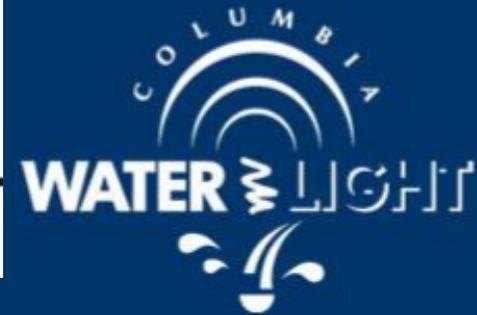
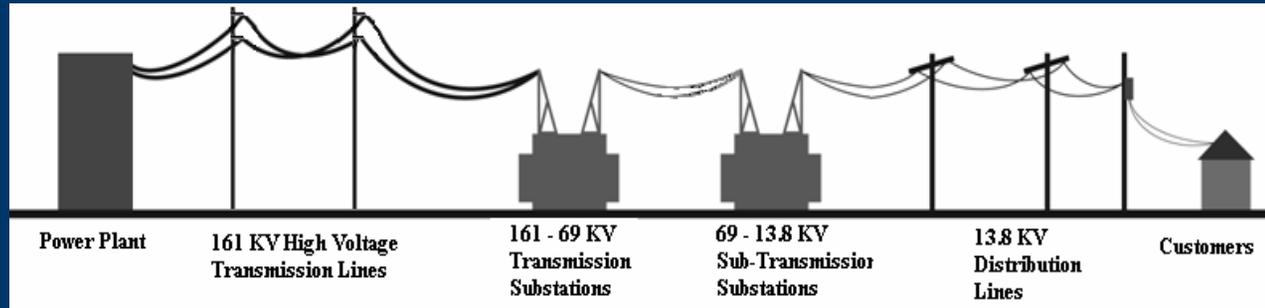


New South Substation & Transmission Lines
Public Hearing
July 15, 2013

New South Substation & Transmission Lines Public Hearing



- System
- History
- Current Problem
- Current Options and Process
- Community Feedback
- Staff Recommendation
 - Options and Cost



System

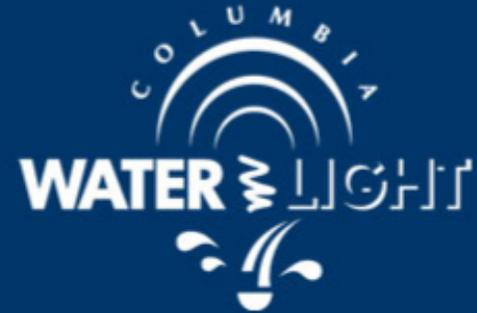
Transmission System: 161 kV power lines

- Columbia's Power Import Lines
- Federal, NERC, Standards for Transmission

Sub-Transmission System: 69 kV power lines

- Operate Under Federal Reliability Guidelines
- Transmission Connection for Other Load Serving Utilities
 - City of Fulton
 - University of Missouri

History

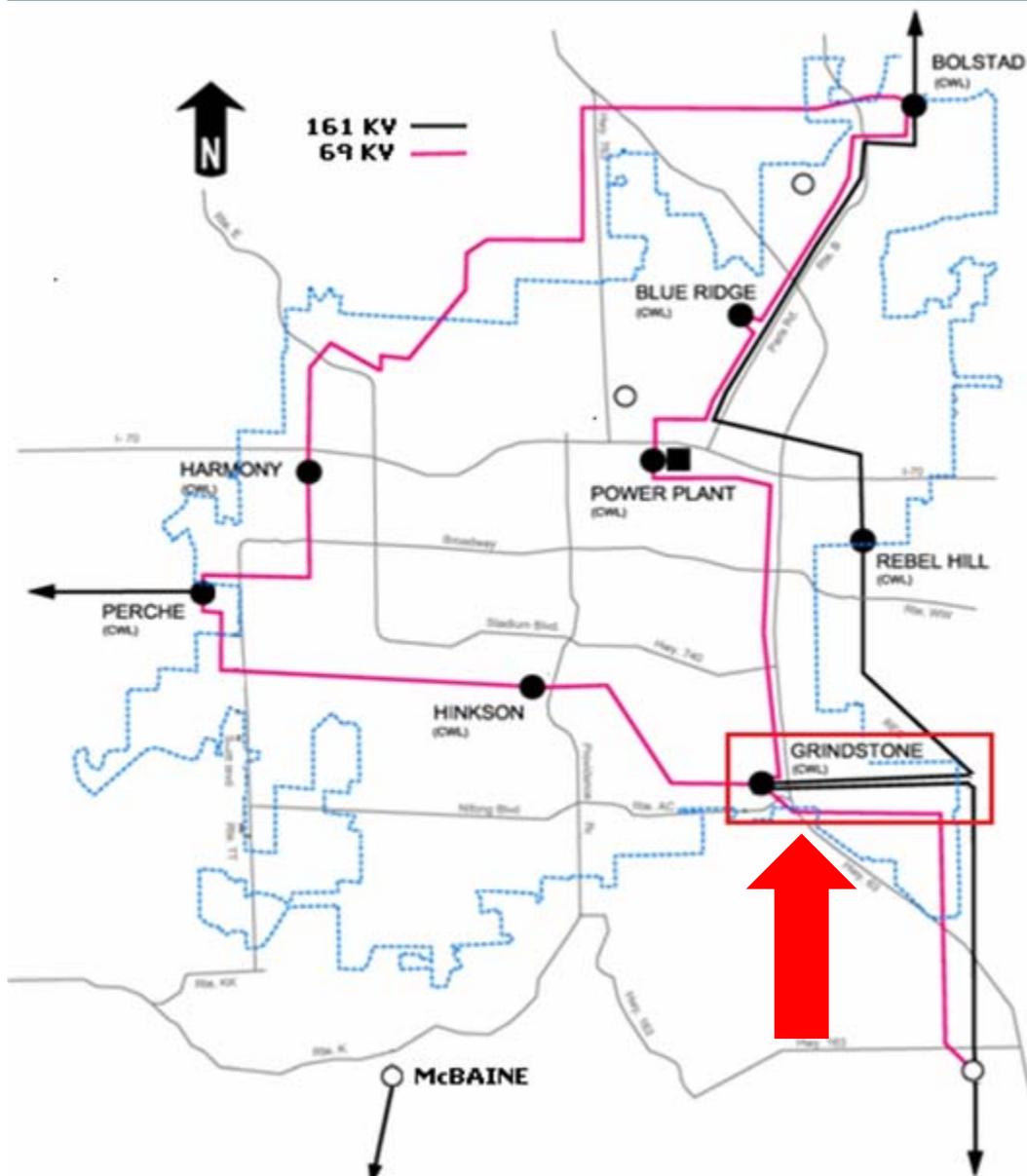
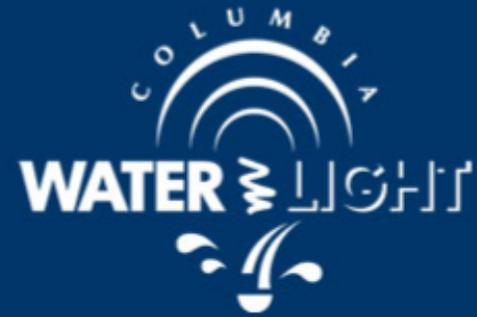


System Transmission Planning

Transmission planning identified contingencies that could result in the overloading of lines on the southern side of Columbia's 69 kV system. The following system improvements were identified:

1. 161 kV Transmission Line into Grindstone
2. 161 kV Transmission Line into Perche Creek
3. Substation addition in the southern part of our service territory

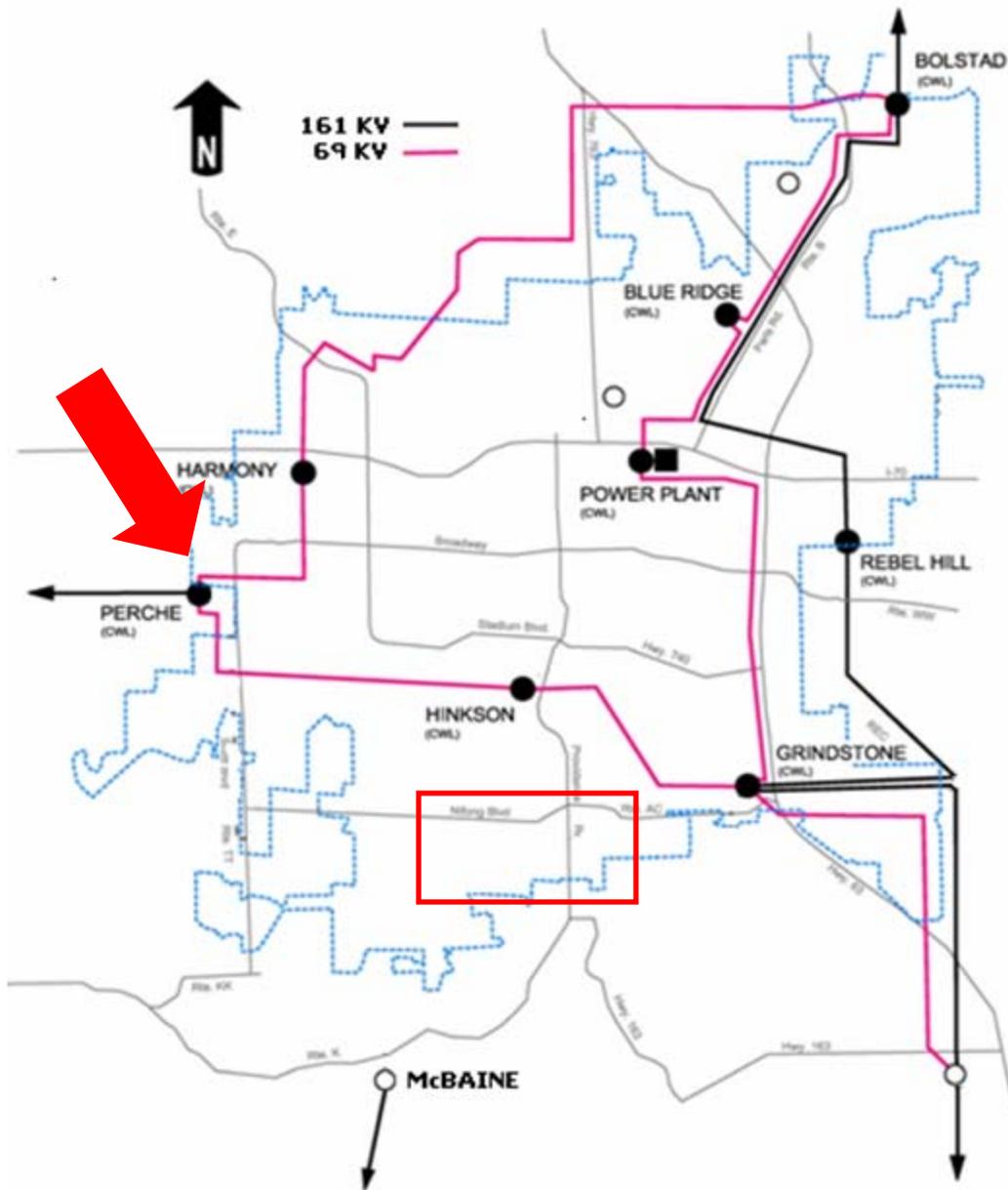
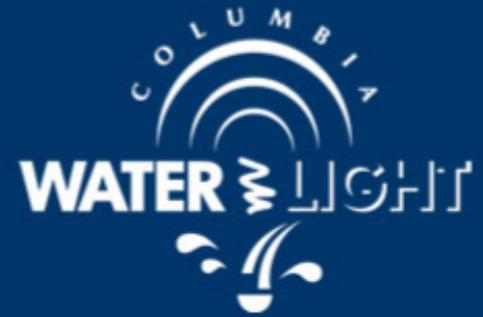
History



System Improvement #1

- 161 kV Transmission Line into Grindstone
- Sectionalization of the Rebel Hill to Boone 161 kV Line
- Eliminates the impact Columbia's Transmission Problem on Neighboring Utilities
- Completed 2007

History



System Improvements

#2 & #3

2. 161 kV Transmission Line into Perche Creek
3. Substation in Southern part of Electric Service Territory



Substation
Location

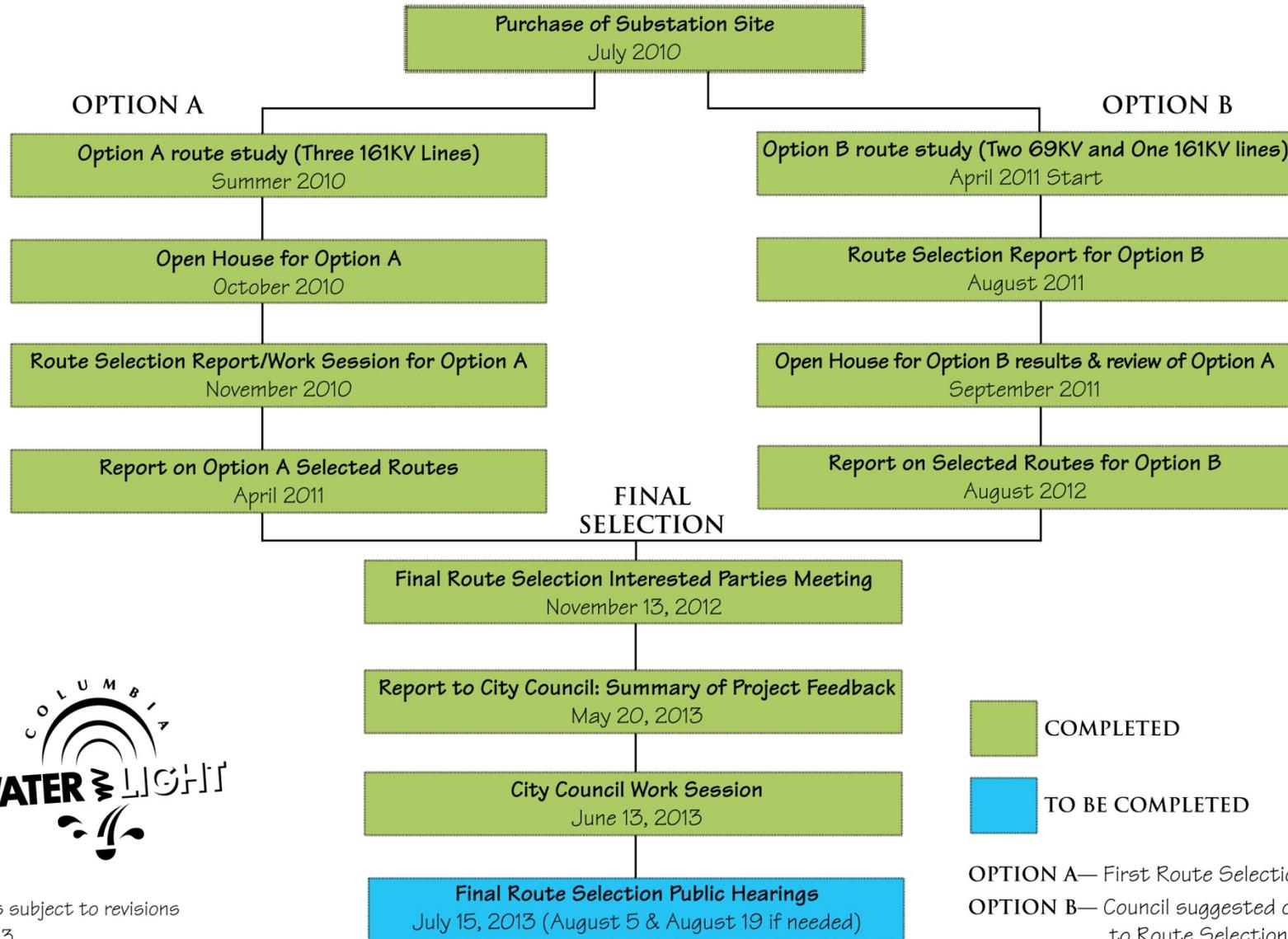


Mill Creek Substation
Location Map

DIAGRAM B

COLUMBIA WATER & LIGHT

Mill Creek substation and electric transmission line project time line

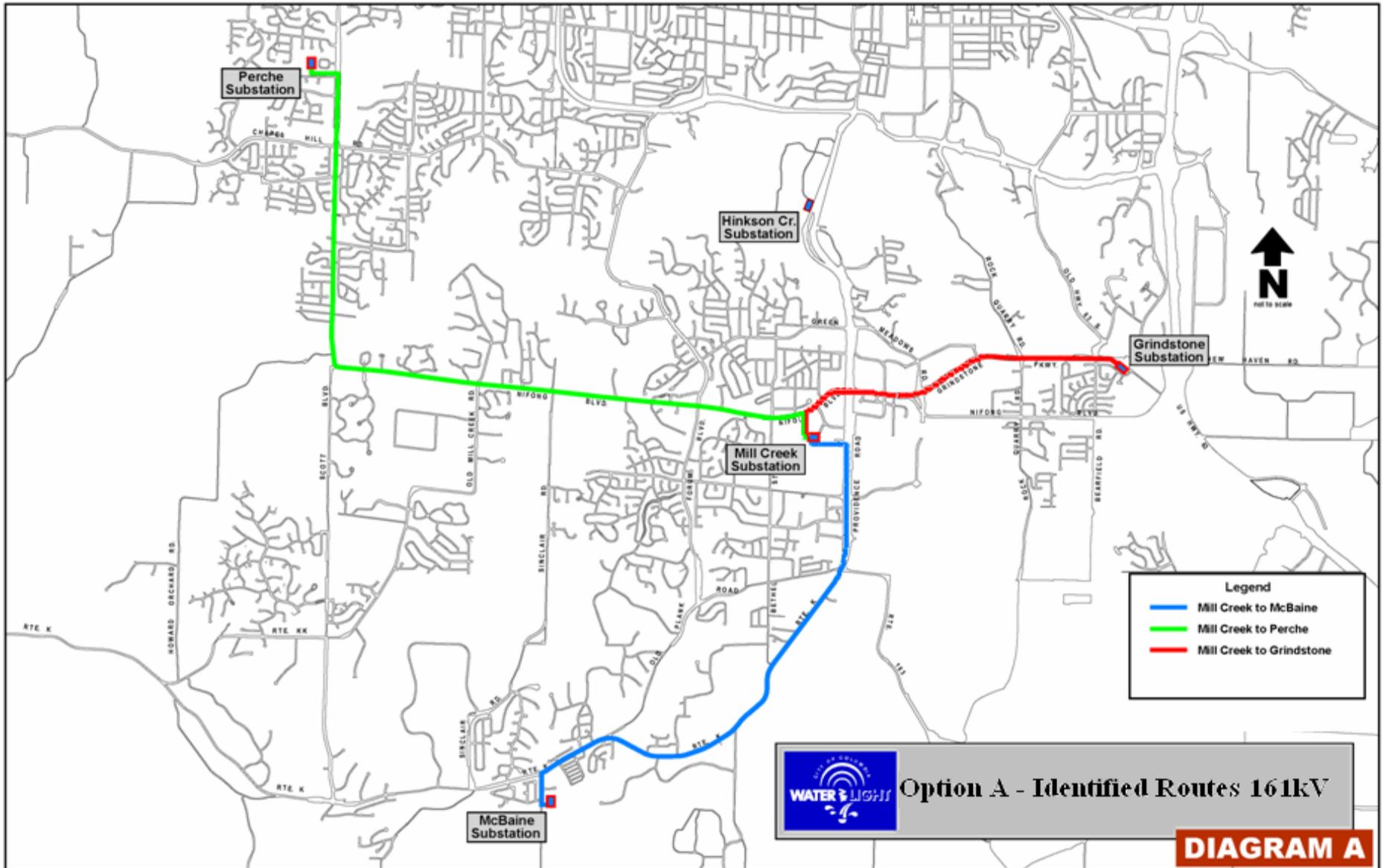


Timeline is subject to revisions
JUNE 2013

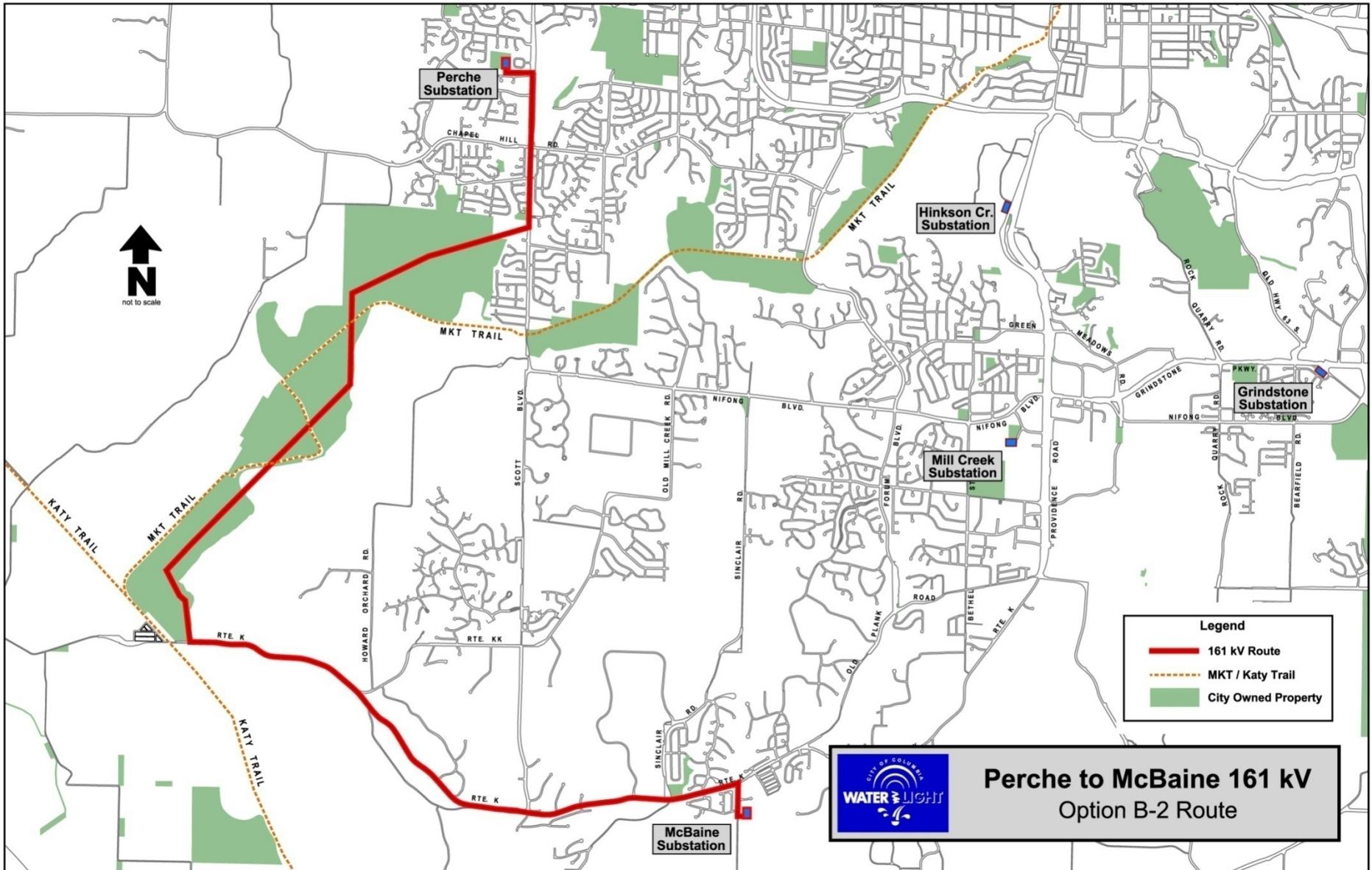
COMPLETED
 TO BE COMPLETED

OPTION A— First Route Selection Study
 OPTION B— Council suggested changes to Route Selection Study

Option A

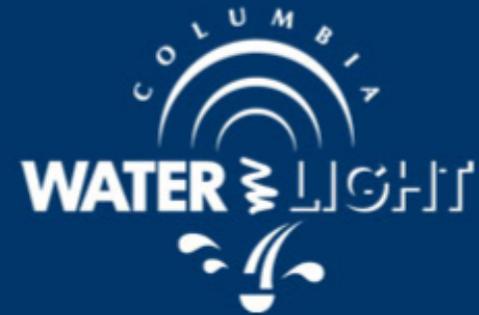


Option B-2



Perche to McBaine 161 kV
Option B-2 Route

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)

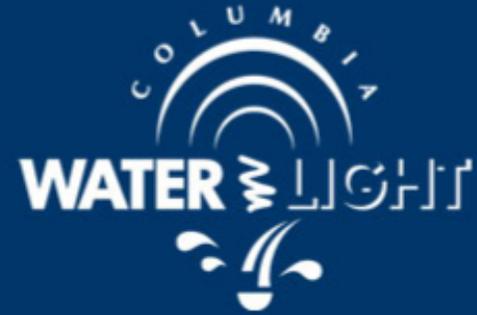
- I understand why this project is necessary for the long-term reliability and load-serving capabilities of the Columbia Water & Light.
- I do not understand why this project is necessary for the long-term reliability and load-serving capabilities of the Columbia Water & Light.

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! _____

Estimated Costs & Potential Rate Impacts

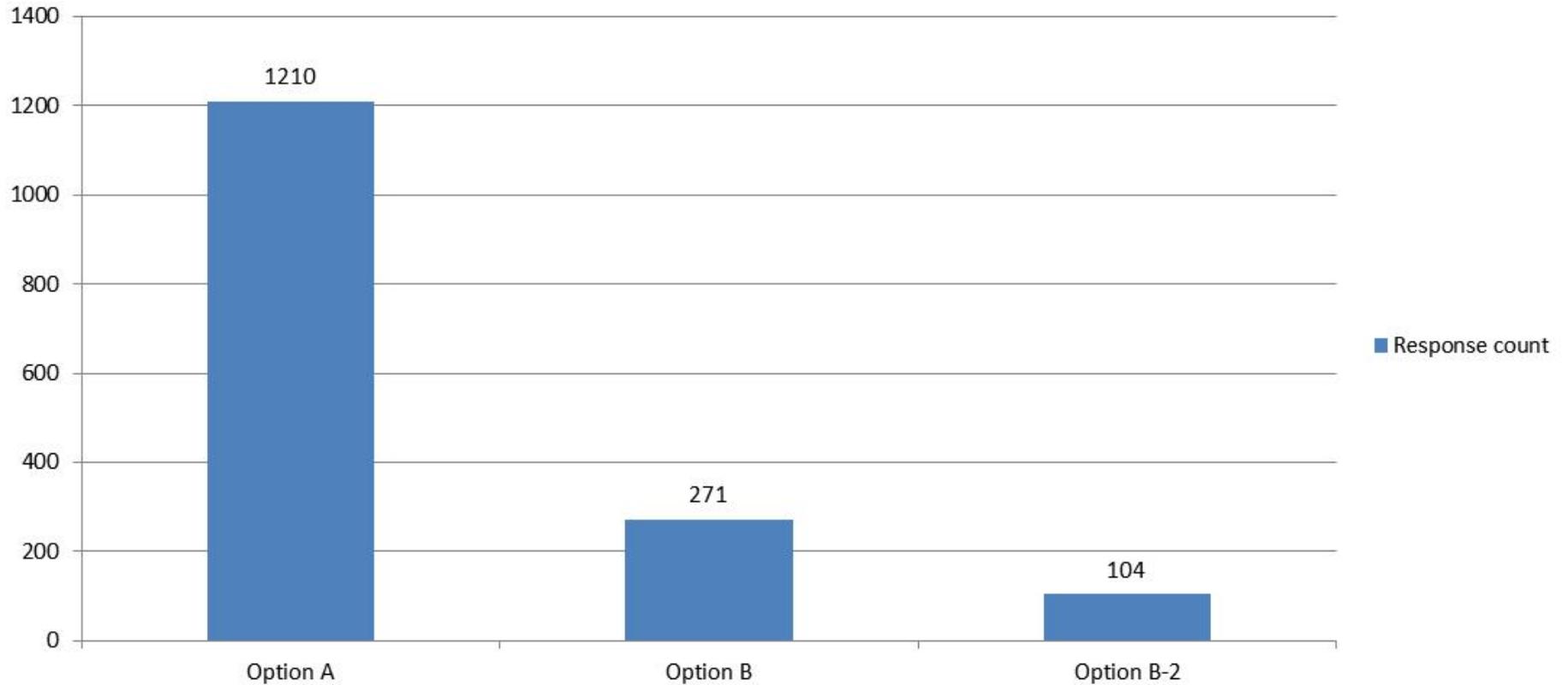


	Option A	Option B	Option B-2
Estimated years before more improvements	20 +	10 to 20	10 to 20
Miles of 161 kilovolt lines	12.07	6.99	9.84
Miles of 69 kilovolt lines	0	2.97	2.97
Total overhead construction cost	\$13,135,117	\$10,151,122	\$12,229,788
Total underground construction cost	\$91,898,566	\$75,833,448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

Note: Easement costs could add 6% to 10% to the costs listed in the table.

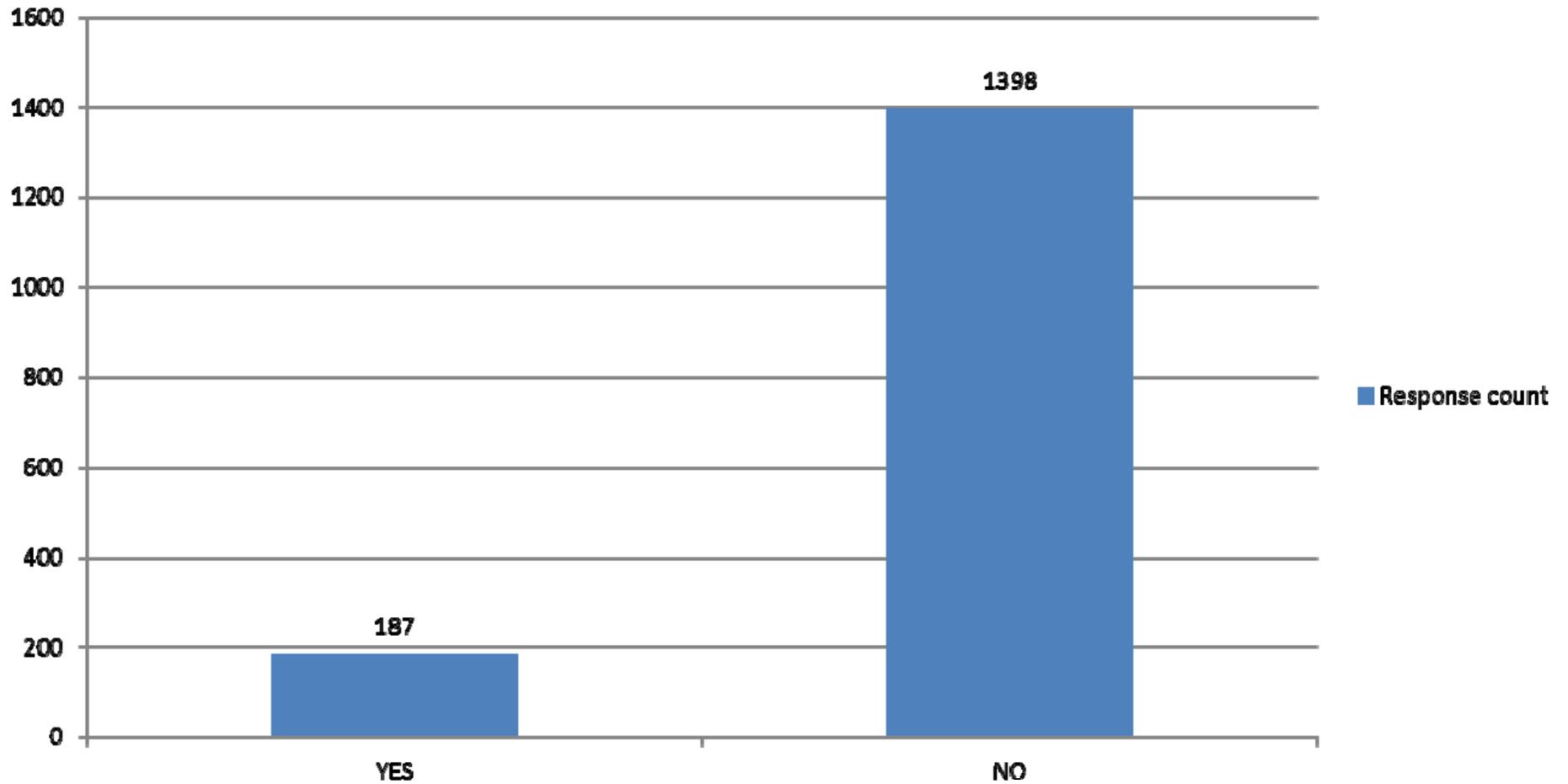
Question 1

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



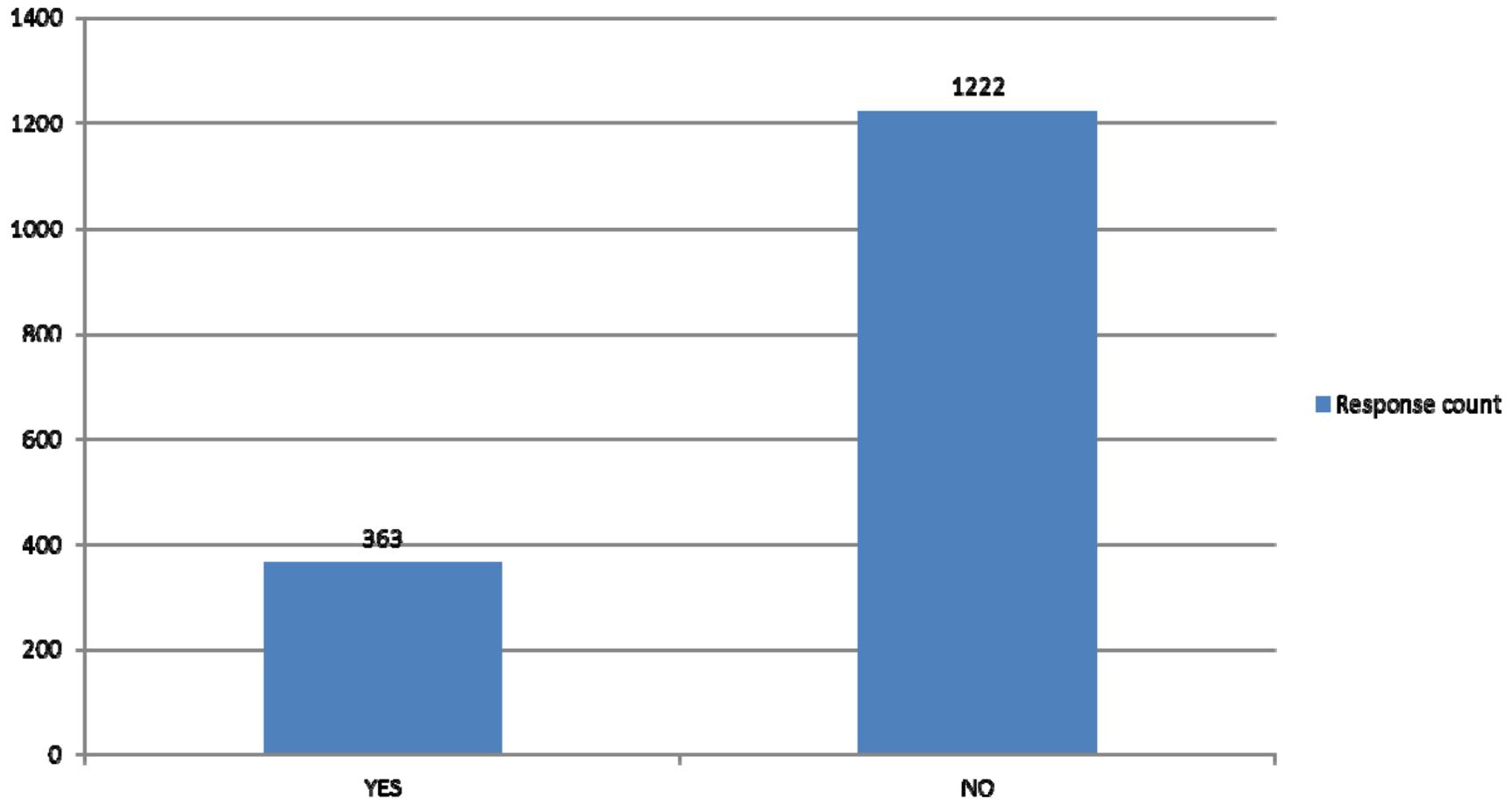
Question 2

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?



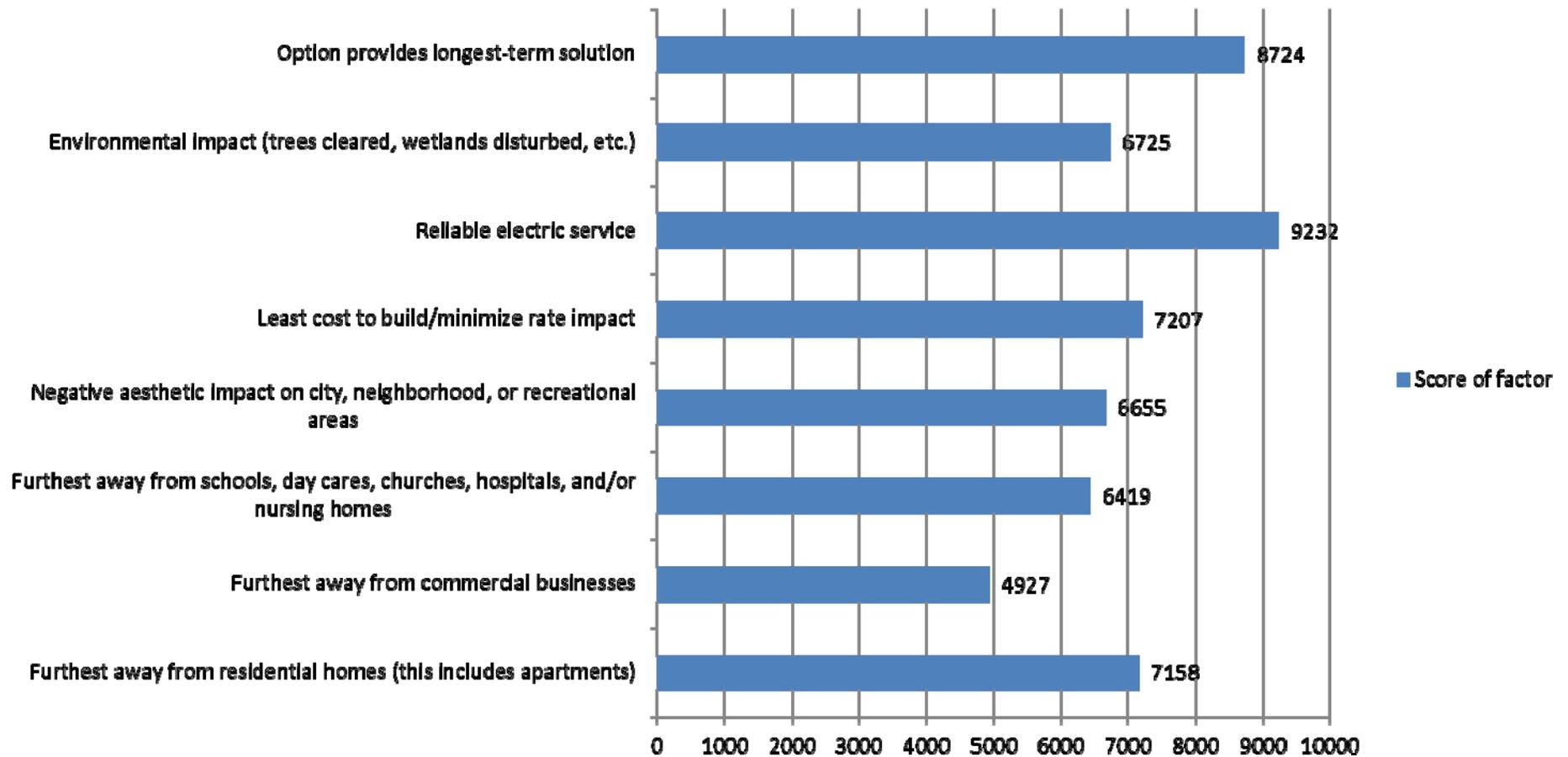
Question 3

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?



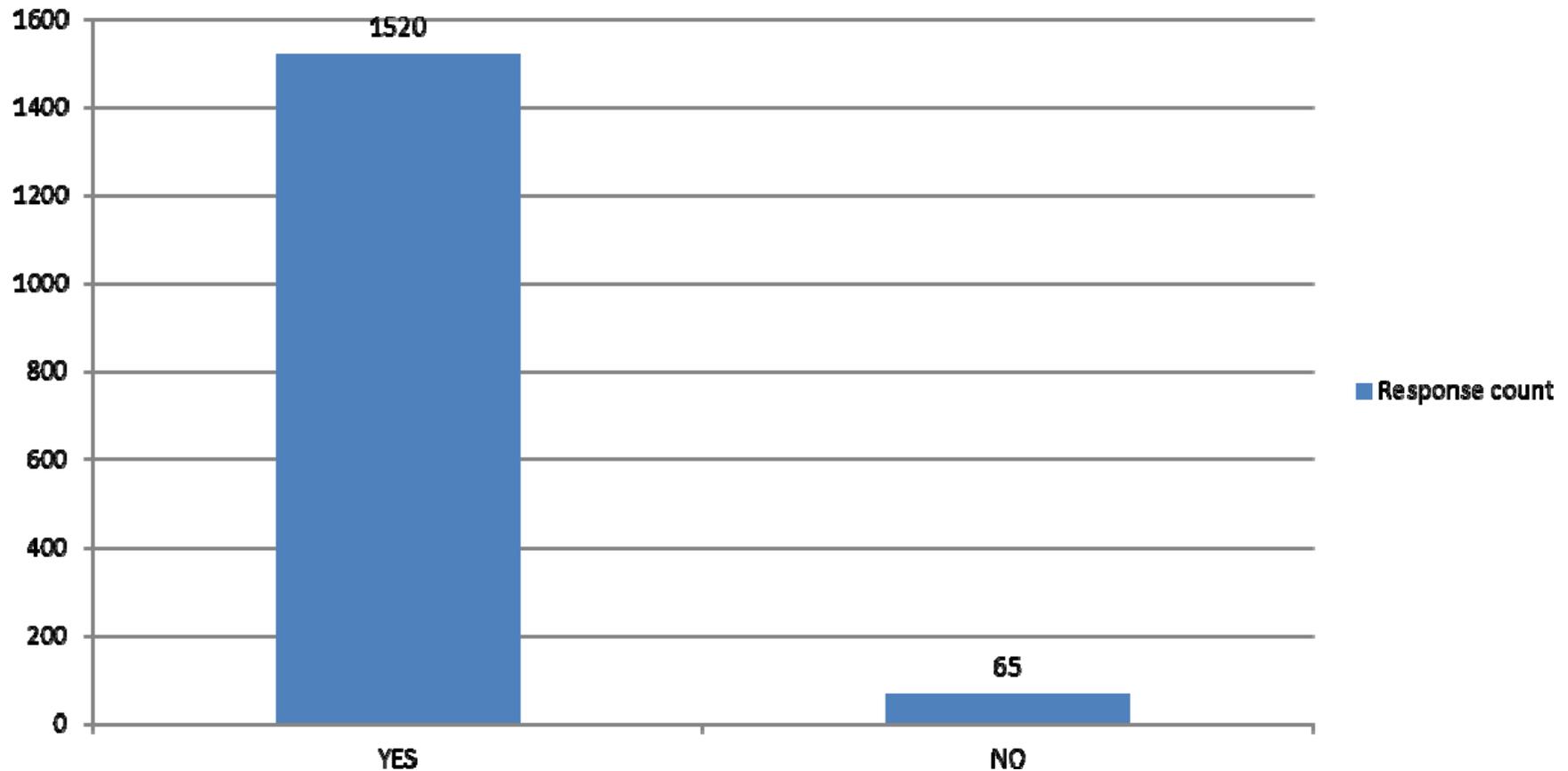
Question 4

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)



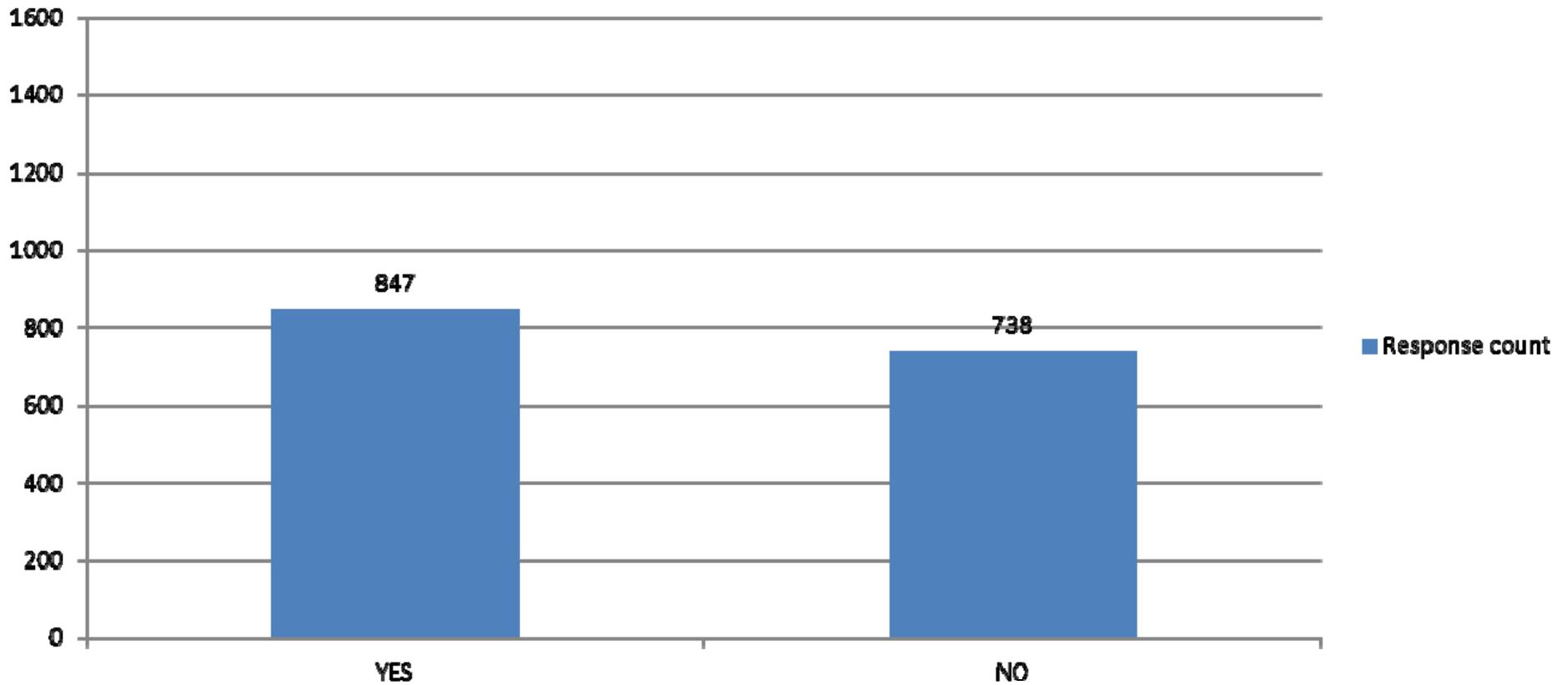
Question 5

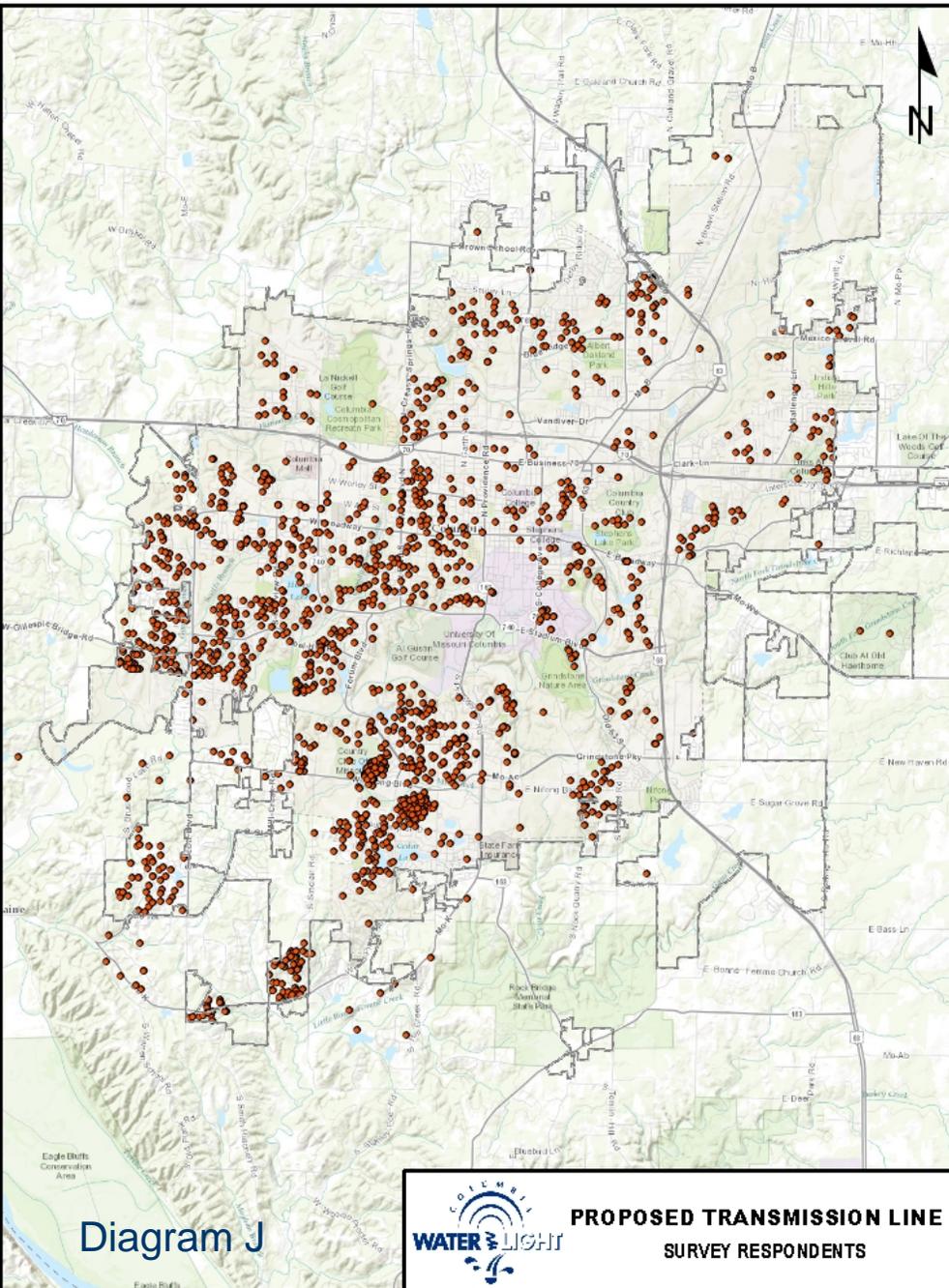
I understand why this project is necessary for the long-term reliability and load-serving capabilities of the City of Columbia Water & Light utility.



Question 6

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



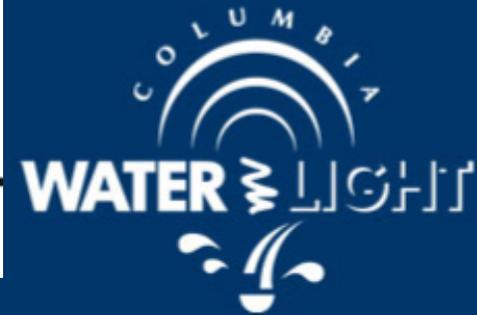
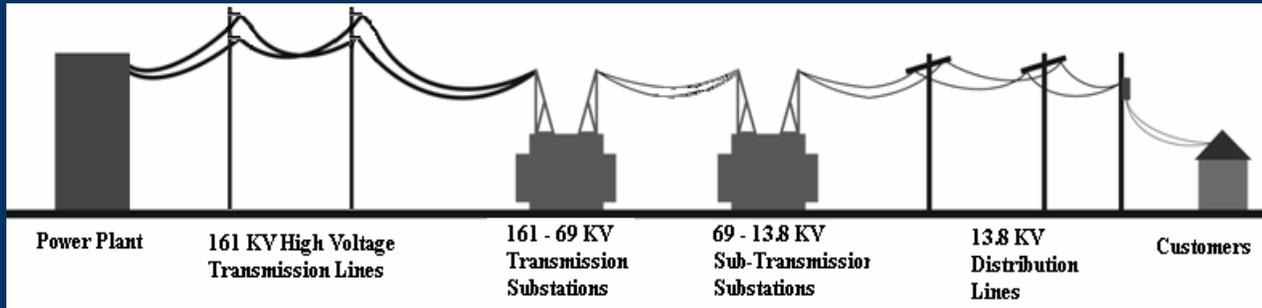


Results by Ward: Question 1

	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%

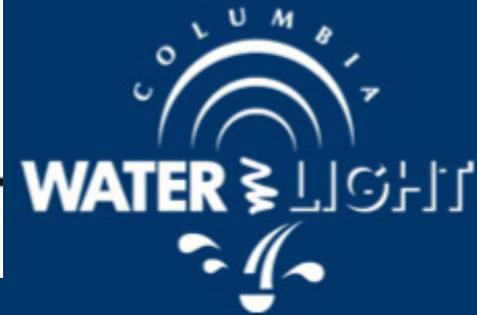
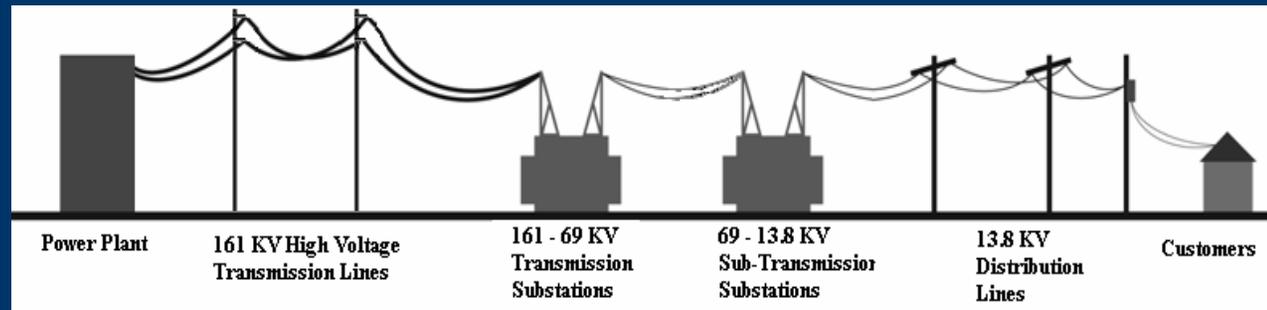
Results by Ward: Question 6

	Overhead Costs	Underground 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%



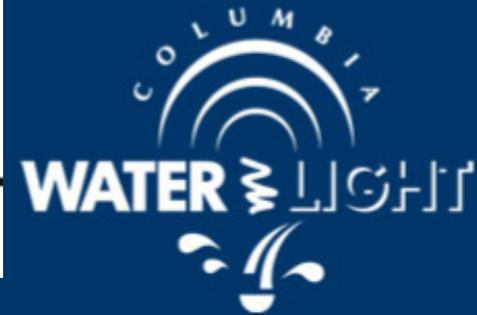
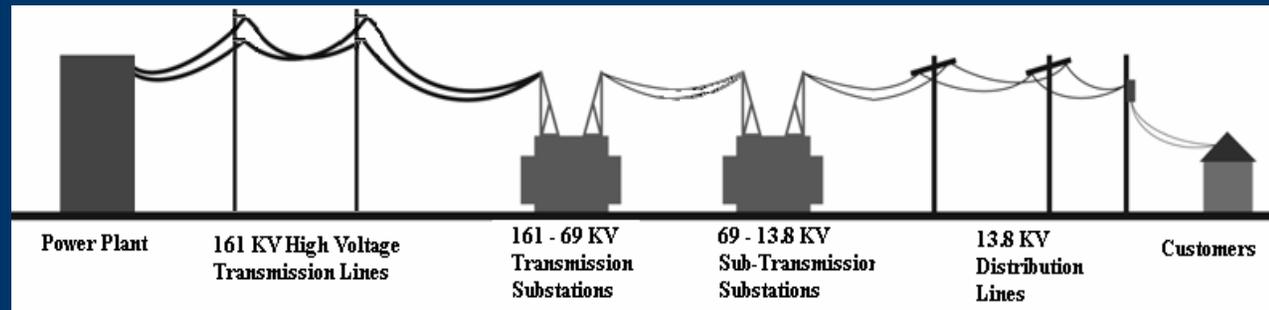
Public's Rank of Importance

1) Reliable electric service	16.2%
2) Option provides longest-term solution	15.3%
3) Least cost to build/minimize rate impact	12.6%
4) Proximity to residential homes (this includes apartments)	12.5%
5) Environmental impact	11.8%
6) Negative aesthetic impacts	11.7%
7) Proximity to schools, day cares, churches, hospitals, nursing homes	11.3%
8) Proximity to commercial businesses	8.6%



Results of the Decision Matrix Analyzing Community Impacts vs. Benefits

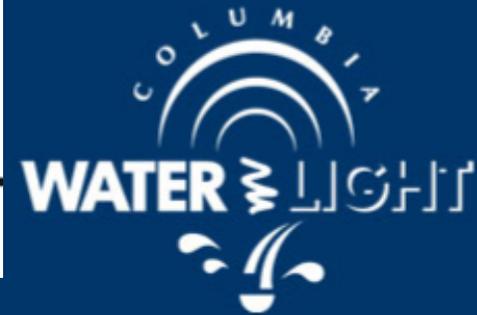
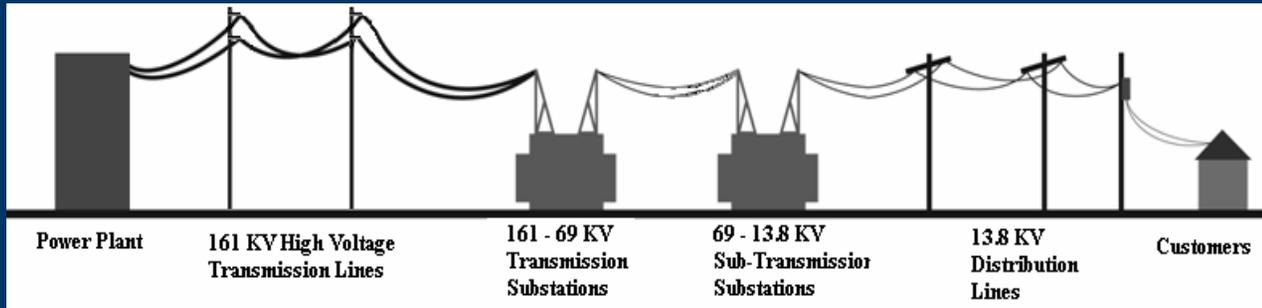
- Option A: -36,341
- Option B: -35,739
- Option B-2: -35,528



Public Opinion Survey

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

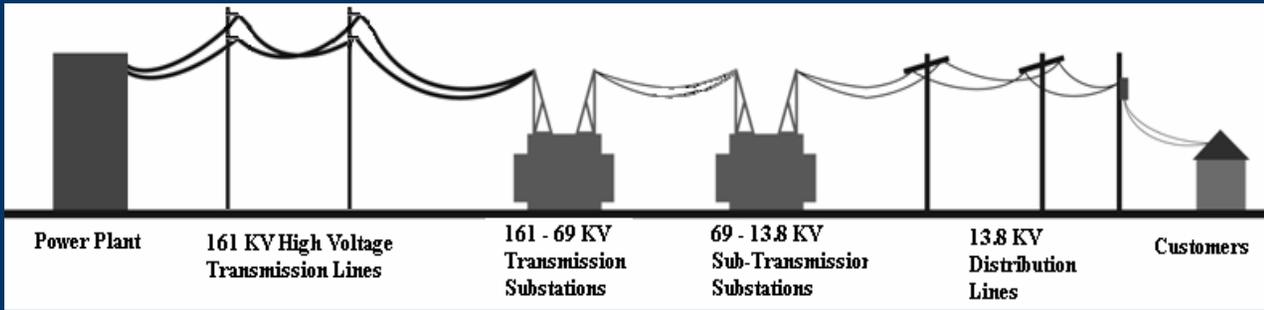
- Option A: 76%
- Option B: 17%
- Option B-2: 7%



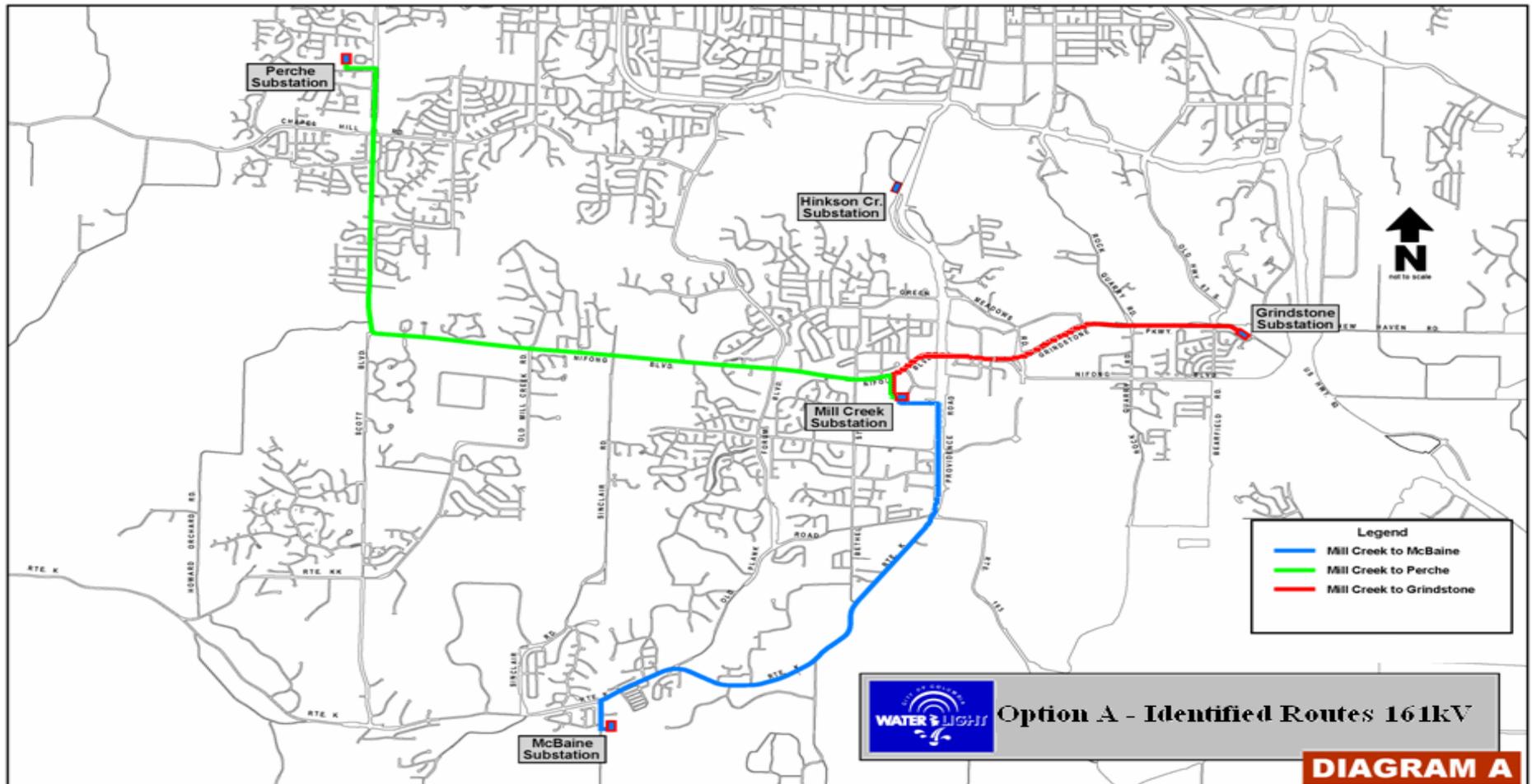
Staff Recommendation

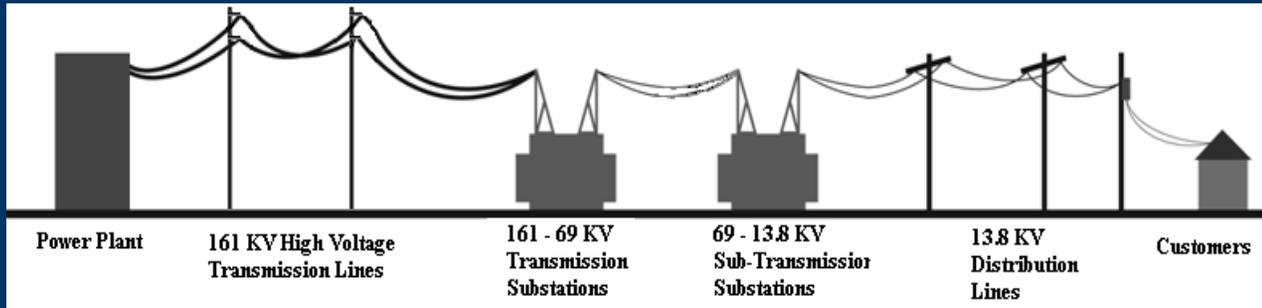
Staff Recommendation: Factors of Importance

- Public Rank of Importance Survey
- Community Impact Matrix
- Public's Preferred Option
- Engineering/Utility Analysis



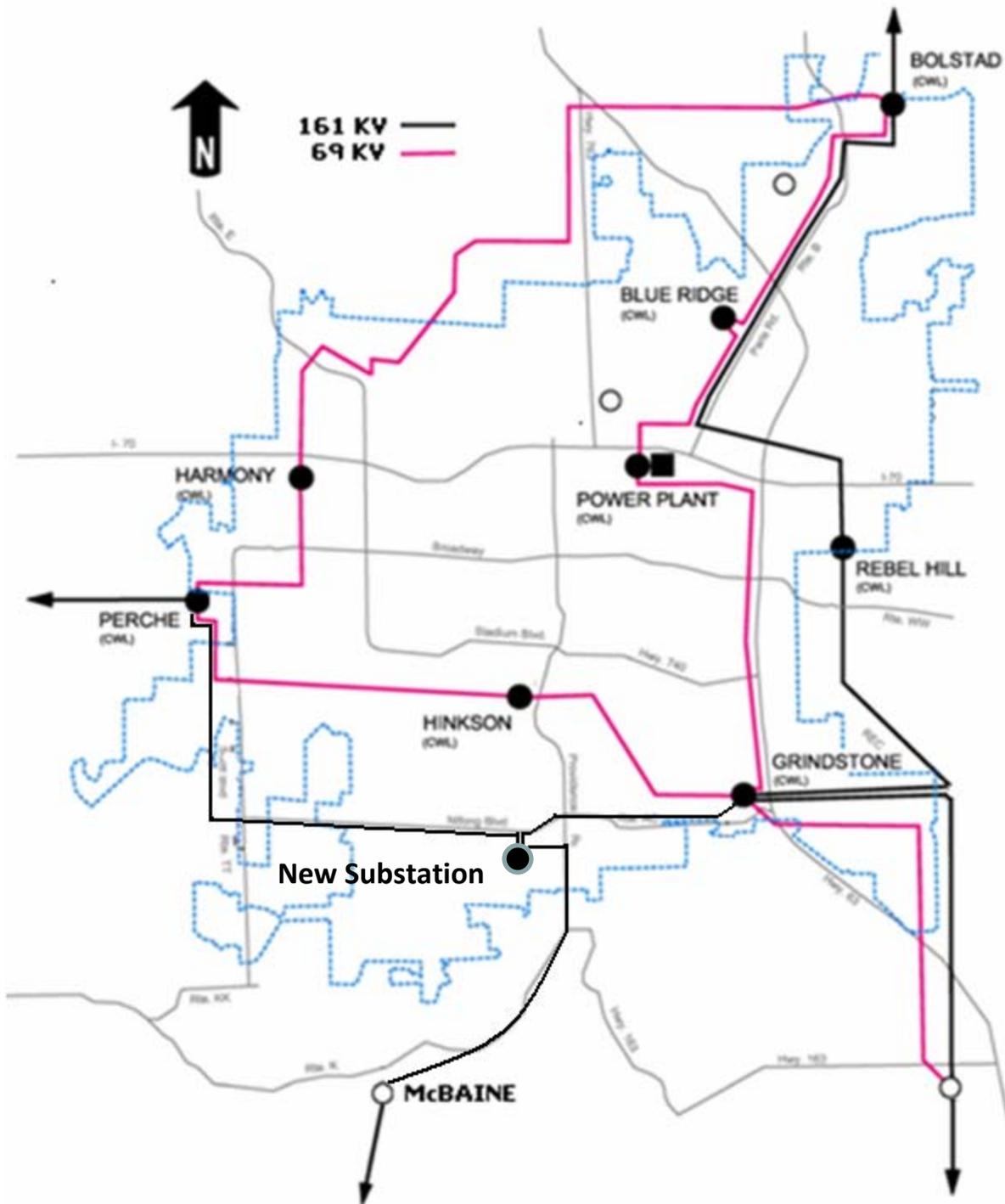
Staff Recommendation: Option A



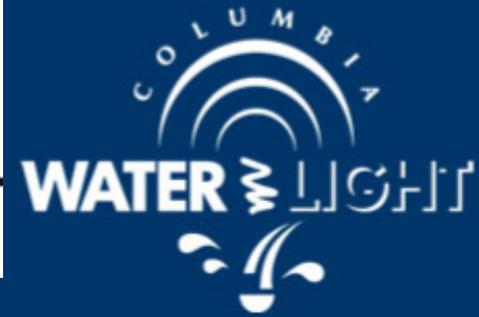
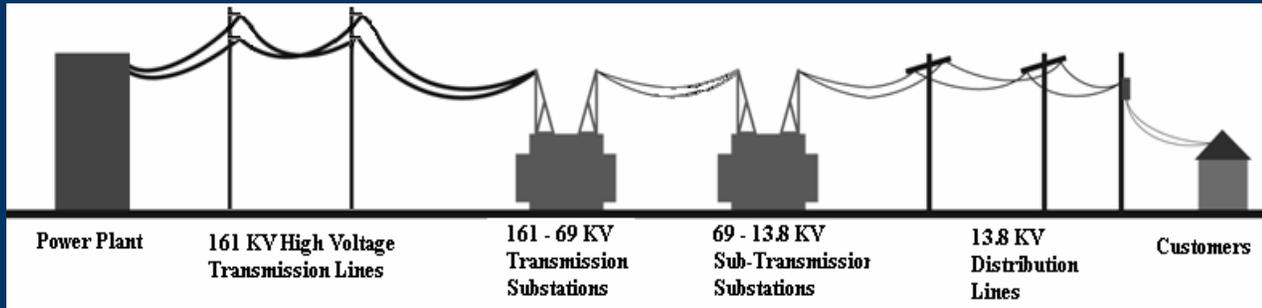


Staff Recommendation of Option A Summary

- Transfers load to the 161 kV system and preserves current 69 kV capacity
- 161 kV option has more power transmission capacity
- Does not require rebuild of existing 69kV system
- Provides connections between 3 different import substations
- Public Survey shows 76% preference for Option A
- Boone County Commission Endorsed Option A (Letter dated January 25, 2013)
- Water & Light Advisory Board Endorsed Option A without Underground Option (June 12, 2013)

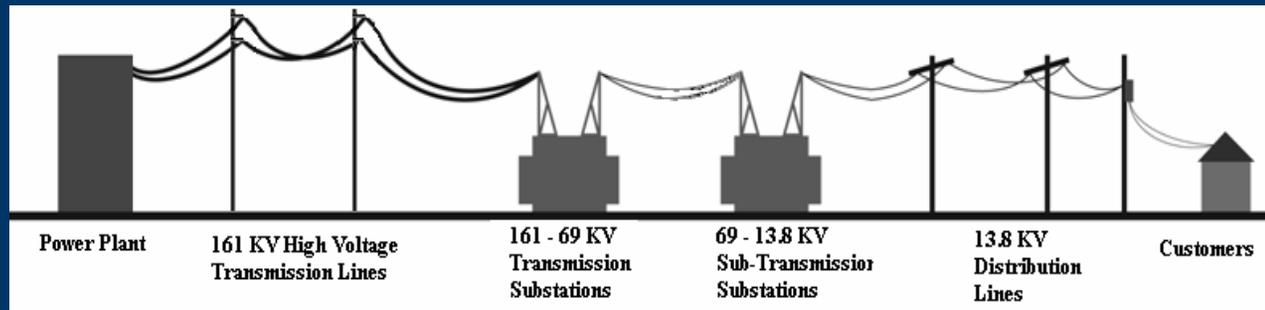


Staff
 Recommendation
 of Option A



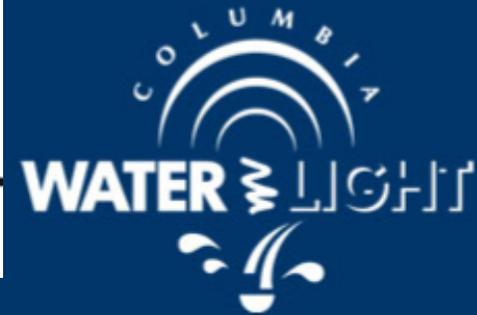
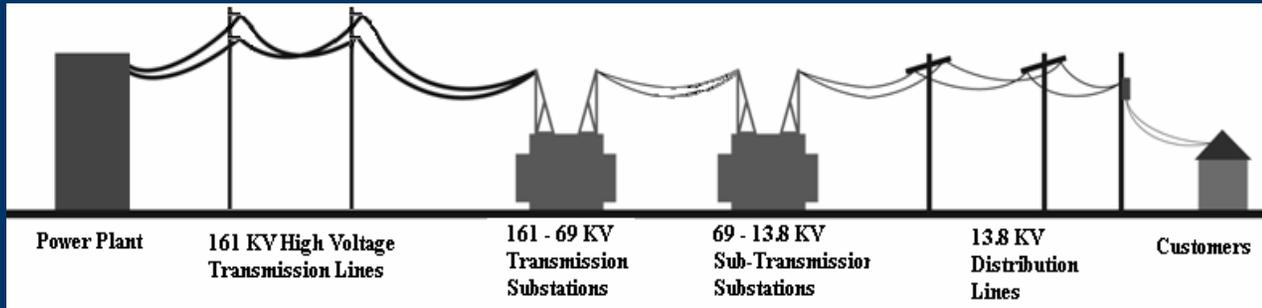
Underground Items to Consider

- Distribution Lines along the Transmission Route
- Transmission Construction Costs
 - Estimated Cost Overhead Construction \$1.1 Million/Mile
 - Estimated Cost Underground Construction \$7.6 Million/Mile
 - Estimated Cost Per Riser Pole: \$150,000 (Riser pole is the transition from underground to overhead)
 - Exit the New Substation Underground and Make One Transition to Overhead on Each of the Three Segments



Underground Items to Consider

- Information on maintenance and repair is scarce.
- “Report of the Joint Legislative Audit and Review Commission To the Governor and The General Assembly of Virginia” in 2006 stated between 0.5% and 0.6% of lines above 69 kV were underground in the US.
- Dominion estimated that annual maintenance costs per mile for underground lines is \$3,616 vs \$2,009 for overhead.
- Dominion reported lifespan for XLPE cable is 40 years vs 70 years for overhead at a replacement cost of \$2.6M per mile.
- All in cost multipliers from utilities that reported maintenance and replacement costs for underground lines were from 7.2 to 7.6.
- Failures on underground lines can last from 1 to 3 weeks to repair.



Steps from Here

1. Council Direction on:
 - A, B or B-2 line routing option
 - Undergrounding to consider in the Route Design
2. Staff to Proceed with Detailed Line Design
3. After Detailed Line Design return to Council with:
 - Final Line Design
 - Easement Acquisitions
 - Detailed Construction Cost Estimates
 - Detailed Construction Time Line
 - Proposed Funding Plan



Columbia Water & Light - Transmission Powerline Timeline

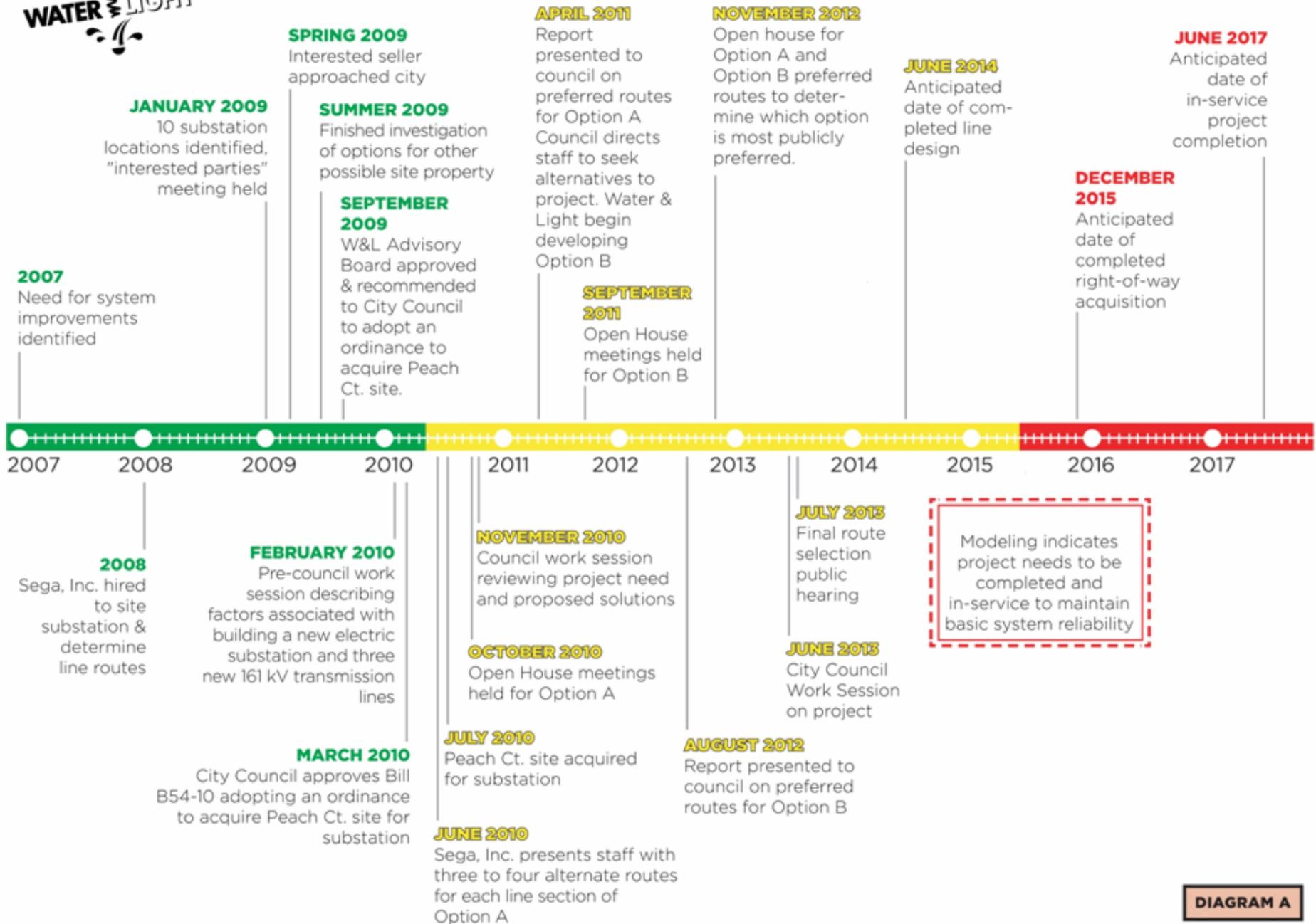


DIAGRAM A