inter-connecting transmission lines necessary to power the new proposed load serving substation.

The new proposed load serving substation was purchased with approval of Council Bill B54-10 and is located on Peach Court. The location of the new proposed substation is shown in Diagram D.

After siting of the load serving substation a Public Improvement Process was started to determine the routing of transmission lines required to power the new proposed substation and provide another transmission connection to Perche Creek substation. The first interested parties meeting in this process was conducted in October 2010. A total of five interested parties meetings, and four Council work sessions have been conducted to present the proposed transmission line routing options.

At the June 13, 2013 Council work session the final transmission line routing alignments were presented together with a detailed overview of the project and the line routing selection methods. These alignment options are shown on the Diagrams A thru C.

**Option A:** This option serves power to the new proposed substation at the 161 kV level with the new proposed substation acting as the common 161 kV terminal between the Perche Creek, Grindstone and McBaine substations. 161 kV to 13.8 kV transformers would serve distribution load directly from the 161 kV transmission system.

**Option B:** This option serves power to the new proposed substation at the 69 kV level with the new proposed substation inserted into the existing 69 kV sub-transmission ring between the Hinkson Creek and Grindstone substations. 69 kV to 13.8 kV transformers would serve distribution load from the existing 69 kV sub-transmission system. This additional loading on the 69 kV would make it necessary to increase the size of conductors and construct new structures between the Grindstone and Perche Creek substations. Additionally a 161 kV transmission line would be constructed along the western periphery of the city limits to provide a required redundant feed into the Perche Creek substation from the McBaine substation.

**Option B-2:** This option is the same as Option B, except the 161 kV line connection between the Perche Creek and McBaine substations is pushed further west to cross city owned property operated by the Sewer Utility. Approximately 37% of this alignment could be constructed on city owned property, although it is 22% longer than the alignment considered in Option B.

These options were derived using an extensive public process to develop a weighted community impact matrix based on public concerns and feedback to identify the most publically acceptable line routes. The scores from this community impact matrix indicated that no individual option had significantly less of a public impact than any another, as shown in Diagram E.

A public feedback survey was developed and conducted of all interested parties and utility customers, shown in Diagram F. Diagram G shows the information that was included with the request to complete this survey. The results of this survey are shown in Diagrams H1 through H6.

Diagram J shows a graphical representation of the indicated residence location for survey respondents along with ward breakout tables for questions 1 and 6.

After working through this route selection process Water & Light Staff is recommending Option A for connection of the new proposed substation and addition of system transmission improvements into Perche Creek substation. Staff is recommending this option because:

- This option transfers load to the 161 kV system and preserves current 69 kV system capacity.
- For the same capital investment the 161 kV option has more than double the power transmission capacity.
- Provides most economical, reliable & long term option

The survey indicated some community acceptance of undergrounding cost. In an attempt to address this staff has included possible undergrounding considerations. The first consideration is to underground electric distribution lines along the selected routes. For option A this would consist of undergrounding approximately 8.3 miles of existing overhead distribution circuits. The second consideration is the scenarios shown in Diagram K. This diagram represents options for undergrounding the 161 KV transmission lines beginning at the new proposed substation. Diagram K shows the length and cost increase for each segment of underground.

At their June 12 meeting, the Water & Light Advisory Board Endorsed Option A without undergrounding options. Once a final alignment has been determined, more detailed design will be conducted to further refine cost estimates to include the costs of undergrounding (distribution and transmission), design, right of

way, construction and other contingencies. Funding for this project is planned from the sale of future Revenue Bonds that will spread the costs of these improvements to future users.

**FISCAL IMPACT:**

\$2.3 million has already been appropriated for this project. Funding for this project is planned from the sale of future Revenue Bonds. Preliminary costs for the alternatives are as follows:

|             |              |              |
|-------------|--------------|--------------|
|             | Overhead     | Underground  |
| Option A -  | \$13 million | \$92 million |
| Option B -  | \$10 million | \$75 million |
| Option B2 - | \$12 million | \$97 million |

**VISION IMPACT:**

<http://www.gocolumbiamo.com/Council/Meetings/visionimpact.php>

5.1 Goal: We envision a community with a well planned, proactive growth strategy that addresses the manner in which infrastructure (including but not limited to roads, utilities and other common facilities used by the community) is developed and maintained, that offers a fair and balanced approach regarding how payment for infrastructure is shared, that offers flexibility to accommodate change, and that provides coordination among all potential stakeholders.

**SUGGESTED COUNCIL ACTIONS:**

Approve the resolution setting a public hearing for the proposed project. Following the Public Hearing, Council should make a motion directing staff to proceed with plans and specifications for one of the options presented.

| FISCAL and VISION NOTES:                   |                |   |  |   |  |
|--|----------------|---|--|---|--|
| City Fiscal Impact<br>Enter all that apply |                | Program Impact                                    |  | Mandates                                      |  |
| City's current net FY cost                 | \$0.00         | New Program/ Agency?                              |  | Federal or State mandated?                    |  |
| Amount of funds already appropriated       | \$2,300,000.00 | Duplicates/Expands an existing program?           |  | <b>Vision Implementation impact</b>           |  |
| Amount of budget amendment needed          | \$0.00         | Fiscal Impact on any local political subdivision? |  | Enter all that apply:<br>Refer to Web site    |  |
| Estimated 2 year net costs:                |                | <b>Resources Required</b>                         |  | Vision Impact?                                |  |
| One Time                                   | \$0.00         | Requires add'l FTE Personnel?                     |  | Primary Vision, Strategy and/or Goal Item #   |  |
| Operating/ Ongoing                         | \$0.00         | Requires add'l facilities?                        |  | Secondary Vision, Strategy and/or Goal Item # |  |
|  |                | Requires add'l capital equipment?                 |  | Fiscal year implementation Task #             |  |

# Option A

Diagram A

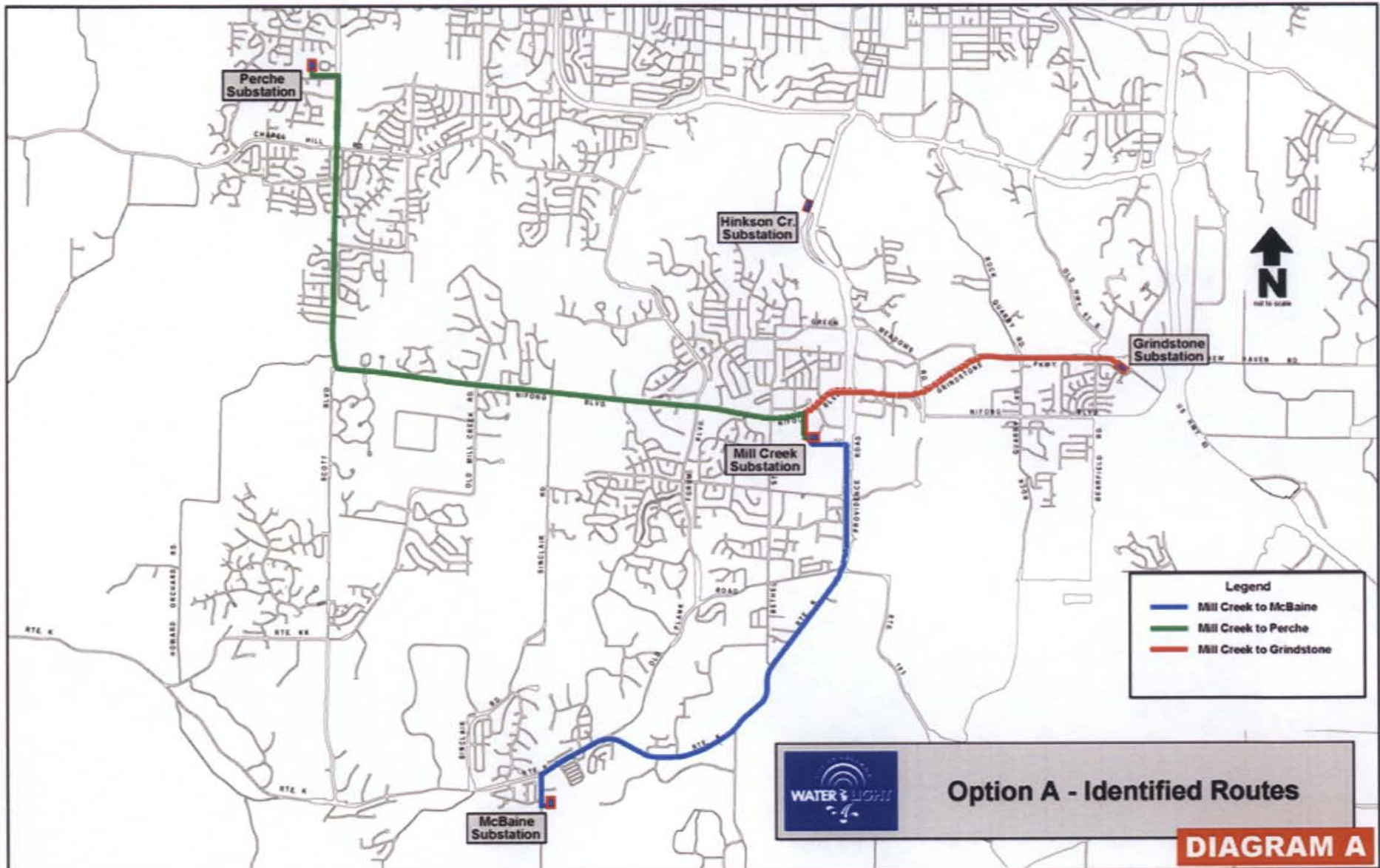




Diagram B

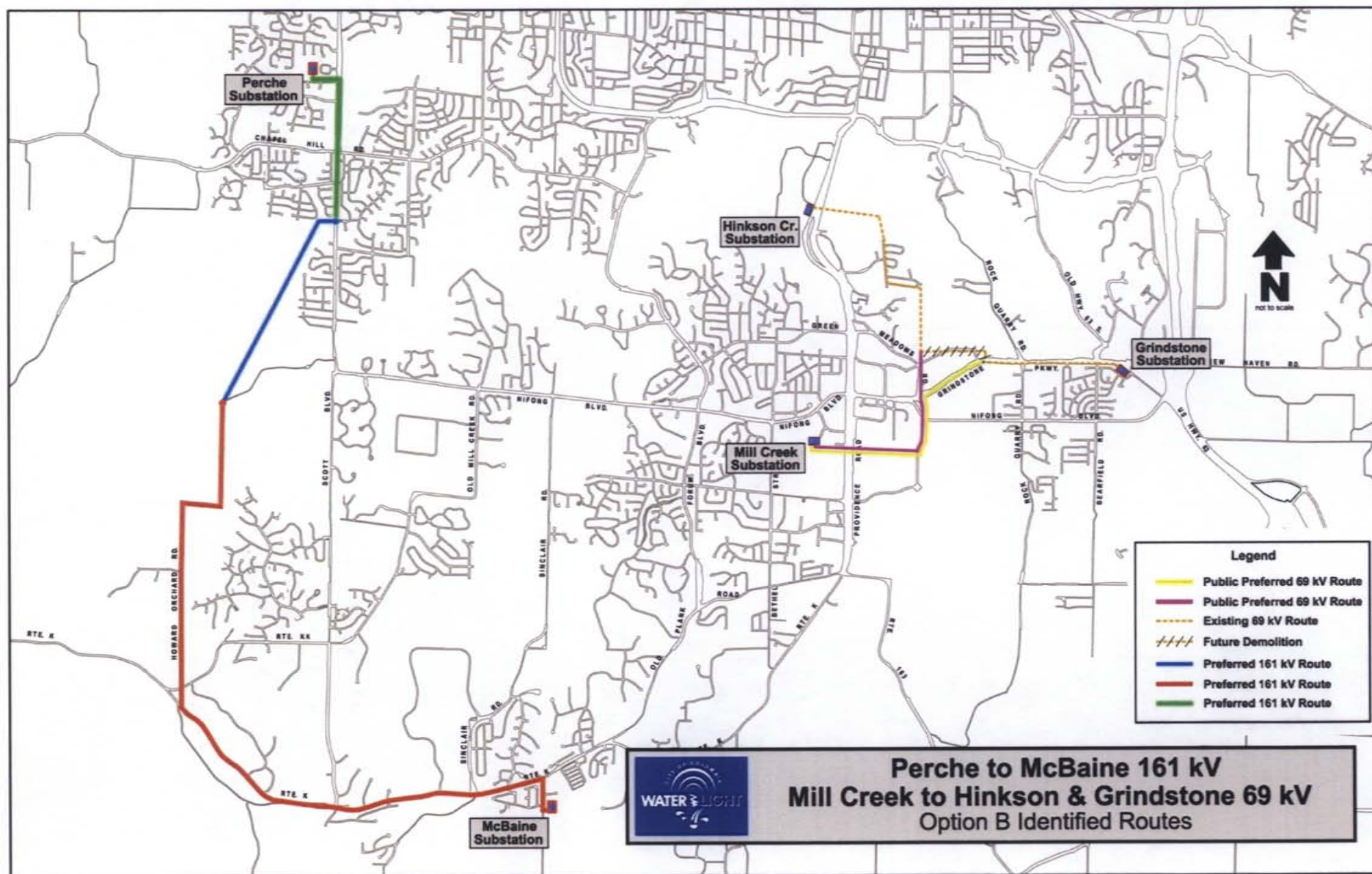


Diagram C

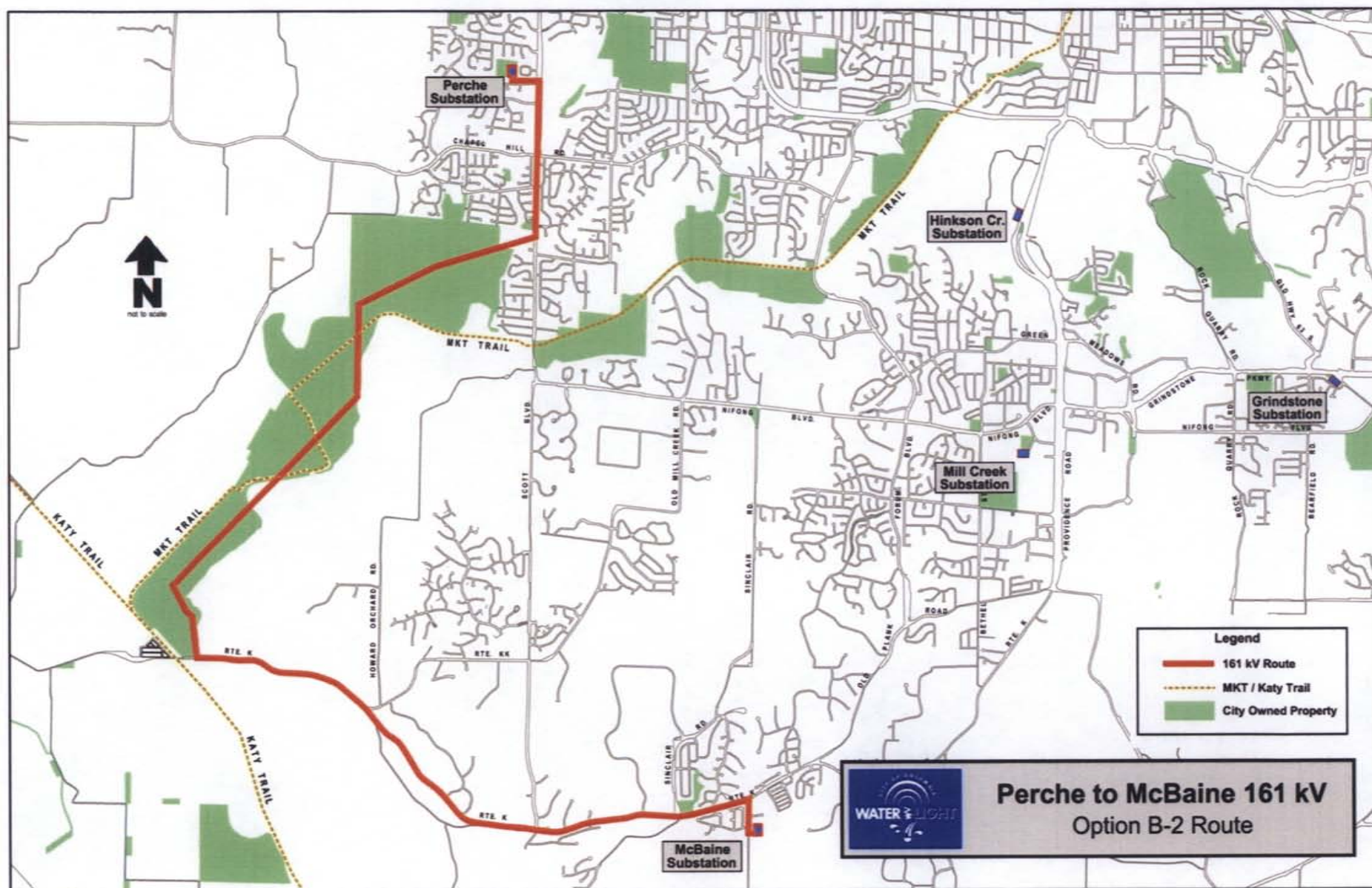




Diagram D



# Diagram E

|  |                         | Summary (Option B-2)         | Summary (Option B) | Summary (Option A) |
|--|-------------------------|------------------------------|--------------------|--------------------|
|  | Public Feedback Ranking | Importance Factor (See Note) | Combined Total     | Combined Total     |
| <b>Proximity to Residences</b>                       | <b>12.5%</b>            |                              |                    |                    |
| Houses 0-100   |                         | -10                          | -5,500             | -4,000             |
| Houses 100-200                                       |                         | -5                           | -7,875             | -6,750             |
| Multi-Family 0-100                                   |                         | -10                          | -5,000             | -10,000            |
| Multi-Family 100-200                                 |                         | -5                           | -4,375             | -2,625             |
| <b>Proximity to Residences TOTALS</b>                |                         |                              | <b>-22,750</b>     | <b>-23,375</b>     |
| <b>Proximity to Day Cares, Schools, Churches,</b>    | <b>11.3%</b>            |                              |                    |                    |
| Day care 0-100                                       |                         | -10                          | 0                  | 0                  |
| Day Care 100-200                                     |                         | -5                           | 0                  | 0                  |
| Schools 0-100  |                         | -10                          | -1,416             | -1,416             |
| Schools 100-200                                      |                         | -5                           | 0                  | 0                  |
| Churches 0-100                                       |                         | -5                           | 0                  | 0                  |
| Churches 100-200                                     |                         | -2                           | 0                  | 0                  |
| Hospitals 0-100                                      |                         | -10                          | 0                  | 0                  |
| Hospitals 100-200                                    |                         | -5                           | 0                  | 0                  |
| Nursing homes 0-100                                  |                         | -10                          | 0                  | 0                  |
| Nursing homes 100-200                                |                         | -5                           | 0                  | 0                  |
| <b>Proximity to Schools TOTALS</b>                   |                         |                              | <b>-1,416</b>      | <b>-1,416</b>      |
| <b>Proximity to Environmental Concerns</b>           | <b>11.8%</b>            |                              |                    |                    |
| Wooded/forested crossed                              |                         | -10                          | -2,008             | 0                  |
| Streams 0-200  |                         | -10                          | -2,006             | -1,416             |
| Conservation areas crossed                           |                         | -10                          | 0                  | 0                  |
| Wetlands crossed                                     |                         | -10                          | -2,310             | -467               |
| Agricultural property crossed                        |                         | 3                            | 5,228              | 0                  |
| <b>Proximity to Environmental Concerns TOTALS</b>    |                         |                              | <b>-1,097</b>      | <b>-1,883</b>      |
| <b>Proximity to Recreation Areas</b>                 | <b>11.7%</b>            |                              |                    |                    |
| Parks 0-100  |                         | -10                          | -496               | -496               |
| Parks 100-200  |                         | -5                           | -248               | -248               |
| Trails 0-100   |                         | -10                          | -42                | -14                |
| Trails 100-200                                       |                         | -5                           | 0                  | 0                  |
| Other recreation areas 0-100                         |                         | -10                          | -468               | 0                  |
| Other recreation areas 100-200                       |                         | -5                           | -234               | -316               |
| <b>Proximity to Recreation Areas TOTALS</b>          |                         |                              | <b>-1,488</b>      | <b>-1,075</b>      |
| <b>Proximity to Businesses</b>                       | <b>8.6%</b>             |                              |                    |                    |
| Commercial structures 0-100                          |                         | -5                           | -2,150             | -2,150             |
| Commercial structures 100-200                        |                         | -2                           | -1,720             | -1,548             |
| <b>Proximity to Businesses TOTALS</b>                |                         |                              | <b>-3,870</b>      | <b>-3,698</b>      |
| <b>TOTAL LINEAL FEET PUBLIC FEEDBACK IMPACT</b>      |                         |                              | <b>-30,621</b>     | <b>-31,447</b>     |
| <b>AVERAGE LINEAL FEET FEEDBACK IMPACT</b>           |                         | -29,611                      |                    |                    |
| <b>COST</b>  | <b>12.6%</b>            |                              |                    |                    |
| COST COMPARISON ADJUSTMENT (Highest cost is          |                         |                              | \$ 11,267,446.00   | \$ 9,854,921.00    |
| COST COMPARISON ADJUSTED APPLIED TO PUBLIC           |                         |                              | 0.94               | 0.82               |
| LINE FEEDBACK.                                       |                         |                              | 0.119              | 0.104              |
|  |                         |                              | -4,907             | -4,292             |
| <b>COMPARISON</b>                                    |                         |                              | <b>-35,528</b>     | <b>-35,739</b>     |
| <b>Reliable Electric Service</b>                     | <b>16.2%</b>            |                              | 0                  | 0                  |
| <b>Longest-Term Solution</b>                         | <b>15.3%</b>            |                              | 0                  | 0                  |
| <b>TOTAL SCORE INCLUDING RELIABILITY AND LONG-TE</b> | <b>100.0%</b>           |                              | <b>-35,528</b>     | <b>-35,739</b>     |



## Diagram F

# This Was the Content of the Survey

## Columbia Water & Light Proposed Transmission Line Project Questionnaire

Thank you for commenting on the proposed transmission line routes for the southern part of Columbia. Input for the final route selection will be collected through December 31, 2012. The public's feedback will be forwarded to the Columbia City Council before they make the decision on the final route.



If you have access to a computer, we urge you to fill out the online questionnaire at (<http://tinyurl.com/columbiaelectric>) so feedback can be more easily tabulated.

Completed forms can be mailed to or dropped off at Columbia Water & Light, Attn: Adam Schuttler, P.O. Box 6015, 701 E. Broadway, Columbia, MO. 65205

Please submit only ONE questionnaire per household or business.



Name Prefix: (Mr., Mrs., Ms.) \_\_\_\_\_ First \_\_\_\_\_ Middle \_\_\_\_\_

Last Name \_\_\_\_\_ Name Suffix \_\_\_\_\_

Street Number \_\_\_\_\_ Street Name \_\_\_\_\_

Street Type (St., Cir., Ct., Ave., Blvd., Rte., etc.) \_\_\_\_\_

Apt. Number \_\_\_\_\_ Zip Code \_\_\_\_\_ Email \_\_\_\_\_

Given the necessity for this project, if you must choose, which option would you prefer to see implemented (circle one) Option A Option B Option B-2

Is your home or business **along** (within 150 feet) one of the **final** routes presented for either Option A, Option B, or Option B-2? (choose one) Yes ☐ No ☐

Is your home or business **near** (between 150 and 500 feet) one of the **final** routes presented for either Option A, Option B, or Option B-2? (choose one) Yes ☐ No ☐

## Proposed Transmission Line Project Questionnaire

Please rank these factors in determining which option is most preferable to you in order of importance (8=most important, 1=least important, no repeated numbers, all blanks must be filled out)

|   | Rank  |
|---|-------|
| 1. Reliable electric service .....  | _____ |
| 2. Least cost to build/minimize rate impact .....   | _____ |
| 3. Option provides longest-term solution .....  | _____ |
| 4. Furthest away from residential homes (this includes apartments) .....                  | _____ |
| 5. Furthest away from commercial businesses .....   | _____ |
| 6. Furthest away from schools, day cares, churches, hospitals, and/or nursing homes ..... | _____ |
| 7. Negative aesthetic impact on city, neighborhood, or recreational areas .....           | _____ |
| 8. Environmental impact (trees cleared, wetlands disturbed, etc.) .....                   | _____ |

Please choose one statement: (choose one)

- ☐ I understand why this project is necessary for the long-term reliability and load-serving capabilities of the Columbia Water & Light.
- ☐ I do not understand why this project is necessary for the long-term reliability and load-serving capabilities of the Columbia Water & Light.

For comparative purposes, consider an average household monthly electric use of 720 kWh with a charge of \$76.42. A Columbia Water & Light customer would pay an estimated additional \$8.26 (10.8%) per month for the next 20 years to construct these lines underground. Under the same usage, a Columbia Water & Light customer would pay an estimated additional \$1.18 (1.5%) per month for the next 20 years to construct these lines overhead. Please choose one of the following responses.

- ☐ I would rather have Columbia Water & Light rates increased to the price necessary to construct the lines underground.
- ☐ I would rather have Columbia Water & Light rates increased to the price necessary to construct the lines overhead.

Comments? Thank you! \_\_\_\_\_

---

---

---

---

---

---

---

---

---

---

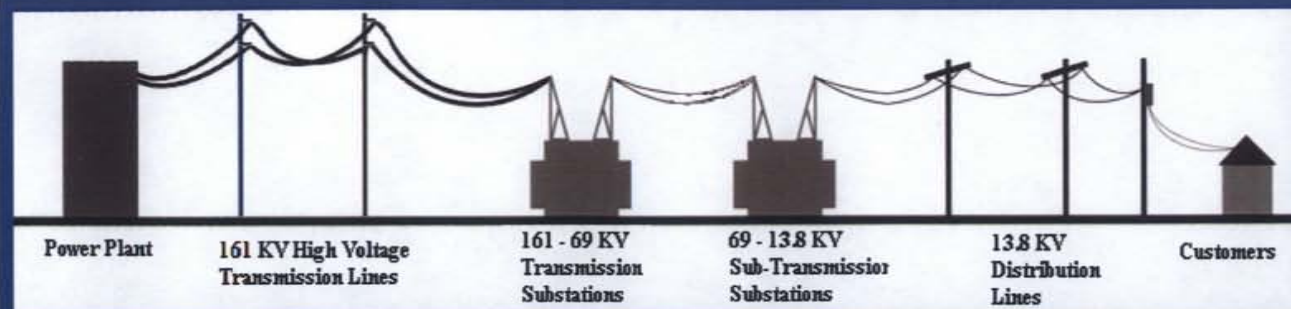


Diagram G

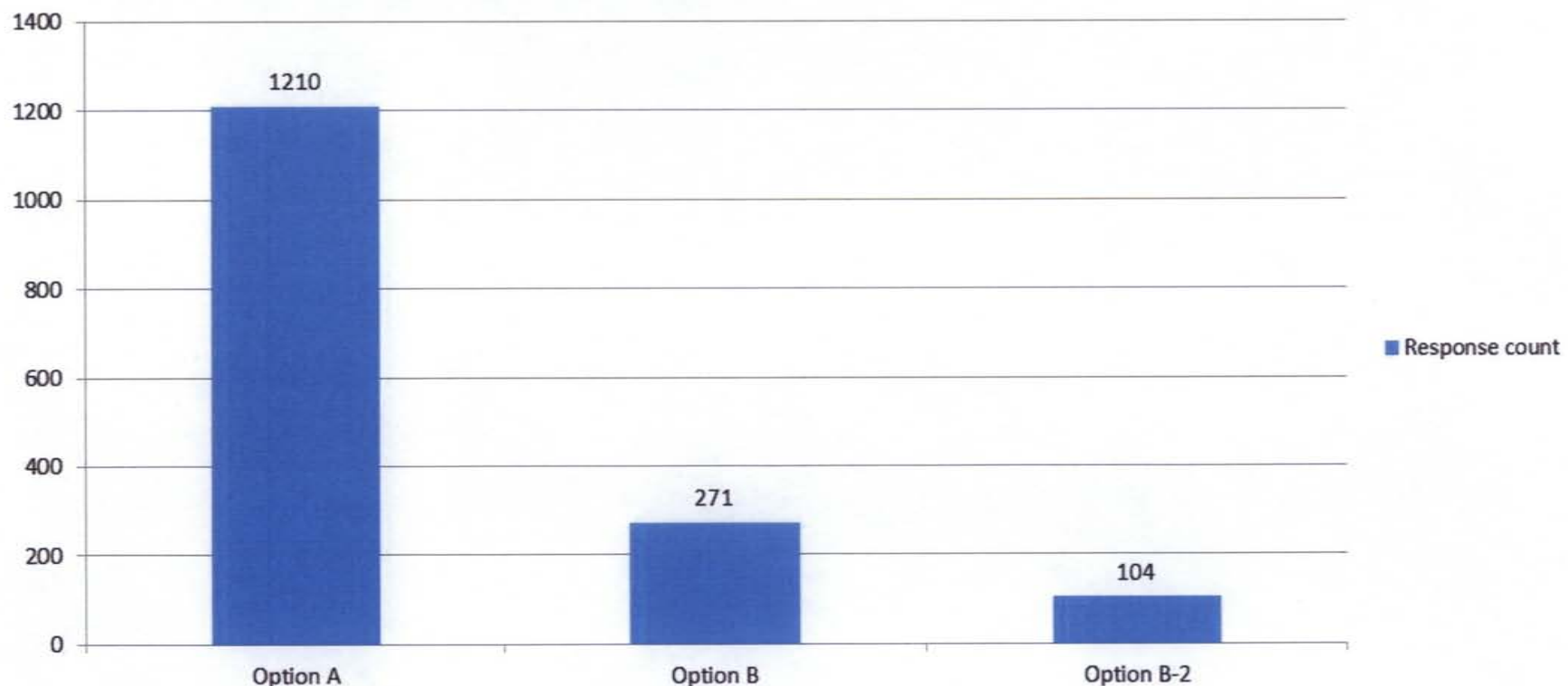
|  | Option A     | Option B     | Option B-2   |
|--|--------------|--------------|--------------|
| Estimated years before more improvements needed  | 20+          | 10 to 20     | 10 to 20     |
| Miles of Line                                    | 12.07        | 9.96         | 12.81        |
| Construction Cost Per Mile Overhead              | \$1,088,245  | \$1,019,189  | \$953,926    |
| Construction Cost Per Mile Underground           | \$7,613,800  | \$7,613,800  | \$7,613,800  |
| Total Number of Electric Customers               | 46,344       | 46,344       | 46,344       |
| Cost Per Mile Per Customer Overhead              | \$23.48      | \$21.99      | \$20.58      |
| Cost Per Mile Per Customer Underground           | \$164.29     | \$164.29     | \$164.29     |
| Total Cost Overhead                              | \$13,135,117 | \$10,151,122 | \$12,219,792 |
| Total Cost Underground                           | \$91,898,566 | \$75,833,448 | \$97,532,778 |
| Total Construction Cost/Customer Overhead        | \$283        | \$219        | \$264        |
| Total Construction Cost/Customer Underground     | \$1,983      | \$1,636      | \$2,105      |
| Cost Per Customer/Month for 20 Years Overhead    | \$1.18       | \$0.91       | \$1.10       |
| Cost Per Customer/Month for 20 Years Underground | \$8.26       | \$6.82       | \$8.77       |
| Avg. Monthly Residential Electric Bill           | \$76         | \$76         | \$76         |
| Rate Increase - Overhead                         | 1.54%        | 1.19%        | 1.44%        |
| Rate Increase - Underground                      | 10.81%       | 8.92%        | 11.48%       |



Diagram H1

# Question 1

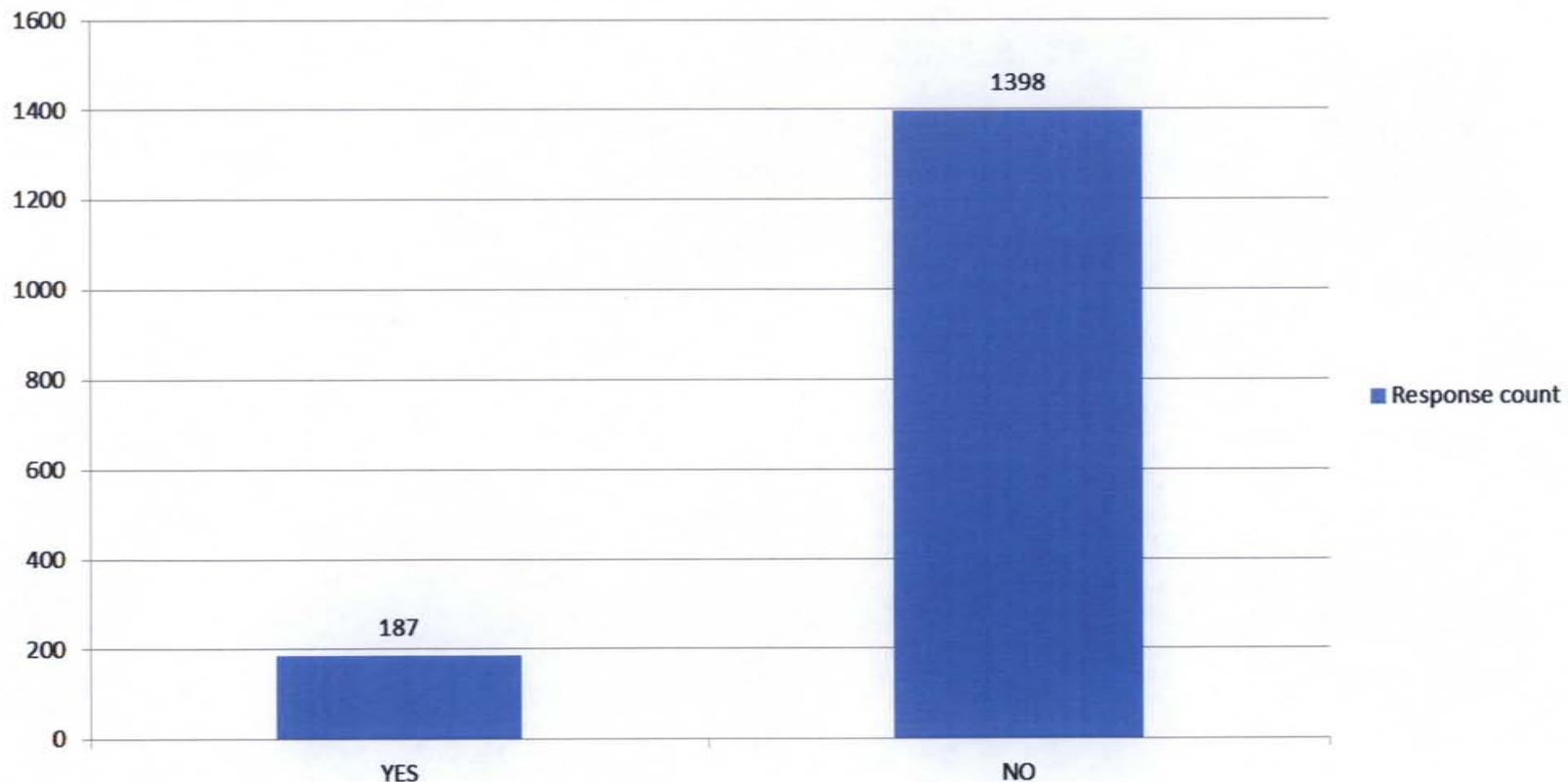
- Given the necessity for this project, if you must choose, which option would you prefer to see implemented?





## Question 2

- Is your home or business along (within 150 feet) one of the final routes presented for either Option A, Option B, or Option B-2?



## Question 3

- Is your home or business near (between 150 and 500 feet) one of the final routes presented for either Option A, Option B, or Option B-2?

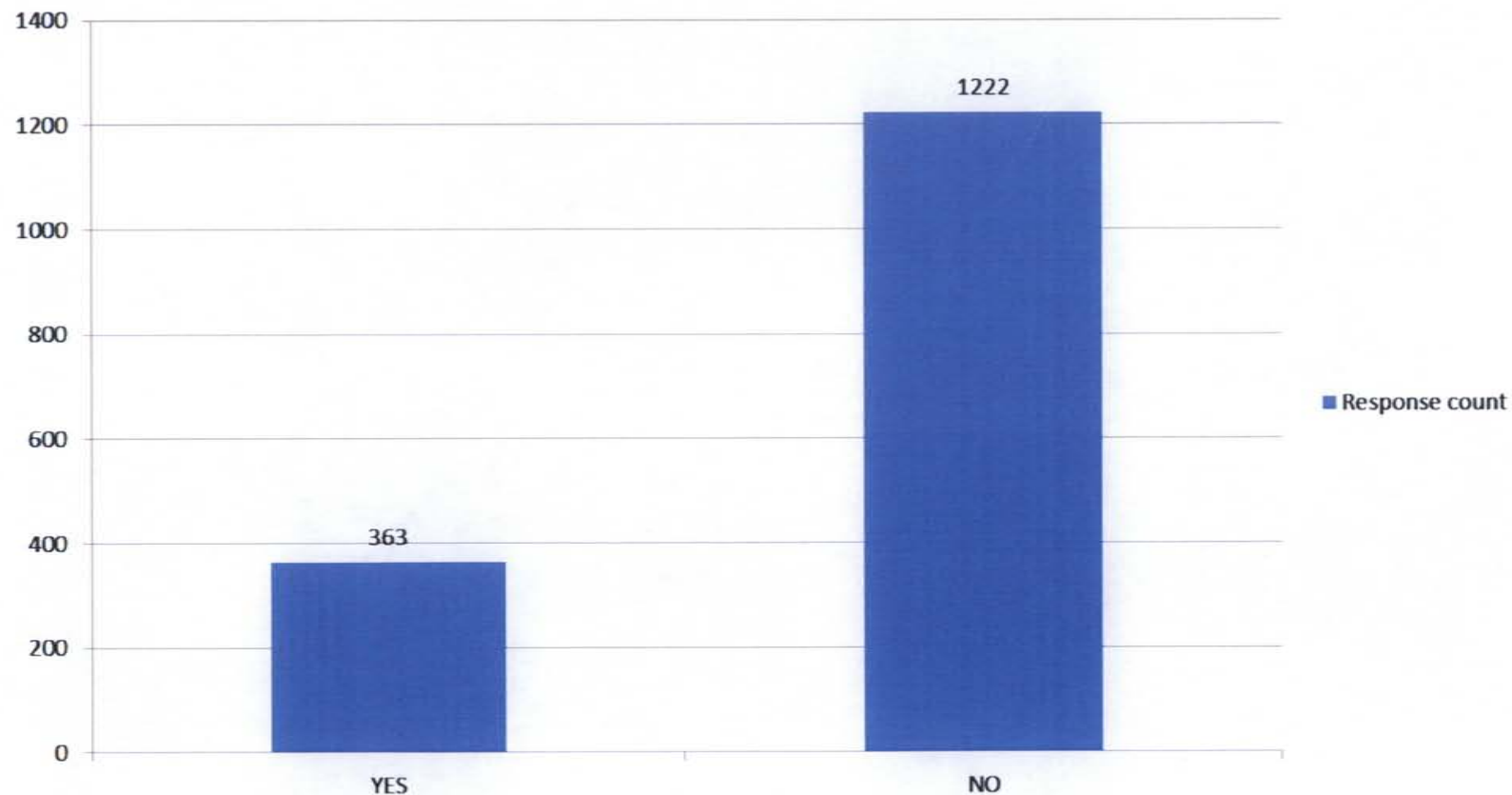


Diagram H4

## Question 4

- Please rank these factors in determining which option is most preferable to you in order of importance (8=most important, 1=least important, no repeated numbers, all blanks must be filled out)

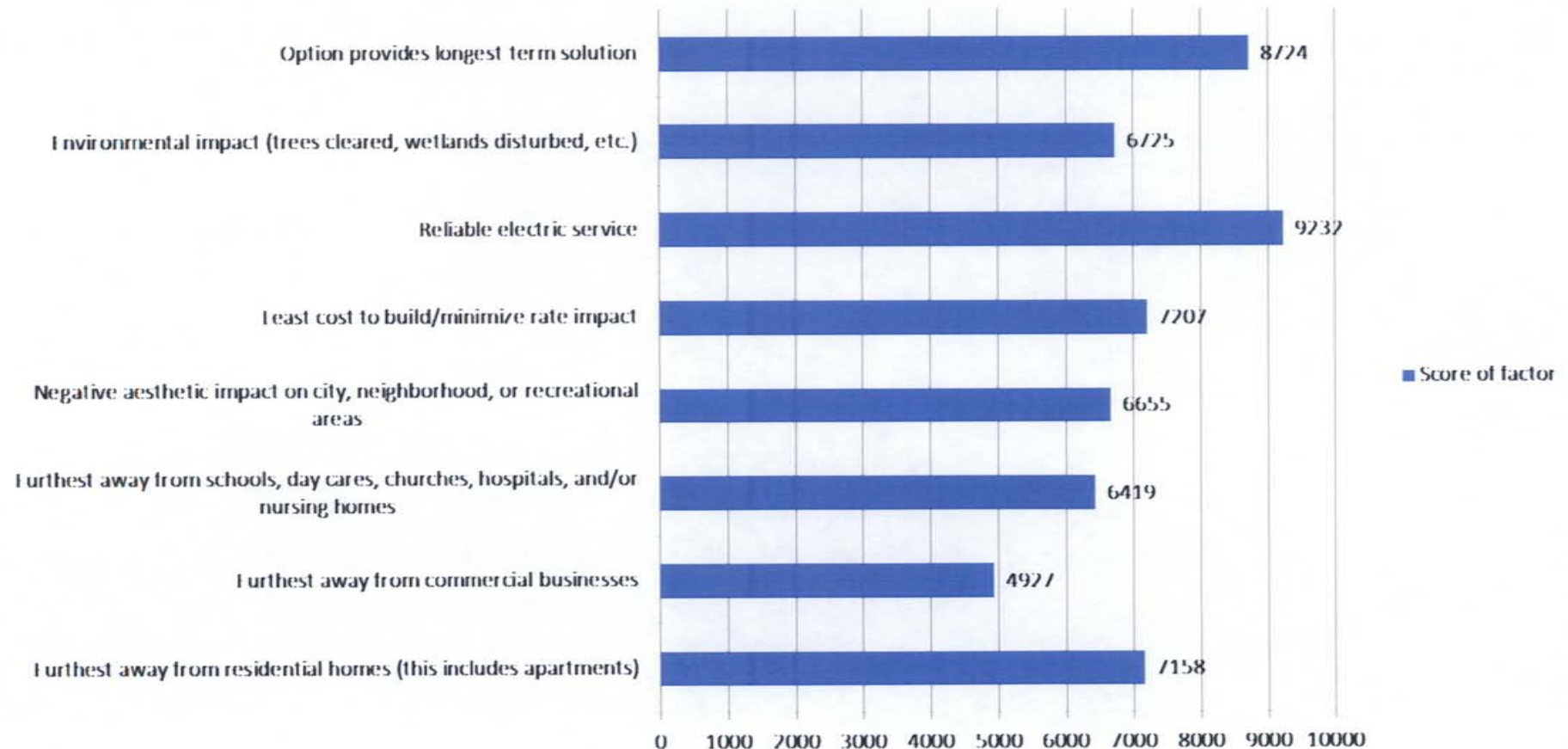




Diagram H5

## Question 5

- I understand why this project is necessary for the long-term reliability and load-serving capabilities of the City of Columbia Water & Light utility

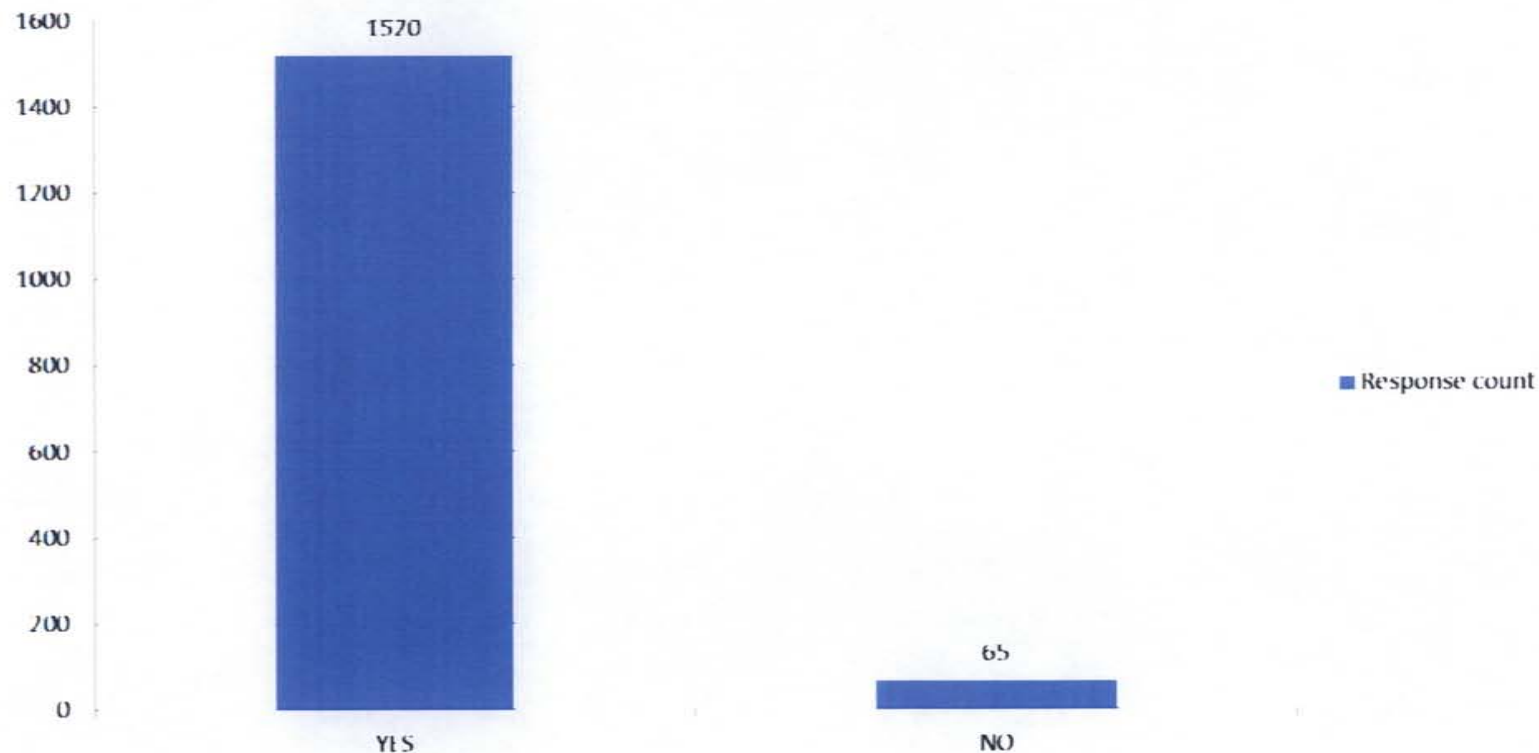
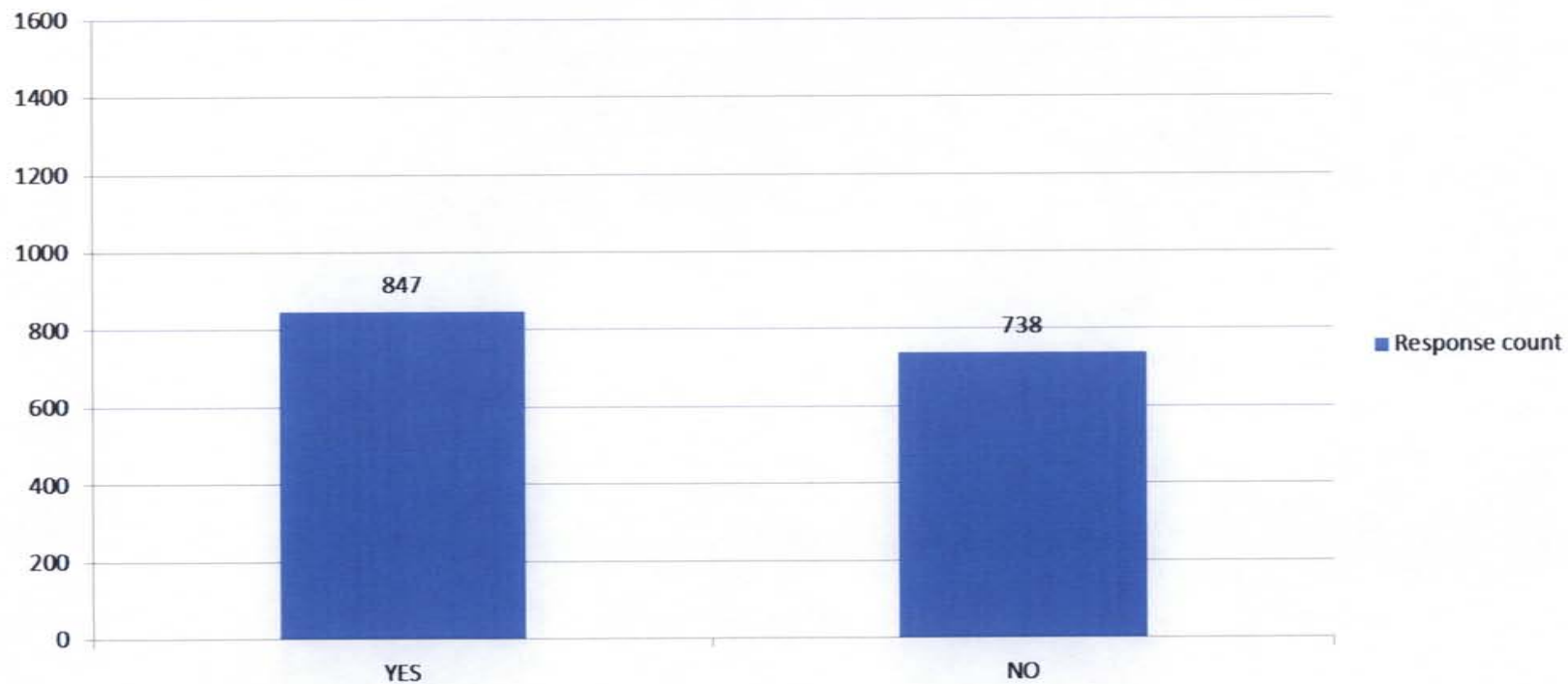


Diagram H6

## Question 6

- I would rather have Columbia Water and Light rates increased to the price necessary to construct the lines underground.



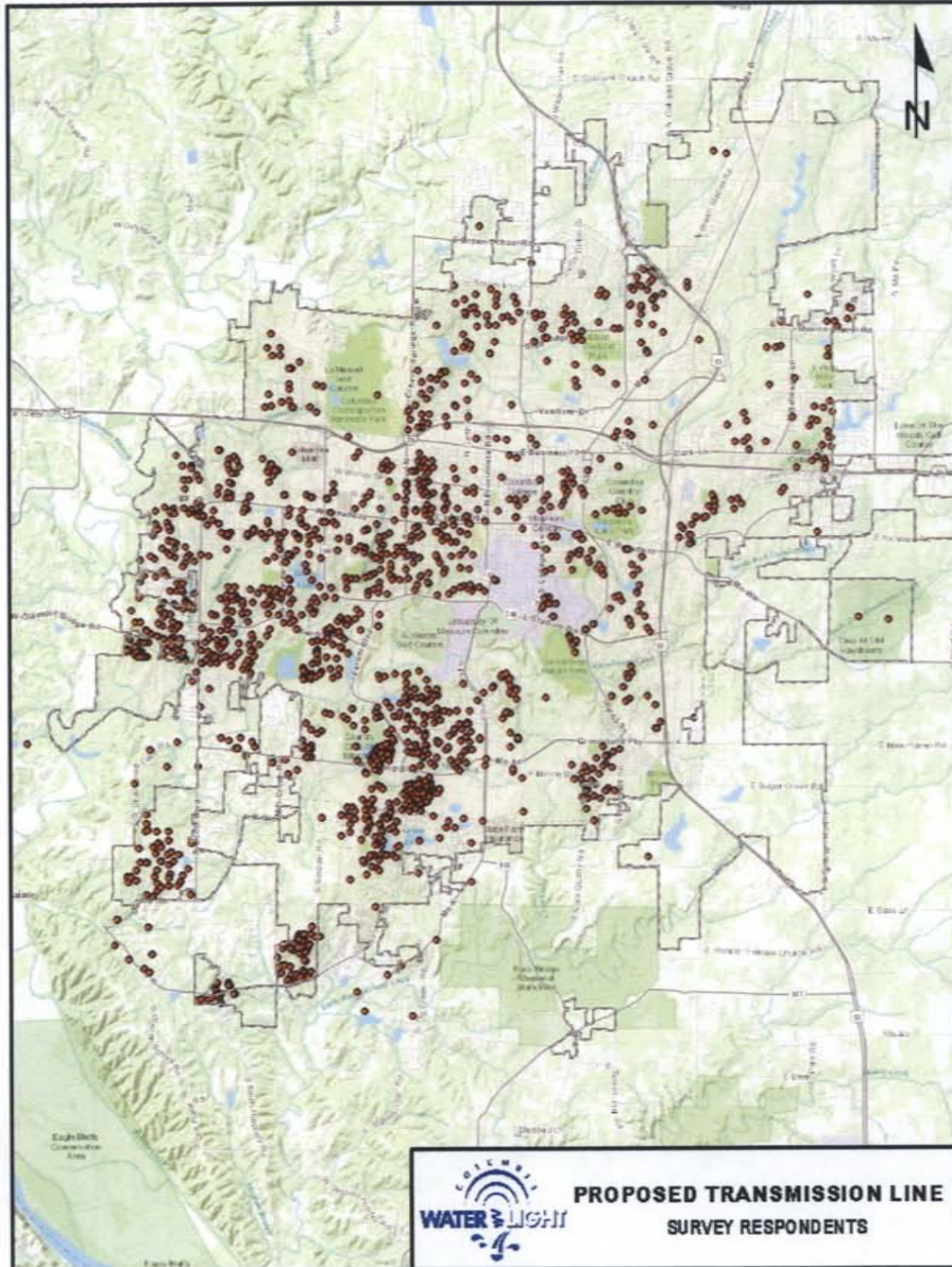


Diagram J

## Ward Breakout for Question 1

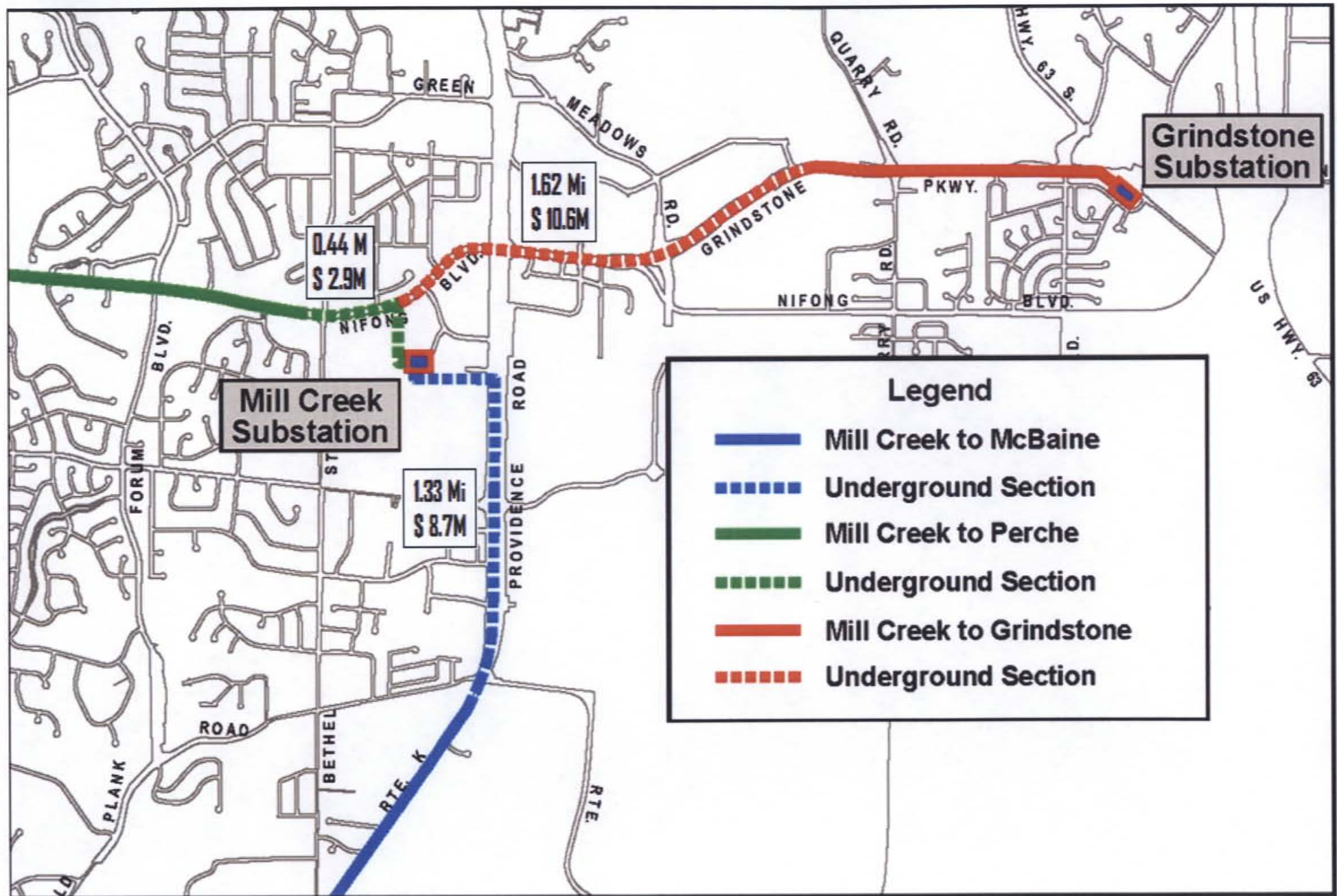
|                    | Option A | Option B | Option B-2 |
|--------------------|----------|----------|------------|
| Ward 1             | 89%      | 10%      | 1%         |
| Ward 2             | 77%      | 19%      | 4%         |
| Ward 3             | 83%      | 13%      | 3%         |
| Ward 4             | 85%      | 11%      | 4%         |
| Ward 5             | 59%      | 27%      | 14%        |
| Ward 6             | 87%      | 9%       | 4%         |
| Outside City Limit | 75%      | 17%      | 8%         |

## Ward Breakout for Question 6

|                    | Overhead Costs | Undergrounding Costs |
|--------------------|----------------|----------------------|
| Ward 1             | 54%            | 46%                  |
| Ward 2             | 55%            | 45%                  |
| Ward 3             | 55%            | 45%                  |
| Ward 4             | 47%            | 53%                  |
| Ward 5             | 38%            | 62%                  |
| Ward 6             | 49%            | 51%                  |
| Outside City Limit | 31%            | 69%                  |



### Diagram K



## **A RESOLUTION**

declaring the necessity for construction of a 161 kV transmission line to the Perche Creek substation and system transmission improvements; stating the nature of and the estimate of the cost of the improvement; providing for payment for the improvement; providing for compliance with the prevailing wage law; and setting a public hearing.

BE IT RESOLVED BY THE COUNCIL OF THE CITY OF COLUMBIA, MISSOURI, AS FOLLOWS:

SECTION 1. The City Council deems the construction of a 161 kV transmission line to the Perche Creek substation and system transmission improvements necessary to the welfare and improvement of the City. Possible options and the estimated costs are as follows:

Option A: This option serves power to the new proposed substation at the 161kV level with the new proposed substation acting as the common 161 kV terminal between the Perche Creek, Grindstone and McBaine substations. The 161 kV to 13.8 kV transformers would serve distribution load directly from the 161 kV transmission system. The estimated cost of the improvement is \$13 million for overhead electric distribution lines; \$92 million for underground electric distribution lines.

Option B: This option serves power to the new proposed substation at the 69 kV level with the new proposed substation inserted into the existing 69 kV sub-transmission ring between the Hinkson Creek and Grindstone substations. The 69 kV to 13.8 kV transformers would serve distribution load from the existing 69 kV sub-transmission system. This additional loading on the 69 kV would make it necessary to increase the size of conductors and construct new structures between the Grindstone and Perche Creek substations. Additionally, a 161 kV transmission line would be constructed along the western periphery of the city limits to provide a required redundant feed into the Perche Creek substation from the McBaine substation. The estimated cost of the improvement is \$10 million for overhead electric distribution lines; \$75 million for underground electric distribution lines.

Option B2: This option serves power to the new proposed substation at the 69 kV level with the new proposed substation inserted into the existing 69 kV sub-transmission ring between the Hinkson Creek and Grindstone substations. The 69 kV to 13.8 kV transformers would serve distribution load from the existing 69 kV sub-transmission system. This additional loading on the 69 kV would make it necessary to increase the size of conductors and construct new structures between

the Grindstone and Perche Creek substations. Additionally, a 161 kV transmission line would be constructed along the western periphery of the city limits to provide a required redundant feed into the Perche Creek substation from the McBaine substation. This option differs from Option B by pushing the 161 kV line connection between the Perche Creek and McBaine substations further west to cross City-owned property operated by City's Sewer Utility. Approximately 37% of this alignment could be constructed on City-owned property, although it is 22% longer than the alignment considered in Option B. The estimated cost of the improvement is \$12 million for overhead electric distribution lines; \$97 million for underground electric distribution lines.

SECTION 2. The nature and scope of the improvement shall consist of furnishing all labor, materials, transportation, insurance and all other items, accessories and incidentals thereto necessary for the complete construction of the improvements.

SECTION 3. Payment for this improvement shall be made from the future sale of Water and Electric Revenue Bonds and such other funds as may be lawfully appropriated.

SECTION 4. Any work done in connection with the construction of the improvement specified above shall be in compliance with the provisions of the prevailing wage laws of the State of Missouri.

SECTION 5. A public hearing in respect to this improvement will be held in the Council Chamber of the City Hall Building, 701 E. Broadway, Columbia, Missouri, at 7:00 p.m. on July 15, 2013. The City Clerk shall cause notice of this hearing to be published in a newspaper published in the City.

ADOPTED this \_\_\_\_\_ day of \_\_\_\_\_, 2013.

ATTEST:

\_\_\_\_\_  
City Clerk

\_\_\_\_\_  
Mayor and Presiding Officer

APPROVED AS TO FORM:

\_\_\_\_\_  
City Counselor