



## Mill Creek Substation & Transmission Lines

Open House # 3  
November 13, 2012

# Introductions



- City of Columbia
  - Ryan Williams, P.E., Assistant Director, Water & Light
  - David Storvick, P.E., Engineering Manager, Water & Light
  - Adam Schuttler, Transmission & Planning Engineer, Water & Light
  - Connie Kacprowicz, Utility Services Specialist, Water & Light
  - James Rowden, Water & Light Staff
- Sega, Inc.
  - John Clayton, P.E., Power Delivery Manager
  - Steve Rodick, P.E., Transmission Line Consultant



# Housekeeping Items

- This is an Interested Parties meeting not a Public Hearing
  - Required by Chapter 22 of the City’s Code of Ordinances
  - Opportunity for Water and Light Staff to share information about this project and to receive comments and suggestions.
- Official comments will be documented by one of the following:
  - Online form: <http://tinyurl.com/columbiaelectric>
  - Comment form
  - E-mail: [wmail@GoColumbiaMo.com](mailto:wmail@GoColumbiaMo.com)
  - Written Letters: Columbia Water & Light, transmission line project, PO Box 6015, Columbia, MO, 65205
- Project Updates
  - [https://www.gocolumbiamo.com/Web\\_Mail/](https://www.gocolumbiamo.com/Web_Mail/)
  - <https://www.gocolumbiamo.com/WaterandLight/Electric/ProposedElectricTransmission.php>

# Outline

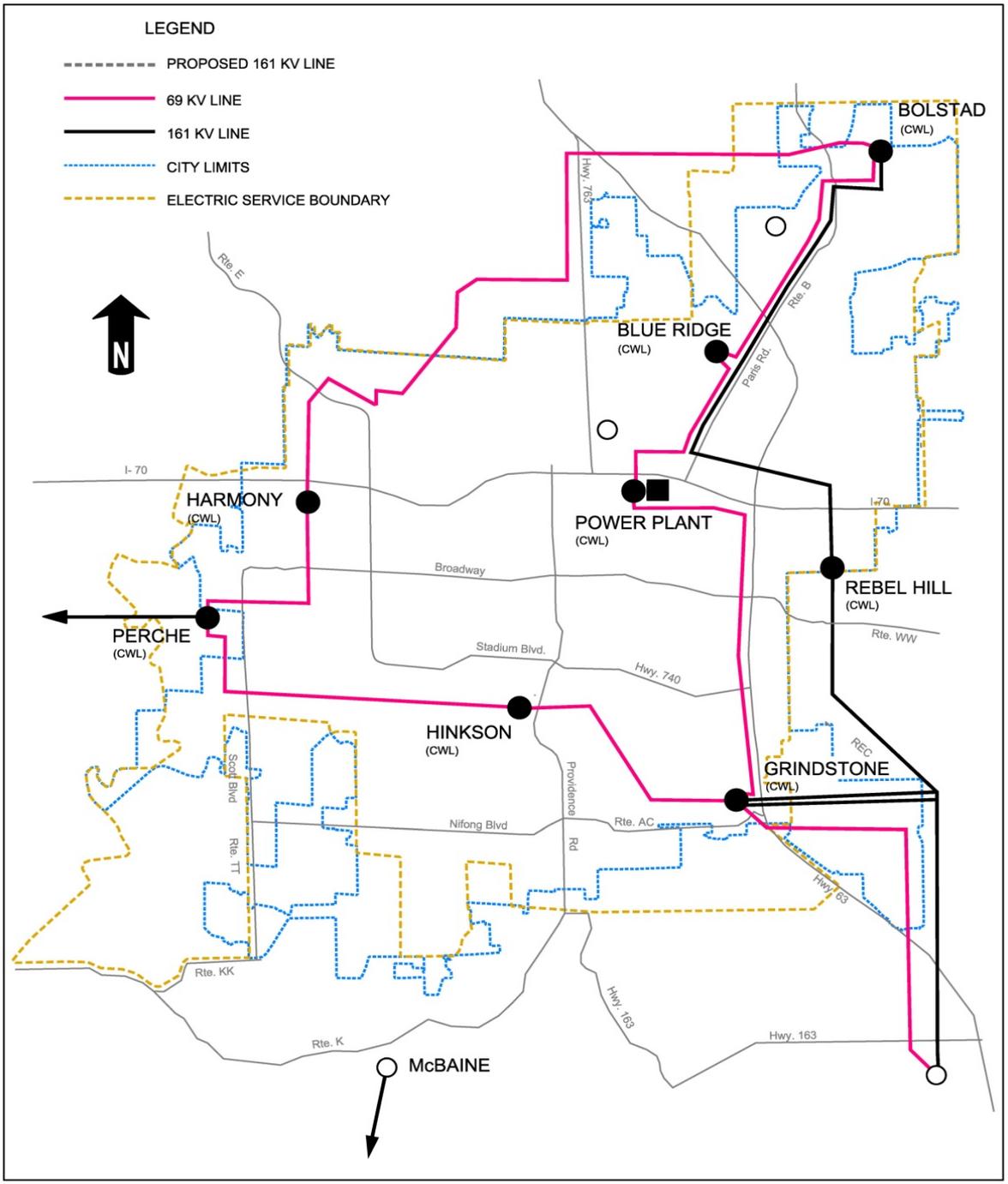
- Open House 6:00 – 7:00
- Presentation 7:00 – 7:30
- Question & Answer 7:30 – 8:00
- Open House 8:00 – 9:00



# Background



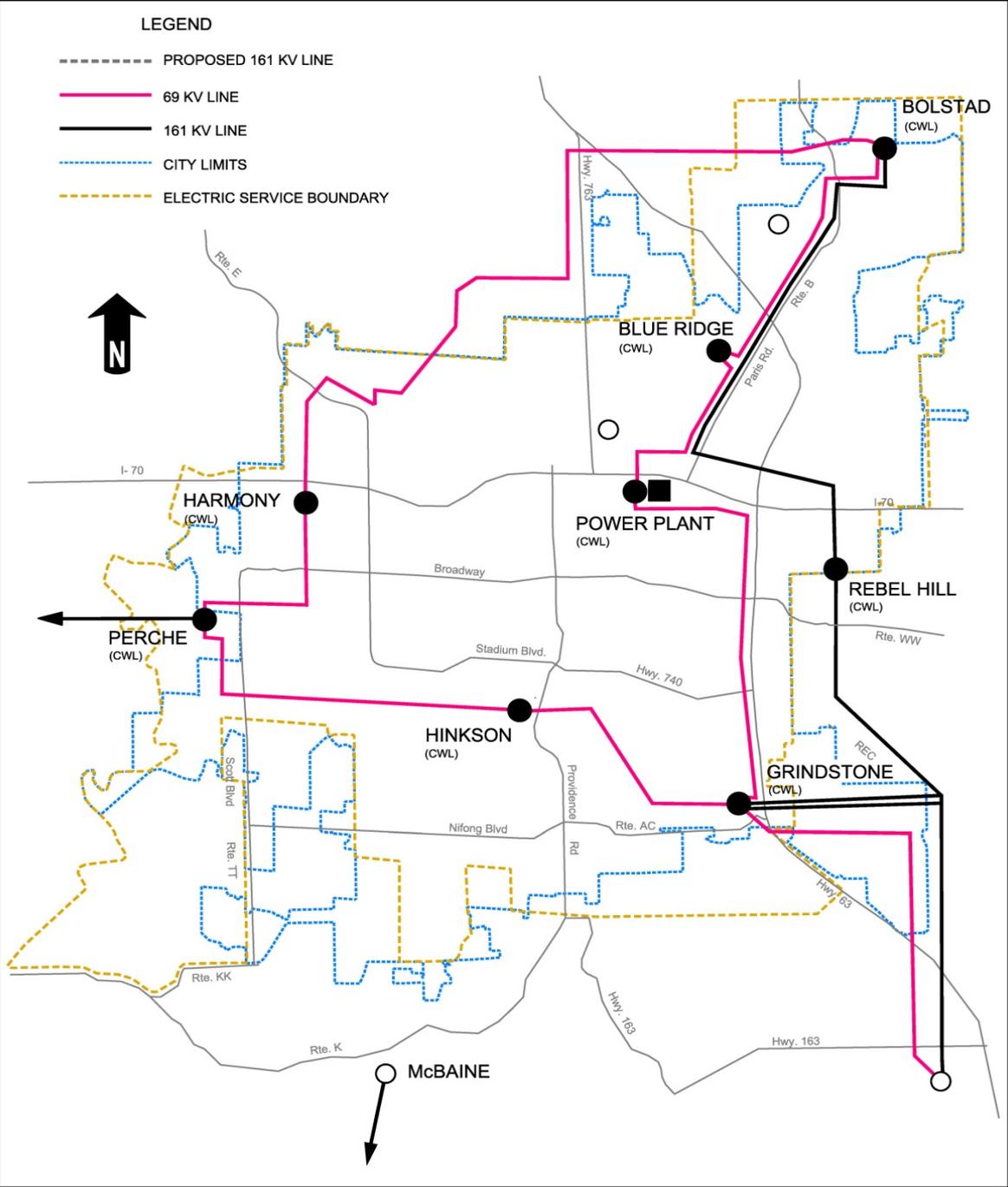
- 2007 – Reliability Concern Identified
  - Water & Light identified weaknesses in the high-voltage electrical transmission lines around the City of Columbia that result in overloads on the 69 kilovolt (kV) system. This is a “reliability” concern.
    - As a registered entity within NERC, The City of Columbia is required by law to maintain reliability. Not doing so can result in extremely expensive fines.
  - Options for addressing this reliability concern were:
    1. Construction of a new generation station (power plant)
    2. Limit electrical service to new customers
    3. Construction of new transmission lines
  - Water & Light determined that constructing new transmission lines was the most feasible option in this case.



# Background



- 2007 – Load Growth Concerns Identified
  - Load growth in the southern portion of Water & Light’s electric service territory has reached the capacity limits of the electrical power substations serving the area. This area of town needs a new substation to continue serving loads as the city grows.

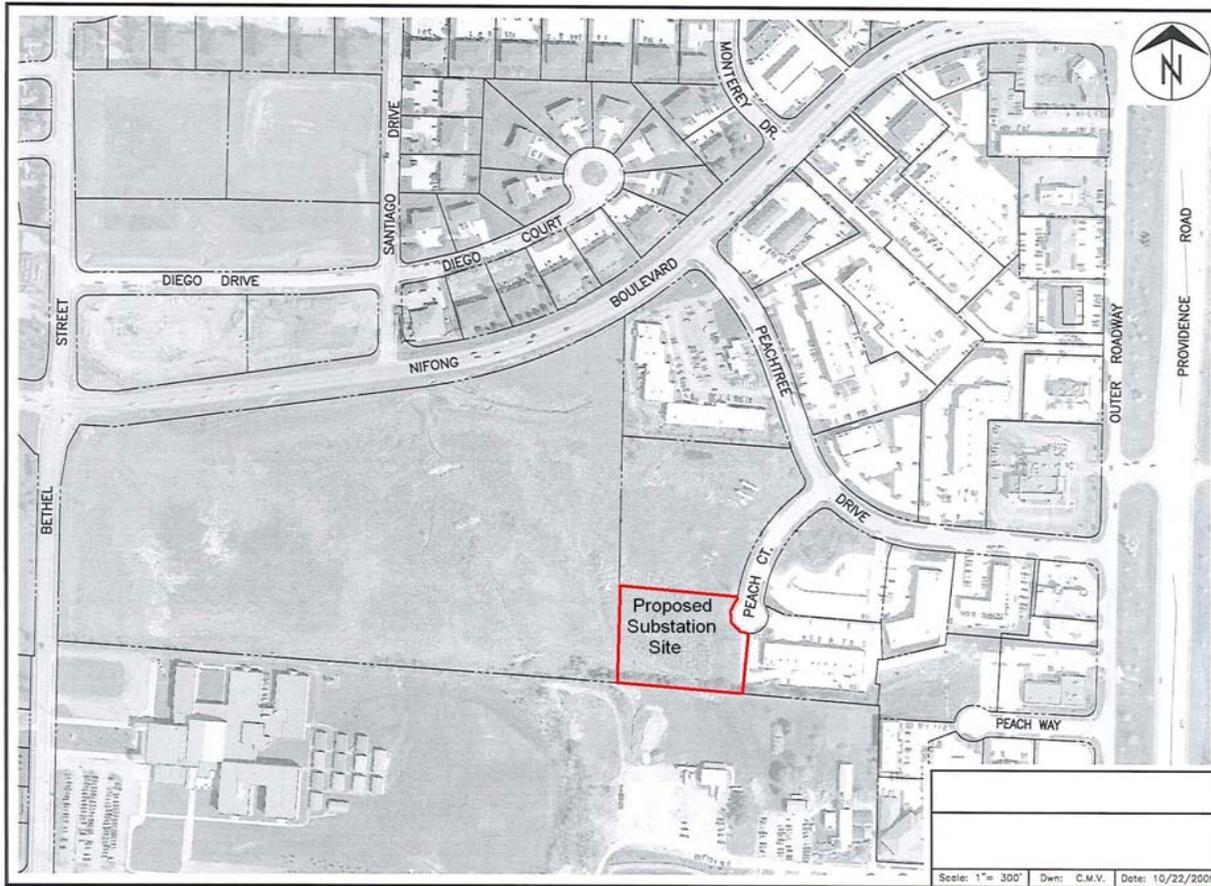


# Mill Creek Substation Location

4005 Peach Ct

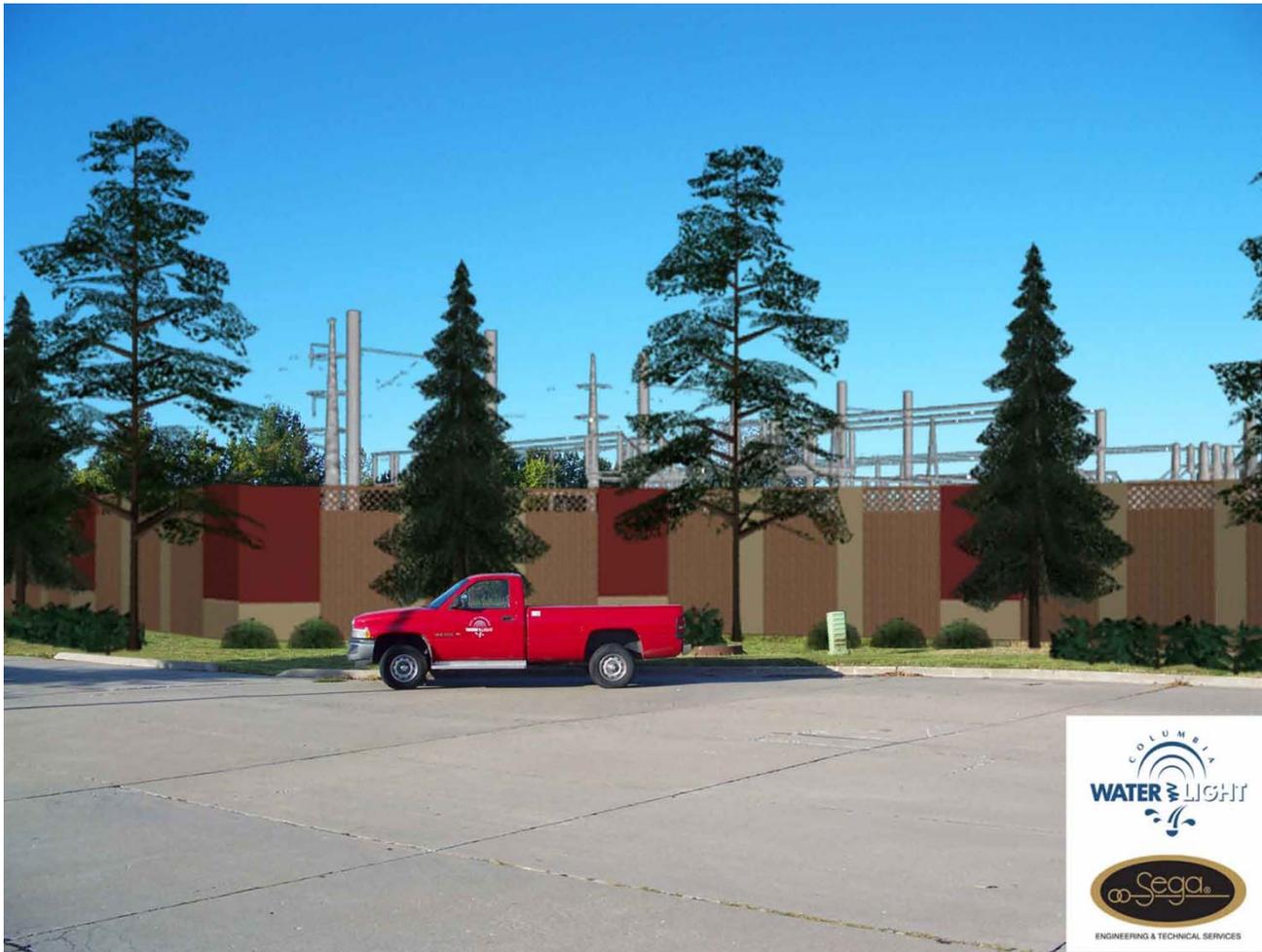


Substation site  
purchased from  
landowner July 2010



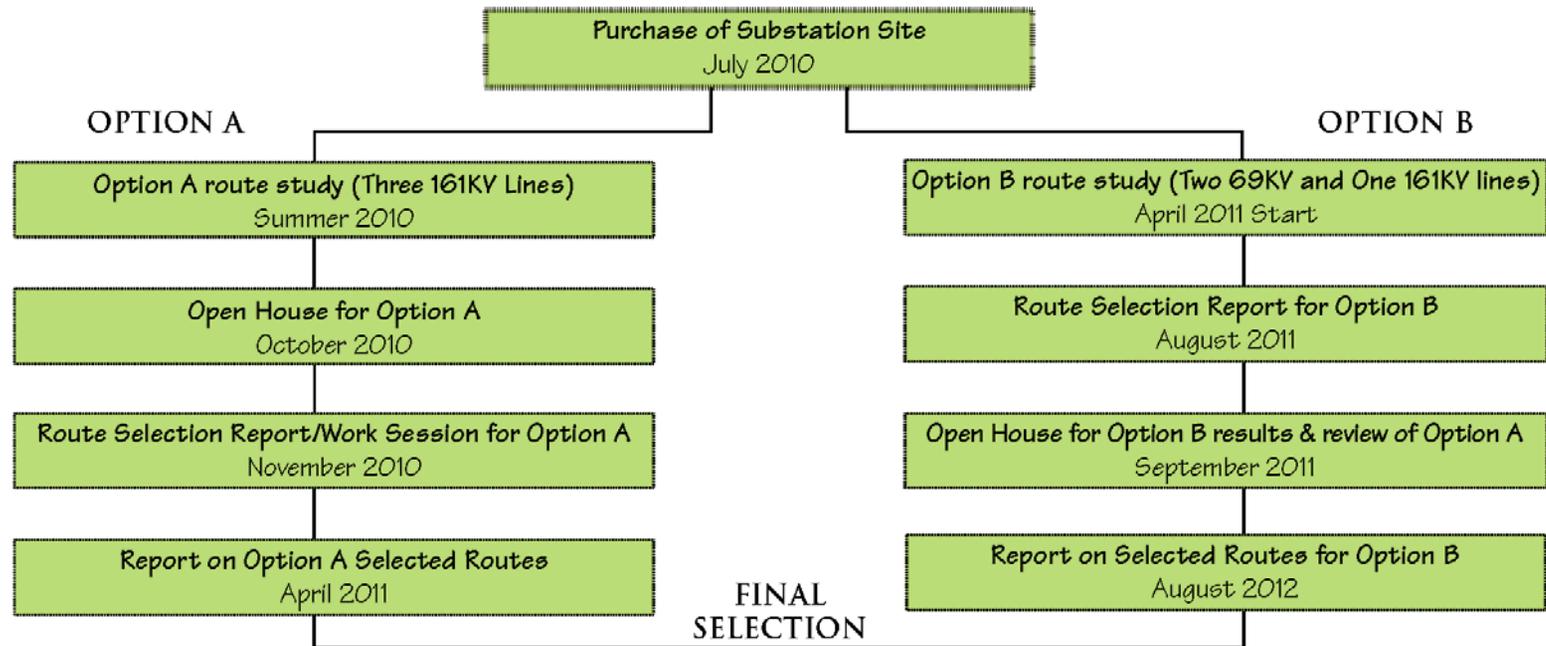
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# Mill Creek Substation

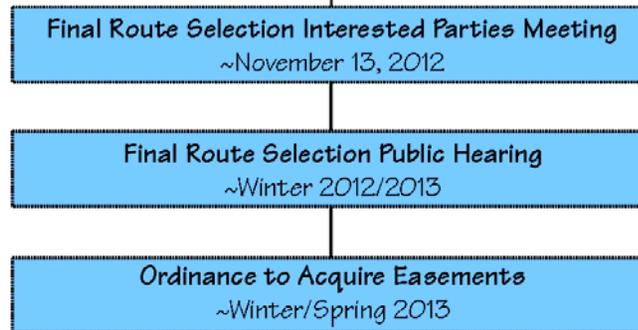


# CITY OF COLUMBIA COLUMBIA WATER & LIGHT

## Mill Creek Substation Transmission Line Routing Project Time Line



Timeline is subject to revisions  
OCTOBER 2012



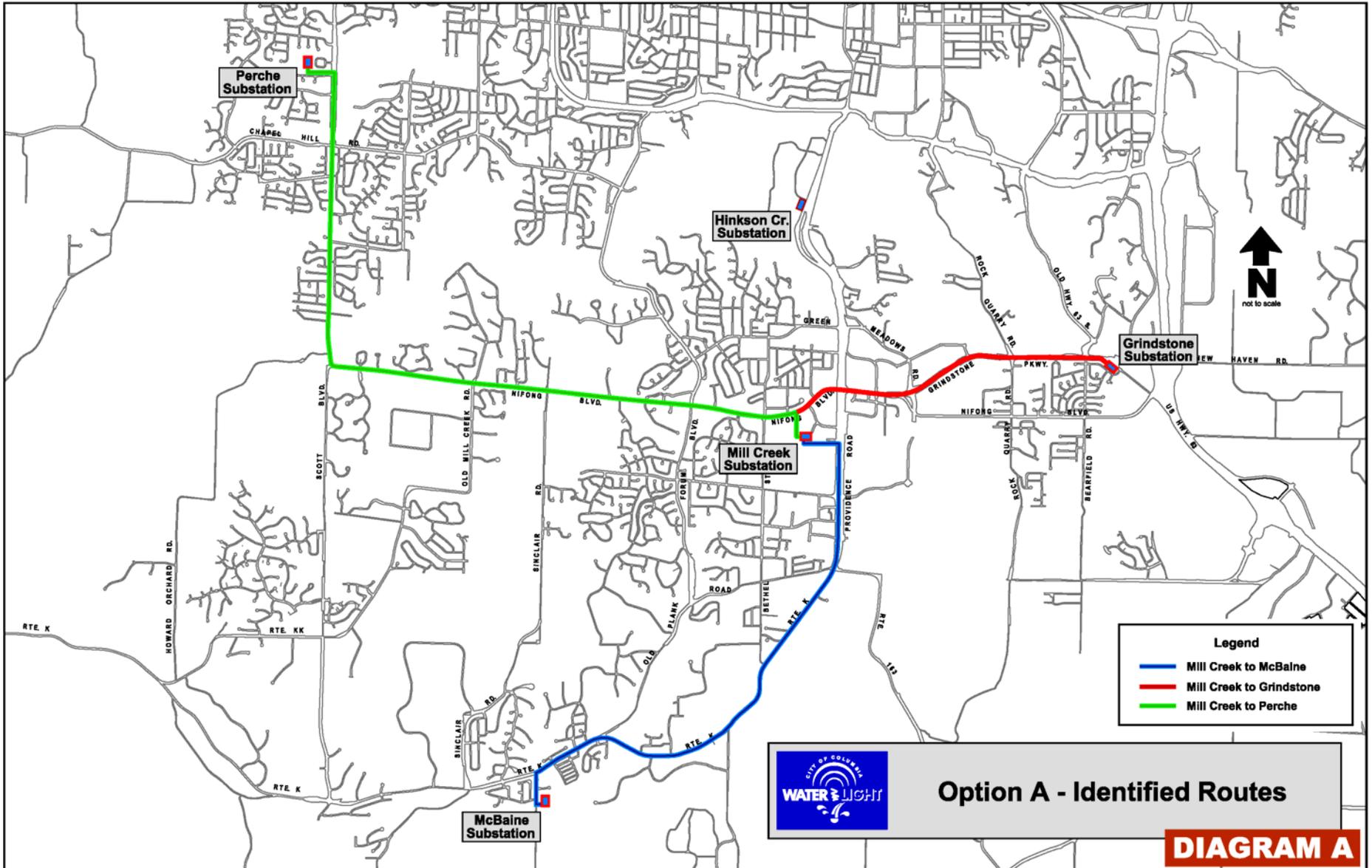
OPTION A— First Route Selection Study  
OPTION B— Council suggested changes  
to Route Selection Study

## Option A



- At the open house meeting in October 2010, Water & Light presented the Option A routes and all route options.
- Since that time, Water & Light has analyzed public feedback and used those results to build the criteria in a decision matrix.
- Water & Light presented the routes identified by the decision matrix to Council in April 2011

# Option A Identified Routes

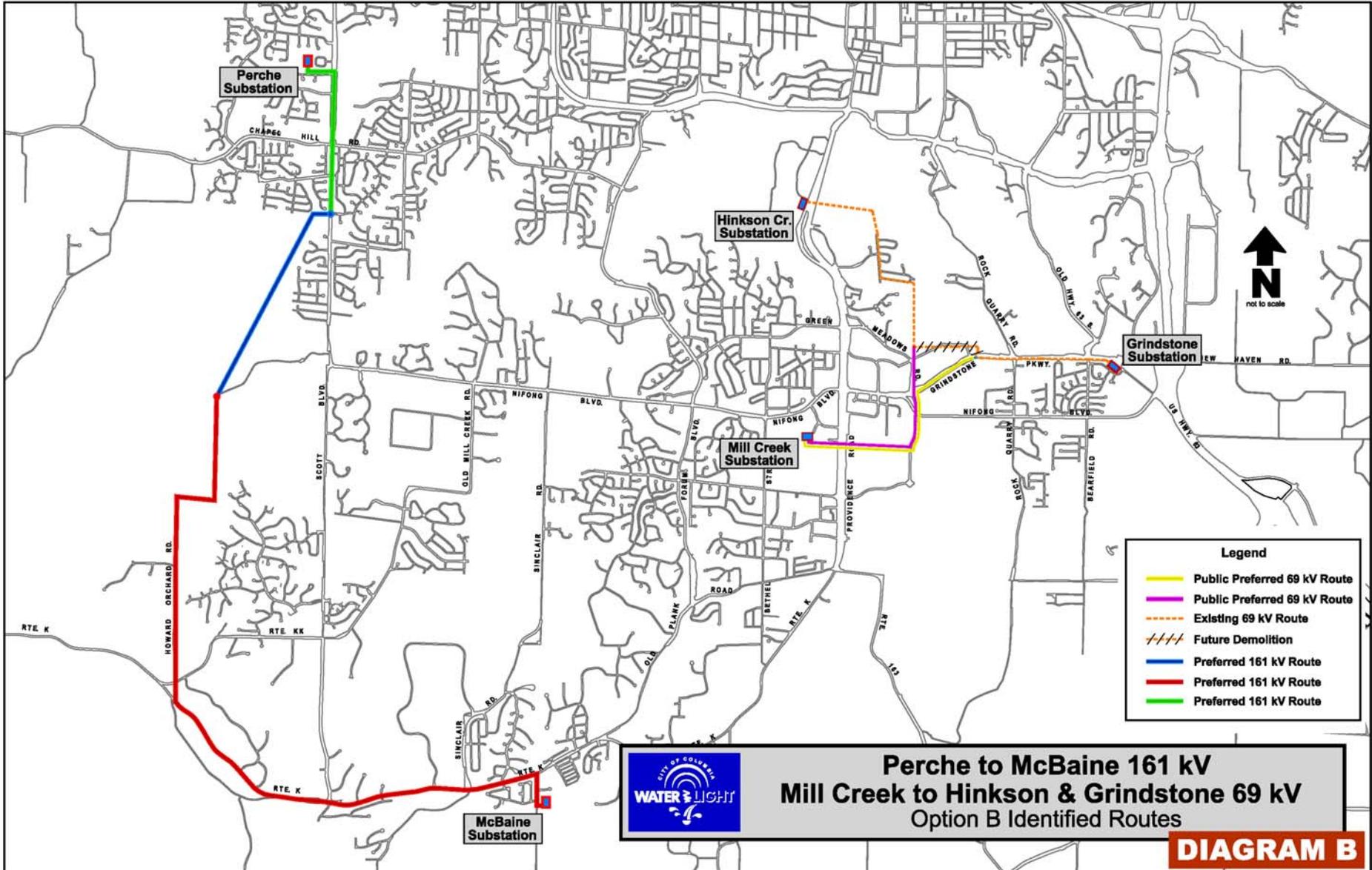


## Option B



- At the open house meeting in last October, Water & Light presented the Option B routes and all route options.
- Since that time, Water & Light has analyzed public feedback and used those results to build the criteria in a decision matrix.
- Water & Light presented the routes identified by the decision matrix to Council in August 2012

# Option B Identified Routes



**Perche to McBaine 161 kV**  
**Mill Creek to Hinkson & Grindstone 69 kV**  
 Option B Identified Routes

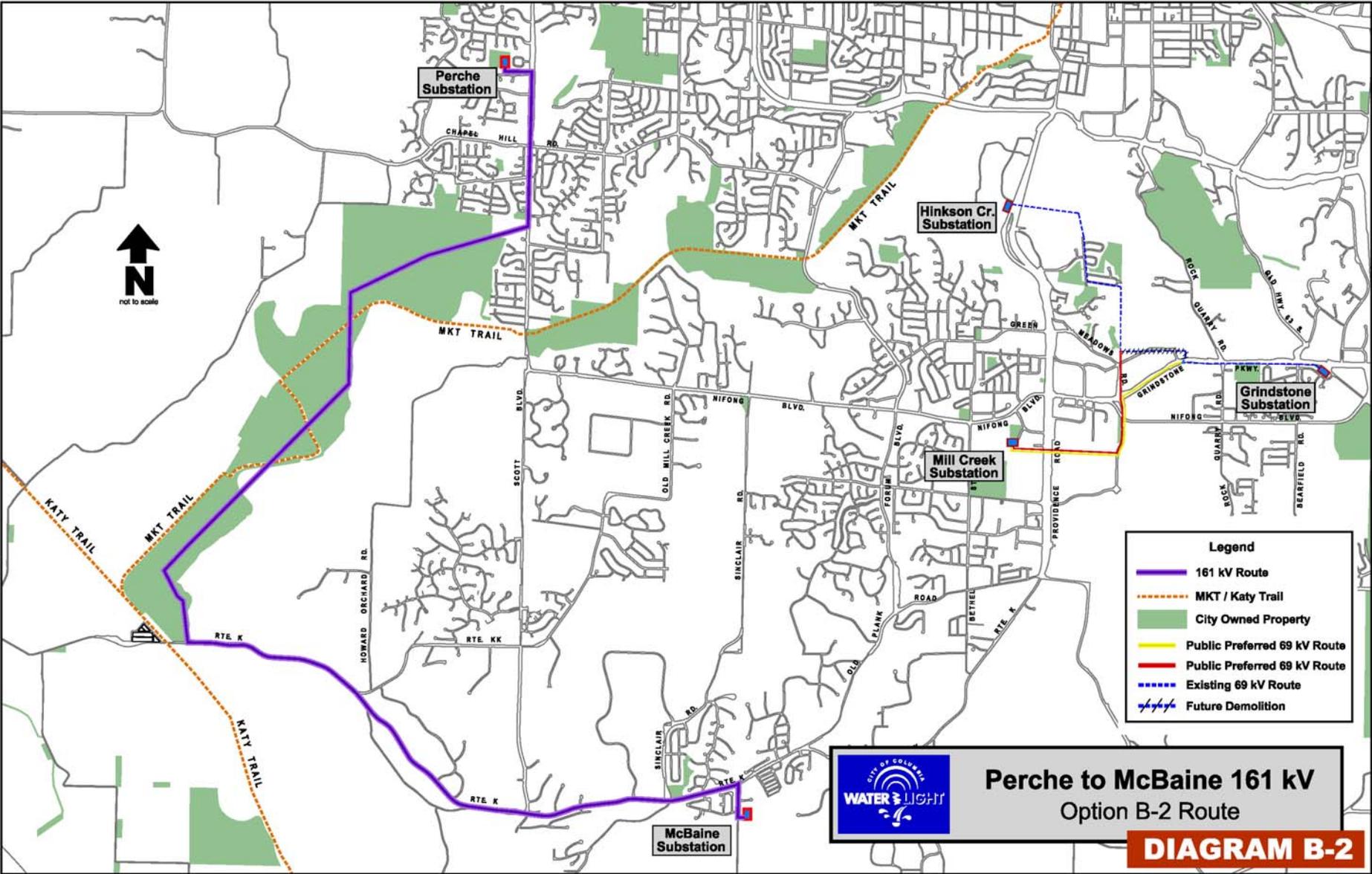
**DIAGRAM B**

## Option B-2



- Considered as an alternative route for Option B McBaine to Perche Creek 161 kV in order to utilize existing city-owned property.
- 37% of alignment could be constructed on city-owned property
- This route is 28% longer than the identified route for Option B
- This route was not initially considered due to the extended length and proximity to the Katy Trail and the MKT Trail. This route would parallel significant portions of the MKT Trail.

# Option B-2




**Perche to McBaine 161 kV**  
 Option B-2 Route  
**DIAGRAM B-2**

# Option A



- Advantages from an engineering/utility standpoint
  - Best Option for supporting long-term load growth in the southwest area of Columbia, including the University of Missouri.
  - Utilizes developed right-of-way corridors and is the easiest Option to maintain.
  - Provides greater reliability with fewer contingencies resulting in outages than other Options.
- Disadvantages from an engineering/utility standpoint
  - No engineering disadvantages identified compared to the other options

## Option B



- Advantages from an engineering/utility standpoint
  - Technically solves our current reliability problem
  - Utilizes some existing transmission paths
  - Slightly shorter overall construction
- Disadvantages from an engineering/utility standpoint
  - The system will have to be upgraded again in the foreseeable future to support load growth and reliability
    - Less reliable: more contingencies result in overloads on the 69 kV system in future models
    - Long-term planning will require additional construction (more costs)
  - Difficult to access/maintain due to cross-country paths

## Option B-2



- Advantages from an engineering/utility standpoint
  - Same as Option B
  - Utilizes existing City-owned property to a greater extent than Option B
  - Easement costs are anticipated to be lower than Option B
- Disadvantages from an engineering/utility standpoint
  - Same as Option B
  - May disturb regulated wetlands during construction and maintenance
  - Longer, in length and more angles than Option B

# Undergrounding the lines



- Advantages
  - Less noticeable
  - Less opportunities for physical damage to the lines due to weather and other circumstances
  - Less overhead vegetation management concerns in regards to fall-in risks
- Disadvantages
  - 7 to 10 times more expensive
  - Half the in-service life as compared to overhead lines
  - Labor intensive and more expensive maintenance
  - Invasive construction will result in serious property disturbance
  - Vegetation management will require customers to keep trees and shrubs within the vicinity of the underground line to be completely removed and kept clear
  - Restrictive land development requirements over and near routes

# Costs



- Electric system projects are paid through utility rates **not** through tax revenues
- Lowest-cost funding method is through a voter-approved bond issue
- Undergrounding the lines will be 7-10 times more expensive than constructing them overhead
- Easement costs will add 6-10% to the total project costs. These numbers are not reflected in the construction and engineering cost estimates.
- Option A includes more 161 kV lines which will meet electric demands for a longer timeframe

# Estimated Construction Costs

Columbia Missouri Proposed Transmission Line Project  
 construction cost estimates for various options being considered  
 November 2012

*Option A - 12.07 Miles of 161 Kilovolt Transmission Lines*

*Option B - 2.97 Miles of 69 Kilovolt Transmission Lines and 6.99 Miles of 161 Kilovolt Transmission Lines*

*Option B2 - 2.97 Miles of 69 Kilovolt Transmission Lines and 9.84 miles of 161 Kilovolt Transmission Lines*

	Option A	Option B	Option B-2
Estimated years before more improvements needed	20 +	10 to 20	10 to 20
Total Miles of Transmission 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	\$12,219,788
Total Cost Underground	\$91,898,566	\$75,833,448	\$97,532,778
Total Construction Cost Per Customer Overhead	\$283.43	\$219.04	\$263.68
Total Construction Cost Per Customer Underground	\$1,982.97	\$1,636.32	\$2,104.54
Cost Per Customer Per Month for 20 Years Overhead	\$1.18	\$0.91	\$1.10
Cost Per Customer Per Month for 20 Years Underground	\$8.26	\$6.82	\$8.77
Average Monthly Residential Electric Bill w/out Electric Heating (current)	\$76.42	\$76.42	\$76.42
Residential Rate Increase w/ 20 Year Voter Approved Bond - Overhead	1.5%	1.2%	1.4%
Residential Rate Increase w/ 20 Year Voter Approved Bond - Underground	10.8%	8.9%	11.5%

**NOTES:**

These costs do not include estimates for easement acquisition.

Easements will add 6% to 10% to the total project cost.

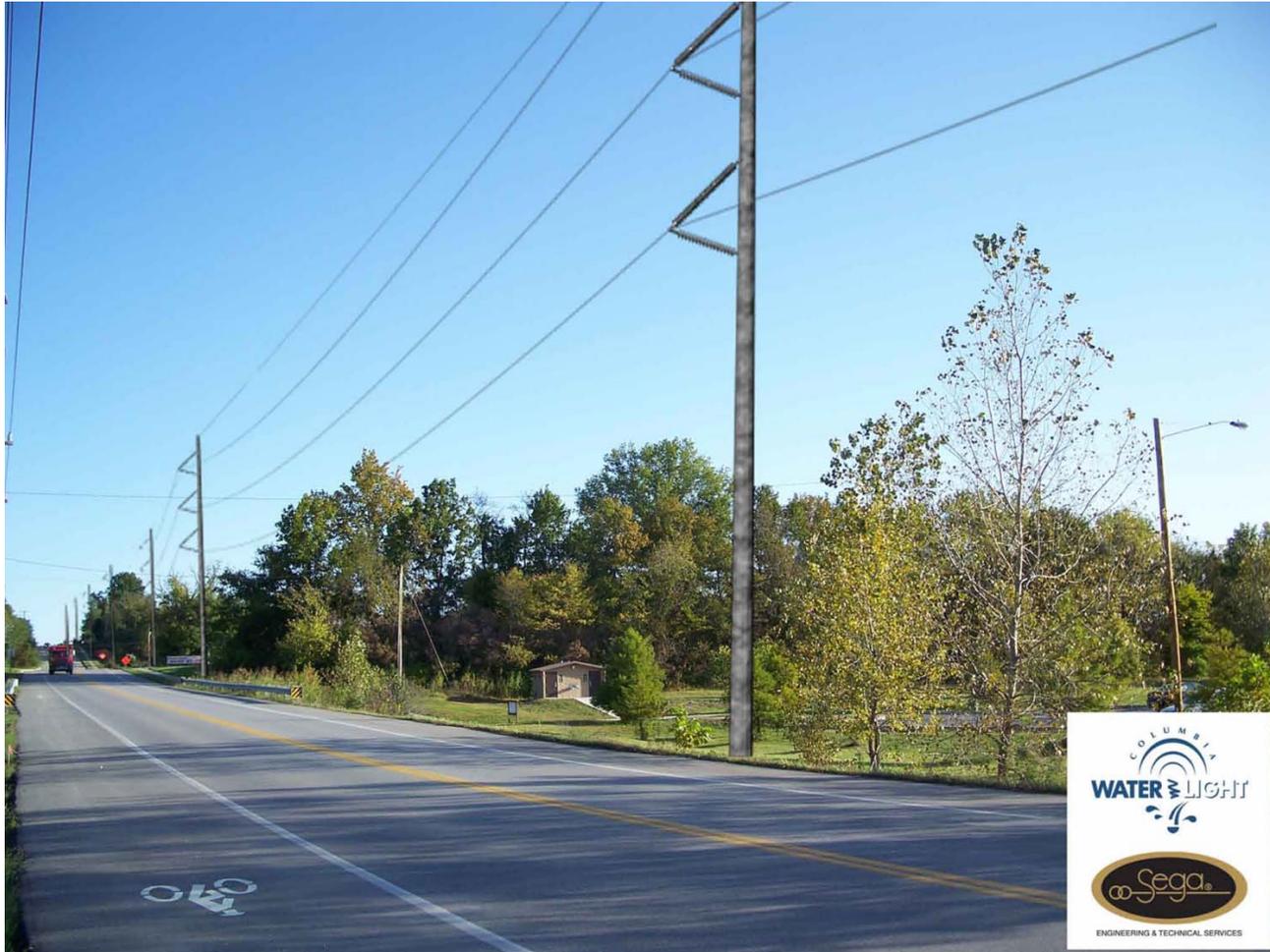
Option A includes more 161 kV lines which will meet electric demands for a longer time frame

# Feedback: what is the biggest concern for the community?

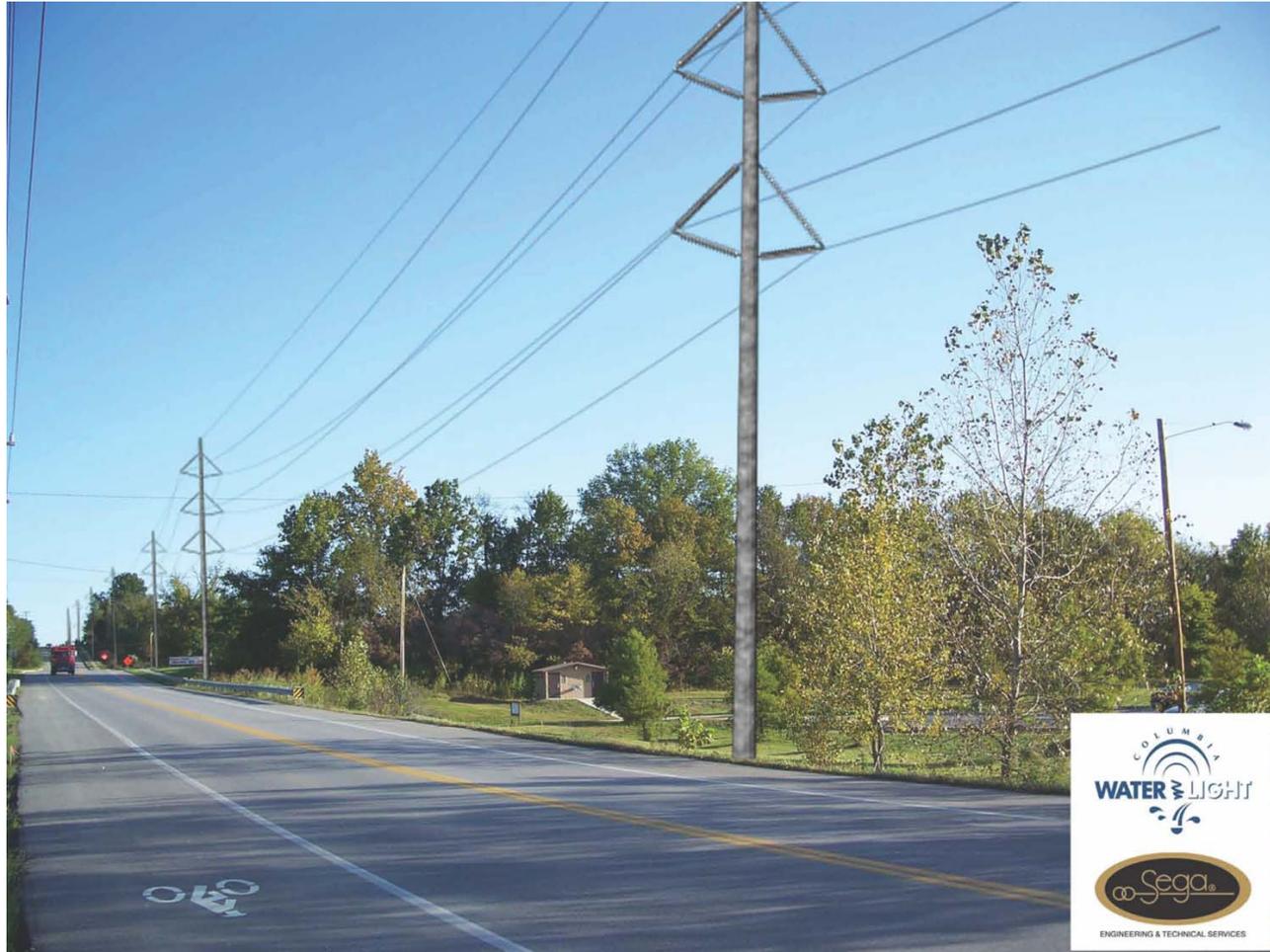


- Rate impact?
- Long term solution?
- Aesthetics?
- Property value?
- Your responses in the online questionnaire will directly determine what is presented to council as the most publicly acceptable option for this project.
  - <http://tinyurl.com/columbiaelectric>

# Single Circuit Line

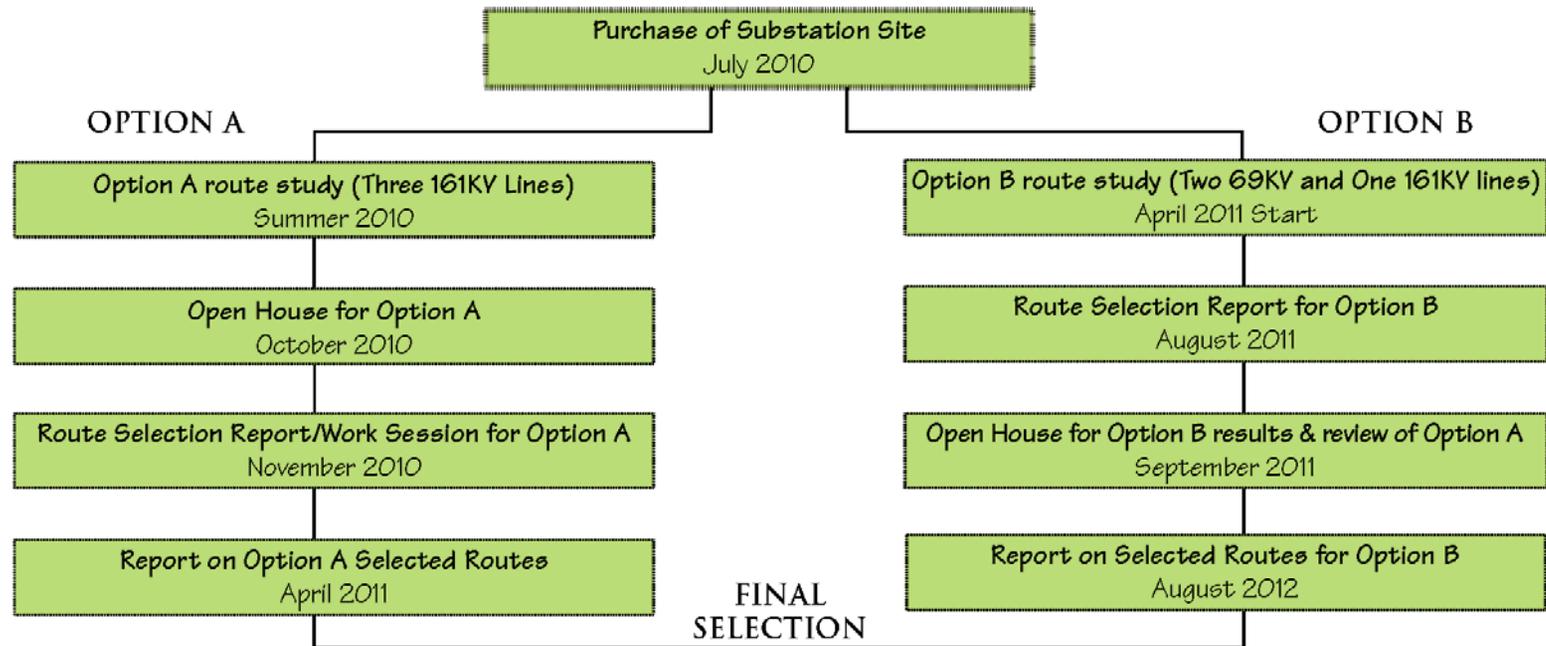


# Double Circuit Line

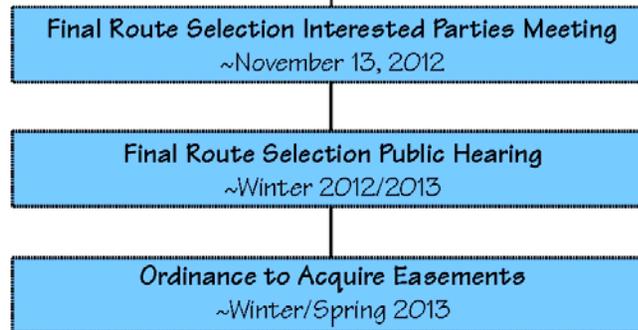


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## Next Phase of Project



- Tabulate results from tonight's open house questionnaire
- Use questionnaire data to construct the Option A vs B vs B-2 transmission line route "decision matrix"
- Report to Council with the results of the decision matrix
- Council will direct Water & Light on the next steps
- We will accept feedback from the online questionnaire until December 31st



Questions?